

SummerRAIsPEm Resource

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Subject: Presentation Material for WEC LAR 135 Pre-Submittal Meeting on February 9, 2017
Attachments: LAR-135 PSM RD.pdf

Billy,

Please find the LAR 135 Pre-Submittal Meeting presentation attached for "Reconciliation of Tolerance Deviations of As-Built Wall, Floor, and Roof Thicknesses"

The attachment contains no proprietary information.

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Reconciliation of Tolerance Deviations of As-built Wall, Floor, and Roof Thicknesses (Public Meeting)

February 9, 2017



Meeting Outline & Objective

Outline

- Background Information
- Opportunity for Improvement
- Proposed Resolution
- Precedent

Objective

- Summarize the draft LAR, address questions, and receive feedback prior to submittal.

Background Information

Tier 1 ITAAC Table 3.3-1 has two purposes:

1. Structural (ITAAC 3.3.00.02a.ii.a/b/c/d/e/f)

– **Design Commitment:**

“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.”

– **Inspection, Test, Analysis**

“An inspection of the as-built concrete thickness will be performed.”

– **Acceptance Criteria (example)**

“A report exists that concludes that the [containment internal structures] as-built concrete thicknesses conform to the building sections defined in **Table 3.3-1**.”

Background Information

Tier 1 ITAAC Table 3.3-1 has two purposes:

2. **Shielding** (ITAAC 3.3.00.03a/b/c/d & .04a)
 - **Design Commitment:** (example)
“Walls and floors of the [nuclear island structures] as defined on **Table 3.3-1** except for designed openings or penetrations provide shielding during normal operations..”
 - **Inspection, Test, Analysis**(example)
“Inspection of the as-built [nuclear island structures] wall and floor thicknesses will be performed.”
 - **Acceptance Criteria** (example)
“A report exists and concludes that the shield walls and floors of the [containment internal structures] as defined in Table 3.3-1, except for designed openings or penetrations, are consistent with the concrete wall thicknesses provided in **Table 3.3-1**.”

In addition to Tier 1 ITAAC Table 3.3-1, ITAAC 3.3.00.04b also contains wall thickness acceptance criteria for the Radwaste Building waste accumulation room



Table used to identify thicknesses of structures that provide shielding during normal operations

Opportunity for Improvement

- Deviations from thicknesses (including tolerances) require a License Amendment Request to be submitted and approved by the NRC; or costly and time consuming repairs made with no safety value added.
 - Examples on the next slide
- The deviations have not adversely impacted the structure's ability to withstand design-basis loads, provide radiation shielding, and/or to act as flood and/or fire barrier.
- A more efficient means of safely addressing potential future deviations in wall thickness is needed

Examples

- V.C. Summer LAR 14-07 to increase the tolerance between module CA04 and the adjacent CB65 and CA01 modules.
- Vogtle LAR 15-015 to increase the tolerance between CA04 and CB65 due to a deformation which resulted in a small section of the wall having additional thickness.
- Vogtle LAR 16-003 to increase the concrete wall thickness tolerance for the column line N Wall from column lines 2 to 4 from elevation 100'-0" to 135'-3".
- Vogtle Unit 3 had an embed plate in the battery room J-wall "twist" slightly during concrete placement, causing a portion of the plate to be embedded deeper in the wall, resulting in the wall thickness at that location being less than the required -1" tolerance. To restore ITAAC compliance, a section of concrete was hydroblasted out so the embed could be reset, and concrete re-placed.
- At V.C. Summer Unit 2, a slight misalignment in the set of module CA20 led to the rebar couplers in the module not lining up with the rebar in walls J-1 and J-2. The structural resolution to make the connection requires making the walls slightly thicker (~1 to 2 inches) for about one foot of wall length. To support ITAAC compliance, V.C. Summer LAR 15-20 was submitted to address the deviation from the ITAAC wall thickness requirements for this section.

Proposed Resolution

- Any deviation in wall, floor, or roof thickness outside design tolerance is evaluated and dispositioned in accordance with Nonconformance and Disposition Report process. (Note: the design tolerance is tighter than the ITAAC tolerance.)

764	3.3.00.02a.ii.a	<p>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.</p>	<p>ii) An inspection of the as-built concrete thickness will be performed.</p>	<p>ii.a) A report exists that concludes that the containment internal structures as-built concrete thickness conforms to the building sections defined in Table 3.3-1.</p>
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Deviations from the design conditions will be analyzed using the design basis loads.

Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built containment internal structures withstand the design basis loads as specified in the Design Description, without loss of structural integrity or the safety-related functions.

Proposed Resolution

777	3.3.00.03a	<p>3. Walls and floors of the nuclear island structures as defined on Table 3.3-1 except for designed openings or penetrations provide shielding during normal operations.</p>	<p>Inspection of the as-built nuclear island structures wall and floor thicknesses will be performed.</p>	<p>a) A report exists and concludes that the shield walls and floors of the containment internal structures as defined in Table 3.3-1, except for designed openings or penetrations, are consistent with the concrete wall thicknesses provided in Table 3.3-1.</p>
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Deviations from the design conditions will be analyzed to ensure adequate shielding during normal operations.

Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built containment internal structures, except for designed openings or penetrations, provide adequate shielding during normal operations (i.e., no change to the radiation zone classification noted in UFSAR subsection 12.3.1.2).

Proposed Resolution

- Any deviation in wall, floor, or roof thickness outside design tolerance, which is tighter than ITAAC tolerance, is evaluated and dispositioned in accordance with Nonconformance and Disposition Report process.
- Allows for deviations in wall thickness, provided they are structurally reconciled, and do not result in an adverse change to a radiation zone.
- No physical design changes or design Code standards application are required for this request.

Proposed Resolution

- The proposed changes do not:
 - Modify any building or structure design function
 - Involve any physical change to the facility
 - Alter SCI and SCII code compliance, including ACI 349-01 and ANSI/AISC N690-94
 - Modify any supplemental requirements described in UFSAR 3.8.4.4.1, “Seismic Category I Structures” or UFSAR 3.8.4.5, “Structural Criteria”
 - Alter compliance with NRC Regulatory Guides 1.69, 1.115, 1.142, and 1.143
 - Alter the existing design requirements for the non-seismic radwaste building as described in UFSAR 3.7.2.8.2, or the non-seismic portion of the turbine building, as described in UFSAR 3.7.2.8.3.
 - Affect radiation source terms used in accident analysis or alter plant radiation zones.

Precedent

- The Economic Simplified Boiling-Water Reactor (ESBWR) Certified Design (see Design Control Document, Revision 10 (April 2014), Tier 1, Table 2.16.5-2, Design Commitment 3), contains the following:

**Table 2.16.5-2
IT.AAC For The Reactor Building**

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3. The critical dimensions used for seismic analyses and the acceptable tolerances are provided in Table 2.16.5-1.	Inspection of the RB will be performed. Deviations from the design conditions will be analyzed using the design basis loads.	Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 2.16.5-1 will demonstrate that the as-built RB will withstand the design basis loads specified in the Design Description of this Subsection 2.16.5 without loss of structural integrity or the safety-related functions.

- ESBWR design certification, provisions to allow reconciliation of deviations in critical structural dimensions in their ITAAC closure report, and is thus a precedent relevant to this license amendment request.

Discussion