NUCLEAR ENERGY INSTITUTE

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November 20, 2001

James E. Lyons
Director, New Reactor Licensing Project Office
U.S. Nuclear Regulatory Commission
Mail Stop O-11 D17
Washington, DC 20555-0001

Dear Mr. Lyons:

In public meetings with the NRC staff on June 15 and September 7, we discussed the need for inspection guidance on the ITAAC verification process. This guidance needs to reflect resolution of the pending policy issue concerning the scope of required COL ITAAC, issues identified in the staff's 1996 draft report on the Revised Construction Inspection Program, and other key issues.

In the September 7 meeting, we committed to share with the staff the enclosed "Draft White Paper on ITAAC Implementation and Transition to Operation Under Part 52" as a basis for further discussion of these issues and input to development of the necessary guidance. The draft white paper, developed with the assistance of the Part 52 Licensing Issues Task Force, benefited greatly from insights gained during our discussions. We believe the paper addresses a number of the issues raised by the staff during those interactions, and we look forward to continuing those discussions. Clarity and development of common understandings on the matters discussed in the paper are essential to establishing confidence of prospective applicants and the public in the NRC's process for licensing and startup of new nuclear plants.

Our objective is to achieve and document common understandings in this important area in the first half of next year. To support timely progress on identifying and resolving ITAAC verification and related issues, we request that the NRC staff provide specific comments on the enclosure by January 10, 2002.

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We view the submittal of this document for NRC staff review and comment as a means of exchanging information that is intended to support generic regulatory improvements. Therefore, we believe an exemption from any review fees is warranted based on the criteria in footnote 4 of 10 CFR 170.21.

We look forward to continuing our discussions of this important topic. In the meantime, if you have any questions about the enclosure, please contact me (202-739-8128 or rls@nei.org) or Russ Bell (202-739-8087 or rjb@nei.org).

Sincerely,

R. Simard

Ron Simard

Enclosure

Enclosure

Draft White Paper:

ITAAC Implementation and Transition to Full Power Operations Under Part 52

Nuclear Energy Institute

Revision 0—November 20, 2001

Draft White Paper on ITAAC Implementation and Transition to Full Power Operations Under Part 52

Executive Summary

ITAAC are the inspections, tests, analyses and acceptance criteria that are established up front in Part 52 combined licenses (COL) for later use in demonstrating that the completed plant conforms to the combined license (COL), the Atomic Energy Act and the NRC's regulations. ITAAC are a lynchpin of the Part 52 process, intended to keep everyone, including the licensee, NRC staff and the public, focused on What Matters Most—the top-level design features and performance characteristics of the plant. Because ITAAC govern the scope of pre-operational hearings, they are central to achieving the goal of predictable, stable and efficient licensing of new nuclear plants.

In the early 1990s, the lead plant design certifications provided valuable experience in defining ITAAC and a clearer understanding of their role in the Part 52 process. In particular, painstaking care was taken to specify ITAAC that correspond to the top level design criteria and performance standards of the certified designs and to make the ITAAC as clear and objective as possible.

In addition to well-defined ITAAC, an effective process for ITAAC implementation, including ITAAC determination by the licensee and ITAAC verification by the NRC, will be critical to achieving the goals of Part 52. This paper describes an effective and workable approach to ITAAC implementation, including ITAAC verification by the NRC, transition to operation under Part 52 and related issues associated with the requirements of Sections 52.99 and 52.103 and the policy objectives of the Part 52 licensing process. The paper is intended to provide a basis for detailed discussion with the NRC staff and development of common understandings on these important matters. Clarity on these matters is essential to establishing confidence of prospective applicants and the public in the NRC's process for licensing and startup of new nuclear plants.

It should be noted that Commission resolution of a key policy issue concerning the scope of required ITAAC is pending at this time. For purposes of this white paper, the discussion assumes that there will be no ITAAC on operational programs.

A number of distinct NRC and licensee processes are involved in construction inspection, ITAAC implementation and transition to operation for new plants licensed under Part 52. This paper discusses these processes, their respective roles, and their relationship to—or independence from—ITAAC. Main points concerning the topics that bear significantly on effective and efficient ITAAC implementation and transition to operation are highlighted below. Thorough discussion of each of these topics is presented in the paper.

NRC Construction Inspection Under Part 52 (Section 3)

Through its Construction Inspection Program (CIP), the NRC will assure the effectiveness of the licensee's construction-related activities and Quality Assurance Program (QAP) implementation.

NRC inspectors are expected to perform the same types of inspections and audits of licensee construction-related activities under Part 52 as they did for plants licensed under Part 50. Application of information technology, risk insights and past construction inspection experience is expected to enable future NRC inspection activities to be more efficient and safety-focused.

ITAAC are a key subset of the normal construction, inspection and test activities performed by the licensee under its QAP. While related, there are important distinctions between ITAAC and the QAP that the NRC CIP and ITAAC verification processes must recognize and preserve:

- QAP -Continuous licensee process for assuring that design and construction activities, including ITAAC inspections, tests and analyses, are performed in accordance with the license, NRC regulations and applicable codes and standards, and that SSCs will perform their intended functions

- ITAAC verification - NRC process for confirming that the licensee has completed specified ITAAC inspections, tests and analyses and that associated acceptance criteria have been met

As part of the CIP, both the NRC staff and industry envision a system of early assessment and approval of licensee construction processes (*e.g.*, reinforced concrete, cable tray and conduit, etc.) with subsequent monitoring to ensure that remaining implementation is consistent with the approved processes. NRC staff determinations of acceptable licensee construction processes would be published via the *Federal Register,* public website or equivalent mechanism. This is known as the "sign-as-you-go" or "SAYGO" process.

This white paper provides input to the NRC update of IMC 2512 on the CIP and basis for development of needed NRC inspection guidance on the ITAAC verification process.

NRC Engineering Design Verification (Section 4)

Engineering design verification is the process by which NRC will verify that licensee engineering processes are adequate and that design documents and construction drawings are consistent with design information approved by the NRC. This is distinct from ITAAC that are used to verify that the as-built plant satisfies the top level design and performance standards specified in the COL and associated acceptance criteria.

Because detailed design information, *e.g.*, specifications and construction drawings, is expected to be essentially complete and available to the NRC staff by the time of COL issuance or shortly thereafter, NRC engineering design verification should be completed before or shortly after the first concrete is poured. Timely completion of engineering design verification by NRC will mark a significant project milestone and one that increases the confidence that the design can be constructed expeditiously without major engineering or licensing iterations.

Similar to the construction "SAYGO" inspections discussed above, the NRC would publish its acceptability determination upon completion of engineering design verification and would continue to monitor ("spot check") licensee implementation thereafter.

ITAAC Process Implementation (Section 5)

ITAAC verification is the NRC process for confirming licensee determinations that ITAAC acceptance criteria have been met, including issuance of ITAAC completion notices required by Section 52.99. NRC ITAAC verification constitutes a substantive determination (i.e., concurrence) by the staff that the licensee has satisfactorily completed one or more ITAAC.

To facilitate effective NRC ITAAC verification and associated inspection planning, construction and inspection activities corresponding to the ITAAC will be specially flagged on licensee construction plans and schedules, and the NRC staff will be kept informed of these schedules.

ITAAC determination bases (IDB) document specific inspection, test or analysis results on which the licensee's ITAAC determinations will be based. The IDB for a given ITAAC is the licensee QAP record or records that corresponds to the acceptance criterion specified in the ITAAC. Examples of IDB include:

- The NDE reports documenting the adequacy of ASME welds in a given system or systems; or
- Walkdown inspection report(s) confirming the proper location, configuration, etc., of SSCs; or

- Pre-operational system function test results that demonstrate adequate flow and/or time response

Additional examples of IDB are presented in Appendix B.

Based on the IDB, and provided there are no NRC inspection findings that must be resolved or pending corrective actions that must be completed in order to satisfy the ITAAC, the licensee will send an ITAAC Determination Letter to NRC. The ITAAC Determination Letter:

- Specifies the scope of completed ITAAC
- Identifies that ITAAC determination bases are available for audit
- Requests NRC staff confirmation of the licensee's ITAAC determination(s) and issuance of the §52.99 *Federal Register* notice (FRN)

Sample ITAAC Determination Letters are presented in Appendix A.

Prior to sending ITAAC determination letters to NRC, the licensee would discuss the status of the ITAAC determination bases and potentially relevant ITAAC implementation issues. The purpose of these interactions is to ensure that the NRC staff is prepared to confirm the licensee's determinations that ITAAC have been met and avoid undue delay in the NRC ITAAC verification and §52.99 notice.

NRC ITAAC verification and issuance of the Section 52.99 notices will be based on the ITAAC determination letter, NRC inspections, and possible NRC audit of the specific bases on which the licensee's ITAAC determination was made. Further general inspection or evaluation of underlying construction activities, processes, records, etc., that is redundant to previous NRC inspections of QAP implementation is not necessary and should not be part of NRC ITAAC verification. The adequacy of cumulative, underlying construction-related activities is assured by the licensee's QAP and NRC oversight thereof.

Advance interactions and the NRC's comprehensive, ITAAC-focused oversight activities are expected to facilitate timely ITAAC verification by NRC, *e.g.*, within 30 days of receiving the ITAAC Determination Letter.

Deficiencies in the IDB identified during NRC ITAAC verification would be referred to the licensee's corrective action program. Unless the deficiency is material to the ITAAC determination, the NRC staff would be expected to make the required Section 52.99 finding of ITAAC completion, while corrective action proceeds separately under the QAP. If a deficiency is material to the ITAAC determination, then the licensee must take appropriate corrective action before the ITAAC can be closed out.

Section 52.99 notices published via the *Federal Register,* public website or equivalent mechanism will signify NRC staff confirmation of the licensee's determination that one or more ITAAC have been met and provide important information to the public concerning the progress of construction activities.

Preoperational Finding Process and Hearing Opportunity (Section 6)

The licensee will precipitate the Section 52.103 process and the notice of intended operation required by Section 52.103(a) by sending a letter to the NRC identifying the intent to load fuel on a specified date. The licensee's letter is also expected to identify those ITAAC that have yet to be completed and a schedule for their completion.

The NRC will publish in the *Federal Register* the notice of intended operation required by Section 52.103(a). This notice will provide opportunity to request a hearing on matters of ITAAC noncompliance. A number of ITAAC are expected to be uncompleted at the time of the Section 52.103(a) notice. It is expected that the notice will identify those ITAAC for which § 52.99 notices of completion have and have not been issued. To request a hearing on ITAAC completed after issuance of the Section 52.103(a) notice, Section 2.714 provides standard NRC administrative procedures for submittal and consideration of late-filed petitions.

Requests for hearing are due in 60 days, at which time the Commission will deny or grant the request. The Commission is obligated to make every effort to resolve issues raised by the hearing requests prior to the scheduled date of fuel load. If there are no requests for hearing, if none granted, or if all issues raised are resolved before fuel load, the NRC would, upon completion and NRC staff verification of all ITAAC, make the required Section 52.103(g) finding authorizing plant operation, including scheduled fuel load, power ascension testing and full power operations.

The Section 52.103(g) finding will be based collectively upon the individual determinations made under Section 52.99. The NRC will not need to perform any new or additional inspections or reviews to make its Section 52.103(g) finding (except as may be necessary to respond to a contention in a Section 52.103 hearing).

If issues are raised that cannot be resolved before fuel load, Section 52.103(c) provides that the Commission shall allow operation for an interim period provided, based on consideration of the outstanding issues, that there would be reasonable assurance of adequate protection of public health and safety. Thus, in the event there are unresolved hearing issues, the Commission must—in addition to the Section 52.103(g) finding—also make a finding under Section 52.103(c) allowing operation for an interim period.

Assuring Operational Readiness Under Part 52 (Section 7)

Under Part 52, the bulk of NRC findings historically made under 10 CFR 50.57(a) in connection with issuance of Part 50 operating licenses are made up front in the COL. The only required finding that remains to be made after the COL is issued is the ITAAC finding required by Section 52.103(g).

NRC assurance of operational readiness under Part 52 is accomplished via a two track approach. Readiness for operation of the physical plant is assured by the ITAAC process, while acceptability of operational programs is assured by required compliance with the terms of the COL and NRC regulations, and NRC oversight thereof.

In parallel with completion and sign-off of ITAAC, it is envisioned that the NRC will perform safety-focused inspections to assess operational programs. It is expected that the primary focus of these inspections will be based on the areas reflected in the Cornerstones of Safe Operation contained in the recently revised Reactor Oversight Program (ROP), including identified Cross Cutting Elements.

Results of operational program inspections will be communicated by the NRC staff to the EDO and Commission prior to the scheduled date of fuel load. If necessary based on these results, the NRC could take appropriate enforcement action to prohibit or delay fuel load pending appropriate corrective action.

Transition to Operation Under Part 52 (Section 8)

As discussed in Section 8, the following conditions are necessary and sufficient for a plant licensed under Part 52 to commence fuel loading, power ascension testing and full power operations:

1. The licensee has completed all ITAAC, the NRC staff has verified that all ITAAC acceptance criteria have been met and the Commission has made the required Section 52.103(g) finding. If necessary, the Commission has also made a finding under Section 52.103(c) allowing operation for an interim period, provided there is reasonable assurance of public health and safety protection, while hearings are completed on issues material to ITAAC compliance.

2. For any petition granted under Section 52.103(f) *(i.e.,* processed in accordance with 10 CFR 2.206), the Commission has determined that no immediate action is required that would disrupt the transition to operation, *e.g.,* issuance of an order preventing fuel load or stopping power ascension testing.

3. There are no outstanding Commission orders prohibiting construction completion, fuel load, power ascension testing or operation resulting from (1) licensee failure to comply with terms of the COL (e.g., license conditions and technical specifications) or NRC regulations or (2) a condition, including operational program deficiency, that indicates that there is not adequate protection of the public health and safety.

4. The licensee has satisfied COL conditions prerequisite to fuel loading and commencement of operation, as applicable.

After the Commission makes its Section 52.103(g) finding authorizing fuel load and operation, no further authorization by the NRC is required to proceed to full power and commercial operation. For example, no separate authorization is required to exceed 5% power.[1] Of course, the licensee must comply with all applicable license conditions and technical specifications associated with power ascension testing and full power operations.

As discussed in Section 9, the ITAAC do not constitute regulatory requirements for COL holders after fuel load.

[1] In a September 5, 2000, SRM, the Commission approved the form and content of a generic combined license proposed by the NRC staff in SECY-00-0092, including conditions D.2 & 3 that would require the Director of NRR to authorize low power (above 5%) and full power operation. These conditions are not consistent with Part 52 which provides that the Section 52.103(g) finding upon completion of all ITAAC is the sole NRC finding required prior to operation, where operation is considered to include fuel load, power ascension testing and full power operations. Furthermore, the condition on commercial operation envisioned by the NRC staff is not consistent with the Part 50 process, which contains no requirements (either in the regulations or standard OL conditions) for NRC authorization to proceed to commercial operation. The industry requests that the NRC staff and Commission revisit the appropriateness of these conditions based on detailed stakeholder discussion of COL issues, which have only recently begun.

Draft White Paper on ITAAC Implementation and Transition to Full Power Operations Under Part 52

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Draft White Paper on ITAAC Implementation and Transition to Full Power Operations Under Part 52

1 Introduction

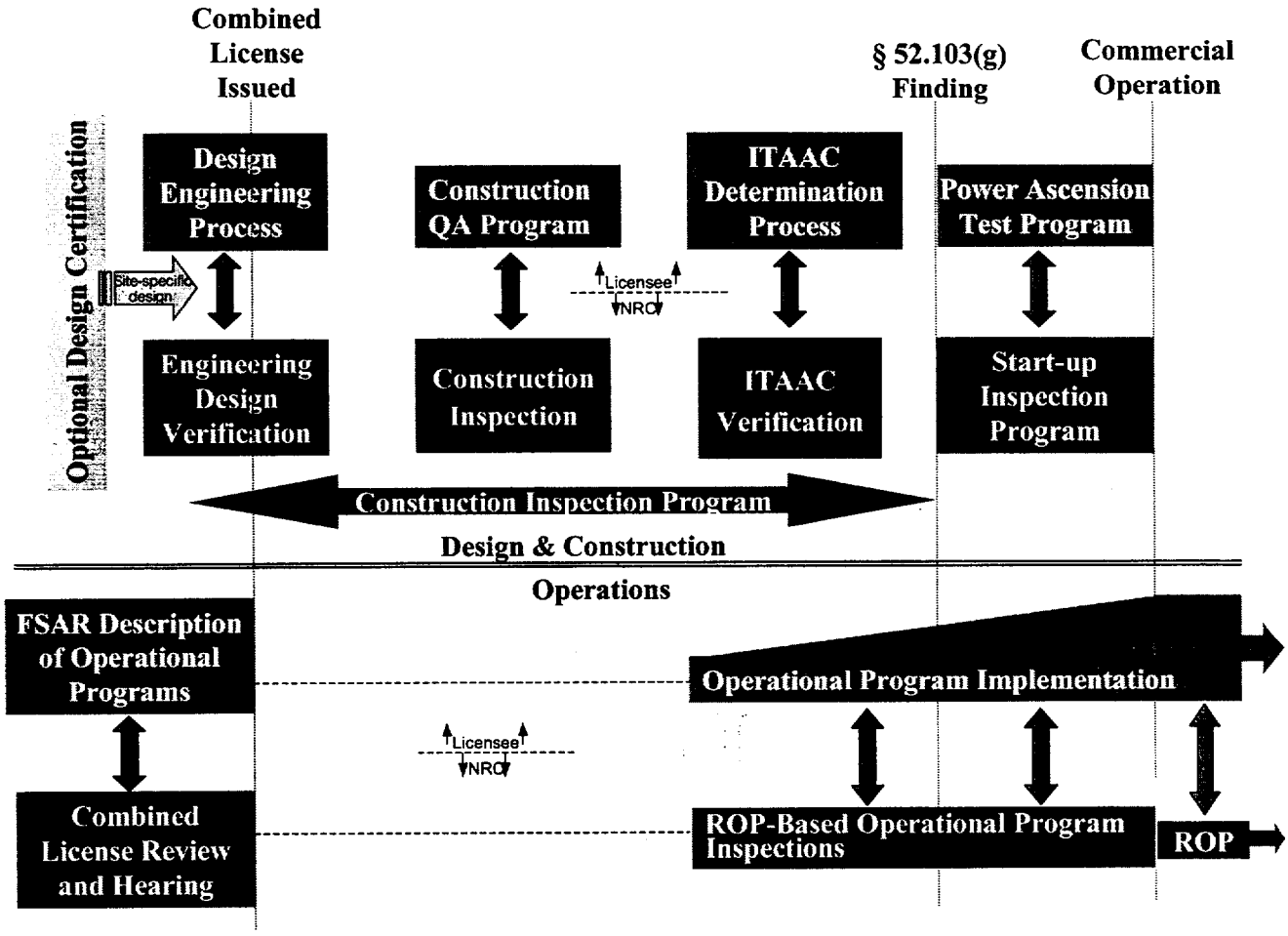
ITAAC are the inspections, tests, analyses and acceptance criteria that are established up front in Part 52 combined licenses (COL) for later use in demonstrating that the completed plant conforms to the combined license (COL), the Atomic Energy Act and the NRC's regulations. ITAAC are a lynchpin of the Part 52 process, intended to keep everyone, including the licensee, NRC staff and the public focused on What Matters Most—the top-level design features and performance characteristics of the plant. Because ITAAC govern the scope of pre-operational hearings, they are central to achieving the goal of predictable, stable and efficient licensing of new nuclear plants.

In the early 1990s, the lead plant design certifications provided valuable experience in defining ITAAC and a clearer understanding of their role in the Part 52 process. In particular, painstaking care was taken to specify ITAAC that correspond to the top level design criteria and performance standards of the certified designs and to make the ITAAC as clear and objective as possible.

In addition to well-defined ITAAC, an effective process for ITAAC implementation, including ITAAC determination by the licensee and ITAAC verification by the NRC, will be critical to achieving the goals of Part 52. This paper describes an effective and workable approach to ITAAC implementation, including ITAAC verification by the NRC, transition to operation under Part 52 and related issues associated with the requirements of Sections 52.99 and 52.103 and the policy objectives of the Part 52 licensing process.

A number of distinct NRC and licensee processes are involved in construction inspection, ITAAC implementation and transition to operation for new plants licensed under Part 52 (see figure below). This paper discusses these processes, their respective roles, and their relationship to—or independence from—ITAAC.

Principal NRC and Licensee Processes Involved in Construction Inspection, ITAAC Implementation and Transition to Operation



2 *Part 52 Requirements*

A combined license (COL) issued under Section 52.97 must contain the ITAAC that will be used to confirm that a completed plant has been built in conformance with its license. Specifically, Section 52.97(b) provides that the ITAAC specified in the COL, 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 Atomic Energy Act, and the Commission's rules and regulations." Where a COL references a design certification, the COL must include the ITAAC in the design certification (to the extent not completed and subject to hearing as part of the COL proceeding). The "necessary and sufficient" requirement of Section 52.97(b) is satisfied by the combination of design certification ITAAC, if applicable, with those

required in a combined license covering site-specific plant design features, including those related to emergency planning.[1] If the COL does not reference a design certification, the scope of the COL ITAAC must encompass the entire plant.

As described in the Part 52 Statements of Consideration, the Commission must make a finding post-construction, and prior to operation, as to "whether construction has been completed in accord with the terms of the combined license, and the final rule so provides." ITAAC are thus created for that sole purpose—to demonstrate that the top level design criteria and performance standards were faithfully implemented and thereby provide reasonable assurance that the plant has been constructed and will be operated in conformity with the license, the Atomic Energy Act, and the Commission's rules and regulations.

10 CFR 52.99 requires the NRC staff to ensure that ITAAC have been performed by the licensee, verify that the prescribed acceptance criteria are met and publish notices of successful ITAAC completion in the *Federal Register*. 10 CFR 52.103 specifies the process and criteria for the post-construction hearing opportunity on allegations of ITAAC noncompliance and requires, prior to operation of the plant, that the Commission find that all ITAAC acceptance criteria are met. Detailed discussion of the §§52.99 and 52.103 processes is provided in later sections of this paper.

Prior to operation, in addition to Part 52 requirements concerning ITAAC, the licensee must comply with the terms and conditions of the license, including technical specifications, and with applicable requirements in 10 CFR Part 50, including NRC regulations on operational programs. Assuring operational readiness of plants licensed under Part 52, including compliance with ITAAC and applicable operational requirements, is discussed in Section 7.

3 *NRC Inspection During Construction*

3.1 Main Points

- Through its Construction Inspection Program (CIP), the NRC will assure the effectiveness of the licensee's construction-related activities and Quality Assurance Program (QAP) implementation.

- NRC inspectors are expected to perform the same types of inspections and audits of licensee construction-related activities under Part 52 as they did for plants licensed under Part 50. Application of information technology, risk

[1] A policy issue is pending before the Commission regarding whether or not combined licenses must also contain ITAAC on operational programs such as security, training, etc. It is the industry's position that programmatic ITAAC are not required by statute and would be contrary to the objective of Part 52.

insights and past construction inspection experience is expected to enable future NRC inspection activities to be more efficient and safety-focused.

- ITAAC are a key subset of the normal construction, inspection and test activities performed by the licensee under its QAP. While related, there are important distinctions between ITAAC and the QAP that the NRC CIP and ITAAC verification processes must recognize and preserve:

    - QAP - Continuous licensee process for assuring that design and construction activities, including ITAAC inspections, tests and analyses, are performed in accordance with the license, NRC regulations and applicable codes and standards, and that SSCs will perform their intended functions
    - ITAAC verification - NRC process for confirming that the licensee has completed specified ITAAC inspections, tests and analyses and that associated acceptance criteria have been met

- As part of the CIP, both the NRC staff and industry envision a system of early assessment and approval of licensee construction processes, e.g., reinforced concrete, cable tray and conduit, etc., with subsequent monitoring to ensure that remaining implementation is consistent with the approved processes. NRC staff determinations of acceptable licensee construction processes would be published via the *Federal Register,* public website or equivalent mechanism. This is known as the "sign-as-you-go" or "SAYGO" process.

- This paper provides input to the NRC update of IMC 2512 on the CIP and basis for development of needed NRC inspection guidance on the ITAAC verification process.

3.2 NRC Construction Inspection Under Part 52

ITAAC are a key subset of the normal construction, inspection and test activities performed by the licensee under its Quality Assurance Program (QAP). Typical activities performed as part of the licensee's QAP include:

- Procedure development, control and implementation
- Technician training and personnel qualification
- Technical and vendor audits
- Control of materials, procurement, warehousing, measurement & test equipment, etc.
- Fabrication, construction, installation, and testing
- Corrective action program
- Record keeping

While the licensee must ensure the quality of all its construction-related activities, it is not practical for NRC to independently verify the adequacy of all quality-related activities. Recognizing this reality, a system of NRC regulations, sampling based inspections/audits and enforcement authority has been used effectively by the NRC to verify quality during the construction of existing plants. This same system applies and will be used to verify the quality construction of future plants.

In particular, via the Construction Inspection Program (CIP), the NRC assesses and verifies the effectiveness of the licensee's construction-related activities and QAP implementation. As part of the CIP, it is expected that the NRC will perform the same types of inspections and audits of licensee construction-related activities under Part 52 as it did for plants licensed under Part 50. As in the past, NRC will perform the following types of CIP activities to verify that the licensee's quality-related activities comply with the terms of the COL and applicable NRC regulations, including the quality assurance requirements of 10 CFR Part 50, Appendix B:

- On-site and off-site observation of in-process work and fabrication/testing of SSCs
- Inspection of SSC installation, placement and procurement controls and implementation of design criteria (e.g., separation)
- Review of work procedures and documentation
- Independent non-destructive examination, walkdowns, etc.
- Identification and follow-up of discrepancies, deficiencies, open items, etc.
- Preparation of inspection reports

While embodying familiar elements, future NRC construction inspection is expected to be more focused and efficient. In particular, application of risk analysis tools developed in recent years is expected to enable future construction inspection activities to be more systematically safety focused than in the past in the same way that risk insights have been used to make the NRC's reactor oversight process more safety focused. In addition, future construction inspection is expected to benefit from extensive experience gained from past CIP implementation and use of advanced information management tools to improve planning, coordination and record keeping/retrieval.

In response to the prospect of applications for new nuclear plants in the near term, the NRC is currently in the process of revising its CIP.[2] In addition to enhancements based on experience, risk insights and information technology, the revised CIP must also reflect the requirements of Part 52, including ITAAC, because this is the licensing process expected to be used by future applicants.

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[2] The NRC staff is in the process of updating the draft revision to NRC Inspection Manual Chapter 2512, *LWR Construction Inspection Program, Construction Phase*, that was included in the NRC's draft 1996 report on the revised CIP.

For example, either as part of the CIP or separately, guidance is needed for the NRC ITAAC verification process embodied in Section 52.99. As an essential first step towards this new guidance, this paper provides an overview of envisioned ITAAC implementation under Part 52 and related issues. In addition, as identified in the NRC staff's 1996 draft CIP report, the revised CIP should reflect that, for plants licensed under Part 52, a principal objective is to support the required NRC finding prior to operation that the ITAAC acceptance criteria have been met and thus there is reasonable assurance that the plant has been constructed and will operate in accordance with the license, NRC regulations and the Atomic Energy Act.

Thus, in addition to being more safety focused through application of risk insights, NRC construction inspection activities should also be *ITAAC-focused*. While the NRC will inspect activities throughout the plant, inspection sampling by NRC that is primarily ITAAC-focused is appropriate given the need for the CIP to support the required preoperational finding and because ITAAC, by definition, correspond to the top level design features and performance criteria approved in the license. For example, the NRC inspectors would presumably include a pump covered by ITAAC in its sample of pump tests to witness or procurement records to review, rather than similar tests and records for a similar pump that is not covered by ITAAC.

Because ITAAC are a subset of the inspections, tests and analyses that the licensee would normally perform during the course of plant design and construction, they do not add to the licensee's construction-related activities. For the same reason, neither does NRC ITAAC verification add to the inspections, audits, etc., performed as part of the CIP. Rather, as discussed below, ITAAC verification in accordance with §52.99 represents an additional regulatory requirement for plants licensed under Part 52.

3.3 Role of the Quality Assurance Program Vs. ITAAC

The role of the QAP is expected to be essentially the same under Part 52 as for existing plants licensed under Part 50. The construction phase QAP is the continuous licensee process for assuring that design and construction activities are performed in accordance with the license, NRC regulations and applicable codes and standards, and that SSCs will perform their intended functions. Under Part 52, certain of these activities correspond to the ITAAC incorporated in the combined license.

The quality assurance requirements of Appendix B are applicable to plants licensed under Part 52 as provided by Section 52.83. Section 50.34(a)(7) requires information on the licensee's QAP and how it meets the requirements of Appendix B to be submitted with each COL application. The COL applicant's QAP will be

reviewed against the applicable requirements of Part 50 and will be approved by the NRC as part of COL issuance. QAP implementation by the licensee, and NRC inspection and enforcement thereof, will ensure that quality related activities associated with plant design, procurement, fabrication, construction, testing and operation are implemented properly and in accordance with licensee procedures, applicable codes and standards, and NRC regulations. As it is under Part 50, compliance with the QAP is required and enforceable under Part 52.

The role of ITAAC is different from the role of the QAP. While the QAP assures the adequacy of quality related construction activities in general, ITAAC focus on verifying that the as-built plant satisfies the top level design and performance standards specified in the COL. Additionally, ITAAC play a special role under Part 52 in defining the scope of the post-construction hearing opportunity.

The following statements from the NRC staff's February 1993 draft Commission paper on COL form and content aptly contrast the QAP and ITAAC and capture the long recognized distinction between ITAAC and normal construction verification activities under the QAP:

- "The QAP will identify, document, and correct deficiencies during construction on an ongoing basis, whereas ITAAC will demonstrate that the end result of the construction process is acceptable."

- "The ITAAC provide for 'end-of-process' determinations, not 'day-to-day' evaluation of the construction process that the QAP provides."

- "The ITAAC would measure the successful end point of the construction process, and QAP documentation could be used to assure the design and construction process had been performed properly."

Thus, in addition to ensuring the quality of plant construction, QAP implementation will provide confidence in underlying construction processes and activities that are not subject to ITAAC. For example, while personnel qualification is generally (except for DAC) not addressed by ITAAC (because ITAAC focus on the acceptability of the end-product), proper training and qualification of individuals performing tests required by ITAAC are assured by the QAP.

QAP requirements governing licensee procurement, fabrication, construction, inspection and test activities are specified in accordance with the safety classification and/or safety significance of the SSCs involved. ITAAC encompass SSCs of varying safety significance and safety classification. Because ITAAC have special regulatory significance under Part 52, licensees are expected to implement ITAAC activities under their QAP in a manner analogous to quality related activities such as the initial test program.

It should be noted that not all QAP deficiencies are material to satisfaction of the ITAAC. In fact, because the scope of the QAP is much broader than the scope of ITAAC, it is expected that very few QAP deficiencies will be material to satisfaction of the ITAAC. As provided in SECY-00-0092, a QAP deficiency is material to the satisfaction of an ITAAC only if the deficiency materially impacts the determination that the ITAAC acceptance criteria have or have not been met, as discussed further below.

Because of the special regulatory significance of ITAAC under Part 52, both the industry and NRC staff have placed extraordinary emphasis on understanding the ITAAC concept and the careful and precise delineation of the top level design and performance standards and associated ITAAC. For the same reason, it is important that the NRC Construction Inspection Program reflect the analogous distinction between ITAAC verification and other construction inspection and test activities.

3.4 NRC Construction Process "SAYGO" Inspections

In numerous papers and public meetings, both the industry and the NRC staff have recognized the merit in a process for making determinations and notifying the public regarding the acceptability of quality related construction processes. This process has been commonly referred to as the "sign-as-you-go"—or "SAYGO"—process. The NRC used a similar process effectively for some of the last nuclear power plants built, including Vogtle Unit 2.

As described in the NRC staff's draft CIP report, a SAYGO process would provide a mechanism to announce staff conclusions regarding significant construction activities or processes. The NRC determinations and notifications would come early in the implementation of significant construction processes—after enough work had been completed to permit judgment of underlying processes, but before the bulk of work of a given type is performed. It is envisioned that meaningful assessments and determinations can be made by NRC inspectors based on completion of approximately 20% of a given type of work. The process would provide additional predictability and certainty, provide for a more systematic assessment of quality, and assure more thorough and timely public information on both licensee and NRC staff activities.

As the plant construction progresses through its various stages, e.g., civil, structural, mechanical, electrical, instrumentation & control, etc., it is envisioned that the NRC would conduct thorough inspections of the licensee's construction processes. Based on these inspections and possible follow-up interactions, the NRC would make judgments on the acceptability of the licensee processes and performance in the field to date. Once NRC inspectors are satisfied, the draft CIP

report envisions that SAYGO determinations of construction process acceptability would be published in the *Federal Register*, and the associated inspection reports made publicly available. It may be appropriate to consider other, *e.g.*, web-based means, of notifying the public of these and similar milestones related to plant construction with the goal of maximizing their visibility and ensuring a single, consistent mechanism for providing significant information to the public.

SAYGO construction process inspections and associated NRC determinations of acceptability are envisioned in numerous work areas, including

- Site preparation
- Structures
- Welding
- Safety-related piping
- Measurement and test equipment
- Penetrations

The NRC's draft CIP identifies many more such areas. Still other construction-related processes may be amenable to early, systematic assessment and determination of acceptability by the NRC, such as receipt inspection, commercial grade dedication, warehousing and others.

Because they focus on assessment of early work of a given type that is implemented in the field, NRC staff SAYGO determinations of acceptable construction processes, and associated Federal Register notices, can be expected before most determinations of satisfactory ITAAC completion. This is because, as identified earlier, ITAAC verifications are end-of-process determinations by the NRC staff.

Summary of Construction Process "SAYGO" Inspections as Part of the NRC Construction Inspection Program

1. The licensee provides the NRC staff with detailed construction schedules that identify the timing of activities that are to be the subject of an NRC construction process inspection and report. These schedules would be provided sufficiently in advance of the activity to enable the NRC staff to properly plan and implement its inspections in parallel with the licensee's activities.

2. NRC staff plans and performs its inspections during and/or shortly after the performance of the activity.

3. After a significant amount (e.g., 20%) of a particular type of work has been performed and the licensee has conducted and documented its own QAP inspections and evaluations, the licensee would request that the NRC perform its inspections in that area and make its determination of process acceptability.

4. NRC staff would promptly inform the licensee of any concerns or deficiencies identified during its inspections. The licensee would promptly evaluate and take any corrective actions that may be necessary to address the concerns or deficiencies. The licensee would also inform the NRC staff of the results of the evaluations and any corrective actions. The NRC staff would perform any necessary follow-up inspections or reviews to determine the acceptability of the evaluations and any corrective actions.

5. Upon an NRC staff determination that the activity in question had been satisfactorily performed (including any necessary corrective actions), NRC staff would publish a formal notice of acceptance via the *Federal Register,* public web site or equivalent mechanism.

6. Following the NRC acceptance, the licensee would perform the balance of work of each type in a manner consistent with the process reviewed and found acceptable by the NRC staff.

7. The NRC would continue to perform inspections, i.e., spot checks, of ongoing implementation to assure continued compliance with the QAP for the accepted processes or activities. These ongoing NRC inspection activities would be documented in normal NRC inspection reports and made publicly available.

8. Problems identified by the licensee's QAP or ongoing NRC inspection (spot checks) concerning implementation of a construction process would be forwarded to the licensee's corrective action program, with follow-up by NRC as appropriate.

9. Underlying NRC inspections of quality related construction activities will be subject to the full range of enforcement authority provided by Part 50. Thus, for any identified deficiencies, the NRC staff would take enforcement action, if necessary, to ensure proper corrective action, including (as appropriate) issuing notices of violation, proposed civil penalties, or show cause orders stopping the activity in question or prohibiting operation.

10. Because the scope of QAP activities is much broader than the scope of ITAAC, many QAP deficiencies will not be material to ITAAC satisfaction. As discussed further in Section 6, construction process deficiencies or other deficiencies in quality related activities identified by either the NRC or the licensee would not be material to the satisfaction of an ITAAC unless the deficiency precludes a determination that the acceptance criteria in the ITAAC have been satisfied.

4 NRC Engineering Design Verification

4.1 Main Points

- Engineering design verification is the process by which NRC will verify that licensee engineering processes are adequate and that design documents and construction drawings are consistent with design information approved by the NRC.

- Engineering design verification is distinct from ITAAC which verify that the as-built plant satisfies the top level design and performance standards specified in the COL and associated acceptance criteria.

- Because detailed design information, *e.g.*, specifications and construction drawings, is expected to be essentially complete and available to the NRC staff by the time of COL issuance or shortly thereafter, NRC engineering design verification should be completed before or shortly after the first concrete is poured.

- Timely completion of engineering design verification by NRC will mark a significant project milestone and one that increases the confidence that the design can be constructed expeditiously without major engineering or licensing iterations.

- Similar to the construction "SAYGO" inspections discussed in Section 3.4, the NRC would publish its acceptability determination upon completion of engineering design verification and would continue to monitor ("spot check") licensee implementation thereafter.

4.2 Discussion

In addition to construction process inspections to be performed by the NRC as discussed in the previous section, the NRC is also expected to conduct wide-ranging inspections of the licensee's design engineering. Engineering design verification is the NRC process for verifying that licensee engineering processes are adequate and that design documents and construction drawings are consistent with the approved design.

COL applications must contain design information that is sufficiently detailed to resolve all safety issues associated with the plant design and support NRC issuance of the COL. This may be accomplished by referencing a design certification and supplementing the approved standard design with the required site specific design

information. If no certified design is referenced, a prospective licensee must provide analogous information for the total plant in the COL application. Lack of an approved design prior to COL issuance may have implications for the timing of design engineering work by the licensee and engineering design verification by the NRC.

The licensee's design authority will complete the detailed plant design consistent with the design information contained in the COL application/license, including site-specifics and both Tier 1 and Tier 2 of the approved standard design (if one is referenced in the COL). These design details are generally not within the scope of the COL application or hearing (except as required per 10 CFR 52.79(b)) and are not required to support COL issuance. Detailed engineering by the licensee and engineering design verification by the NRC may take place in parallel with NRC review of the COL application, and may be completed after the COL is issued.

As detailed design work is completed, any deviations from the approved standard or plant-specific design information will be handled in accordance with the applicable Part 52 change control process, including NRC staff approval and notification of changes, as appropriate. Documentation of the deviations will be reflected in the licensee's final safety analysis report (or update thereto). For example, deviations from the design approved in the COL application might include updated reference to revised codes, standards, or regulatory guides (if any), as well as other changes necessitated during the engineering, procurement, or construction processes.

The NRC staff has stated their intent to audit the design engineering process and engineering products to establish confidence that they are consistent with the design approved in the COL. This review is also intended to allow the staff to become familiar with design documents in support of construction inspection activities. To increase the confidence that the design can be constructed expeditiously without major engineering or licensing iterations, detailed design information, *e.g.*, specifications and construction drawings, is expected to be essentially complete and available to the NRC staff by the time of COL issuance or shortly thereafter, and NRC engineering design verification should be completed before or shortly after the first concrete is poured. It is recognized that certain design engineering work may continue after the COL is issued. However, enough of the design should be completed around the time of COL issuance to enable the NRC to make its acceptability determination.

To facilitate timely and efficient engineering design verification by the NRC staff, engineering information will be organized and readily retrievable for audit. It is not expected that the NRC staff would perform a 100 percent audit of this information. Based on past practices by the staff, it is expected that the staff will continue to use system-based, "vertical slice" audits for verifying the licensee's design engineering

and employ staff resources in combination with reviews of the various technical audits conducted by the licensee.

As part of engineering design verification of construction drawings and other design documents, NRC inspectors are expected to verify the adequacy of licensee engineering processes and design outputs in the following design areas

- Environmental Qualification
- Seismic design
- Separation/independence
- HELB analyses
- Fire protection
- Configuration management
- Design engineering for systems, structures and components

Engineering design verification will be a significant inspection activity by the NRC both in terms of the resources involved and its importance, and its completion will be a significant milestone for the NRC and licensee. Accordingly, and to maximize public visibility, it is envisioned that the NRC determination that licensee design engineering processes are acceptable would be published via the *Federal Register,* public web site or equivalent mechanism.

Following the NRC engineering design verification, it is anticipated that NRC will occasionally audit ("spot check") licensee implementation of design engineering processes on an ongoing basis. Having already established the effectiveness of the design engineering processes, ongoing spot checks of design engineering would involve a significantly reduced level of NRC inspection resources. These inspections would focus on configuration management and design details completed after the main thrust of NRC engineering design verification was completed.

Engineering design verification is similar to construction process inspections discussed in Section 3.2 in three key respects: early NRC staff approval of a key licensee process, continuing "spot checks" following approval, and public notice of the NRC review and acceptability determination.

Once NRC has verified the detailed engineering on the initial unit of an approved standard design, engineering design verification by the NRC would not be repeated for subsequent like units using the same design engineering information. However, NRC inspectors would be expected to audit plant-specific design changes and configuration management.

Engineering design verification is distinct from ITAAC verification. Engineering design verification ensures the detailed design conforms with the design

information approved in the COL, while ITAAC verify that the as-built plant satisfies the top level design and performance standards specified in the COL and associated acceptance criteria. Moreover, engineering design verification is expected to be completed prior to COL issuance or in the very early stages of plant construction, while ITAAC verification will continue throughout construction until shortly before fuel load.

It is important that NRC inspection guidance be developed concerning engineering design verification and that it reflect the important distinction between NRC engineering design verification and ITAAC.

5 *ITAAC Process Implementation*

5.1 Main Points

- ITAAC verification is the NRC process for confirming licensee determinations that ITAAC acceptance criteria have been met, including issuance of ITAAC completion notices required by Section 52.99. NRC ITAAC verification constitutes a substantive determination (i.e., concurrence) by the staff that the licensee has satisfactorily completed one or more ITAAC.

- To facilitate effective NRC ITAAC verification and associated inspection planning, construction and inspection activities corresponding to the ITAAC will be specially flagged on licensee construction plans and schedules, and the NRC staff will be kept informed of these schedules.

- ITAAC determination bases (IDB) document specific inspection, test or analysis results on which the licensee's ITAAC determinations will be based. The IDB for a given ITAAC is the licensee QAP record or records that correspond to the acceptance criterion specified in the ITAAC. Examples of IDB include:

    - The NDE reports documenting the adequacy of ASME welds in a given system or systems; or
    - Walkdown inspection report(s) confirming the proper location, configuration, etc., of SSCs; or
    - Pre-operational system function test results that demonstrate adequate flow and/or time response

- Based on the IDB, and provided there are no NRC inspection findings that must be resolved or pending corrective actions that must be completed in order to satisfy the ITAAC, the licensee will send an ITAAC Determination

Letter to NRC. The ITAAC Determination Letter:

- Specifies the scope of completed ITAAC
- Identifies that ITAAC determination bases are available for audit
- Requests NRC staff confirmation of the licensee's ITAAC determination(s) and issuance of the §52.99 *Federal Register* notice (FRN)

- Prior to sending ITAAC determination letters to NRC, the licensee would discuss the status of the ITAAC determination bases and potentially relevant ITAAC implementation issues. The purpose of these interactions is to ensure that the NRC staff is prepared to confirm the licensee's determinations that ITAAC have been met and avoid undue delay in the NRC ITAAC verification and §52.99 notice.

- NRC ITAAC verification and issuance of the Section 52.99 notices will be based on the ITAAC determination letter, NRC inspections and possible NRC audit of the specific bases on which the licensee's ITAAC determination was made. Further general inspection or evaluation of underlying construction activities, processes, records, etc., that is redundant to previous NRC inspections of QAP implementation is not necessary and should not be part of NRC ITAAC verification. The adequacy of cumulative, underlying construction-related activities is assured by the licensee's QAP and NRC oversight thereof.

- Advance interactions and the NRC's comprehensive, ITAAC-focused oversight activities are expected to facilitate timely ITAAC verification by NRC, *e.g.*, within 30 days of receiving the ITAAC Determination Letter.

- Deficiencies in the IDB identified during NRC ITAAC verification would be referred to the licensee's corrective action program. Unless the deficiency is material to the ITAAC determination, the NRC staff would be expected to make the required Section 52.99 finding of ITAAC completion, while corrective action proceeds separately under the QAP. If a deficiency is material to the ITAAC determination, then the licensee must take appropriate corrective action before the ITAAC can be closed out.

- Section 52.99 notices published via the *Federal Register,* public website or equivalent mechanism will signify NRC staff confirmation of the licensee's determination that one or more ITAAC have been met and provide important information to the public concerning the progress of construction activities.

5.2 ITAAC Implementation Planning and Coordination

In conjunction with its overall construction inspection activities, the NRC staff will verify that the ITAAC are met. Effective licensee and NRC coordination on construction and inspection schedules is essential to ensure that the NRC staff can plan its inspections of the as-built plant and has opportunities to observe ITAAC inspections and tests. To this end, construction and inspection activities corresponding to the ITAAC will be specially flagged on licensee construction plans and schedules, and the NRC staff will be kept informed of these schedules.

To facilitate necessary scheduling, resource loading and related planning by the NRC, it is expected that licensees will share construction plans and schedules with the NRC as soon as practical in parallel with COL interactions, at least several months before plant construction is scheduled to begin in earnest. This information is expected to identify a schedule for ITAAC completion as basis for NRC planning of its ITAAC verification activities, as well as the determination bases that will support NRC verification of each ITAAC to be included in the COL. Detailed construction schedules, construction inspection plans and ITAAC determination bases will not be within the scope of the COL application or hearing. Rather, this information will be developed by the licensee in preparation for plant construction.

When developing plant-specific schedules, emphasis will be placed on identifying early opportunities for ITAAC completion so that §52.99 notices are not all concentrated at the very end of the construction process. Distributing §52.99 opportunities as much as possible will result in a more orderly and manageable process, more timely and meaningful public information, and will provide tangible evidence of construction progress.

ITAAC established for the existing certified designs are organized primarily by system, although non-system ITAAC were established in such areas as radiation protection, piping design and buildings. (Future ITAAC established for new plant designs may, but are not required to, follow this largely system-based approach.) System and non-system ITAAC typically contain numerous individually numbered ITAAC line items. Licensees may complete, and NRC may sign off, an individual numbered ITAAC line item within a system or non-system. The schedule for completion and NRC verification of ITAAC will likely involve logical groupings of several completed ITAAC (perhaps involving multiple systems) within single licensee ITAAC Determination Letters. It is expected that each grouping would be the subject of an associated §52.99 notice.

Licensees would generally not request NRC ITAAC verification for a partially completed ITAAC line item. The exception to this might be the "basic configuration" ITAAC included in two of the three existing design certifications. The basic

configuration ITAAC encompass acceptance criteria in five distinct and separable areas: SSC functional arrangement, quality of ASME welds, environmental qualification, seismic qualification, and motor-operated valve performance under design basis conditions. It is envisioned that individual elements of the basic configuration ITAAC would be completed and signed off at different times during plant construction.

The keys to assuring an orderly, reasoned and manageable ITAAC verification process are (1) scheduling and completion of ITAAC determinations and findings as early as practical according to a preset schedule, and (2) focusing and simplifying the ITAAC verification process as much as possible as discussed below.

5.3 Licensee ITAAC Determination Letters

As specified construction and/or test activities are completed, the licensee will determine that one or more ITAAC have been completed and will send an "ITAAC Determination Letter" to the NRC staff. This letter will (1) clearly identify which of the acceptance criteria of the license have been met, (2) state that ITAAC determination bases are available for audit, and (3) request NRC staff confirmation of satisfactory ITAAC completion and notice in the *Federal Register* per 10 CFR 52.99. ITAAC determination letters will be signed by a designated officer or manager of the licensee.

For each completed ITAAC, the licensee will maintain an "ITAAC Determination Record" available for audit on site. The ITAAC Determination Record will identify the specific terms of the subject ITAAC, the SSCs within the scope of the ITAAC, and the specific inspection, test or analysis results relied upon for the ITAAC determination. Only those results directly relied upon by the licensee in making the specific ITAAC determination in question will be included with the ITAAC Determination Record. Full test reports or completed procedures from which specific results were extracted as the basis for the ITAAC determination would be referenced on the ITAAC Determination Record as appropriate.

For example, consider the pump flow test for the ABWR High Pressure Core Flooder (HPCF) system (ABWR ITAAC 2.4.2.3.d), The test data sheet from the completed pump flow test procedure would document the specific result relied upon for the licensee's ITAAC determination and would be attached to the ITAAC Determination Record for the HPCF ITAAC 2.4.2.3.d. This data sheet constitutes the ITAAC determination basis for this ITAAC. Reference to the completed test procedure from which the specific test result was extracted would also be provided. However, the procurement records for the HPCF pumps would not be part of, or referenced in, the ITAAC Determination Record because, while these are important QAP records with respect to the pedigree of the HPCF pumps, they will not be specifically relied upon

for the flow test ITAAC determination. Supporting documentation referenced on the ITAAC Determination Record (e.g., full reports, completed test procedures, etc.), as well as other QAP records, will be available for audit.

Sample ITAAC Determination Letters and ITAAC Determination Records are presented in Appendix A. Examples of ITAAC Determination Bases for several types of ITAAC are presented in Appendix B.

Processes/activities not directly relied upon for making ITAAC determinations (e.g., procurement and construction processes, installation and test procedures, technician training, etc.) will be implemented under the licensee's QAP and verified by the NRC staff as part of its construction inspection program.

NRC inspection and verification of QAP implementation provides assurance that "day-to-day" processes and activities not directly relied upon for specific ITAAC determinations are implemented properly. Reliance on QAP implementation frees the ITAAC verification process to focus on the specific "end-of-process" inspection, test or analysis specified in the ITAAC and whether the associated acceptance criteria have been met.

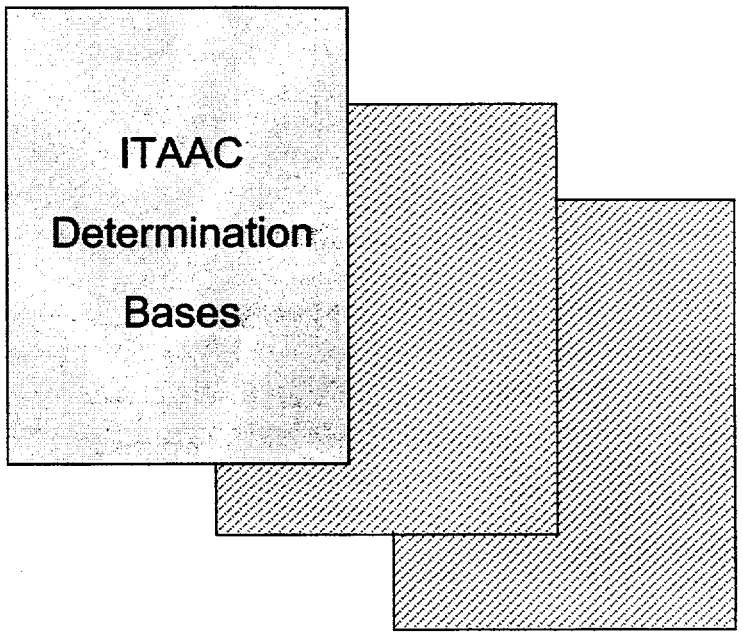
Upon making an ITAAC determination, the licensee will implement appropriate work and configuration management controls to ensure that subsequent maintenance and modification activities do not invalidate satisfaction of the ITAAC.

Licensee ITAAC Determinations

Licensee ITAAC
Determination Letter

- Specifies scope of completed ITAAC
- Identifies that ITAAC determination bases are available for audit
- Requests NRC staff confirmation and §52.99 FRN

Construction QAP Records



5.4 NRC Staff ITAAC Verification

Because of NRC staff awareness of the licensee's schedule for ITAAC completion, the NRC staff will know when specific ITAAC are to be performed by the licensee and when ITAAC Determination Letters are scheduled for submittal. It is expected that a target, such as within 30 days of NRC receipt of ITAAC Determination Letters, would be established as the time frame for NRC staff verification of satisfactory ITAAC completion and issuance of the associated *Federal Register* notices required by Section 52.99.

Licensee interactions with cognizant NRC staff are expected in advance of ITAAC Determination Letters to ensure staff readiness to sign off on the ITAAC that the licensee considers complete. The need for and extent of such advance communication will vary depending on the scope of the envisioned ITAAC determination letter and the extent of potentially relevant ITAAC implementation issues.

Through day-to-day, on-site inspection activities, interactions with licensee personnel and observation of activities in the field, the NRC staff is expected to be very familiar with the status and adequacy of plant construction, QAP implementation and ITAAC completion.[3] As such, cognizant NRC staff should be able to readily verify the licensee's determination upon receipt of a licensee ITAAC Determination Letter and issue the required §52.99 notice. For example, a relevant NRC inspection report may exist, and/or the staff may have witnessed the specific successful inspection or test in question. This is made more likely, as discussed earlier, by ensuring that NRC inspection activities are appropriately ITAAC focused.

The NRC staff may choose to audit the licensee's ITAAC determination bases or verify the as-built condition. What is not necessary and should be avoided as part of NRC ITAAC verification is further general inspection or evaluation of underlying construction activities, processes, records, etc., that is redundant to previous NRC inspections of QAP implementation. For example, reassessment or re-inspection of the licensee's procedures and processes for ASME welds is not necessary to support NRC ITAAC verification because (1) the NRC will have previously determined that the licensee's welding processes are acceptable, and (2) ITAAC acceptance criteria for ASME welds focus on the end-quality of the welds and not on the underlying licensee procedures. Evidence of the end-quality of the welds will be part of the determination bases for this ITAAC.

Many of the ITAAC are identical or similar from system to system. NRC may choose to group similar ITAAC together for the purposes of its ITAAC verification and 52.99 notices. In determining whether the group of ITAAC have been satisfied, NRC may decide to inspect or audit a sample of the individual ITAAC. Such an approach would be consistent with NRC's normal approach to inspections, in that NRC typically does not inspect or audit 100% of a licensee's activities but instead makes its findings based upon inspections and audits of a fraction of a licensee's activities.

If the NRC staff decides to conduct an audit or inspection to confirm a licensee ITAAC determination and identifies discrepancies in the ITAAC determination bases or in the field, such matters would be referred to the licensee's normal corrective action program. Unless there is a deficiency that indicates an ITAAC has not been successfully completed, the staff would be expected to make the required Section 52.99 finding of ITAAC completion, while corrective action proceeds separately under the QAP. If a deficiency is material to the ITAAC determination, then appropriate corrective action must be taken by the licensee before the ITAAC can be closed out. For example, suppose the test gauge used to demonstrate that a particular pump flow rate meets or exceeds the minimum value specified in an ITAAC acceptance criterion is

[3] The staff's 1996 draft report on the Revised CIP envisioned that a resident inspection office for a new plant under construction would consist of a technical staff of 6 to 12 individuals who rotate into and out of the office based on the expertise needed.

found to be out of calibration. An analysis of the situation might demonstrate that, even accounting for the out of calibration condition of the flow measuring device, the ITAAC was indeed satisfied. On the other hand, the pump flow test might need to be repeated after appropriate corrective action (e.g., replacement or recalibration of the flow meter), if, upon analysis, the licensee cannot conclude that the ITAAC acceptance criterion was indeed satisfied. In any event, the calibration problem constitutes a deficiency that would be addressed via the licensee's corrective action program, including, for significant deficiencies, investigation for implications for the measurement and test equipment program.

The ITAAC verification process will continue until (1) the licensee determines every individual ITAAC acceptance criterion is met and establishes the appropriate ITAAC Determination Records, (2) licensee determinations are confirmed by the NRC staff, and (3) the required notices are published in the *Federal Register*.

NRC ITAAC verification constitutes a substantive determination (i.e., concurrence) by the staff that the licensee has performed one or more ITAAC inspections, tests and analyses and the associated acceptance criteria have been met. After notice of successful completion of an ITAAC is published in the *Federal Register*, the NRC will not need to perform any further inspections or reviews related to that ITAAC absent the identification of significant new information that calls into question whether the ITAAC was met. Examples of significant new information that could affect a completed ITAAC determination include a major plant modification affecting the component(s) subject to the ITAAC, or evidence of material noncompliance with the ITAAC that was not known by the staff when it made its initial determination of successful ITAAC completion. Absent significant new information, the staff's §52.99 finding will be binding, and would not be reconsidered by the NRC staff.

If a license obtains new information (e.g., an event that damages an SSC or in response to a 52.99 notice) that may invalidate a previously accepted ITAAC, the licensee will enter the information in its corrective action program. The licensee will conduct an evaluation of the information to determine whether the SSC still satisfies the ITAAC. If the ITAAC remains satisfied, the licensee will document the assessment and any action taken in accordance with the corrective action program.

If, based on the licensee's evaluation of the new information, the SSC does not satisfy the ITAAC, the licensee will notify the NRC, take appropriate corrective action, and re-perform the ITA (to the extent necessary). The licensee will inform the NRC of the schedule for the ITA to be repeated. Following successful re-performance of the ITAAC, the licensee will submit a revised ITAAC Determination Letter to the NRC. Following NRC verification that the ITAAC has been satisfied, a revised 52.99 notice will be issued.

5.5 10 CFR 52.99 Notices

Section 52.99 requires that notices of successful ITAAC completion be published at appropriate intervals during plant construction in the *Federal Register*. Publication of §52.99 notices in the *Federal Register* will signify NRC staff confirmation of the licensee's determination that one or more ITAAC have been met.

For efficiency and to reduce administrative burden, §52.99 notices may be structured to cover multiple ITAAC completed in a similar time frame. For example, a single *Federal Register* notice may cover multiple actuation logic ITAAC completed for a given system or systems; environmental qualification for equipment in multiple systems; multiple system hydrostatic tests; etc. Alternatively, notices could be published periodically to cover those ITAAC completed during a given period. Opportunities for issuing §52.99 notices will be identified based on licensee and NRC staff interactions on overall construction and inspection schedules prior to and during the course of construction and preoperational testing.

Basic attributes of §52.99 notices should include the following:

- Background and contextual information concerning Part 52, issuance of the COL and the ITAAC process
- Identification of ITAAC that are the subject of the notice
- Reference to ITAAC determination bases, relevant NRC inspection reports and supporting information considered by the staff
- NRC staff determination that the acceptance criteria in the subject ITAAC have been met, i.e., that the ITAAC have been successfully completed
- Identification that opportunity for hearing will be provided in accordance with § 52.103(a)
- Request that any person with information contrary to the NRC conclusion in the notice provide that information to the NRC and the licensee as soon as possible upon discovery to enable appropriate follow-up by NRC and corrective action by the licensee

6 *Preoperational Finding Process and Hearing Opportunity*

6.1 Main Points

- The licensee precipitates the Section 52.103 process and the notice of intended operation required by Section 52.103(a) by sending a letter to the NRC identifying the intent to load fuel on a specified date. The licensee's letter is also expected to identify those ITAAC that have yet to be completed and a schedule for their completion.

- The NRC will publish in the *Federal Register* the notice of intended operation required by Section 52.103(a). This notice will provide opportunity to request a hearing on matters of ITAAC noncompliance.

- A number of ITAAC are expected to be uncompleted at the time of the Section 52.103(a) notice. It is expected that the notice will identify those ITAAC for which § 52.99 notices of completion have and have not been issued. To request a hearing on ITAAC completed after issuance of the Section 52.103(a) notice, Section 2.714 provides standard NRC administrative procedures for submittal and consideration of late-filed petitions.

- Requests for hearing are due in 60 days, at which time the Commission will deny or grant the request. The Commission is obligated to make every effort to resolve issues raised by the hearing requests prior to the scheduled date of fuel load.

- If there are no requests for hearing, none granted, or if all issues raised are resolved before fuel load, the NRC would, upon completion and NRC staff verification of all ITAAC, make the required Section 52.103(g) finding authorizing plant operation, including scheduled fuel load, power ascension testing and full power operations.

- The Section 52.103(g) finding will be based collectively upon the individual determinations made under Section 52.99. The NRC will not need to perform any new or additional inspections or reviews to make its Section 52.103(g) finding (except as may be necessary to respond to a contention in a Section 52.103 hearing).

- If issues are raised that cannot be resolved before fuel load, Section 52.103(c) provides that the Commission shall allow operation for an interim period provided, based on consideration of the outstanding issues, that there would be reasonable assurance of adequate protection of public health and safety.

- Thus, in the event there are unresolved hearing issues, the Commission must—in addition to the Section 52.103(g) finding—also make a finding under Section 52.103(c) allowing operation for an interim period.

- As discussed in Section 8, after the Commission makes its Section 52.103(g) finding authorizing fuel load and operation, no further authorization by the NRC is required to proceed to full power and commercial operation. For example, no separate authorization is required to exceed 5% power.

6.2 Findings Required Under Part 52

As described in the Statements of Consideration for Part 52, the Commission has established a process that requires two separate but related regulatory determinations. First, the NRC must determine that the ITAAC established in the combined license are "necessary and sufficient" to provide reasonable assurance that the facility has been constructed and will operate in accordance with the license, the Atomic Energy Act and the Commission's regulations. That determination will be made in connection with issuance of the combined license and an associated opportunity for hearing in accordance with Section 189a of the Atomic Energy Act.

Second, the Commission must find prior to authorizing operation that the ITAAC acceptance criteria have, in fact, been satisfied. As observed by the Commission, that finding, by its nature, cannot be made "until after construction is substantially complete." As a result, to the extent that a second opportunity for hearing must be afforded prior to operation pursuant to Section 189a of the Atomic Energy Act, the Commission concluded when issuing Part 52 that the opportunity for a hearing should be confined "to the single issue that cannot have been litigated earlier—whether the acceptance criteria are satisfied." This second finding, required by Section 52.103(g), is in addition to the periodic *Federal Register* notices of successful completion of individual ITAAC required by Section 52.99.

6.3 Section 52.103(a) Notice of Intended Operation

At least 180 days prior to the scheduled fuel load date, the NRC is to publish a *Federal Register* notice of intended operation required by Section 52.103(a). The licensee will trigger the Section 52.103 process with a letter that notifies the NRC of the scheduled date for fuel load, states that all ITAAC will be met prior to that date and requests that the NRC publish the required Section 52.103(a) notice. Because many ITAAC correspond to preoperational tests that are performed during the last six months before fuel load, not all ITAAC will have been completed and signed off

by the NRC staff at the time of the Section 52.103(a) notice.[4] The licensee letter and associated Section 52.103(a) notice are expected to clearly identify the ITAAC that have yet to be completed and a schedule for their completion. NRC ITAAC verification and issuance of ITAAC completion notices in accordance with Section 52.99 will continue after the Section 52.103(a) notice until all ITAAC are complete. All ITAAC must be completed and verified by the NRC in order to support the Commission's Section 52.103(g) finding and subsequent fuel load.

The NRC staff would be expected to inform the Commission regarding the status of ITAAC completion and to publish the required Section 52.103(a) notice—despite the existence of open QAP deficiencies or other incomplete activities—provided that the deficiencies and incomplete activities do not impact the determination that the ITAAC have been or will be satisfied before fuel load. As discussed earlier, deficiencies in QAP implementation identified by either the licensee or NRC staff will be referred to the licensee's normal corrective actions process and their satisfactory disposition assured through NRC inspection and enforcement. The NRC retains plenary Part 50 authority to take enforcement action as necessary to address such matters, including suspension, modification or revocation of the COL itself. Interactions between the licensee and the NRC staff are expected to ensure effective coordination on the actions that must be completed in the last six months before fuel load.

6.4 Section 52.103 Preoperational Hearing Opportunity

The *Federal Register* notice required by Section 52.103(a) notice will also provide an opportunity to request a hearing on matters of ITAAC noncompliance to persons whose interests may be affected by the operation of the plant. This is the sole opportunity to request a hearing provided by Section 52.103. The public has 60 days from the date of the notice to request a hearing on a question concerning ITAAC compliance.[5] Per Section 52.103(b), a petition must make a *prima facie* (meaning "on its face" or sufficient at first impression) showing that one or more of the acceptance criteria have not been or will not be met and the specific operational

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[4] Indeed, Part 52 contemplates that there will be uncompleted ITAAC at the time of the notice of intended operation when it states in Section 52.103(a) that the public may request a hearing on "whether the facility as constructed complies, *or on completion will comply*, [with the ITAAC]," and in Section 52.103(b) that requests for hearing must show "that one or more of the acceptance criteria ... have not been, *or will not be met*." (Emphases added)

[5] By the time of the Section 52.103(a) notice, an extensive public record will exist concerning plant construction, including numerous NRC inspection reports and *Federal Register* notices of acceptable ITAAC completion. As identified in the Part 52 Statements of Consideration, the Commission expects that interested persons would be familiar with the construction record and identified that the 60-day comment period is intended for consideration of options, consultation with other persons and drafting of pleadings.

consequences of nonconformance that would be contrary to providing reasonable assurance of adequate protection of the public health and safety.

For example, one of the ITAAC requires that pressure boundary welds comply with the requirements in the ASME code. A statement by a welder at the plant that he/she had observed a particular pressure boundary weld with excessive porosity may constitute *prima facie* evidence of a noncompliance with the ITAAC. Conversely, if it was determined that an ASME Code welder was not properly certified, this would not, by itself, constitute *prima facie* evidence of noncompliance with this ITAAC because the improper certification does not constitute evidence material to the condition of any welds. The licensee determination that this ITAAC is met will be based on specific radiographs or other non-destructive examinations indicating that the welds are satisfactory, irrespective of inadequate welder certification records.

A number of ITAAC are expected to be uncompleted at the time of the Section 52.103(a) notice and even after the close of the 60-day comment period. Therefore, members of the public may not be able to provide evidence of noncompliance with some ITAAC during the 60-day period. However, Section 2.714 provides standard NRC administrative procedures for submittal and consideration of late-filed petitions. Thus, even after the close of the 60-day comment period, a person may still request a hearing on such ITAAC based upon information obtained after the 60-day period that provides a basis for a contention that an acceptance criterion for an ITAAC was, in fact, not met. The petition would have to meet the criteria of both Sections 52.103(b) and 2.714, and, to ensure timely closure of the Section 103 proceeding, late filed petitions must be received within 60 days of the date of the final Section 52.99 notice of ITAAC completion. The pendancy of any hearing opportunity or request would not necessarily impact the Commission's Section 52.103(g) finding, fuel load or operation. Consistent with Section 52.103(c), the Commission, upon receipt of a late request for hearing, will expeditiously deny or grant the request and, if granted, allow operation during an interim period provided there is reasonable assurance of the adequate protection of public health and safety.

Some ITAAC will not be completed until shortly before NRC makes its 52.103(g) finding authorizing fuel load and operation. A person should be allowed to file a request for hearing with respect to such ITAAC within 60 days of issuance of the 52.99 notice on the ITAAC. The NRC should expeditiously decide whether to grant such a request. If the request is granted, and if the NRC has previously made a 52.103(g) finding and authorized fuel load and operation, the NRC should also make a determination under Section 52.103(c) as to whether operation may continue pending completion of the hearing. If NRC cannot make a finding under Section 52.103(c), the reactor should be shut down or interim operation should be appropriately conditioned in light of the issues raised by the intervener.

6.5 Section 52.103(g) Preoperational Finding

If there are no requests for hearing or no requests are granted by the Commission, the NRC would, upon completion and NRC staff verification of the last ITAAC, make its Section 52.103(g) finding authorizing plant operation, including scheduled fuel load, power ascension testing and full power operations.

In evaluating hearing requests, the Commission may, in addition to considering the *prima facie* evidence presented, consider whether the contention is exempt from adjudication under the Administrative Procedures Act.[6]

If a hearing request is granted based on the required *prima facie* showing, the Commission, per Section 52.103(d), will determine appropriate hearing procedures (i.e., whether the hearing will be informal or adjudicatory) and state its reasons therefor. Per Section 52.103(e), the Commission will, to the maximum possible extent, render a decision on matters raised by the hearing request prior to the scheduled date for fuel load. If the issues raised by the hearing request are resolved before fuel load, the NRC would, again, upon completion and NRC staff verification of the last ITAAC, make its Section 52.103(g) finding authorizing plant operation.

The Commission's preoperational finding under Section 52.103(g) will signify that all of the ITAAC acceptance criteria in the COL have been met. It is expected that the Section 52.103(g) finding will be based collectively upon the individual determinations made under Section 52.99 and that the NRC will not need to perform any new or additional inspections or reviews to make its Section 52.103(g) finding (except as may be necessary to respond to a contention in a Section 52.103 hearing). Given the nature of the Section 52.103(g) finding, the Commission may, absent a hearing, elect to delegate the responsibility for making this finding to the staff.

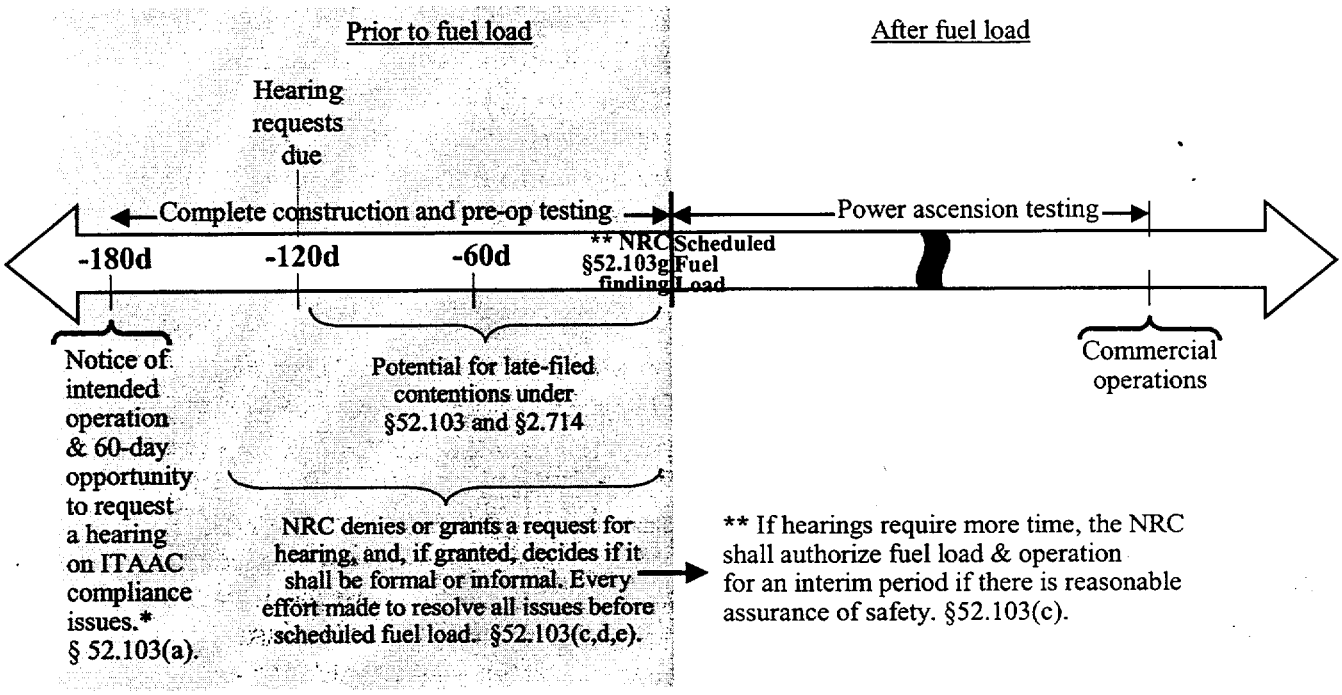
If the issues raised by the hearing request are not resolved by fuel load, Section 52.103(c) provides that, based on evaluation of issues raised by the hearing request(s), the Commission will allow operation during an interim period provided there will be reasonable assurance of adequate protection of the public health and safety. Thus, in the event there are unresolved hearing issues, the Commission must make two findings prior to authorizing fuel load:

- A finding under Section 52.103(g) signifying that all of the acceptance criteria in the ITAAC have been met
- A finding under Section 52.103(c) allowing operation during the interim

[6] Per the Statements of Consideration for Part 52, "[t]he final rule makes issues of conformity with the terms of the COL part of any post-construction hearing, unless those issues are excepted from adjudication by the APA exception for findings which are based solely on the results of tests and inspections."

period before the hearing is complete that there is reasonable assurance of adequate protection of the public health and safety

10 CFR 52.103 Process



* Requests for hearing must concern non-compliance with ITAAC acceptance criteria and must identify safety impact. § 52.103(b).

Note: Third party requests for action unrelated to ITAAC acceptance criteria will be processed under normal NRC procedures (10 CFR 2.206). § 52.103(f).

6.6 Petitions Under 10 CFR 2.206

As provided by Section 52.103(f), a member of the public can also raise issues by requesting modification of the terms and conditions of the combined license. Such requests will be processed by the NRC as requests for action in accordance with 10 CFR 2.206. For example, an allegation that the terms of the COL (e.g., a particular ITAAC) are themselves inadequate would be handled in this manner. Furthermore, to the extent that the petition requests deviation from or addition to the referenced design certification, the petition must provide sufficient information to enable the NRC to satisfy the change process requirements of the design certification rule. The Commission must determine whether to grant or deny such a petition and, if the petition is granted, whether any immediate action is required. Fuel loading and operation will not be affected by the granting of the petition unless a Commission order prohibiting such action is made immediately effective.

7 *Assuring Operational Readiness Under Part 52*[7]

7.1 Main Points

- Under Part 52, the bulk of NRC findings historically made under 10 CFR 50.57(a) in connection with issuance of Part 50 operating licenses are made up front in the COL. The only required finding that remains to be made after the COL is issued is the ITAAC finding required by Section 52.103(g).

- NRC assurance of operational readiness under Part 52 is accomplished via a two track approach. Readiness for operation of the physical plant is assured by the ITAAC process, while acceptability of operational programs is assured by required compliance with the terms of the COL and NRC regulations and NRC oversight thereof.

- In parallel with completion and sign-off of ITAAC, it is envisioned that the NRC will perform safety-focused inspections to assess operational programs. It is expected that the primary focus of these inspections will be based on the areas reflected in the Cornerstones of Safe Operation contained in the recently revised Reactor Oversight Program (ROP), including identified Cross Cutting Elements.

[7] For purposes of this white paper, the implementation guidance provided concerning operational readiness under Part 52 reflects the industry view that there will be no ITAAC on operational programs. A Commission policy determination on this issue is pending.

- Results of operational program inspections will be communicated by the NRC staff to the EDO and Commission prior to the scheduled date of fuel load. If necessary based on these results, the NRC could take appropriate enforcement action to prohibit or delay fuel load pending appropriate corrective action.

7.2 Discussion

The Part 50 prerequisites for issuance of an operating license differ substantially from the prerequisites for authorizing operation under Part 52.

Under 10 CFR 50.57, an operating license may not be issued until the Commission makes six findings, including findings regarding substantial completion of the facility, technical qualifications of the applicant, and reasonable assurance that activities authorized by the operating license can be conducted without endangering the public health and safety. In making these findings, the NRC has traditionally conducted wide-ranging inspections and reviews of the design, construction, preoperational testing, and operational capability (including personnel, procedures, and implementation). Based upon the result of these inspections and reviews, the NRC has made a determination of the operational readiness of the plant, in accordance with NRC Inspection Procedure 94300 (inactive).

Under Part 52, the bulk of these findings are made up front in the COL, and, as discussed earlier, the sole remaining NRC action required prior to initial operation is a finding by the Commission that the ITAAC acceptance criteria in the COL are met. Once the Commission finds that the acceptance criteria are met, the licensee may commence initial operation unless there is an outstanding enforcement order prohibiting fuel load and operation or an applicable license condition or technical specification has not been satisfied. Thus, under Part 52, the Part 50 "operational readiness" finding has been supplanted by the Section 52.103(g) finding on ITAAC satisfaction.

Although the nature of the Commission's findings under Part 50 and Part 52 are substantially different, it is expected, as discussed earlier, that the type of inspections and reviews conducted by the NRC under Part 52 will be similar to the inspections and reviews conducted under Part 50, with the addition of verifying compliance with ITAAC. Thus, under Part 52, it is expected that the NRC will still conduct reviews of the detailed design, inspections of construction and preoperational testing (including items that are not subject to ITAAC), and inspections and reviews of operational program readiness similar to the inspections embodied in NRC Inspection Procedure 93806.

Notwithstanding the important differences between Part 50 and Part 52, licensees under either regime are subject to the complete terms of the license and all applicable NRC regulations. Absent compliance, the licensee is potentially subject to an NRC order prohibiting construction completion, fuel load, power ascension testing or operation, depending on the safety significance of the noncompliance.

Thus as a practical matter, NRC assurance of operational readiness under Part 52 is accomplished via a two track approach. Readiness for operation of the physical plant is assured by the ITAAC process, while acceptability of operational programs is assured by required compliance with the terms of the COL and NRC regulations and NRC oversight thereof.

In parallel with completion and sign-off of ITAAC, it is envisioned that the NRC will perform safety-focused inspections to assess operational programs. It is expected that the primary focus of these inspections will be based on the areas reflected in the Cornerstones of Safe Operation contained in the recently revised Reactor Oversight Program (ROP), including identified Cross Cutting Elements. The Cornerstone inspection areas are Reactor Safety, Radiation Safety, and Safeguards, and the Cross Cutting Elements are Human Performance, Safety Conscious Work Environment, and the Corrective Action Program. The envisioned scope of safety-focused inspections reflects the areas identified in the baseline inspection portion of the ROP. It is recognized that not all aspects of the revised ROP will apply to operational program readiness inspections. For example, the Performance Indicator portion of the ROP would not apply since the plant will not yet have operated. Further, the Significance Determination Process portion of the ROP does not lend itself to the pre-operational assessment process because the findings and action matrix results are based on a risk severity assessment for an operating reactor.

This approach will focus inspection activities on safety significant areas, promote efficient use of resources, and provide for a systematic transition to the Operations Phase ROP. Consistent with a safety-focused approach, relatively less inspection resources would be devoted to regulatory compliance inspections in such areas as the Technical Specification Program.

It is expected that the safety-focused inspection scope would be consistent with those areas that are contained in the current ROP baseline inspection program procedures as follows:

- Reactor Safety - NRC Inspection Procedure 71111 (Initiating Events, Mitigating Systems, Barrier Integrity); NRC Inspection Procedure 71114 (Emergency Preparedness)

- Radiation Safety - NRC Inspection Procedure 71121 (Occupational Radiation Safety); NRC Inspection Procedure 71122 (Public Radiation safety)

- Safeguards - NRC Inspection Procedure 71130 (Physical Protection)

- Cross Cutting Elements - NRC Inspection Procedure 71152 (Identification and Resolution of Problems)

In addition, regulatory compliance inspections would be based on the applicable portions of the NRC Inspection Manual (Inspection and Enforcement Manual Chapter 2513, Appendix B).

It is envisioned that operational program inspections will be scheduled and performed much as they have in the past for Part 50 plants. If the results indicate that the licensee's programs and performance do not provide adequate protection of safety, such conclusions would be provided to the EDO and Commission prior to the scheduled date of fuel load, and the NRC could take appropriate enforcement action to prohibit or delay fuel load pending appropriate corrective action. Conversely, if there are no significant violations that would warrant enforcement action that delays fuel load, it is expected that the NRC staff will also communicate this result to the EDO and Commission prior to fuel load.

8 *Transition to Full Power Operations Under Part 52*

As discussed in the preceding sections, the following conditions are necessary and sufficient for a plant licensed under Part 52 to commence fuel loading, power ascension testing and full power operations:

1. The licensee has completed all ITAAC, the NRC staff has verified that all ITAAC acceptance criteria have been met and the Commission has made the required Section 52.103(g) finding. If necessary, the Commission has also made a finding under Section 52.103(c) allowing operation for an interim period, provided there is reasonable assurance of public health and safety protection, while hearings are completed on issues material to ITAAC compliance.

2. For any petition granted under Section 52.103(f) (*i.e.*, processed in accordance with 10 CFR 2.206), the Commission has determined that no immediate action is required that would disrupt the transition to operation, *e.g.*, issuance of an order preventing fuel load or stopping power ascension testing.

3. There are no outstanding Commission orders prohibiting construction completion, fuel load, power ascension testing or operation resulting from (1) licensee failure to comply with terms of the COL (e.g., license conditions and

technical specifications) or NRC regulations or (2) a condition, including operational program deficiency, that indicates that there is not adequate protection of the public health and safety.

4. The licensee has satisfied COL conditions prerequisite to fuel loading and commencement of operation, as applicable.

After the Commission makes its Section 52.103(g) finding authorizing fuel load and operation, no further authorization by the NRC is required to proceed to full power and commercial operation. For example, no separate authorization is required to exceed 5% power.[8] Of course, the licensee must comply with all applicable license conditions and technical specifications associated with power ascension testing and full power operations.

9. *Role of ITAAC After Fuel Load*

As discussed earlier, the sole purpose of ITAAC is to provide the basis for the Commission's decision to authorize fuel load and initial operation. Therefore, after fuel load, the ITAAC do not constitute regulatory requirements for the COL holder or for renewal of the COL. Nevertheless, subsequent modifications must comply with the Tier 1 design descriptions unless a change is made in accordance with the design certification rule. The COL holder may voluntarily elect to refer to the ITAAC when making subsequent modifications, but is not required to do so.

Reasonable assurance of adequate protection of the public health and safety during plant operation throughout the term of the license plus any extension is assured by required continuing compliance with the terms of the COL and the NRC's regulations, including 10 CFR Parts 20, 21, 50, 73, etc., and NRC oversight thereof.

END

[8] In a September 5, 2000, SRM, the Commission approved the form and content of a generic combined license proposed by the NRC staff in SECY-00-0092, including conditions D.2 & 3 that would require the Director of NRR to authorize low power (above 5%) and full power operation. These conditions are not consistent with Part 52 which provides that the Section 52.103(g) finding upon completion of all ITAAC is the sole NRC finding required prior to operation, where operation is considered to include fuel load, power ascension testing and full power operations. Furthermore, the condition on commercial operation envisioned by the NRC staff is not consistent with the Part 50 process, which contains no requirements (either in the regulations or standard OL conditions) for NRC authorization to proceed to commercial operation. The industry requests that the NRC staff and Commission revisit the appropriateness of these conditions based on detailed stakeholder discussion of COL issues which have only recently begun.

Appendix A
Sample ITAAC Determination Letters and ITAAC Determination Records

Sample ITAAC Determination Letter to NRC
Plant ABWR – ITAAC 2.4.2.2

Date_____

RE: ITAAC Completion Notice

Mr._____
Nuclear Regulatory Commission

We have completed ASME Code Components Hydrostatic Test(s), ITAAC 2.4.2.2 High Pressure Core Flooder System and determined that the specific acceptance criterion for this ITAAC has been met. The results of the hydrostatic test(s) of the ASME Code components of the HPCF System conform with the requirements in the ASME Code, Section III.

The bases for this determination are available at the plant site. We request NRC staff confirmation of this determination and publication of the required notice in the *Federal Register* per 10 CFR 52.99 and in accordance with the NRC process and schedule guidance for ITAAC completion, evaluation and notification.

Sincerely,

_____
Designated Licensee Officer or Manager

ITAAC ACCEPTANCE CRITERIA DETERMINATION RECORD
(Available for Audit)

PLANT ABWR

High Pressure Core Flooder System
ITAAC 2.4.2.2
ASME Code Components Hydrostatic Test

1. Required Inspection, Test, or Analysis

   A hydrostatic test will be conducted on those code components of the HPCF system required to be hydrostatically tested by the code.

2. Acceptance Criteria

   The results of the hydrostatic test of the ASME Code components of the HPCF system conform with the requirements in the ASME Code, Section III.

3. Test/Inspection Report

   See attached "Leak Test Record" (hydrostatic test report) and system test scope.

4. Conclusions

   A comparison was performed between the required and actual hydrostatic test(s) pressures and test(s) durations. The scope of each test segment was examined to ensure appropriate overlap and complete testing of the HPCF code components within the HPCF system. The required hydrostatic test pressures and durations were satisfied and the ASME Code components in the HPCF system required by the ASME Code, Section III to be hydrostatically tested were included in the test scope. This satisfies the acceptance criteria for ITAAC 2.4.2.2.

5. Signature

_____ _____

LEAK TEST REPORT

1.	UNIT_____ SYSTEM TEST NUMBER_____ SYSTEM_____ CODE_____ CLASS_____ LEAK TEST PROCEDURE NUMBER_____REV._____SPEC._____
2.	TEST REQUIREMENTS: DESIGN PRESSURE_____P.S.I.G. TEST PRESSURE_____P.S.I.G. @_____°F MIN. MAX TEST PRESSURE_____P.S.I.G. MIN. HOLD TIME_____ EXAMINATION PRESSURE_____P.S.I.G. GAUGE PRESSURE_____P.S.I.G. GAUGE PRESSURE RANGE_____TO_____ NUMBER GUAGED____ TEST MEDIUM_____ RELIEF VALVE SETTINGS_____P.S.I.G REMARKS_____
3.	TEST RECORD GUAGE S/ N _____ RANGE_____TO_____P.S.I.G. GUAGE "PRE-TEST" CALIBRATION DATE_____ VERIFIED BY_____QC PRESSURE TEST RELIEF VALVE SERIAL NO._____ SETTING_____ TEST MEDIUM_____ TEST TEMPERATURE_____°F GUAGE S/N_____ TEST PRESSURE_____ TIME AT PRESSURE_____ EXAMINATION PRESSURE_____P.S.I.G SYSTEM FILL AND AIR VENT VERIFIED BY _____TEST ENGINEER TEST CONDUCTED BY:_____ ENGINEER DATE_____ GUAGE "POST TEST" CALIBRATION DATE_____ VERIFIED BY:_____ QC
4.	LEAK TEST WITNESSED AND ACCEPTED BY: CONSTRUCTION QC_____ DATE_____ AUTHORIZED NUCLEAR INSPECTOR_____ DATE_____ _____ _____ (ORGANIZATION) (SIGNATURE) DATE _____ _____ (ORGANIZATION) (SIGNATURE) DATE
	SYSTEM SECURED BY: _____TEST ENGINEER DATE_____ _____QC ENGINEER DATE_____

SAMPLE
Licensee ITAAC Determination Letter
Plant ABWR – ITAAC 2.4.2.6

NRC Project Manager:

We have completed inspections required by ITAAC 2.4.2, Item 6, of the main control room displays and controls for the High Pressure Core Flooder System and determined that the specified acceptance criterion for this ITAAC has been met, namely, displays and controls exist or can be retrieved in the main control room as defined in Section 2.4.2 of the certified design material incorporated in the combined license.

The bases for this determination are available for audit the plant site. We request NRC staff confirmation of this determination and publication of the required notice in the *Federal Register* per 10 CFR 52.99 and in accordance with the process and schedule guidance of NRC Inspection Module IP- [ITAAC Verification].

Signed,

_____

Designated Licensee Officer or Manager

ITAAC Acceptance Criteria Determination Record - Plant ABWR (Available for Audit)

High Pressure Core Flooder System
ITACC 2.4.2 Item 7
Remote Shutdown System Displays

1. Required Inspection, Test or Analysis

   Inspections will be preformed on the RSS displays and controls for the HPCF System.

2. Acceptance Criteria

   Displays and control exist on the RSS as defined in Section 2.4.2.

3. Test/Inspection Reports

   See attached inspection record and loop checks/calibration records

4. Conclusion

   A comparison was performed between the parameter displays and controls and status indications for the active safety-related components shown on Figure 2.4.2a of ITACC 2.4.2 and those listed within the attached inspection report. All control switched, parameter displays and status indicators required within the remote shutdown system by the acceptance criteria have been verified to be retrievable on the panel displays. In addition, loops checks have been performed on the indication and instrumentation verifying proper function. This satisfies the acceptance criteria for this ITACC.

5. Signature

_____ _____

Acceptance Criteria Determination Record
Plant ABWR
High Pressure Core Flooder System
ITACC 2.4.2 Item 7
Remote Shutdown System Displays

1. Verify that the Following Controls exist or can be retrieved in the remote shutdown system control panels:

Required Parameter	Instrument Number	Initial	Date
Main Pump Discharge Press	1E41-PIXXX	_____	_____
HPCF Flow Rate	1E41-FIXXX	_____	_____
HPCF CST Suction MOV	1E41-FXXX		
Control Switch	1E41-CSXXX	_____	_____
Open Indication	Green Light	_____	_____
Closed Indication	Red Light	_____	_____
Auto Indication	--Light	_____	_____
Manual Indication	--Light	_____	_____
HPCF S/P Suction MOV	1E41-FXXX		
Control Switch	1E41-CSXXX	_____	_____
Open Indication	Green Light	_____	_____
Closed Indication	Red Light	_____	_____
Auto Indication	--Light	_____	_____
Manual Indication	--Light	_____	_____
HPCF Test Line MOV	1E41-FXXX		
Control Switch	1E41-CSXXX	_____	_____
Open Indication	Green Light	_____	_____
Closed Indication	Red Light	_____	_____
Auto Indication	--Light	_____	_____
Manual Indication	--Light	_____	_____
HPCF Injection MOV	1E41-FXXX		
Control Switch	1E41-CSXXX	_____	_____
Open Indication	Green Light	_____	_____
Closed Indication	Red Light	_____	_____
Auto Indication	--Light	_____	_____
Manual Indication	--Light	_____	_____

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Acceptance Criteria Determination Record
Plant ABWR
High Pressure Core Flooder System
ITACC 2.4.2 Item 7
Remote Shutdown System Displays

Required Parameter	Instrument Number	Initial	Date
HPCF Main Pump	1E41 – CXXX		
Control Switch	1E41 – CSXXX	_____	_____
Running Indication	Red Light	_____	_____
Off Indication	Green Light	_____	_____
Auto Indication	--Light	_____	_____
HPCF Mini-Flow MOV	1E41 - FXXX		
Control Switch	1E41 - CSXXX	_____	_____
Open Indication	Green Light	_____	_____
Closed Indication	Red Light	_____	_____
Auto Indication	--Light	_____	_____
Manual Indication	--Light	_____	_____
Manual Initiation Pushbutton	1E41 – PBXXX	_____	_____
Indicating Light	Red Light	_____	_____

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Appendix B
Examples of ITAAC Determination Bases

Example 1: Functional Arrangement - Chemical and Volume Control System (CVS) - AP600 ITAAC 2.3.2.1				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The functional arrangement of the CVS is as described in the Design Description of this Section 2.3.2.	Inspection of the as-built system will be performed.	The as-built CVS conforms with the functional arrangement as described in the Design Description of this Section 2.3.2.	• As-built walkdown inspection report	• Construction drawings

Example 2: ASME Class 1, 2, & 3 Welds - Chemical and Volume Control System (CVS) - AP600 ITAAC 2.3.2.3.a				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
Pressure boundary welds in components identified in Table 2.3.2-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.	• Weld NDE checklist "Traveler"	• Completed weld NDE checklist • Individual weld NDE records, e.g., radiographs • Welder qualification records • Welding procedures

Example 3: Seismic Qualification - Chemical and Volume Control System (CVS) AP600 ITAAC 2.3.2.5				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The seismic Category I equipment identified in Table 2.3.2-1 can withstand seismic design basis loads without loss of safety function.	i. Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.3.2-1 is located on the Nuclear Island. ii. Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii. Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions	i. The seismic Category I equipment identified in table 2.3.2-1 is located on the Nuclear Island. ii. A report exists and concludes that seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function. iii. A report exists and concludes that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	• System Component Evaluation Worksheets ("SCEW" Sheets) • Installation inspection record, including location, anchorage, orientation, and other SEQ considerations.	• Seismic test reports • Seismic loading analyses • Installation procedures • Vendor & test lab QA audit reports • Seismic test procedures

Example 4: Environmental Qualification - Chemical and Volume Control System (CVS) - AP600 ITAAC 2.3.2.6.a				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The Class 1E equipment identified in Table 2.3.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during , and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.3.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	• System Component Evaluation Worksheets ("SCEW" Sheets)	• EQ reports • EQ zones • Installation inspection record • System design analyses/bases • Installation procedures • Procurement, receipt and storage records • Vendor & test lab QA audit reports • EQ test procedures

Ex. 5: Motor Operated Valve Design Bases Fxn - Chemical & Volume Control System (CVS) - AP600 ITAAC 2.3.2.11.a				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The motor-operated and check valves identified in Table 2.3.2-1 perform an active safety-related function to change position as indicated in the table.	i. Tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions. ii. Inspection will be performed for the existence of a report verifying that the as-installed motor-operated valves are bounded by the tested conditions. iii. Test of the as-installed MOVs will be performed under pre-operational flow, differential pressure and temperature conditions	i. A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.3.2-1 under design conditions. ii. A report exists and concludes that the as-installed motor-operated valves are bounded by the tests or type tests. iii. Each MOV changes position as indicated in Table 2.3.2-1 under pre-operational conditions.	• Factory test data sheet of MOV design bases testing • As-built design analysis • System pre-operational test data sheet	• Factory test report • Design bases test procedures • Test lab and vendor QA audit • Design calcs • Completed pre-op test procedure • Test instrument calibration records

Example 6: Physical Separation – RHR System - ABWR ITAAC 2.4.1.10				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
Each mechanical division of the RHR System (Divisions A, B, C) is physically separated from the other divisions.	Inspections of the as-built RHR System will be performed.	Each mechanical division of the RHR System is physically separated from other mechanical divisions of RHR System by structural and/or fire barriers with the exception of components inside primary containment.	• As-built walkdown inspection reports	• Detailed design that implements approved physical separation criteria • HELB analyses/zones • Procurement and installation records for penetrations, doors, fire barriers, etc.

Example 7: Main Control Area Envelope – Control Building - ABWR 2.15.12.5				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The main control area envelope is separated from the rest of the C/B by walls, floors, doors and penetrations, which have a three-hour fire rating.	Inspections of the as-built structure will be conducted.	The as-built C/B has a main control area envelope separated from the rest of the C/B by walls, floors, doors and penetrations, which have a three-hour fire rating.	• As-built walkdown inspection report	• Detailed design that implements the approved fire barrier criteria • Procurement and installation records for penetrations, doors, fire barriers, etc.

Example 8: NPSH – RCIC System - ABWR ITAAC 2.4.4.3,j				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The RCIC System pump has sufficient NPSH.	Inspections, tests, and analyses will be performed based upon the as built system. NPSH tests of the pump will be performed at test facility. The analysis will consider the effects of: 1) Pressure losses for pump inlet piping and components. 2) Suction from suppression pool with water level at the minimum value. 3) 50% blockages of pump suction strainers. 4) Design basis fluid temperature (77° C). 5) Containment at atmospheric pressure.	The available NPSH exceeds the NPSH required by the pump.	• Factory test pump curve • As-built design analyses that considers the factors 1-5 identified under ITA	• Factory test report • Vendor QA audit • Vendor test procedures

Example 9: Electrical Independence – RHR System ABWR ITAAC 2.4.1.9				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
Each of the three RHR divisions is powered from the Class 1E division as shown on Figures 2.4.1a, 2.4.1b and 2.4.1c. In the RHR System, independence is provided between Class 1E divisions, and between Class 1E divisions and non- Class 1E equipment.	a. Tests will be performed on RHR System by providing a test signal to only one Class 1E division at a time. b. Inspection of the as-installed Class 1E divisions of the RHR System will be performed.	a. The test signal exists only in the Class 1E division under test in the RHR System. b. In the RHR System, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.	• Independence testing data sheets • As-built walkdown inspection reports	• Completed independence testing test procedure/report • Detailed design that implements approved separation and isolation criteria

Example 10: Diesel Load Capacity – EDG System - ABWR ITAAC 2.12.13.2				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The DGs are sized to supply their load demand following a LOCA.	Analyses to determine DG load demand, based on the as-built DG load profile, will be performed.	Analyses for the as-built DG systems exist and conclude that the DG System capacities exceed, as determined by their nameplate ratings, their load demand following a LOCA.	• As-built load profile for each EDG • Updated (as-built) calc • EDG nameplate data	• EDG procurement records • Licensee calculation procedures

Example 11: System Functional Tests – HPCF System – ABWR ITAAC 2.4.2.3.f				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
System flow into the reactor vessel is achieved within 16 seconds of receipt of an initiation signal and power available at the emergency busses.	Tests will be conducted on each HPCF division using simulated initiation signals.	The HPCF System flow is achieved within 16 seconds of receipt of a simulated initiation signal.	• System pre-operational test data sheet	• Completed pre-operational test procedure/report • Design calcs • Test instrument calibration records • M&TE Program audit • Technician qualification records

Example 12: Actuation Logic – RHR System ABWR ITAAC 2.4.1.3.e				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The system automatically aligns to the LPFL mode of operation from the test mode, the suppression pool cooling or wetwell spray modes upon receipt of an initiation signal.	Tests will be conducted on each RHR division using simulated LPFL initiation signals.	Each division automatically aligns to the LPFL mode of operation from the test mode, the suppression pool cooling or wetwell spray modes upon receiving an initiation signal. The wetwell spray mode is applicable for Divisions B or C.	• Instrument loop test data sheets	• Completed instrument loop test procedures

Example 13: Hydrostatic Testing – HPCF System – ABWR ITAAC 2.4.2.2				
			Construction QAP Records	
Requirement	Inspection, Test or Analysis	Acceptance Criteria	ITAAC Determination Bases	Examples of Supporting Documentation
The ASME Code components of the HPCF System retain their pressure boundary integrity under internal pressures that will be experienced during service.	A hydrostatic test will be conducted on those Code components of the HPCF System required to be hydrostatically tested by the ASME Code.	The results of the hydrostatic test of the ASME Code components of the HPCF System conform with the requirements in the ASME Code, Section III.	• Hydrostatic test data sheets	• Completed hydro test procedure • Pressure gauge calibration record • Documentation of proper test overlap