Additional Changes Not Associated with the RAIs

TN Americas LLC is requesting multiple changes to the proposed Amendment 1 Technical Specifications (TS) and Updated Final Safety Analysis Report (UFSAR) that are not related to the RAI questions. These changes fall into two categories: A) Changes associated with fabricability and B) Non-fabricability changes for correction or clarification. The requested changes are discussed in the following sections of this enclosure and include a description of the change, the impact on the design, and a summary of the affected UFSAR chapters.

A. Fabricability changes

These changes are made to improve and facilitate overall fabrication of the HSM-MX. The combined impact of the changes detailed below was evaluated by structural, thermal, and nuclear disciplines. The fabricability changes were modeled as applicable, and the results and analyses presented in the UFSAR have been updated accordingly. The HSM-MX is the only component affected by these fabricability improvements; therefore, criticality and confinement are not affected. The changes to the geometry and revisions to analysis results are reflected by the structural disciplines in UFSAR Chapters A.1, A.2, A.3, and Section A.3.9.1 for the impact of the changes (i.e., revised thermal gradients) on the DSC shell structural analysis, Section A.3.9.4 for the HSM-MX structural analysis, and Section A.3.9.7 for the HSM-MX stability analysis. All HSM-MX shielding models have been rerun with the new geometry and the dose rate tables updated. The geometry changes to models and results affecting the shielding analyses are compiled and provided in Chapters A.6 and A.11, and Section A.12.3.3. Modifications to geometry and results affecting the thermal analyses are provided in Section A.4.5. Unless otherwise noted, the following changes are combined and reflected in the abovementioned UFSAR chapters by each discipline.

1. **Make the outside walls on the end of the HSM-MX array vertical and increase the thickness of the end walls**

   - Description: Drawing MX01-5000-SAR, Sheet 3, zones C4 and C7 - The overall HSM-MX geometry is updated to square off the top corners of the HSM-MX, making the outside walls vertical, increasing the concrete thicknesses on the sides of the HSM-MX. As a result, the expansion options are modified and renamed as the 1) Construction Joint option as shown in Drawing MX01-5000-SAR, Sheet 5, and 2) the Expansion Joint option as shown in Drawing MX01-5000-SAR, Sheet 6.

   - UFSAR Impact: The model used in the thermal evaluation was a repetitive segment in the middle of the HSM-MX array, and therefore is not impacted by this change. The vertical walls provide added concrete for increased shielding. Geometry changes were made to HSM-MX shielding models and results of all combined changes affecting the shielding analyses are compiled and reflected in Chapters A.6 and A.11, and Section A.12.3.3. The new geometry from this change increases the weight and changes the overall HSM-MX geometry. These changes are included in the combined effect of all the changes presented in the structural analyses provided in Chapter A.3, Section A.3.9.4 for the HSM-MX structural analysis, and A.3.9.7 for the HSM-MX stability analysis.

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2. Trim the top of the front shelf/pedestal of the HSM-MX

- Description: Drawing MX01-5000-SAR, Sheet 7, Section A-A, Detail 8 - Simplify the geometry in the front wall of the HSM-MX by removing a step behind the door recess. This step does not support the DSC, since front DSC support is built into the door recess.

- UFSAR Impact: The model used in the thermal evaluation was updated to reflect this change and results for the analysis were updated in Section A.4.5. Similarly, this geometry change was made to HSM-MX shielding models and results of all combined changes affecting the shielding analyses are compiled and reflected in Chapters A.6 and A.11, and Section A.12.3.3. This change is also included in the combined effect of all the changes presented in the structural analyses provided in Chapter A.3, Section A.3.9.4 for the HSM-MX structural analysis, and Section A.3.9.7 for the HSM-MX stability analysis.

3. Extend concrete door opening interior chamfer

- Description: Drawing MX01-5000-SAR, Sheet 7, Section A-A, zones C5 and D5 (Lower compartment) and Section B-B, zones D2 and E2 (Upper compartment) - Extend concrete door opening interior chamfer from 180 degrees to 360 degrees around the circumference.

- UFSAR Impact: The model used in the thermal evaluation was updated to reflect this change and results for the analysis were updated in Section A.4.5. The 360-degree chamfer is included in the shielding models. The structural analysis accounted for this change in the weight calculation, and the revised weight was used in the stability calculations in Section A.3.9.7.

4. Increase thickness of HSM-MX roof to eliminate horizontal scabbing embedment plates

- Description: Drawing MX01-5000-SAR, Sheet 3, zone B8 - Increase the top elevation of the HSM-MX from 26'-9 1/2" to 27'-1 3/8" (excluding outlet vent covers) by increasing the thickness of the roof, and thus eliminating the need for scabbing plate embedments (Drawing MX01-5000-SAR, Sheet 12, Detail 12) for tornado missile protection inside the outlet vents.

- UFSAR Impact: The impact of the increased roof thickness on the thermal gradient and concrete temperatures are combined with the other changes in the model used in the thermal evaluation and results for the analysis were updated in Section A.4.5. The missile impact evaluation was updated to reflect the increased roof thickness without the scabbing plates, and the effect of the increased weight of the HSM-MX was captured with all the combined effect of all the changes presented in the structural analyses provided in Chapter A.3, Section A.3.9.4 for the HSM-MX structural analysis, and Section A.3.9.7 for the HSM-MX stability analysis. Geometry changes were made to HSM-MX shielding models and results of all combined changes affecting the shielding analyses are compiled and reflected in Chapters A.6 and A.11, and Section A.12.3.3.

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5. **Reduced concrete rebar size to use rebar that is better able to bend and meet design requirements**

   - Description: Drawing MX01-5000-SAR, Sheet 10, Sections K-K and L-L - Replace #11 rebar with a combination of #9 and #5 rebar. The bend radius required is difficult to achieve with the thicker rebar, so the rebar layout is revised to use a different configuration of #9 and #5 rebar.

   - UFSAR Impact: The structural evaluations were performed to determine the rebar layout needed for this rebar size. Updated demand to capacity ratios are provided in Table A.3.9.4-6. The shielding and thermal analyses do not consider the rebar layout, and are therefore not impacted by this change.

6. **Decrease the number of Dose Reduction Hardware (DRH) pipes by one on the Outlet Vent Cover**

   - Description: Drawing MX01-5000-SAR, Sheet 9, Detail 4 - Reduced the dose reduction hardware pipes from 23 to 22 in the outlet vent cover so that the steel liner plate to which the dose reduction hardware pipes (Item 57) attach can be fabricated from two identical plates for ease of fabrication.

   - UFSAR Impact: The models in the shielding evaluation were revised, and the results updated in Chapters A.6 and A.11. The use of more pipes blocks more airflow; therefore, this change is conservative for the thermal model, and no update was made to the thermal evaluation. Similarly, the weight of one pipe is insignificant relative to the weight of the HSM-MX, so this change has no impact on the structural analyses.

7. **Add a door/plate combination over the Retractable Roller Tray (RRT) opening**

   - Description: Drawing MX01-5000-SAR, Sheet 3, Detail 3 - The RRT cover plates were added to provide extra shielding at gaps at the RRT block locations.

   - UFSAR Impact: The RRT cover plates were added to the shielding model and the impact of this change is included with the shielding analyses results of all combined changes reflected in Chapters A.6 and A.11, and Section A.12.3.3. The RRT plates are below the level of detail presented in the UFSAR; therefore, there is no impact on the structural analyses. The addition of the RRT cover plates to the exterior of the HSM-MX is not modeled in the thermal evaluation since it has insignificant heat removal capability; therefore there is no thermal impact. The additional operational step of removing the RRT cover plates before insertion is addressed in Chapter 9, Sections A.9.1 and A.9.2.

8. **Fully develop door rebar design**

   - Description: Drawing MX01-5000-SAR, Sheet 13, Door Reinforcing Details - Simplify the door rebar geometry to reduce crowding and allow for improved concrete flow during fabrication. Specifically, change HSM-MX door reinforcements (rebar) to form U stirrups at the top and bottom of the door to make them fully developed. Eliminate (1) "#4 rebar U band radially placed"; and (2) "32 #5 spaced radially."

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- UFSAR Impact: This level of detail of this door rebar is below that provided in the UFSAR; therefore, there is no structural impact. The thermal and shielding analyses do not account for the rebar in the door; therefore there is no change to the thermal or shielding evaluations.

9. Modify Side Heat Shield

- Description: Drawing MX01-5000-SAR, Sheet 17 - Round the upper compartment heat shield assembly length and width down to the nearest ½" and eliminate a square cutout in the lower front portion of the wall heat shield in the upper compartment of the HSM-MX as a result of Change #2. Additionally, notch both the upper and lower compartment side heat shields at the front center to avoid interference with the door embedment.

- UFSAR Impact: The thermal analysis evaluates the concrete temperatures based on the heat shield geometry; therefore, this modification was included in the combined changes reflected in the model and results in Section A.4.5. Additionally, the structural evaluation of the heat shields and attachments performed in Section A.3.9.4 is updated to reflect the new geometry. The resulting change in load on the heat shield and embedments is insufficient to require a change to the specified embedments. The heat shield is not included in the shielding models.

B. Correction or clarification

1. TS Table 3: Adjust the method of indicating Control Component limits from "fuel assembly" to "zone" to be consistent with other TN Americas licensed products. Add "/zone)" after "(Curies" and revise the values. The UFSAR text is modified accordingly in Sections 6.1 and 6.2.4.

2. TS Section 5.1.2(c). Specify that the dose rate on the end shield wall exterior is an average value, consistent with the UFSAR analysis.

3. In UFSAR Table 1-2, the word "poison" is changed to the correct spelling.

4. UFSAR Section A.8.2.1.3 third bullet and the sentence following that bullet are revised for clarity regarding steel components in the HSM-MX.

5. UFSAR Section A.8.2.2 first paragraph, first sentence is corrected by removing "Table 8-11" from the sequence of referenced tables.

6. UFSAR Section A.2.4.2.2 first paragraph is revised for clarity regarding concrete and steel structures in the HSM-MX.