

Vogle PEmails

From: Hoellman, Jordan
Sent: Tuesday, April 12, 2016 7:58 AM
To: Vogtle PEmails
Subject: 4/14/16 Public Meeting slides - Shield Building Roof Beams
Attachments: 2016-04-14 Shield Building Roof Beams - Public Meeting slides.pdf

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Hearing Identifier: Vogtle_COL_Docs_Public
Email Number: 22

Mail Envelope Properties (e9722b3ab1084865b60d71bb52f3c0e8)

Subject: 4/14/16 Public Meeting slides - Shield Building Roof Beams
Sent Date: 4/12/2016 7:58:04 AM
Received Date: 4/12/2016 7:58:05 AM
From: Hoellman, Jordan

Created By: Jordan.Hoellman2@nrc.gov

Recipients:
"Vogtle PEmails" <Vogtle.PEmails@nrc.gov>
Tracking Status: None

Post Office: HQPWMSMRS03.nrc.gov

Files	Size	Date & Time	
MESSAGE	229	4/12/2016 7:58:05 AM	
2016-04-14 Shield Building Roof Beams - Public Meeting slides.pdf			121243

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Shield Building Roof Beams (Part of WEC LAR-74) Public Meeting

April 14, 2016



Background

- Radial beams span between the compression ring in the center of the roof and the tension ring above the shield building wall
 - Beams support the concrete roof of the Shield Building
 - Licensing basis specifies beam size as W36x393
- Between each pair of radial beams are W36x135 circumferential beams
 - Stabilize the radial beams during construction and support the roof of the Shield Building
- Beams are currently rolled sections
- Designed per AISC N690-94 (Tier 2* requirement)

Material Requirements

- The Shield Building beam structural shape must meet Charpy V-notch (CVN) impact requirements of -70 °F (30°F below the lowest service metal temperature (-40°F))
 - AIA is a beyond design basis event
 - Applying the impact testing criteria from AISC N690-94 for design basis loading assures sufficiently ductile material
- The Charpy V-notch (CVN) impact test, a standardized high strain-rate test, determines the amount of energy absorbed by a material during fracture, it is a measure of the material ductility

Procurement

- The W36x393 beams that are currently specified in the licensing basis are no longer available
 - A LAR is planned to propose using commercially available W36x395 beams
 - Calculations updated to reflect W36x395 beams
- However, inquiries made of mills worldwide have been unsuccessful in locating a mill capable of producing large structural shapes (W36x395 & W36x135) with acceptable CVN at -70°F.

Proposed Resolution

- Change beam size from W36x393 to W36x395
 - Expected to impact UFSAR Subsection 3H.5.6, Figure 3H.5-11, Figure 3H.5-14, Figure 3H.5-15
- Allow built up plate girders to be a substitute for the W36x395 and W36x135 rolled beams
 - Welded built-up plate girders are fabricated of a material (ASTM A572 plate Gr 50) that provides the impact resistance that satisfies the material requirements with equivalent section properties
 - These plate girders are designed to provide the equal or greater section properties as the rolled structural shapes
 - Add information to the UFSAR text and figures to identify that the W36x395 and W36x135 beams may be fabricated plate girders
 - Performing a supplemental calculation to substitute the rolled section with a built up plate girder
 - Expected to impact UFSAR Subsection 3H.5.6, Table 3H.5-15, Figure 3H.5-11, Figure 3H.5-14, Figure 3H.5-15

Questions