U.S. Nuclear Regulatory Commission
U.S. Department of Energy
Southern Nuclear Company
Westinghouse

Simulated Inspections, Tests, Analyses, and Acceptance Criteria Closure and Verification Demonstration Proposal

July 29, 2010

Background:

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," requires combined license (COL) applicants to submit and perform inspections, tests, analyses, and acceptance criteria (ITAAC) in order to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the COL. The licensee notifies the U.S. Nuclear Regulatory Commission (NRC) that it has completed the ITAAC by submitting an ITAAC closure letter (ICL) stating that the prescribed inspections, tests, and analyses have been performed and that the prescribed acceptance criteria have been met. In turn, the NRC staff will review all ICLs to verify that the prescribed ITAAC are met, and will then issue a *Federal Register* notice (FRN) of the staff's determination of the successful completion of the ITAAC. When the staff has verified that all ITAAC have been closed, the Commission will decide whether to make a finding that the licensee has met the acceptance criteria in the COL. If the Commission finds that all the acceptance criteria are met, then the licensee may operate the facility under 10 CFR 52.103(g).

Currently, the staff is gaining experience by inspecting the ITAAC contained in the Vogtle limited work authorization and by conducting a pilot inspection of design acceptance criteria related to the South Texas Project. Additionally, the staff has several initiatives in progress to ensure that the ITAAC closure and verification processes are effective and efficient. These initiatives include: (1) holding NRC internal workshops to develop the inspection strategy and exercise the ITAAC closure verification process, (2) working with applicants on the development and refinement of the ITAAC schedule, (3) preparing proposed rule language for ITAAC maintenance, (4) holding bimonthly Category 3 public workshops with stakeholders to evaluate and resolve issues associated with ITAAC closure, and (5) revising Regulatory Issue Summary 2008-05, "Lessons Learned To Improve Inspections, Tests, Analyses, and Acceptance Criteria Submittal," dated February 27, 2008, on ITAAC quality and inspectability and conducting related internal training.

In addition to the ongoing activities, the U.S. Department of Energy (DOE) proposes to sponsor an exercise with the NRC and industry to demonstrate the review and closure of ITAAC. This exercise can be quite valuable because previous commercial reactors that were constructed and licensed under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," did not use ITAAC. Furthermore, industry and the NRC staff have long known that a substantial percentage of ITAAC will be completed in the year leading to the scheduled date for fuel loading. Accordingly, through discussions with DOE on its proposal, the staff suggested a study on the expected surge in ITAAC submittals during the last stages of construction to evaluate possible strategies to effectively and efficiently complete the reviews at the end of the construction process. The staff and DOE have agreed to cooperatively pursue this demonstration project. DOE will focus its efforts on the selection and the possible financial reimbursement of participating licensees and vendors. The NRC staff will facilitate the ITAAC closure process, including the coordination of efforts with the participating licensees and vendors.

Objective and Approach:

The objective of this demonstration project is to verify that both the industry closure processes and the NRC verification processes are reliable and efficient to support ITAAC closure. Specifically, the industry will simulate the development of several ITAAC closure documents and the submission of the associated ITAAC closure notifications under 10 CFR 52.99(c)(1). During this process, NRC Region II staff will simulate inspection planning and the documentation of inspection results in the Construction Inspection Program Information Management System (CIPIMS). NRC Headquarters staff in the Office of New Reactors (NRO) will simulate the review of ICLs submitted by the applicant and inspection results documented in CIPIMS. NRO will also simulate the NRC's internal ITAAC closure verification process.

Participants in this exercise will initially include the NRC, DOE as a project sponsor, and Westinghouse and Southern Nuclear Company (SNC) as the participating applicants. Based on available resources, schedule implications, and expected benefits, the NRC staff may engage other new reactor vendors and applicants in similar demonstrations.

Lastly, the exercise will involve evaluation of the surge in ITAAC closure submittals expected during the last year of construction of a new nuclear power plant.

For purposes of this demonstration project, participants will assume that ITAAC exist and that the plant is under construction. Actual NRC Region II inspections will not take place; instead, inspection data will be simulated to test the process.

Demonstration Plan:

The ITAAC closure demonstration project will include the following five ITAAC from the AP1000, Revision 17 design:

(1) ITAAC 2.1.02.07a.i –The Reactor Coolant System (RCS) Harsh Environment Type Test

(2) ITAAC 2.2.01.04a.ii – Containment System Impact Testing

(3) ITAAC 2.2.02.01 – Passive Containment Cooling Functional Arrangement

(4) ITAAC 2.2.03.08c.i – Injection Line Flow Resistance Testing and Analysis

(5) ITAAC 2.6.03.08 – DC System Fault Current Analysis

Westinghouse and SNC will participate in the initial demonstration. Other design centers and license applicants may participate in future demonstrations. The exercise will be facilitated using the existing NRC ITAAC workshop infrastructure, which is open to public participation and provides for a series of open and interactive discussions as the exercise progresses. The project is divided into the following four stages:

(1) ITAAC Performance

The applicant will simulate the performance of the selected ITAAC and develop the documentation required to support ITAAC closure. As part of the ITAAC closure package, the applicant will prepare the ICL to provide information sufficient to demonstrate that the inspections, tests, and analyses have been performed and that the acceptance criteria are met based on the templates provided in NEI 08-01, "Industry Guideline for the ITAAC Closure under 10 CFR Part 52," issued January 2009.

Concurrently, NRC Region II staff will prepare an inspection plan for the selected ITAAC, document the selected ITAAC information and the simulated inspection results in CIPIMS, and generate information reports pertaining to ITAAC inspections. Stage 1 of the exercise concludes when the ITAAC performance demonstration is completed and when the ITAAC closure package is prepared and made available to the NRC.

(2) ITAAC Closure

Once the ITAAC closure package is made available to the NRC and the agency receives the ICL, the staff will exercise the NRC's ITAAC closure verification process. The NRO staff will process the ICL as outlined in the draft ITAAC closure verification process office instruction and its appendices. This review may include the use of NRO technical staff to evaluate complex technical information. Stage 2 of the exercise concludes when the staff verifies proper ITAAC closure and simulates the publishing of an FRN.

(3) Exercise Workshop

The NRC will hold a public workshop to summarize and discuss the exercise and to present the ICLs. Participants will discuss their observations of the exercise, identify issues with the process, and propose solutions. Westinghouse will also present the analysis results of the makeup and volumes of the system-specific ITAAC in the expected surge of ITAAC closure submittals during the last year of construction. The issues associated with the expected surge in ITAAC should be discussed in detail to identify strategies to minimize any schedule impact. Stage 3 of the exercise concludes when the participants complete and achieve the goals of the workshop.

(4) Lessons Learned

The NRC will draft a lessons-learned report that highlights successes in the ITAAC closure and verification processes and that details areas that could be further refined. The report will include input gathered from participants and the public throughout the exercise and during the public workshops. The staff will continue to coordinate with the applicant on the refinement of the ITAAC closure schedule, based on insights that it

obtains from the analysis of the ITAAC closure surge, to mitigate any potential delays in ITAAC inspections and closures and to minimize the impact on NRC resources.

Milestones Summary:

Milestones	Date
Project Development Meeting	Completed
Abstract Development	Completed
NRO Management Endorsement	Completed
DOE/Westinghouse/SNC Endorsement	Completed
Public Meeting/Project Initiation	Completed
Stage 1 Complete (ITAAC Performance)	September 30, 2010
Stage 2 Complete (ITAAC Closure)	November 19, 2010
Stage 3 Complete (Exercise Workshop)	December 16, 2010
Stage 4 Complete (Lessons Learned)	February 28, 2011

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Exercise Guidance:

- 10 CFR Part 52
- NRC Inspection Manual Chapter 2503, “Construction Inspection Program: Inspections of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC),” dated October 3, 2007
- ITAAC Inspection Procedures 65000 series
- Regulatory Guide 1.215, “Guidance for ITAAC Closure under 10 CFR Part 52”
- NEI 08-01
- NRC ITAAC Closure Verification Process Office Instructions (Draft)

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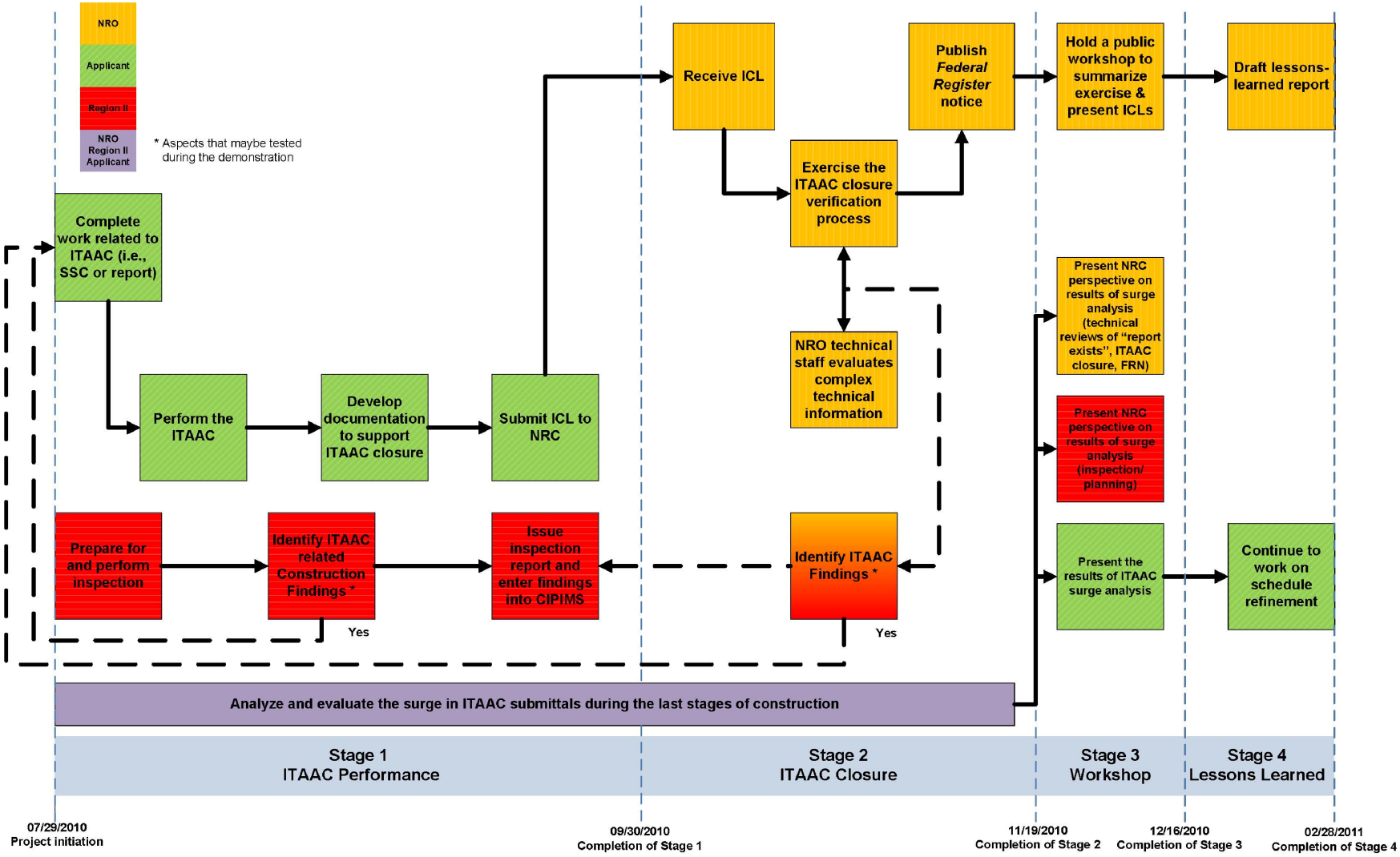
Simulated ITAAC Closure and Verification Demonstration Flowchart