Westinghouse Electric Company

ITAAC "Technical Bases"

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Brian Bedford

Westinghouse Electric Company

Westinghouse

Introduction and Purpose

Introduction

- Detailed ITAAC Planning has revealed several ITAAC where successful completion of the ITA may be achieved by different, technically acceptable means.
- Beneficial for all involved to address uncertainty early in the process

PURPOSE

- Recognize that certain ITAAC require additional focus to improve the predictability for ITAAC Completion
- Discuss options for a forum to address such items

Identification Process

- As part of ITAAC planning for AP1000®, a performance plan is written outlining the technical basis for the ITAAC, the AP1000 Plan to complete it, and the documentation necessary to support completion.
- Each AP1000 performance plan meets the technical bases for the ITAAC. Goal is to communicate these bases and remove uncertainty for those with a high potential for interpretation.

EXAMPLES

*Intended to demonstrate the need for further discussion, not resolve the individual examples

ITAAC Statement – 2.3.06.11a

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
11.a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.3.6-1 to perform active functions.	Stroke testing will be performed on the remotely operated valves identified in Table 2.3.6-1 using the controls in the MCR.	Controls in the MCR operate to cause those remotely operated valves identified in Table 2.3.6-1 to perform active functions.

ITAAC Interpretation – 2.3.06.11a

Item for Interpretation	AP1000 Interpretation
There are multiple controls in the MCR capable of operating these valves: •Which control (or controls) are used to operate the valves?	The Plant Control System (PLS) is the system normally used for operating these valves remotely, and the test should be done from one PLS operator work station. The valves are also subject to Plant Safety and Monitoring System (PMS) control, and that logic is tested separately under ITAAC 11b.

ITAAC Statement – 2.2.05.10

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10. After loss of motive power, the remotely operated valves identified in Table 2.2.5-1 assume the indicated loss of motive power position.	Testing of the remotely operated valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.5-1 assumes the indicated loss of motive power position.

ITAAC Interpretation – 2.2.05.10

Item for Interpretation	AP1000 Interpretation
'Motive power' for air operated valves is compressed air. A loss of compressed air by isolation from CAS does not immediately result in a valve change of state. However, loss of power to the associated 3-way solenoid valve results in isolation of CAS to the valve and venting of the valve actuator.	For air operated valves, testing will include both removing the air supply and venting the diaphragm (if necessary) to fully remove the motive power, and then observe the valve position.

ITAAC Statement – 3.3.00.02a.ii.d

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	ii) An inspection of the as-built concrete thickness will be performed.	ii.d) A report exists that concludes that the as-built concrete thicknesses of the radiologically controlled area of the auxiliary building sections conform to the building sections defined in Table 3.3-1.

ITAAC Interpretation – 3.3.00.02a.ii.d

Item for Interpretation	AP1000 Interpretation
No objective standard is provided for how frequently to measure each building section. One measurement per section may or may not be sufficient, and infinite measurement of the entire surface is not practical.	An AP1000 Engineering Guideline, (initially based on ACI 117-2010 and augmented for the specifics of AP1000 design) provides minimum measurement frequencies based on section construction type. These measurement points are sufficient to determine the overall thickness of each building section.

ITAAC Statement – 3.3.00.02a.ii.d

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	ii) An inspection of the as-built concrete thickness will be performed.	ii.d) A report exists that concludes that the as-built concrete thicknesses of the radiologically controlled area of the auxiliary building sections conform to the building sections defined in Table 3.3-1.

ITAAC Interpretation – 3.3.00.02a.ii.d

Item for Interpretation	AP1000 Interpretation
Table 3.3-1 Note 2: “These wall (and floor) thicknesses have a construction tolerance of ± 1 inch, except for exterior walls below grade where the tolerance is +12 inches, - 1 inch.	The Nuclear Island Basemat is neither a wall nor a floor per ACI-349. Therefore the tolerance in Note 2 does not apply. Since no stated tolerance exists in the ITAAC statement, the Basemat ITAAC tolerance is as-stated on the detailed design drawings, consistent with other portions of the Licensing Basis (i.e. design of critical sections).

Next Steps

- Discuss the most appropriate forum for discussing these and other similar ITAAC
- Potential Options:
  - Planned meetings with Resident and Region II inspectors to review AP1000 Performance Plans for upcoming targeted ITAAC Inspections
  - Category 2 Public meetings with NRO and Region II
  - Other

Back-up Slide: ITAAC Table 3.3-1 Excerpt

Table 3.3-1
Definition of Wall Thicknesses for Nuclear Island Buildings, Turbine Building, and Annex Building[1]

Wall or Section Description	Column Lines	Floor Elevation or Elevation Range	Concrete Thickness[2][3][4][5]	Applicable Radiation Shielding Wall (Yes/No)
Containment Building Internal Structure				
Shield Wall between Reactor Vessel Cavity and RCDT Room	E-W wall parallel with column line 7	From 71'-6" to 83'-0"	3'-0"	Yes
West Reactor Vessel Cavity Wall	N-S wall parallel with column line N	From 83'-0" to 98'-0"	7'-6"	Yes
North Reactor Vessel Cavity Wall	E-W wall parallel with column line 7	From 83'-0" to 98'-0"	9'-0"	Yes
East Reactor Vessel Cavity Wall	N-S wall parallel with column line N	From 83'-0" to 98'-0"	7'-6"	Yes
West Refueling Cavity Wall	N-S wall parallel with column line N	From 98'-0" to 135'-3"	4'-0"	Yes
North Refueling Cavity Wall	E-W wall parallel with column line 7	From 98'-0" to 135'-3"	4'-0"	Yes
East Refueling Cavity Wall	N-S wall parallel with column line N	From 98'-0" to 135'-3"	4'-0"	Yes
South Refueling Cavity Wall	E-W wall parallel with column line 7	From 98'-0" to 135'-3"	4'-0"	Yes
South wall of west steam generator compartment	Not Applicable	From 103'-0" to 153'-0"	2'-6"	Yes
West wall of west steam generator compartment	Not Applicable	From 103'-0" to 153'-0"	2'-6"	Yes
North wall of west steam generator compartment	Not Applicable	From 103'-0" to 153'-0"	2'-6"	Yes
South wall of pressurizer compartment	Not Applicable	From 103'-0" to 153'-6"	2'-6"	Yes
West wall of pressurizer compartment	Not Applicable	From 107'-2" to 160'-0"	2'-6"	Yes
North wall of pressurizer compartment	Not Applicable	From 107'-2" to 160'-0"	2'-6"	Yes
East wall of pressurizer compartment	Not Applicable	From 118'-6" to 160'-0"	2'-6"	Yes
North-east wall of in-containment refueling water storage tank	Parallel to column line N	From 103'-0" to 135'-3"	2'-6"	No
West wall of in-containment refueling water storage tank	Not applicable	From 103'-0" to 135'-3"	5/8" steel plate with stiffeners	No
South wall of east steam generator compartment	Not Applicable	From 87'-6" to 153'-0"	2'-6"	Yes

1. The column lines and floor elevations are identified and included on Figures 3.3-1 through 3.3-12.
2. These wall (and floor) thicknesses have a construction tolerance of ± 1 inch, except for exterior walls below grade where the tolerance is +12 inches, - 1 inch.
3. For walls that are part of structural modules, the concrete thickness also includes the steel face plates.
4. For floors with steel surface plates, the concrete thickness also includes the plate thickness.
5. Where a wall (or a floor) has openings, the concrete thickness does not apply at the opening.
6. The elevation ranges for the shield building items are rounded to the nearest inch.