

10 CFR 52.103(g) Basis Document

[Plant name]

[Docket #]

[License #]

This document describes the basis for the U.S. Nuclear Regulatory Commission (NRC) staff's determination that the acceptance criteria in combined license [license #], Appendix C, [enter title] are met. This determination will be used to support a formal finding under Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.103(g), that all acceptance criteria in the combined license are met, which allows operation of the facility to commence.

[As discussed in NEI 08-01, "Industry Guideline for the ITAAC [inspections, tests, analysis, and acceptance criteria] Closure Process Under 10 CFR Part 52,"] the licensee's All ITAAC Complete notification, required per 10 CFR 52.99(c)(4) and received on [date], informed the staff that: [1) all inspections, tests, and analyses (ITA) in the combined license have been completed, 2) all acceptance criteria are met, 3) all ITAAC Closure Notifications (ICNs) have been submitted, 4) the licensee is not aware of any condition warranting submission of an ITAAC Post-Closure Notification (PCN), and 5) the licensee is maintaining the successful completion of all ITAAC pending the NRC's 10 CFR 52.103(g) finding. {Update paragraph based on content of the all ITAAC complete notification as required}].

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1.0 RECOMMENDATION

The staff has determined that [licensee name] has met all the acceptance criteria in Appendix C of the [plant name] combined license [license #].

The staff therefore recommends that the [Director, Office of Nuclear Reactor Regulation] issue an affirmative finding, that the acceptance criteria are met under 10 CFR 52.103(g), which will allow operation of the facility to commence.

2.0 GENERAL DISCUSSION

Section 185b. (42 USC 2235(b)) of the Atomic Energy Act of 1954, as amended (AEA), and 10 CFR 52.97(b) require that the Commission identify within the combined license the inspections, tests, and analyses, including those applicable to emergency planning, that the licensee shall perform, and the acceptance criteria that, if met, are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the AEA, and the Commission's rules and regulations. To fulfill this requirement, the Commission included ITAAC in Appendix C of the combined license for [plant name].

Following issuance of the combined license, Section 185b. requires that the Commission ensure that the prescribed inspections, tests, and analyses are performed, and prior to operation of the facility, find that the prescribed acceptance criteria are met. The NRC codified the requirement to ensure completion of the ITA in 10 CFR 52.99(e) and codified the requirement regarding the finding that the acceptance criteria are met in 10 CFR 52.103(g).

The staff implemented a two-pronged approach to fulfill these requirements. First, the staff reviewed 100 percent of the licensee's ICNs submitted under 10 CFR 52.99(c)(1). These reviews verified the licensee provided a sufficient basis to demonstrate that the ITA was performed as required and that the results met the prescribed acceptance criteria. [The staff also reviewed 100 percent of the ITAAC post-closure notifications (IPCNs) submitted under 10 CFR 52.99(c)(2) to verify that the ITAAC were still satisfied notwithstanding new, material information.] Second, the staff performed independent inspections of a carefully selected sample of ITAAC to independently verify: a) the licensee's performance of the ITA and b) that the obtained results met the prescribed acceptance criteria. Additionally, these inspections also verified the licensee: (1) had quality construction programs, processes, and procedures, (2) provided adequate quality assurance oversight of construction activities, and (3) identified and corrected conditions adverse to quality. Moreover, a sample of the ICNs were inspected against their associated closure packages to verify the accuracy of the information reported within the ICNs.

The staff's efforts to verify that [licensee name] performed the required inspections, tests, and analyses and met all the acceptance criteria in Appendix C of combined license [license #] was performed through ongoing activities that commenced prior to issuance of the combined license and which were drawn to a conclusion following submission of the licensee's "All ITAAC Complete" notification on [date], pursuant to 10 CFR 52.99(c)(4).

As discussed below in Sections 3 and 4, the principal basis for the staff's determination that the acceptance criteria are met is the staff's review of the licensee's ITAAC notifications under 10 CFR 52.99(c) coupled with the results of the staff's oversight activities. These oversight activities included: construction inspections, vendor inspections, activities of the on-site resident inspectors, public meetings, and the routine and periodic assessment of the licensee's performance.

The Commission, in the Staff Requirements Memorandum (SRM) for SECY-13-0033, delegated the responsibility for the 10 CFR 52.103(g) finding to the staff. Pursuant to 10 CFR 52.103(h), after making the 10 CFR 52.103(g) finding, the ITAAC do not, by virtue of their inclusion in the combined license, constitute regulatory requirements for the licensee. All ITAAC expire upon final Commission action in the proceeding[, **except for the specific ITAAC for which the Commission has granted a hearing under 10 CFR 52.103(a)**].

While ITAAC are no longer requirements after the 10 CFR 52.103(g) finding, subsequent changes to the facility or procedures described in the final safety analysis report (as updated) must comply with the requirements in 10 CFR 52.98(e) or (f), as applicable.

The technical specifications in the combined license [**license #**], Appendix A, [**title**] become effective upon a finding that the acceptance criteria in the license (ITAAC) are met in accordance with 10 CFR 52.103(g).

3.0 ITAAC NOTIFICATIONS - 10 CFR 52.99(c)

10 CFR 52.99(c); "Licensee notifications," requires that the licensee submit to the NRC the following ITAAC notifications:

- 10 CFR 52.99(c)(1) - ITAAC Closure Notification
- 10 CFR 52.99(c)(2) - ITAAC Post Closure Notification
- 10 CFR 52.99(c)(3) - Uncompleted ITAAC Notification
- 10 CFR 52.99(c)(4) - All ITAAC Complete Notification

3.1 ITAAC CLOSURE NOTIFICATION – 10 CFR 52.99(c)(1)

After each ITAAC was completed, the licensee pursuant to 10 CFR 52.99(c)(1) submitted to the NRC an ICN, which the staff reviewed in accordance with the Office of New Reactors (NRO) Office Instruction (OI) NRO-REG-103, "Inspections, Tests, Analyses, and Acceptance Criteria Closure Verification Process." The staff also considered the ITAAC closure guidance in NEI 08-01. NEI 08-01 was developed in a lengthy process involving numerous public meetings and extensive comments from the staff. In Regulatory Guide 1.215, "Guidance for ITAAC Closure Under 10 CFR Part 52," the NRC approved the use of the NEI 08-01, subject to certain exceptions and additional guidance stated in RG 1.215.

In accordance with the 2007 final rule amending Part 52 (72 FR 49352, 49366; August 28, 2007), the NRC expects the notification to be sufficiently complete and detailed for a reasonable person to understand the bases for the licensee's representation that the inspections, tests, and analyses have been successfully completed and the acceptance criteria met. A reasonable person is defined in

NEI 08-01 as someone who is appropriately informed about and familiar with applicable NRC regulations, licensing requirements, and technical and/or engineering concepts related to ITAAC.

When evaluating for “sufficient information,” the staff required, at a minimum, a summary description of the basis for the licensee’s conclusion that the inspections, tests, and/or analyses were performed, and that the prescribed acceptance criteria are met. A simple statement that the ITA activities were performed, and/or that the acceptance criteria of an ITAAC are met was not acceptable. The “summary description” had to address at a minimum: (1) the full scope of the ITAAC, (2) the licensee’s ITAAC completion methodology, and (3) an ITAAC’s distinctive aspects. The staff, to aid in its review, referred to the guidance and example ITAAC notifications in NEI 08-01.

These ICN reviews did not involve independent verification of whether the licensee had adequately performed the ITAAC activities described in the notification, as this is an inspection function discussed below in Section 4. Likewise, a “closure verification review” was not meant to be an in-depth “technical review” of all aspects of an ITAAC’s implementation. Rather, it was an assessment of whether the information provided was sufficient to support the licensee’s assertion that the ITA were successfully completed and the acceptance criteria are met.

For each ICN, the reviewer verified the licensee performed the inspections, tests, and analyses as required and demonstrated it had met the ITAAC’s acceptance criteria. The reviewer accomplished this by comparing the information in the notification with the performance requirement(s) specified in the ITA and the prescribed acceptance criteria. The ITA may have required only one, or a combination of up to three different types of activities: (1) inspections, (2) tests, and (3) analyses. These activities, including other terms commonly used in the ITAAC, are defined in Appendix C of the combined license. The reviewer verified the activities that the licensee performed, as stated in the ICN, agreed with those definitions and matched the activities specified in the ITAAC. For example, if the ITA required an inspection and an analysis, the reviewer verified that the ICN indicated the licensee performed both activities. Additional activities may have been performed; however, if the licensee implemented fewer activities than required in the ITA, the ITAAC was not successfully performed and the licensee’s ITAAC Closure Notification was rejected and a new ITAAC Closure Notification submitted that addressed all required activities.

The ITAAC’s acceptance criteria may have required a specific performance, physical condition, test, or analysis result for a structure, system, or component (SSC) in order to demonstrate that the design requirement stated in the design commitment for the ITAAC is met. Each reviewer verified that for each ITAAC the outcome achieved in fact met the prescribed acceptance criteria.

The ITAAC closure Verification and Evaluation Form served to guide and document the staff’s closure review. For each ICN the staff verified:

- the correct licensee, plant name, unit number and NRC docket number were included on the ICN,
- that the ITAAC in the ICN agreed verbatim with the ITAAC contained in the current approved version of the combined license at the time of ICN submittal,

- that the ITAAC determination basis (IDB) contained sufficient information, including summarizing the methodology for performing the ITAAC, to demonstrate the licensee had successfully performed the inspection, test, and/or analysis stated in the ITAAC,
- that the methodology described in the ICN's IDB was either reviewed and approved by the NRC or was acceptable based on sound scientific, mathematical, and/or engineering principles, and would be repeatable, if necessary, without any significant change to the reported result,
- that the IDB of the ICN contained sufficient information to demonstrate the licensee had fully met the entire acceptance criterion stated in the ITAAC,
- that all planned NRC inspections were completed for the ITAAC,
- that NRC inspectors identified no ITAAC findings for the ITAAC or any ITAAC findings were closed (an ITAAC Finding is an NRC inspection finding that is associated with a specific ITAAC and is material to the ITAAC acceptance criteria),
- for ITAAC specified as being performed on as-built SSCs, that an acceptable technical justification was provided if the inspections, tests, and/or analyses were performed at locations other than the final installed location, and
- that completion of the ITAAC was affirmed by the signature of a licensee representative.

ITAAC notifications that lacked sufficient information to demonstrate the licensee had successfully performed the ITAAC were rejected by the staff. The staff communicated this to the licensee either informally through public meetings or formally through written correspondence. Whenever the staff rejected an ICN, the licensee was always required to revise the ICN to address the insufficient information and submit a new ICN of record to the NRC.

The closure verification status for each ITAAC is tracked in the NRC's Verification of ITAAC Closure, Evaluation, and Status (VOICES) database. VOICES contains pre-populated entries for each ITAAC entry in Appendix C of the combined license. As the licensee completed the ITAAC, its associated VOICES entry was updated with the ITAAC's status and web links to the ICN submittal, the completed Verification and Evaluation Form, and any NRC inspection reports for that ITAAC.

Throughout the construction period, the staff periodically posted the licensee's ICNs and the staff's determinations on whether the ITAAC were successfully completed in an ITAAC Status Report posted on the NRC's public website. In addition, up until the last date for submission of requests for a hearing under 10 CFR 52.103(a), the staff, at appropriate intervals during construction, published *Federal Register notices* of its determinations that ITAAC were successfully completed pursuant to 10 CFR 52.99(e).

The licensee's ICN for each ITAAC in Appendix C of combined license [license #], along with the associated Verification and Evaluation Form completed by the staff, may be accessed via the final ITAAC Status Report for [plant name], available at [Agencywide Documents Access and Management System (ADAMS) Accession number for final ITAAC Status Report].

The [plant name] combined license [license #] originally contained [number] initial ITAAC entries. [number of ITAAC] of the ITAAC entries were from [Revision # of the [design

[name] design control document (DCD) and # were [plant name]] site-specific ITAAC. Throughout the construction period, the NRC approved license amendment and exemption requests submitted by the licensee that modified the number and content of the ITAAC. At the time of receipt of the “All ITAAC Complete” notification on [date], the [plant name] combined license [license #] was at license amendment [number] and Appendix C contained [number] ITAAC.

For each of the [number] ITAAC in the license, the staff verified that a corresponding ITAAC entry existed in VOICES, the licensee had submitted the required ICN, and the staff had verified that the ICN had sufficient information to demonstrate the ITA were performed and the acceptance criteria are met.

The NRC staff’s periodic determinations of successful ITAAC completion were based on information available at the time and are subject to the licensee’s ability to maintain successful ITAAC completion. The ITAAC closure process is not finalized for such ITAAC until the NRC makes an affirmative finding under 10 CFR 52.103(g).

3.2 ITAAC POST-CLOSURE NOTIFICATION – 10 CFR 52.99(c)(2)

Subsequent to the submittal of an ICN, if the basis for ITAAC completion is materially altered by new information, the licensee is required by 10 CFR 52.99(c)(2) to notify the NRC of this new, material information in an IPCN. This notification must be submitted in a timely manner and must demonstrate that, notwithstanding the new information, the ITAAC has been successfully completed.

A post-closure notification need not be submitted following all maintenance or repairs affecting an SSC covered by an ITAAC. Rather an IPCN is only required if one of five thresholds are exceeded. These thresholds were discussed, with numerous examples, in NEI 08-01. The rule creating 10 CFR 52.99(c)(2) (77 FR 51880, 51888; August 28, 2012) discussed five ITAAC maintenance thresholds for when an IPCN would be required:

1. Material Error or Omission—Is there a material error or omission in the original ICN?
2. Post Work Verification—Will the post work verification use a significantly different approach than the original performance of the ITA as described in the original ICN?
3. Engineering Change—Will an engineering change be made that materially alters the determination that the acceptance criteria are met?
4. Additional Items to be Verified—Will there be additional items that need to be verified through the ITAAC?
5. Complete and Valid ITAAC Closure Representation—Will any other licensee activities materially alter the ITAAC determination basis?

If an ITAAC maintenance threshold has been exceeded, the licensee may need to take actions such as 1) reperformance of the inspections, tests, and/or analyses, 2) performance of an alternative method of verification, or 3) submission of a license amendment and possibly an exemption request.

As discussed in NEI 08-01, a licensee should voluntarily notify the NRC of new information that materially alters the determination basis for a previously completed

ITAAC within 7 days of discovery and within 24 hours of discovery if the All ITAAC Complete notification has been submitted. In addition to these notifications, the staff's knowledge of the licensee's need to submit an IPCN was supplemented by the on-site construction resident inspector's daily review of the licensee's corrective action program documents. The staff also reviewed the results of the NRC's periodic inspections pursuant to inspection procedure (IP) 40600; "Licensee Program for Managing Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Closure," one aspect of which verified compliance with 10 CFR 52.99(c)(2).

[For each IPCN, the staff's review verified that the IPCN contained a description of the resolution of the circumstances surrounding the identification of the new material information, and that the IPCN provided sufficient information to demonstrate that, notwithstanding the new information, the prescribed inspections, tests, and or analyses were completed and the acceptance criteria met. The staff conducted its IPCN reviews in accordance with NRO-REG-103 and completed an associated Verification and Evaluation Form in a manner similar to that discussed above for ICNs.

The licensee's IPCNs along with the staff's completed Verification and Evaluation Forms may be accessed via the final ITAAC Status Report, available at [ADAMS Accession number for final ITAAC Status Report]].

3.3 UNCOMPLETED ITAAC CLOSURE NOTIFICATION - 10 CFR 52.99(c)(3)

For those ITAAC not completed as of 225 days before scheduled fuel load, 10 CFR 52.99(c)(3) requires the licensee to submit uncompleted ITAAC notifications (UINs) to the NRC by this date. UINs must provide sufficient information to demonstrate that the uncompleted ITAAC will be completed successfully.

The UINs principally serve to support the 10 CFR 52.103(a) hearing process by providing information to interested stakeholders and the public on how the licensee intends to accomplish the uncompleted inspections, tests, and analyses and demonstrate that it will meet the stated acceptance criteria. UINs did not play a formal role in the staff's determination on whether the acceptance criteria are met because for each UIN the licensee was required to submit an ICN after the ITAAC was completed.

[Though the NRC was not required to review the UINs, the staff agreed with the licensee's request that the staff review the UINs submitted by [licensee name] for [plant name]. These reviews provided for the early identification and resolution of issues related to the interpretation of ITAAC requirements, the ITAAC's scope, and the clarity and sufficiency of the information provided as the basis to demonstrate the licensee's planned performance of the ITAAC.]

The UINs [and the staff's associated UIN review checklist] may be accessed via the final ITAAC Status Report, available at [link to ADAMS document for final ITAAC Status Report]. [The results of the staff's UIN reviews were not published in the Federal Register.]

4.0 CONSTRUCTION REACTOR OVERSIGHT PROCESS (cROP)

The principal objective of the construction reactor oversight process (cROP) and its companion construction inspection program (CIP) is to provide reasonable assurance

that the facility had been constructed and will be operated in conformity with the license, the provisions of the AEA, and the Commission's rules and regulations.

To meet this objective, the staff inspected licensee activities and processes in the three strategic performance areas: construction reactor safety, operational readiness, and safeguards programs, which contain the following six cornerstones of safety (Figure 2):

- a. For the construction reactor safety area, the cornerstones of safety are as follows:
 - Design/Engineering: The objective of this cornerstone is to ensure that licensees adequately develop and implement programs and processes for design and engineering controls.
 - Procurement/Fabrication: The objective of this cornerstone is to ensure that licensees adequately develop and implement programs and processes for procurement and fabrication activities.
 - Construction/Installation: The objective of this cornerstone is to ensure that licensees adequately develop and implement programs and processes to ensure the construction and installation of facilities and structures, systems, and components are in accordance with the design.
 - Inspection/Testing: The objective of this cornerstone is to ensure that licensees adequately develop and implement programs and processes to inspect and test programs, facilities, and structures, systems, and components.
- b. For the operational readiness area, the cornerstone of safety is as follows:
 - Operational Programs: The objective of this cornerstone is to ensure that licensees adequately develop and implement the operational programs required by a license condition or regulation.
- c. For the safeguards programs area, the cornerstone of safety is as follows:
 - Security programs for construction inspection and operations: The objective of this cornerstone is to provide assurance that (1) fitness-for-duty issues do not adversely impact construction activities; and (2) the licensee's security programs use a defense-in-depth approach and can protect against the design basis threat of radiological sabotage from internal and external threats.

The cROP and the CIP were implemented per Inspection Manual Chapter (IMC) 2506, "Construction Reactor Oversight Process General Guidance and Basis Document"; IMC 2505, "Periodic Assessment of Construction Inspection Program Results"; IMC 2503, "Construction Inspection Program: Inspections of Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Related Work"; and IMC 2504, "Construction Inspection Program - Inspection of Construction and Operational Programs."

As applied to the ITAAC, the cROP and CIP aim to provide a sufficient basis to support a staff determination on whether the acceptance criteria in the combined license are met. This includes providing the necessary confidence that the licensee's ITAAC completion

and verification processes were effective and that the licensee's ITAAC notifications were sufficient and accurate.

Based on the CIP results and periodic assessments of the licensee's performance throughout construction per IMC 2505, the staff is confident that the stated objectives of the cROP and CIP were met, that the licensee's ITAAC completion and verification processes were effective and that the licensee's ITAAC notifications were sufficient and accurate to support the staff's 10 CFR 52.103(g) finding, as discussed below.

4.1 ITAAC Prioritization Process

While the scope of the NRC's inspection programs are comprehensive, 100% inspection was neither necessary nor efficient when evaluating licensee performance. For this reason, the NRC historically has relied on a sample-based inspection program. For [plant name], the construction inspection program focused on a select sample of pre-defined inspection targets (i.e., "Targeted ITAAC").

The methodology for prioritizing the ITAAC for inspection was based in part on a quantitative process called the Analytic Hierarchy Process (AHP). AHP is a method of comparison used to reduce the subjectivity in prioritization and provide structure to the decision making process. The prioritization process was managed such that the rating given each ITAAC correlated to the amount of assurance one could obtain from inspecting that ITAAC. In this way, it was not the ITAAC that were prioritized, but rather the value of inspecting that ITAAC, to maximize the agency's ability to detect any significant construction flaw.

Further detail on the AHP process is contained in the "Technical Report on the Prioritization of ITAAC" (ADAMS Accession No. ML060740006). The process of populating the ITAAC Matrix (Figure 1) and prioritizing the ITAAC for inspection is described in Office Instruction NRO-REG-102, "Prioritization of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for Inspection." The ITAAC selection approach assured that a diverse set of ITAAC were inspected such that the results of the inspection process were representative of the entire ITAAC population.

The grouping of ITAAC into a matrix supported the identification and use of consistent inspection guidance for similar ITAAC within a single design and was structured to integrate into the NRC inspection program certain complementary inspection activities that evaluated the licensee's control of the relevant construction processes.

As a planning tool, the ITAAC Matrix (Figure 1) identified 25 core inspection procedures (Table 1) that comprised a comprehensive set of construction programs and construction processes that the NRC believes encompass those combined license holder activities involved in the quality construction of a nuclear power plant. A review of the matrix's six column titles (i.e., the programmatic activities) and the 19 matrix row titles (i.e., the SSCs and process activities) reveals those activities that represent the technical disciplines and programmatic controls that were used not only to fabricate and install the SSCs, but also to check, test, and confirm that the completed as-built facility will perform as designed.

Three additional inspection procedures were added to provide inspection guidance for design acceptance criteria in the areas of safety-related piping design, pipe rupture

hazard analysis, and digital instrumentation and control (DI&C) system/software. A fourth was added for the Human Factors Engineering Integrated System Validation ITAAC. These procedures are also identified in Table 1.

The staff decided that all ITAAC related to security, emergency planning, and design acceptance criteria would be targeted for inspection; therefore, these ITAAC were excluded from the prioritization process. The remainder of the NRC's inspection sample focused on ITAAC activities determined to have a value of inspection, based on the output of the prioritization ranking process, equal to or greater than [0.4]. These pre-defined inspection targets (referred to as "Targeted ITAAC") comprised the CIP's baseline inspection program.

Changes to the targeted ITAAC population were made throughout construction in accordance with Appendix D of OI NRO-REG-102. These changes were made in response to issued license amendments that modified, added, or deleted ITAAC in Appendix C of the COL.

[Additional changes to the targeted ITAAC population were implemented in accordance with IMC 2506, Appendix B, Section B.03.13; "Process for the Modification of the ITAAC Target Set." These changes were made in response to the NRC's ongoing assessment of licensee performance and inspection results of the targeted ITAAC.]

Based on the initial targeting and subsequent changes thereto, the NRC targeted for inspection approximately [#]% of the [plant name] ITAAC population. The list of targeted ITAAC for [plant name] is available in ADAMS [ML#####] and on the NRC's public website.

4.2 Construction Inspection Program

The nature of ITAAC activities called for periodic inspections over the course of the entire construction project, with inspection timing corresponding to ongoing or recently completed licensee activities. The schedule for the staff's ITAAC-related inspections was periodically assessed, and inspections were re-prioritized as necessary to correspond with the current state of knowledge of the licensee's schedule and the licensee's performance. The need to adjust inspection samples was also periodically assessed per the guidance provided in IMC 2505.

To implement the CIP, inspection planning occurred well in advance of actual inspection and began with the development of inspection strategy documents for each ITAAC family. The inspection strategy documents included a description of the ITAAC family, inspection procedures to be used, applicable SSCs to be inspected, attributes of the inspection procedures to be completed to credit an inspection sample, a representative sample for each targeted ITAAC, inspection frequency (including a sample range and resource estimate), other planning considerations, and references.

The inspection of each targeted ITAAC was considered complete when the site-specific plan was completed. This means that, after adjustment by the assessment process, the necessary targeted ITAAC samples and associated programs were inspected, the SSCs designated in the plan were inspected, the designated steps of each row procedure were addressed, and the designated steps of each column procedure were addressed.

IMC 2506 defines an inspection finding as a performance deficiency of more than minor significance. A finding may or may not be associated with regulatory non-compliance and, therefore, may or may not result in a violation. There are two types of construction inspection findings that can be identified through implementation of the construction inspection program: ITAAC Finding and Construction Finding.

- An ITAAC Finding is a finding that is identified through the implementation of the construction inspection program that is associated with a specific ITAAC and is material to the ITAAC acceptance criteria.
- A Construction Finding is a finding that is identified through implementation of the construction inspection program that is not an ITAAC finding.

The staff verified each construction inspection finding was entered into the licensee's corrective action program. For each construction inspection finding determined to be an ITAAC Finding, the staff verified through subsequent inspection that the licensee adequately corrected the condition prior to closing out the ITAAC Finding.

Construction inspection findings were evaluated for significance in accordance with IMC 2519, "Construction Significance Determination Process [SDP]," and were assigned a color representing the significance of the finding. The color thresholds for the construction SDP were risk informed through the assignment of systems and structures by an expert panel to columns in the construction SDP matrix based on risk achievement worth values and other risk importance considerations. In addition, color thresholds were based on a qualitative measure of construction quality, which was defined through expert staff judgment. A description of each color threshold is as follows:

- Red (high safety or security significance) qualitatively indicates a decline in licensee performance that is associated with unacceptable quality of construction that provides no assurance that the plant is being constructed in accordance with its design in the area(s) associated with the finding.
- Yellow (substantial safety or security significance) qualitatively, indicates a decline in licensee performance that is still acceptable with cROP cornerstone objectives met, but with significant reduction in the assurance that the plant is being constructed in accordance with its design in the area(s) associated with the finding.
- White (low to moderate safety or security significance) qualitatively indicates an acceptable level of performance by the licensee, but outside the nominal risk range. Cornerstone objectives are met with minimal reduction in assurance that the plant is being constructed in accordance with its design in the area(s) associated with the finding.
- Green (very low safety or security significance) qualitatively indicates that licensee performance is acceptable and cornerstone objectives are fully met. Acceptable licensee corrective actions for these issues provide assurance that the plant is being constructed in accordance with its design in the area(s) associated with the finding.

In accordance with guidance provided in IMC 2505, the staff considered the safety significance of the construction inspection findings to assess the licensee's level of safety performance within each of the six cornerstones of safety associated with the

strategic performance areas (Figure 2) defined in IMC 2506 and IMC 2200, “Security Program for Construction.”

The staff also conducted inspections of the licensee’s construction programs pursuant to IMC 2504. Inspection of the construction programs indirectly evaluated the licensee’s ITAAC performance because these programs affect the quality of the SSCs that are the subject of the ITAAC. Areas of inspection included the licensee’s ITAAC management program; quality assurance (QA) activities affecting SSCs; reporting of defects and non-compliances; fitness for duty; and the preoperational testing program. In addition to the construction programs, the staff also inspected the licensee’s operational programs in accordance with IMC 2504.

A fundamental goal of the NRC’s oversight of construction activities was to establish confidence that the licensee (and its contractors) were detecting and correcting problems in a manner that ensured quality and safety were paramount and that construction activities were completed in a manner that ensured the facility was constructed in accordance with the design and would operate safely. A key premise of the NRC’s oversight process is that weaknesses in a licensee’s corrective action program would manifest themselves as performance issues that would be identified during the NRC’s inspection program.

The NRC accomplished these objectives through (a) routine resident inspector reviews of corrective action program issues, (b) inspection samples during each inspection, (c) follow-up of selected NRC-identified issues, and (d) periodic team inspections in accordance with Inspection Procedure (IP) 35007 “Quality Assurance Program Implementation During Construction and Pre-Construction Activities.” Additionally, the adequacy of the licensee’s corrective action program was assessed during each end-of-cycle review throughout the construction of the facility.

The NRC’s construction inspection reports for [plant name] are listed in Attachment 1. The reports are available in ADAMS and may be accessed from the links provided in the attachment.

During performance of the construction inspection program the NRC identified [XXX] construction inspection findings for [plant name]. Of these, [XXX] were identified as ITAAC Findings and [XXX] were Construction Findings. For each ITAAC Finding, the staff through subsequent inspection verified that any deficient conditions material to the acceptance criteria were corrected. *[Add discussion of construction inspection findings commensurate with the significance of the findings. For example, if all findings are Green, the following discussion would be sufficient: “In addition, all construction inspection findings were Green (very low safety or security significance) and qualitatively indicate that the licensee’s performance was acceptable and all cornerstone objectives were fully met.”]*

The corrective actions taken by the licensee for the ITAAC Findings provide assurance that the plant was constructed in accordance with its design in the area(s) associated with the finding. Summaries of the ITAAC findings may be accessed via the NRC website [insert web link]. Attachment 4 lists all the ITAAC findings for [plant name] and provides web links to the associated inspection reports.

4.3 Reactor Construction Assessment

The cROP integrated the NRC's inspection, assessment, and enforcement programs to allow the staff to evaluate [licensee name] overall performance and safety culture and to communicate this information to licensee management, and except for certain security-related information, to members of the public and other stakeholders. Per IMC 2505, [licensee name] performance was reviewed throughout construction on a routine basis, quarterly, and every 12-months.

The Reactor Construction Assessment Program used the information from NRC inspections of selected construction activities and programs, NRC enforcement actions, allegations, and NRC safety culture assessments to arrive at an objective integrated assessment of [licensee name] safety performance. Based on this assessment information, the NRC determined the appropriate level of its response, such as performing supplemental inspections, conducting meetings with NRC and licensee management, or other responses as described in IMC 2505's Construction Action Matrix (CAM).

The CAM (Figure 3) lists expected NRC and licensee actions based on the inputs to the assessment process and the licensee's placement into one of the following CAM columns. Actions are graded such that the agency becomes more engaged as licensee performance declines.

- Licensee Response Column (Column 1).
- Regulatory Response Column (Column 2).
- Degraded Performance Column (Column 3).
- Multiple/Repetitive Degraded Cornerstone Column (Column 4).
- Unacceptable Performance Column (Column 5).

Additionally, the NRC identified cross-cutting issues to inform the licensee if the NRC had a concern with the licensee's performance in the cross-cutting area and to encourage the licensee to take appropriate actions before more significant performance issues emerged. The cross-cutting aspects are described in IMC 0613, "Power Reactor Construction Inspection Reports," Appendix F. Cross-cutting aspects are assigned and cross-cutting issues are identified on a "per site" basis, not on a "per unit" basis. Construction cross-cutting themes include:

- Human Performance
- Problem Identification and Resolution
- Safety Conscious Work Environment

Performance outside of the licensee response band is subject to plant-specific supplemental inspections based on the assessed performance. The depth and breadth of specific supplemental inspections depends upon the significance of the identified issues. In addition, the staff conducts reactive inspections in response to non-performance events and issues that occurred at the facility.

The NRC's Plant Assessment Letters for [plant name] are available from the links provided in Attachment 2.

[Add discussion of plant assessment letters commensurate with the NRC's assessment of licensee performance. For example, if all cornerstone objectives are met and all inspection findings are Green, the following discussion would be sufficient: Throughout the construction period the NRC determined that overall, the licensee constructed the facility in a manner that preserved public health and safety and met all cornerstone objectives. Licensee performance remained within the Licensee Response Column of the NRC's Construction Reactor Oversight Process (cROP) Action Matrix throughout construction because all inspection findings had very low (i.e., Green) safety significance.]

4.4 Vendor Inspection Program

The vendor inspection staff implemented the vendor inspection program at vendor facilities where basic components for [plant name] were designed, manufactured, or stored. IMC 2507, "Vendor Inspections," provides guidance for the inspection and assessment of QA programs, detailed design and manufacturing activities, and implementation of the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance," in support of operating and new reactor licensing, as well as construction activities. Specifically, IMC-2507 defines the vendor inspection program for the following activities:

- Inspections of vendor QA program implementation during design and procurement activities in support of material, equipment, and services supplied to the commercial nuclear industry.
- Inspections to assess whether the vendor QA programs address specific processes such as commercial-grade dedication practices, vendor/sub-vendor oversight, and reporting of defects and noncompliance associated with safety-related components or services utilized in a nuclear power plant in accordance with 10 CFR Part 21 or 10 CFR 50.55(e) as applicable.
- Inspection to assess whether the vendor QA program implementation during design, fabrication, and testing of basic components supports ITAAC-related activities such as inspection of offsite fabrication, modular construction techniques, equipment qualification, and fabrication of long-lead components.
- Inspections to verify that root cause analyses of reported defects and failures to comply are being identified and that suitable corrective actions are developed and implemented.
- Provide input to the NRC operating experience program in order to provide timely information to the nuclear industry of potential issues that are safety significant and with generic implications. These issues could include substandard, suspected counterfeit, or fraudulently marked basic components.

Performance of ITAAC at vendor facilities remains the ultimate responsibility of the licensee. The licensees must therefore address the ITAAC findings identified during a vendor inspection in its ICNs. However, vendor findings are not treated in the same manner as those identified under the construction inspection program. Specifically, vendor findings are not evaluated via the SDP or considered in the licensee plant assessment process.

The NRC's inspection reports for its vendor inspections are publicly available at [\[insert link\]](#). The vendor inspection reports specifically related to ITAAC for [\[plant name\]](#) are listed in Attachment 3, which provides links to the associated inspection reports.

For each ITAAC finding identified at a vendor facility, the issue was corrected by the vendor and the NRC performed either a subsequent on-site inspection or an in-office review of the vendor's corrective actions prior to closing out the ITAAC finding.

The ITAAC findings related to [\[plant name\]](#) that were identified during vendor inspections at a vendor facility are listed in Attachment 4 along with links to the associated inspection reports.

[If necessary, insert paragraph to further discuss documentation of vendor ITAAC findings.]

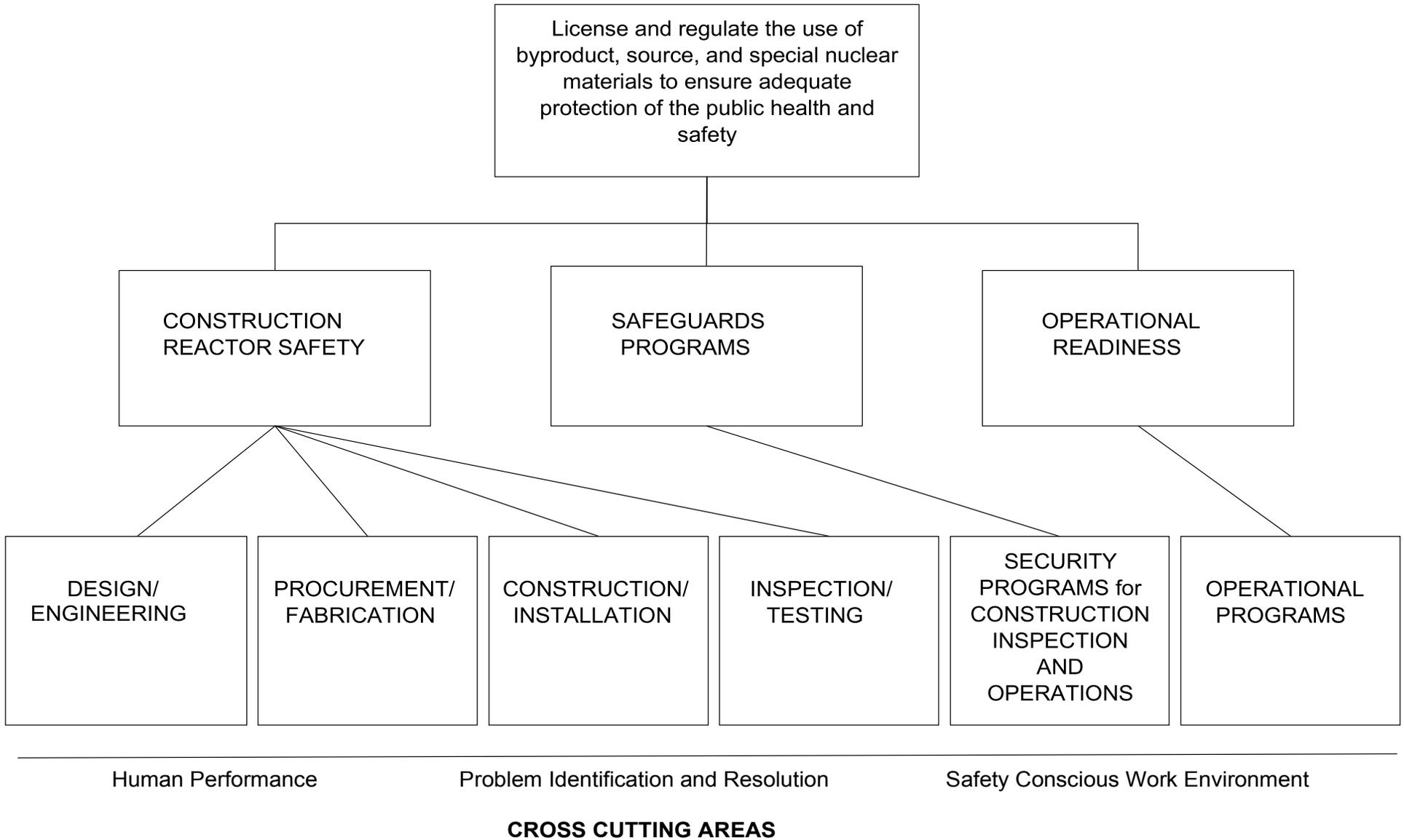
5.0 Conclusion

As discussed above, the NRC implemented systematic processes for reviewing licensee ITAAC notifications, inspecting licensee and vendor activities related to ITAAC, and assessing licensee performance. Based on the results of these processes, the staff has determined that all acceptance criteria in the [\[plant name\]](#) combined license [\[license #\]](#) are met.

**Figure 1
ITAAC Matrix**

	A) As-Built Inspection	B) Welding	C) Construction Testing	D) Operational Testing	E) Qualification Criteria	F) Design and Fabrication Requirement
01) Foundations & Buildings	A01	B01	C01	D01	E01	F01
02) Structural Concrete	A02	B02	C02	D02	E03	F02
03) Piping	A03	B03	C03	D03	E03	F03
04) Pipe Support & Restraints	A04	B04	C04	D04	E04	F04
05) Reactor Pressure Vessel & Internals	A05	B05	C05	D05	E05	F05
06) Mechanical Components	A06	B06	C06	D06	E06	F06
07) Valves	A07	B07	C07	D07	E07	F07
08) Electrical Components & Systems	A08	B08	C08	D08	E08	F08
09) Electrical Cables	A09	B09	C09	D09	E09	F09
10) Instrumentation & Control Components & Systems	A10	B10	C10	D10	E10	F10
11) Containment Integrity & Penetrations	A11	B11	C11	D11	E11	F11
12) Heating Ventilation and Air Conditioning (HVAC)	A12	B12	C12	D12	E12	F12
13) Equipment Handling & Fuel Racks	A13	B13	C13	D13	E13	F13
14) Complex Systems with Multiple Components	A14	B14	C14	D14	E14	F14
15) Fire Protection	A15	B15	C15	D15	E15	F15
16) Engineering	A16	B16	C16	D16	E16	F16
17) Security	A17	B17	C17	D17	E17	F17
18) Emergency Preparedness	A18	B18	C18	D18	E18	F18
19) Radiation Protection	A19	B19	C19	D19	E19	F19

**Figure 2
Construction Regulatory Oversight Framework**



**Figure 3
Construction Action Matrix**

	Licensee Response Column	Regulatory Response Column (Column 2)	Degraded Performance Column (Column 3)	Multiple/ Repetitive Degraded Cornerstone Column (Column 4)	Unacceptable Performance Column (Column 5)	
RESULTS	All Inspection Findings Green; Cornerstone Objectives Fully Met	One or Two White Findings in a strategic performance area; Cornerstone objectives met with minimal degradation in safety performance	One degraded cornerstone (3 white findings or 1 yellow finding) or any 3 white findings in a strategic performance area; Cornerstone objectives met with moderate degradation in safety performance	Repetitive degraded cornerstone, multiple degraded cornerstones, multiple yellow findings, or 1 red finding; Cornerstone objectives met with longstanding issues or significant degradation in safety performance	Overall unacceptable performance; Construction suspended in the area of concern	
RESPONSE	Regulatory Performance Meeting	None	BC or DD Meet with Licensee	RA/DRAC (or Designee) Meet with Senior Licensee Management.	EDO/DEDO (or Designee) meet with Senior Licensee Management	EDO/DEDO (or Designee) Meet with Senior Licensee Management
	Licensee Action	Licensee Corrective Action	Licensee Root cause Evaluation and corrective action with NRC Oversight	Licensee cumulative root cause evaluation with NRC Oversight	Licensee Performance Improvement Plan with NRC Oversight	Licensee Performance Improvement Plan / Construction Restart Plan with NRC Oversight
	NRC Inspection	Risk-Informed Baseline Inspection Program	Baseline and supplemental inspection procedure 90001	Baseline and supplemental inspection procedure 90002	Baseline and supplemental inspection procedure 90003	Baseline and Supplemental as Practicable, Plus Special Inspections per Construction Restart Checklist.
	Regulatory Actions ¹	None	Supplemental inspection only	Supplemental inspection only Plant Discussed at AARM if Conditions Met	-10 CFR 2.204 DFI -10 CFR 50.54(f) Letter - CAL/Order Plant Discussed at AARM	Order to Modify, Suspend, or Revoke Licensed Activities Plant Discussed at AARM
COMMUNICATION	Assessment Letters	BC or DD review/sign assessment letter (w/ inspection plan)	DD review/sign assessment letter (w/ inspection plan)	DRAC review/sign assessment letter (w/ inspection plan)	RA review/sign assessment letter (w/ inspection plan)	RA review/sign assessment letter (w/ inspection plan)
	Public Stakeholders	Various public stakeholder options (see section 12) involving the SRI or BC	Various public stakeholder options (see section 12) involving the BC or DD	RA/DRAC (or Designee) Discuss Performance with Senior Licensee Management	EDO/DEDO (or Designee) Discuss Performance with Senior Licensee Management	EDO/DEDO (or Designee) Discuss Performance with Senior Licensee Management
	External Stakeholders ²	None	State Governors	State Governors, DHS, Congress	State Governors, DHS, Congress	State Governors, DHS, Congress
	Commission Involvement	None	None	Possible Commission Meeting if Licensee Remains for one and one half years	Commission Meeting with Senior Licensee Management Within 6 mo. ³	Commission Meeting with Senior Licensee Management

INCREASING SAFETY SIGNIFICANCE →

¹ Other than the CAL, the regulatory actions for plants in Column 4 are not mandatory NRC actions. However, the regional office should consider each of these regulatory actions when significant new information regarding licensee performance becomes available.

² These specific stakeholders shall be notified if a plant is moving to the specified column because of security-related issues.

³ The timing of the meeting shall be based on a collegial determination by the Commission informed by a recommendation from the EDO, and may exceed the six-month requirement

Table 1
Inspection Procedures

- 65001 Inspections of Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) Related Work
- 65001.01 Inspection of ITAAC-Related Foundations and Buildings
- 65001.02 Inspection of ITAAC-Related Installation of Structural Concrete
- 65001.03 Inspection of ITAAC-Related Installation of Piping
- 65001.04 Inspection of ITAAC-Related Installation of Pipe Supports & Restraints
- 65001.05 Inspection of ITAAC-Related Installation of Reactor Pressure Vessel & Internals
- 65001.06 Inspection of ITAAC-Related Installation of Mechanical Components
- 65001.07 Inspection of ITAAC-Related Installation of Valves
- 65001.08 Inspection of ITAAC-Related Installation of Electrical Components & Systems
- 65001.09 Inspection of ITAAC-Related Installation of Electric and Fiber Optic Cable
- 65001.10 Inspection of ITAAC-Related Installation of Instrument Components & Systems
- 65001.11 Construction Inspection Program Inspection of ITAAC-Related Containment Integrity & Containment Penetrations
- 65001.12 Inspection of ITAAC-Related Installation of Heating, Ventilating, and Air Conditioning Systems
- 65001.13 Inspection of ITAAC-Related Installation of Load Handling Equipment & Fuel Racks
- 65001.14 Inspection of ITAAC-Related Installation of Complex Systems with Multiple Components
- 65001.15 Inspection of ITAAC-Related Installation of Fire Protection Equipment
- 65001.16 Inspection of ITAAC-Related Engineering
- 65001.17 Inspection of ITAAC-Related Security Structures, Systems, and Components
- 65001.18 Inspection of Emergency Planning ITAAC
- 65001.19 Inspection of Installation of ITAAC-Related Radiation Monitoring Components and Systems
- 65001.20 Inspection of Safety-Related Piping DAC-Related ITAAC
- 65001.21 Inspection of Pipe Rupture Hazard Analysis Design Acceptance Criteria (DAC) – Related ITAAC
- 65001.22 Inspection of Digital Instrumentation and Control (DI&C) System/Software Design Acceptance Criteria (DAC) – Related to ITAAC
- 65001.23 Inspection of Human Factors Engineering Integrated System Validation ITAAC

- 65001.A ITAAC Attributes for As-Built Inspection
- 65001.B Inspection of the ITAAC-Related Welding Program
- 65001.C Inspection of the ITAAC-Related Construction Test Program
- 65001.D Inspection of the ITAAC-Related Operational Testing Program
- 65001.E Inspection of the ITAAC-Related Qualification Program
- 65001.F Inspection of the ITAAC-Related Design and Fabrication Requirements

Attachment 1

Construction Inspection Reports

Date	ML#	Subject	Related Correspondence

Attachment 2

Plant Assessment Letters

Date	ML#	Subject	Related Correspondence

Attachment 3

Vendor Inspection Reports

Date	ML#	Subject	Related Correspondence

Attachment 4

ITAAC Findings

ITAAC Findings - Construction Inspection :

Finding Number	Title	Inspection Report (IR) ML # Opened	IR ML # Closed

ITAAC Findings Vendor Inspection:

Finding Number	Title	IR ML # Opened	IR ML # Closed