Enclosure 7 to E-54692

CoC 1042 Amendment 2, Revision 1
UFSAR Changed Pages

MX-RRT Handling Device

The same MX-RRT handling device loading the EOS-DSCs in EOS-TCs to the HSM-MX will be used for loading the 61BTH Type 2 in the OS197 to the HSM-MX. Therefore, there is no change to Section A.1.2.2.

HSM-MX Transfer Cask Adapter

To account for the difference between the OS197 top flange diameter and the EOS-TC diameter, an HSM-MX transfer cask (TC) adapter may be mounted to the door recess of the HSM-MX*, see Figure B.1-1. The adapter interface is designed mainly to aid in TC/HSM alignment as well as protect workers from radiation shielding between the OS197 and the HSM-MX door opening during transfer operations*. Dose rates and occupational exposure in Chapter B.6 and Chapter B.11 are reported without the HSM-MX TC adapter; therefore, the use of this item is mainly for *alignment and* ALARA purposes.

B.1.2.3 Operational Features for the NUHOMS® MATRIX-61BTH System

B.1.2.3.1 Spent Fuel Assembly Loading Operations

The primary operations for loading fuels into the NUHOMS® 61BTH Type 2 DSC, moving the loaded OS197 TC to ISFSI, and transferring the NUHOMS® 61BTH Type 2 DSC to the HSM-MX is same as described in Section A.1.2.3.1.

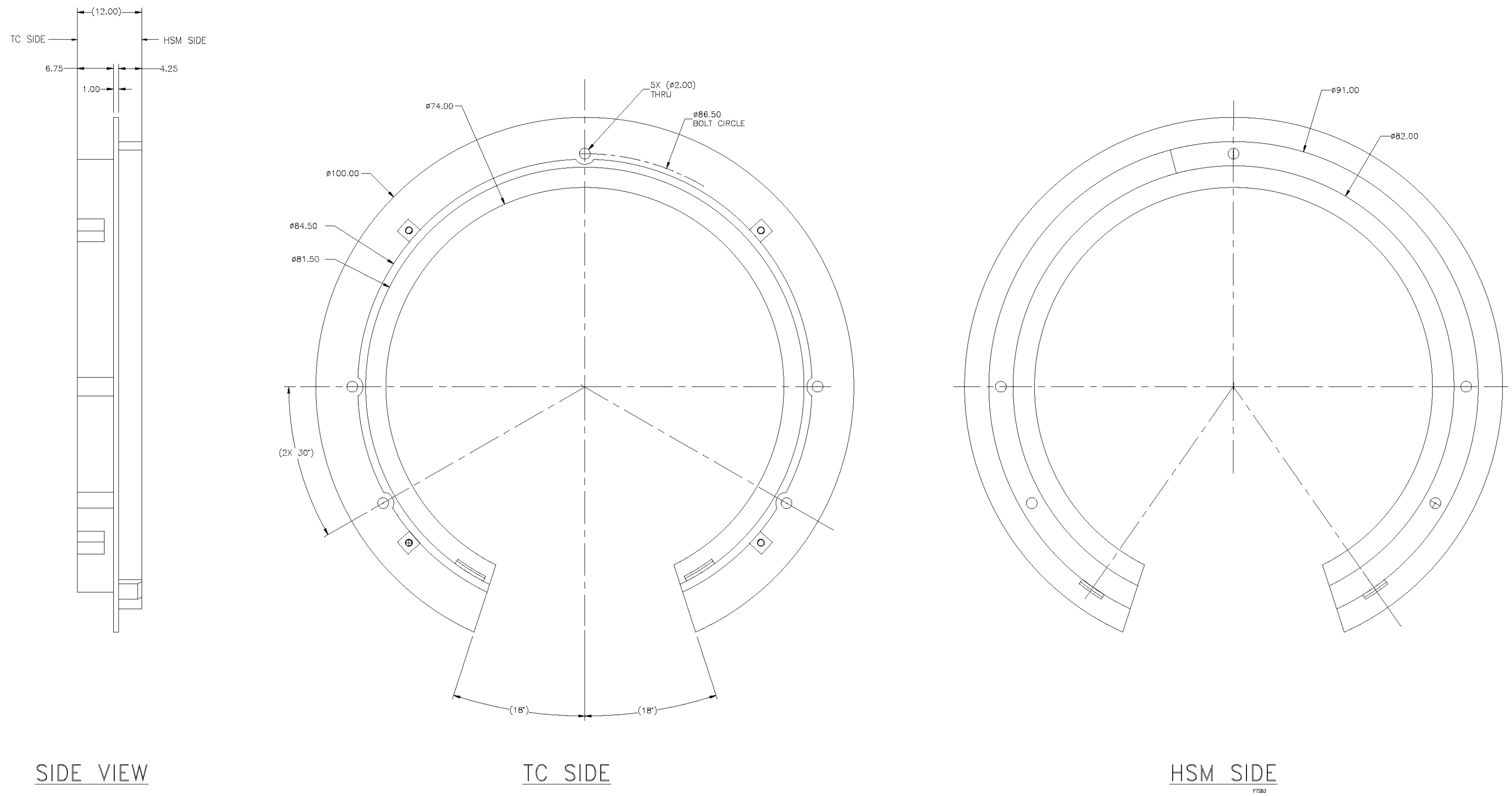

Figure B.1-1
Optional Adapter Ring to Dock the OS197 TC loaded with the 61BTH Type 2 DSC with the HSM-MX

Appendix B is newly added in Amendment 2.
All Indicated Changes are in response to RSI-1

B.2.2 Spent Fuel to Be Stored

The NUHOMS® 61BTH Type 2 DSC is designed to store intact (including reconstituted), damaged, and failed BWR fuel assemblies as specified in Section 2.3 of the Technical Specifications (TS) [B.2-10]. The fuel to be stored is limited to a maximum lattice average initial enrichment of 5.0 wt. % U-235. The maximum allowable fuel assembly average burnup is limited to 62 GWd/MTU.

The NUHOMS® 61BTH Type 2 DSC is also authorized to store fuel assemblies containing blended low enriched uranium (BLEU) fuel material. Fuel pellets containing BLEU fuel material are no different than commercial grade UO_2 fuel pellets except for elevated concentrations of U-232, U-234, and U-236. It is established in Section 6.2.5 that BLEU fuel has negligible effect on source terms and estimated dose rates compared to commercial grade uranium.

Reconstituted fuel assemblies containing replacement irradiated stainless steel rods or lower enrichment UO_2 rods instead of Zircaloy clad enriched UO_2 rods are acceptable for storage in 61BTH Type 2 DSCs as intact fuel assemblies. The effect on dose rates from irradiated stainless steel rods is negligible when the reconstituted fuel assemblies are loaded in the inner basket locations as discussed in Section B.6.2.6.

The NUHOMS® 61BTH Type 2 DSCs can also accommodate up to a maximum of 61 damaged fuel assemblies placed in the fuel compartments located in accordance with TS Figure 5 [B.2-10]. Damaged BWR fuel assemblies are fuel assemblies containing fuel rods with known or suspected cladding defects greater than hairline cracks or pinhole leaks. The extent of damage in the fuel assembly, including non-cladding damage, is to be limited such that a fuel assembly maintains its configuration for normal and off-normal conditions. *The extent of cladding damage is also limited such that no release of pellet material is observed during inspection and handling operations in the pool prior to loading operations.* Damaged fuel assemblies shall also contain top and bottom end fittings. Damaged fuel assemblies may also contain missing or partial fuel rods.

The NUHOMS® 61BTH Type 2 DSC, when used with the top grid assembly (Alternate 1) design, is also able to accommodate up to a maximum of four failed fuel assemblies encapsulated in individual failed fuel canisters (FFC) and placed in cells located at the outer edge of the DSC as shown in TS Figure 5 [B.2-10]. Failed fuel is defined as ruptured fuel rods, severed fuel rods, loose fuel pellets, fuel fragments, or the fuel assemblies that may not maintain configuration for normal and off-normal conditions. Failed fuel assemblies may also contain breached rods, grossly breached rods, and other defects such as missing or partial rods, missing grid spacers, or damaged spacers to the extent that the fuel assembly may not maintain configuration for normal or off-normal conditions. Failed fuel shall be stored in a failed fuel canister (FFC). The DSC may contain both failed and damaged fuel when loaded per TS Figure 5 [B.2-10].

Fuel debris and damaged fuel rods that have been removed from a damaged fuel assembly and placed in a secondary container are also considered as failed fuel. Loose fuel debris not contained in a secondary container may also be placed in an FFC for storage, provided the size of the debris is larger than the FFC screen mesh opening and it is located at least 10 inches above the top of the bottom shield plug of the DSC.

Fuel debris may be associated with any type of UO_2 fuel provided that the maximum uranium content and initial enrichment limits are met. The total weight of each FFC plus all its contents shall be less than 705 lbs. The maximum uranium content for the FFC is defined in TS Table 13 [B.2-10].

As limited by their definition, damaged FAs maintain their geometric configuration for normal and off-normal conditions and are confined to their respective compartments by means of top and bottom end caps. Damaged FAs do not contain missing major sub-components like top and bottom nozzles that impact their ability to maintain their geometric configuration for normal and off-normal conditions during loading.

From the standpoint of NUREG-1536 Revision 1, the damaged FAs for the EOS System are more similar to the undamaged FAs, where their geometry is still in the form of intact bundles. For completeness, failed fuel for the EOS System is more similar to the damaged FAs per NUREG-1536 Revision 1 and will require FFCs.

The fuel compartment and the top and bottom end cap together form the "acceptable alternative," per NUREG-1536 Revision 1 for confinement of damaged fuel. If fuel particles are released from the damaged assembly, the top and bottom end caps provide for the confinement of gross fuel particles to a known volume. Similarly, the FFC provides confinement of the FFC contents to a known volume, and has lifting features to allow the ability to unload the FFC. Additionally, consistent with ISG-2, Revision 2, ready retrieval of the damaged and failed fuel is based on the ability to remove a canister from the HSM.

The structural analysis for damaged fuel cladding described in Chapter B.3 demonstrates that the cladding does not undergo additional degradation under normal and off-normal conditions of storage. The structural analyses performed for FFCs are provided in Section T.3.6.3.4 of reference [B.2-7]. The criticality analysis described in Chapter B.7 is based on damaged and failed fuel in the most limiting credible geometry and material reconfigurations under normal, off-normal, and accident conditions. The maximum enrichment values for damaged or failed fuel are reduced to account for fuel reconfiguration. The thermal analysis described in Chapter B.4 evaluates the effect on the surrounding intact fuel assemblies of reconfiguration of damaged fuel assemblies into rubble under accident conditions. The shielding analysis described in Chapter B.6 states that damaged or failed fuel reconfiguration has a negligible effect on dose rates compared to intact fuel.

B.3.3 Mechanical Properties of Materials

B.3.3.1 61BTH Type 2 DSC

No change to Section T.3.3 of the CoC 1004 UFSAR [B.3-3].

B.3.3.2 OS197 TC

The OS197 TC shell, inner liner, top cover plate, and bottom cover plate use ASME material SA-240 Type 304, while the top flange*, lower trunnion,* and bottom support rings use ASME SA-182 F304N. *Additionally, one option for the upper trunnion uses ASME SA-182 Type FXM-19. No change to the material properties for SA-240 Type 304, SA-182 Type FXM-19, or SA-182 Type F304N, provided in rows 1, 2, and 9 respectively of Table 8.1-3 of CoC 1004 UFSAR* [B.3-3].

B.3.3.3 HSM-MX

The material properties for the HSM-MX are summarized in Chapter A.8.