

Public Version

TN Americas CoC 1004 Amendment 18 Pre-Application Meeting

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Agenda

- **Background**
- **Scope of Amendment**
- **Structural Analysis Summary**
- **Thermal Analysis Summary**
- **Shielding Analysis Summary**
- **Criticality Analysis Summary**
- **Clarification/Simplification Items**
- **Schedule**

Proprietary

- **Questions / Open Discussion**

Introduction

➤ Purpose of Meeting

- To present TN Americas' proposed methodology for performing structural, thermal, and criticality analysis for PWR fuel assemblies loaded into the newly designed NUHOMS® 24PTH Type 3 DSC.
- Briefly discuss other scope items.
- Provide an opportunity to receive NRC feedback and facilitate planning prior to submittal of Amendment No. 18 to CoC 1004.
- Achieve clear, common understanding of the path forward for Amendment No. 18 regarding scope and schedule.

Primary Scope

- Develop a [] basket design (similar to EOS-37PTH) to interface with the existing NUHOMS® 24PTH DSC shell
 - Satisfy all requirements for NUHOMS® 24PTH system as specified in the Technical Specification (TS) for CoC 1004. These requirements include but are not limited to the following items:
 - Heat loads per HLZCs shown in TS Figure 1-11 through 1-15a
 - Capability to load maximum 12 damaged fuel assemblies per TS Figure 1-16
 - Capability to load maximum 8 failed fuel assemblies per TS Figure 1-16
 - Maximum burnup of 62 GWd/MTU and maximum initial enrichment of 5% per TS Table 1-11
- Add an alternate [] bottom for 24PTH-S-LC DSC
- Add an alternate to the Top Shield Plug (TSP) for 24PTH-S-LC []
- Maintain the maximum critical lift weight of a loaded transfer cask to 200 kips (100 t) for a 24PTH-S-LC System

Alternate [] Bottom



Alternate Top Shield Plug

Structural Summary

- **24PTH Type 3 basket design:**

- Consisting of EOS-style [] structure for basket compartments
- []
- []
- []

- **Structural evaluation of 24PTH Type 3 basket assembly:**

- Bounding fuel assembly weight
- Bounding weight for 24PTH-S, 24PTH-L and 24PTH-S-LC DSC basket
- Bounding thermal load: Storage and transfer conditions

Structural Summary

- **Methodology**

- Structural evaluation is based on the approved methodologies for EOS-37PTH DSC basket from CoC 1042 Amendment 0 and 1
- []
- Bounding normal/off-normal loads: Dead weight + Handling (basket in horizontal position) + Thermal
- Accident loads: 75g side drop
- Criteria:
 - ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NG
 - Strain criteria: Steel grid plates under accident conditions

- **Structural Evaluation Results**

- Stresses and strains meet the criteria for both normal/off-normal and accident loading conditions

Thermal Summary

- **The 24PTH Type 3 basket design includes various features to improve the thermal performance such as:**
 - []
 - []
 - []
 - []
- **Thermal performance of the 24PTH Type 3 basket assembly is evaluated for the 24PTH-S, 24PTH-L and the 24PTH-S-LC DSCs**
 - **24PTH-S is the bounding DSC type for thermal evaluation due to its smallest basket length**
 - **Bounding storage condition is the normal storage condition in HSM-H**
 - **Bounding transfer condition is the normal transfer condition in OS197 TC**

Thermal Summary

- **Methodology**

- **Storage evaluation is based on reviewed and accepted models and analyses for 32PTH1 DSC in HSM-H from CoC 1004 Amendment 15 and EOS-37PTH DSC in EOS-HSM from CoC 1042 Amendment 0 and 1**
- **Transfer evaluation is based on reviewed and accepted models and analyses for 61BTH DSC in OS197 from CoC 1042 Amendment 2**
- **Coupled DSC/HSM-H and DSC/TC models in ANSYS Fluent**
- **Grid convergence index (GCI) study has been provided**

- **Thermal Results (preliminary)**

- **No change to the specified time limits in the current UFSAR**
- **Maximum fuel cladding temperatures are bounded by the values in the current UFSAR**
- **Maximum internal pressure are bounded by the value in the current UFSAR**

Shielding Summary

- [] Therefore, centerline dose rates at the top and bottom of the cask increase for the Type 3 design.
 - Overall increase in occupational exposure is 3%, which is negligible.
 - Increase ITE cask top dose rate limit in the welding configuration []
 - Increase the door centerline dose rate limit for the 24PTH-S-LC []
 - The remaining ITE dose rate limits are unchanged.
- Note: Dose rates are preliminary.

Criticality Summary

- **A sensitivity study is performed to demonstrate that basket Type 3D is bounded by the basket type 1C/2C enrichment limits currently provided in the technical specifications.**
 - []
 - []
- **The delta in k-effective is approximately 0.015 for all intact, damaged, and failed fuel cases considered.**

Clarification/Simplification Items

Other Changes:

1. **As part of the 24PTH Type 3 basket :**
 - Add new Appendix A ITE section 2.4 to address use of HSLA steel.
 - Increase maximum FA weight in Table 1-1I from 1682 lbs to 1750 lbs and delete total weight of FFC plus contents from Table 1-1I (as well as 1-1e and 1-1t) consistent with TS level of detail for FA weights in CoC 1029 and CoC 1042.
2. **Deletion of Appendix A ITE Section 4.4 requirement for initial HSM delta T measurement with a loaded DSC.**
 - OE indicates this measurement is no longer needed to validate system performance and aligns with CoC 1042 TS level of detail.
3. **Clarifies Appendix A ITE Section 3.2 and Appendix B TS Section 4.3.2 language related to transfer cask liquid neutron shields**
 - Clarifies what text applies the OS197L TC.
 - Formatting only. No new content.
4. **Updated Appendix C ASME Code Alternatives Table C-12 to add approved code alternative NG-4231.1 (ML22025A169)**
 - Administrative

Clarification Items(continued)

5. **Change Appendix B TS Section 4.3.2, first paragraph, by removing a reference to 10 CFR Part 20 to clarify language indicating that the site specific evaluation in accordance with 10 CFR 72.212 is to demonstrate compliance with 10 CFR 72.104.**
 - Clarifies existing requirement only.
6. **Clarify TC/DSC annulus draining language in Appendix B TS Section 4.3 within the last paragraph.**
 - Clarifies draining requirements language to indicate that the NS level should be monitored when draining the TC/DSC annulus as those two drain locations are close to one another.
7. **Clarify in Appendix B TS LCO 3.1.3 that there is no transfer time limit associated with the 24PTH-S-LC DSC as indicated in existing analysis and within the applicability section of bases B10 TS 3.1.3 of the UFSAR.**
 - Clarifies transfer time based on existing UFSAR Appendix P thermal information. No new technical content.
8. **Editorially correct CoC name/address information by adding missing space between 7160 and Riverwood Drive.**
 - Administrative.

Submittal Schedule

Application Submittal - May 2022

Requested approval - November 2023

Questions/ Open Discussion



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Giving nuclear energy its full value