Simulated ITAAC Closure and Verification Demonstration Project

January 27, 2010

Agenda

- Southern Company/WEC (Paulo Albuquerque/Brian Bedford)
- Comment on Staff's position of the completed ITAAC closure letters.
  - Recurring General Comments
  - ITAAC 2.1 02.07a.i, RCS Harsh Environment Type Test
  - ITAAC 2.2 01.04a.ii, Containment System Impact Testing
  - ITAAC 2.2 02.01, Passive Containment Cooling Functional Arrangement
  - ITAAC 2.2 03.08c.i, Injection Line Flow Resistance Testing and Analysis
  - ITAAC 2.6 03.08, DC System Fault Current Analysis
  - ITAAC 3.7 00.01, Design Reliability Assurance Program

RECURRING GENERAL COMMENTS

NRC Feedback *(paraphrased)*	SNC/WEC Response	Lesson Learned/ Corrective Action
Principal Completion Documents in the ITAAC Completion Package should be listed as references.	Agree that those technical documents directly supporting the conclusion that the ITAAC has been completed should be listed as references in the closure letter to be consistent with NEI 08-01	List Principal Completion Documents as references in ITAAC Closure Letters.
ICL Determination Basis for Pre-Op tests should either include a detailed description of the test, **OR** list the test procedure as a reference.	List test procedure and results as a reference in the Closure Letter. If test procedures are listed, the Determination Basis is acceptable as written.	List Principal Completion Documents as references in ITAAC Closure Letters.
Letters for partial ITAAC Closure (i.e. "sub-ITA") should clearly state the part of the ITAAC it addresses, and list the full sub-ITA..	Agree. This is an administrative oversight.	Combine these "sub-ITA" into one Closure Letter for this pilot project. Any future partial letters will include clear identification.

ITAAC 2.1.02.07a.i – RCS Harsh Environment

Accepted, Not Verified

08-01 Example Used:	NRC: D-1 (Template)	SNC: D-7 (ASME Welds)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
Many test descriptions reside in App 3D of AP1000, but which tests were used	The program description in 3D provides an adequate description. Confirmation of positive compliance with the program, coupled with the documentation packages as references available for inspection is sufficient for a knowledgeable person to understand the basis for the conclusion.	Discuss during public meeting.
App 3D should be listed in the references	Agree (Recurring comment #1)	List as reference
Equipment qualification reports should be included in the references	Agree (Recurring comment #1)	List as references

ITAAC 2.2.01.04a.ii – Containment Impact Testing

Accepted, Verified

08-01 Example Used:	NRC: D-7 (ASME Welds)	SNC: D-7 (ASME Welds)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
None	N/A	N/A

ITAAC 2.2.02.01 – PCS Functional Arrangement

Not Accepted, Not Verified

08-01 Example Used:	NRC: D-18 (ABWR Basic Configuration)	SNC: D-1 (Template)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
ICL did not list the walk down procedure in the reference list	Agree (Recurring comment #1)	List as reference
Detailed checklists and observations are not referenced as indicated on D-18 template.	The D-18 example is for an ABWR ITAAC that is not identical to this AP1000 ITAAC, so the wording of the determination basis may not be identical. The walkdown inspection report should be listed as a reference	List inspection report as reference. Discuss/Understand that NEI 08-01 Appendix D letters are *examples* that are useful comparisons, but may not yield verbatim compliance.
The referenced table and figure in the IDB did not list or show all the sensors and valves as required in the acceptance criteria	The referenced table and figure are from Tier 1 of the certified design, and they provide the complete basis for meeting the acceptance criteria. "All the sensors and valves" are not part of Tier 1, and therefore not part of this ITAAC.	Discuss during public meeting
The IDB did not indicate that each component is in its proper functional or logical (for I&C) relation to the system	The IDB wording can be improved, however most of the ABWR "basic configuration" in D-18 is handled by other AP1000 ITAAC.	Discuss during public meeting

ITAAC 2.2.03.08c.i-01 – CMT Flow Resistance

Not Accepted, Not Verified

08-01 Example Used:	NRC: D-1 (Template)	SNC: D-6 (FHM Test)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
A performance test and calculation were performed, but not referenced	Agree (Recurring comment #1)	List as reference
Letter refers to flow loss instead of head loss	While head loss is more appropriate, the term flow loss is sufficient for a knowledgeable person to understand the basis for the ITAAC conclusion.	Discuss if this was an additional comment, or would've been a basis for not verifying ITAAC Closure.
Test methodology is not sufficiently detailed	See Recurring comment #2	List test as reference
Staff could not determine if the value of uncertainty adjustment for the flow resistance calculation was appropriate for test conditions.	See Recurring comment #2 Uncertainty adjustment would be available for inspection in the test procedure & results.	List test as reference

ITAAC 2.2.03.08c.i-02 – Accumulator Flow Resistance

Not Accepted, Not Verified

08-01 Example Used:	NRC: D-1 (Template)	SNC: D-6 (FHM Test)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
Missing Information – requires detailed test statement on accumulator for the "sub-ITA"	See Recurring Comment #3	Correct Closure Letter
Insufficient Information – ICL needs to reference pre-op testing if applicable or provide sufficient details on the "performance test" and associated QA and controls	See Recurring Comment #2	List test as reference

ITAAC 2.2.03.08c.i-03 – IRWST Flow Resistance

Accepted, Not Verified

08-01 Example Used:	NRC: D-1 (Template)	SNC: D-6 (FHM Test)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
Insufficient Information – ICL needs to reference pre-op testing if applicable or provide sufficient details on the "performance test" and associated QA and controls.	See Recurring Comment #2	List test as reference

ITAAC 2.2.03.08c.i-04 – Containment Recirc Flow Resistance. *Accepted, Not Verified*

08-01 Example Used:	NRC: D-13 (GDCS Squib Valve test)	SNC: D-6 (FHM Test)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
IDB should call out how the elements of the ITA coincide with the actual SSCs tested (temp. water supply, which valves were opened, etc.)	The information provided in the Determination Basis is sufficient for a knowledgeable person to understand the basis for concluding the ITAAC is complete.	Discuss at public meeting
Level of detail is insufficient. Contrary to template, IDB did not call out valve numbers, drain numbers, specific reports, and the actual pre-operational test.	The test summary provided in the Determination Basis is sufficient. Including component tag numbers is not required for a knowledgeable person to understand the basis for concluding the ITAAC is complete. These details would be included in the test procedure that will be added as a reference available for inspection (Recurring comment #2).	Remove tag numbers from NEI 08-01 Appendix D examples unless specifically included in the DCD ITAAC statement. Discuss at public meeting

ITAAC 2.6.03.08 – IDS Fault Current Analysis

Accepted, Verified

08-01 Example Used:	NRC: D-1 (Template)	SNC: D-1 (Template)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
None	N/A	N/A

ITAAC 3.7.00.01 – DRAP

Not Accepted, Verified

08-01 Example Used:	NRC: D-10 (DRAP)	SNC: D-10 (DRAP)
NRC Feedback	**SNC/WEC Response**	**Lesson Learned/ Corrective Action**
References are missing	Agree – administrative oversight. References for the QMS and APP-GW-GAM-200 will be added in the Reference section.	All documents discussed in the Determination Basis should be listed as references
Headings are not consistent with template.	One heading in the example is incorrect, and a different heading in the closure letter is incorrect. Is this an additional comment, or would it be a basis for not accepting the letter? While not verbatim from NEI 08-01, the headings are very similar.	Correct the letter. Update NEI 08-01 to make all headings consistent. Correct other letters for consistency. Discuss at public meeting.

Questions/Comments

ITAAC Listing

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2.1.02.07a.i		
7.a) The Class 1E equipment identified in Table 2.1.2-1 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.	i) Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	i) A report exists and concludes that the Class 1E equipment identified in Table 2.1.2-1 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.
2.2.01.04a.ii		
4.a) The components identified in Table 2.2.1-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	ii) Impact testing will be performed on the containment and pressure retaining penetration materials in accordance with the ASME Code Section III, Subsection NE, to confirm the fracture toughness of the materials.	ii) A report exists and concludes that the containment and pressure retaining penetration materials conform with fracture toughness requirements of the ASME Code Section III.

ITAAC Listing

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2.2.02.01		
1. The functional arrangement of the PCS is as described in the Design Description of this Section 2.2.2.	Inspection of the as-built system will be performed.	The as-built PCS conforms to the functional arrangement as described in the Design Description of this Section 2.2.2.
2.2.03.08c.i		
8. The PXS provides RCS makeup, boration, and safety injection during design basis events.	A low-pressure injection test and analysis for each CMT, each accumulator, each IRWST injection line, and each containment recirculation line will be conducted. Each test is initiated by opening isolation valve(s) in the line being tested. Test fixtures may be used to simulate squib valves. CMTs: Each CMT will be initially filled with water. All valves in these lines will be open during the test.	

ITAAC Listing

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2.2.03.08c.i (continued)		
8. The PXS provides RCS makeup, boration, and safety injection during design basis events.	Accumulators: Each accumulator will be partially filled with water and pressurized with nitrogen. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves. IRWST Injection: The IRWST will be partially filled with water. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves. Containment Recirculation: A temporary water supply will be connected to the recirculation lines. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves Simulated ITAAC Closure and Verification Demonstration	*Accumulators:* *The calculated flow resistance between each accumulator and the reactor vessel is* *≥1.47 x 10-5 ft/gpm2 and* *≤1.83 x 10-5 ft/gpm2.* *IRWST Injection:* *The calculated flow resistance for each IRWST injection line between the IRWST and the reactor vessel is* *Line A: ≥ 5.53 x 10^{-6} ft/gpm^2 and ≤ 9.20 x 10^{-6} ft/gpm^2 and* *Line B: ≥ 6.21 x 10^{-6} ft/gpm^2 and ≤ 1.03 x 10^{-5} ft/gpm^2* *Containment Recirculation:* *The calculated flow resistance for each containment recirculation line between the containment and the reactor vessel is:* *Line A: ≤ 1.11 x 10^{-5} ft/gpm^2 and* *Line B: ≤ 1.04 x 10^{-5} ft/gpm^2*

ITAAC Listing

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2.6.03.08		
8. Circuit breakers and fuses in IDS battery, battery charger, dc distribution panel, and MCC circuits are rated to interrupt fault currents.	Analyses for the as-built IDS dc electrical distribution system to determine fault currents will be performed.	Analyses for the as-built IDS dc electrical distribution system exist and conclude that the analyzed fault currents do not exceed the interrupt capacity of circuit breakers and fuses in the battery, battery charger, dc distribution panel, and MCC circuits, as determined by their nameplate ratings
3.7.00.01		
1. The D-RAP ensures that the design of SSCs within the scope of the reliability assurance program (Table 3.7-1) is consistent with the risk insights and key assumptions (e.g., SSC design, reliability, and availability).	An analysis will confirm that the design of RAP SSCs identified in Table 3.7-1 has been completed in accordance with applicable D RAP activities.	An analysis report documents that safety-related SSCs identified in Table 3.7-1 have been designed in accordance with a 10 CFR 50 Appendix B quality program. An analysis report documents that non-safety-related SSCs identified in Table 3.7-1 have been designed in accordance with a program that satisfies quality assurance requirements for SSCs important to investment protection.

ITAAC 2.2.02.01 (Functional Arrangement) Additional Information – DCD Excerpts

2.2.2 Passive Containment Cooling System

Design Description

The passive containment cooling system (PCS) removes heat from the containment during design basis events.

The PCS is as shown in Figure 2.2.2-1 and the component locations of the PCS are as shown in Table 2.2.2-4.

1. The functional arrangement of the PCS is as described in the Design Description of this Section 2.2.2.

2. a) The components identified in Table 2.2.2-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

Table 2.2.2-4

Component Name	Tag No.	Component Location
PCCWST	PCS-MT-01	Shield Building
PCCAWST	PCS-MT-05	Yard
Recirculation Pump A	PCS-MP-01A	Auxiliary Building
Recirculation Pump B	PCS-MP-01B	Auxiliary Building

ITAAC 2.2.02.01 (Functional Arrangement) Additional Information – DCD Excerpts

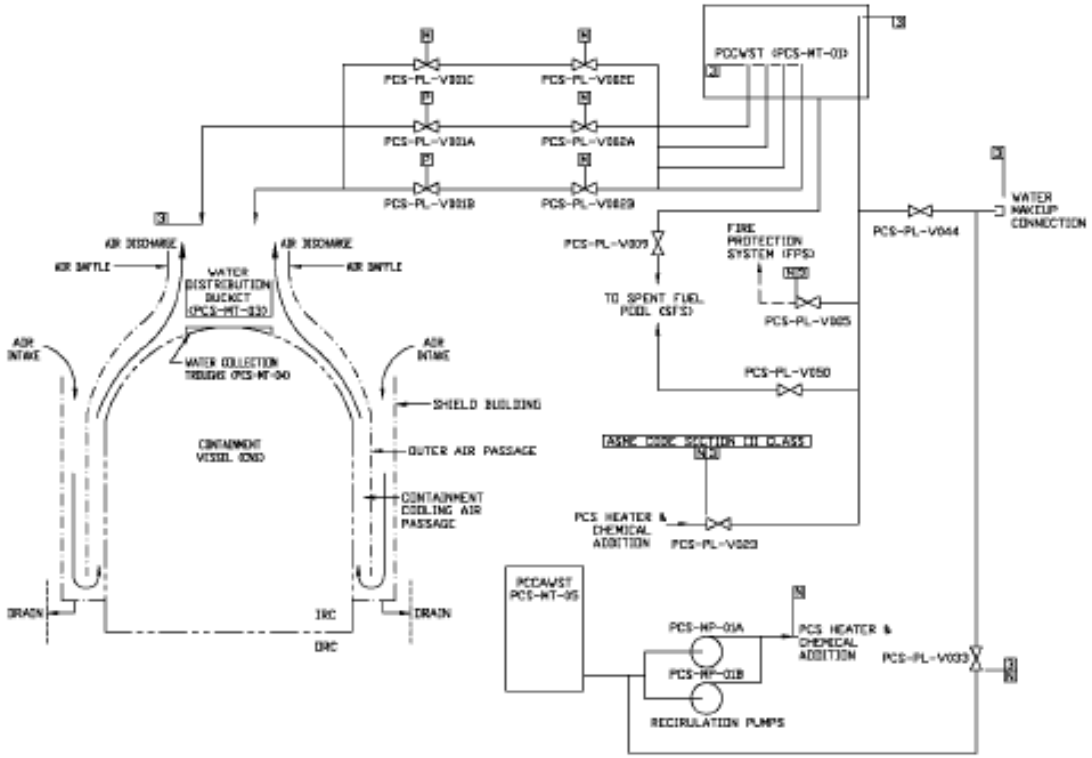

Figure 2.2.2-1
Passive Containment Cooling System

ITAAC 2.2.02.01 (Functional Arrangement)
Additional Information – DCD Excerpts

- AP1000 DCD Tier 1 Section 1.1:

Functional Arrangement (for a system) means the physical arrangement of systems and components to provide the service for which the system is intended, and which is described in the system design description.