

NRR-PMDAPEm Resource

From: Chawla, Mahesh
Sent: Monday, October 30, 2017 11:40 AM
To: Christensen, Lori (Lori.Christensen@nexteraenergy.com); Schultz, Eric; Manthei, Scott; Locke, Kim (Kim.Locke@nexteraenergy.com); Catron, Steve (Steve.Catron@fpl.com); Kilby, Gary
Subject: DRAFT RAIs for Containment Dome Truss LAR - Point Beach Nuclear Plant, Units 1 and 2 - MF9532/33 - L-2017-LLA-0209

By letter dated March 31, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17090A511), NextEra Energy Point Beach, LLC (NextEra) (the licensee) submitted a license amendment request (LAR) for Point Beach Nuclear Plant (PBNP), Units 1 and 2. The proposed LAR would document a risk-informed resolution strategy to resolve low risk, legacy design code non-conformances associated with construction trusses in the containment building of PBNP Units 1 and 2. In order to complete the review of subject submittal, the Nuclear Regulatory Commission (NRC) staff has the following request for additional information related to your submittal:

REQUEST FOR ADDITIONAL INFORMATION (RAI)

Background:

In the LAR Section 1.0 “*Summary Description*,” the licensee stated that “*NextEra is requesting an amendment to the current licensing basis for Point Beach Nuclear Plant, Units 1 and 2, to address design code non-conformances associated with the steel construction trusses located in the containment buildings of Units 1 and 2. A risk-informed resolution strategy is proposed to address the non-conformances related to a low risk, legacy condition from original station construction.*”

The licensee also stated that “*The proposed change is acceptance of the final configuration of the construction trusses, including the attached containment spray piping and ventilation ductwork, and the containment liners/walls adjacent to the trusses, using a risk-informed resolution. The risk-based analyses conclude that the final modified configuration of the Unit 1 construction truss, and the current configuration of the Unit 2 construction truss, with implementation of identified safety enhancement modifications to both Units, will not pose a hazard to the safe operation of Point Beach and does not pose a risk to the health and safety of the public.*”

RAI-1:

Issues:

LAR Section 3.1.1, “*PRA Analysis Summary*,” second bullet states, “*demonstrated that the construction trusses will retain their structural stability and will not catastrophically fail or result in a seismic II/I interaction (dropped object) as a result of a design basis seismic or thermal event*”

Request

Clarify in detail whether the proposed resolution of the containment dome trusses non-conformances will restore the containment dome structures to the original intended seismic criteria.

RAI-2:

Issues:

The construction trusses in each unit were originally installed to provide support for the containment dome liner and initial dome concrete pour during original station construction. After the initial concrete pour cured, the truss structures were lowered a few inches away from the containment liner, no longer providing structural support to the dome, and remained in place. The trusses were then used as an attachment point for containment spray piping, ventilation ductwork, post-accident containment ventilation (PACV) piping, and miscellaneous lights and associated conduits. An initial analysis of seismic adequacy was performed by the construction vendor.

LAR Section 2.1.1 stated that *“the trusses were not included in the original FSAR seismic classification tables. They were subsequently added to the UFSAR in 2013 as a Seismic Class I structure supporting Class I piping and ductwork.”*

Request

LAR Section 2.1.1 indicates that the containment dome truss is now qualified as a Seismic Class I structure. This statement contradicts the information in Section 1.0 of the LAR. Please clarify whether the containment dome trusses are qualified as Seismic Cat I or the original intended seismic criteria. Describe the assessments and modifications that were performed for qualification.

RAI-3:

Issues:

LAR Section 2.0 *“Detailed Description”* states that *“The construction trusses were subsequently reanalyzed and walkdowns and reviews of plant photos discovered a discrepancy between the as-built configuration of the trusses and the design drawing that the analysis was based on. Specifically, the lower diagonal bracing framework of the trusses, and the bottom lower diagonal bracing location on the truss, were different than shown on the design drawing. Consequently, these activities and the refinements of the analysis resulted in identifying non-conformances to the design code of record, “AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings,” April 1963, 6th Edition, for postulated seismic loads. Follow-on inspection of the trusses during initial resolution activities further identified a nonconformance with regard to the available clearance between a limited number of locations on the construction trusses and the containment liner in each Unit.”*

Enclosure 5 of the LAR, Reference 5.2 *“6904-15-TR, Rev. 0, Calculation for Adequacy of Containment Construction Truss,”* Section 3.0, *“Field Verification”* states: *“A field examination of the Unit 2 truss was performed by WEPCO and Sargent & Lundy (S&L) engineer ... This examination consisted of general comparison between the as-installed configuration of the truss and the configuration as-detail on drawing C-125 These items were found to be in order. Dimensions of specific bolt, weld, and structural plate/shape details were not inspected.”*

LAR Section 2.1.1 *“Construction Trusses”* stated that *“The trusses were not included in the original FSAR seismic classification tables. They were subsequently added to the UFSAR in 2013 as a Seismic Class I structure supporting Class I piping and ductwork.”*

Request

Clarify whether structural assessments and modifications were performed consistent with licensing basis AISC, April 1963, 6th Edition. If other criteria was used, discuss your rationale for selecting criteria other than the licensing basis.

RAI-4:

Issues:

LAR Section 3.3.2 stated that *“Upon approval of this LAR, a modification will be made to the Unit 1 construction truss to improve clearance between the truss and the containment liner to achieve reduced stress levels. The modification includes a small amount of material removal at truss upper chord structural tee flanges. The modification will be performed at six specified locations around the circumference of containment.”* However, Calculation number 11Q0060-C-038, Revision 0, *“Seismic Strength Capacity of Units 1 and 2 Containment Dome Trusses with Modifications to meet AISC N690 Acceptance Criteria,”* (LAR – Enclosure 5, Reference 5.24) states that *“trimming the first panel point at...11 locations for Unit 2 [(5) for T1 and (6) for T2 trusses]...”*

Request

- a. Clarify the location(s) in Units 1 and provide technical justification to all intended truss modifications that will be performed in accordance with AISC N690
- b. Discuss rationale for not performing modifications to Unit 2 truss locations identified as needing trimming modification in Calculation number 11Q0060-C-038.

RAI-5:

Confirm that the UFSAR Chapter 15 analyses have adequately considered the following as a result of the abandonment of the containment dome truss in place:

- a. change in the containment available volume,
- b. change in the containment total heat sink,

Or provide adequate justification that the UFSAR Chapter 15 analyses remains bounding.

RAI-6:

RG 1.174, Rev. 2, indicates that in implementing risk-informed decision making, licensing basis changes are expected to meet a set of key principles. One of the five principles states that “the proposed change maintains sufficient safety margins.” The staff noted that in Table 4-2 of Enclosure 5, the licensee identified the alternative criteria/methods for the licensee’s risk-informed approach.

- a. Section 2 of Enclosure 5 of the March 31, 2017 submittal indicates that damping factors used in the design of welded steel framed and bolted steel framed structures are 2% and 5% for the Hypothetical Earthquake in the UFSAR. In Section 5.3, the applicant stated that the damping value used in the analyses is 7% for bolted steel with bearing connections. The applicant stated that while each of the individual 18 trusses is a welded planar truss assembly, the transfer of load between the 18 trusses is through a bolted brace system and concluded that the use of 7% damping is appropriate.
 - i. Justify that the as-built conditions of each of those 18 truss assemblies are consistent with the assumption that the transfer of load is through a bolted brace system.
 - ii. Explain how the safety margins are impacted by the use of a 7% damping factor and whether sufficient safety margins are maintained.
- b. Section 6.2.1 of the March 31, 2017 submittal stated that the development of the ground motion time histories for the SSI analysis met Section 2.4 of ASCE/SEI 43-05 with the limitations identified in NUREG/CR-6926. The staff noted that NUREG/CR-6926 identified three requirements related to damping selection, power spectral density check, and the correlation coefficient for statistical independence are not consistent with the NUREG-0800, Standard Review Plan. Clarify whether those three requirements identified in NUREG/CR-6926 related to computing time histories have been addressed.

- c. Results in Section 6.5.1.2 of Enclosure 5 of the March 31, 2017 submittal identify locations that would exceed the AISC N690 allowable stress. The licensee explained in Section 5.5 of Enclosure 5 of the March 31, 2017 submittal that it is acceptable to use a strain-based acceptance criteria. The staff noted that NUREG-0800, Standard Review Plan Section 3.8.4.III.5 states that the staff should evaluate the justification provided to show that structural integrity will not be affected if the applicant proposes to exceed some of these limits.
 - i. Justify the use of the proposed 1.5% strain acceptance criterion as it relates to structural integrity.
 - ii. Explain how the safety margins are impacted by the proposed 1.5% strain acceptance criterion and whether sufficient safety margins are maintained.

References:

1. Letter NRC 2017-0017, dated March 31, 2017, from Robert Coffey, Site Vice President to USNRC regarding the "License Amendment Request 278, Risk-Informed Approach to Resolve Construction Truss Design Code Non-conformances" (ADAMS Accession No. ML17090A511).
2. "AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings," American Institute of Steel Construction, 6th Edition, April 1963.
3. ACI 318-63, "Building Code Requirements for Reinforced Concrete," American Concrete Institute, 1963.

Please arrange a teleconference with the NRC Staff to discuss the above request. Thanks

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Subject: DRAFT RAIs for Containment Dome Truss LAR - Point Beach Nuclear Plant, Units 1 and 2 - MF9532/33 - L-2017-LLA-0209
Sent Date: 10/30/2017 11:39:31 AM
Received Date: 10/30/2017 11:39:00 AM
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Reply Requested: No

Sensitivity: Normal

Expiration Date:

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