

Multi-Purpose Canister (MPC)
3.1.1

3.1 SFSC INTEGRITY

3.1.1 Multi-Purpose Canister (MPC)

LCO 3.1.1 The MPC shall be dry and helium filled.

Table 3-1 provides decay heat and burnup limits for forced helium dehydration (FHD), ~~and vacuum drying (VDS), and open loop drying (LPD).~~ FHD is not subject to time limits. ~~Vacuum drying of the MPC-68M is not subject to time limits.~~ Vacuum drying of, ~~for all other MPCs, may be is~~ subject to ~~the following~~ time limits, from the end of bulk water removal until the start of helium backfill, ~~as shown in Table 3-1.:~~

MPC Total Decay Heat (Q)	Vacuum Drying Time Limit
$Q \leq 26 \text{ kW}$	None
$26 \text{ kW} < Q \leq 30 \text{ kW}$	40 hours
$Q > 30 \text{ kW}$	Not Permitted (see Table 3-1)

~~Note 1: Maximum storage cell heat load must not exceed MPC heat load limits in the table divided by number of storage cells.~~

APPLICABILITY: During TRANSPORT OPERATIONS and STORAGE OPERATIONS.

ACTIONS

-----NOTES-----

Separate Condition entry is allowed for each MPC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. MPC cavity vacuum drying pressure or demister exit gas temperature limit not met.	A.1 Perform an engineering evaluation to determine the quantity of moisture left in the MPC.	7 days
	<u>AND</u> A.2 Develop and initiate corrective actions necessary to return the MPC to compliance with Table 3-1.	30 days

SFSC Heat Removal System
3.1.2OR

For OVERPACKS with installed temperature monitoring equipment, verify that the difference between the average OVERPACK air outlet temperature and ISFSI ambient temperature is $\leq 155^{\circ}\text{F}$ for OVERPACKS containing PWR MPCs, $\leq 137^{\circ}\text{F}$ for OVERPACKS containing BWR MPCs (except MPC-68M) and $\leq 164^{\circ}\text{F}$ for OVERPACKS containing MPC-68M.

24 hours
(Overpacks containing MPCs with heat loads greater than 19 kW at time of inspection)

OR

30 days
(Overpacks containing MPCs with heat loads less than or equal to 19 kW at time of inspection)

MPC Cavity Drying Limits
Table 3-1Table 3-1
MPC Cavity Drying Limits for all MPC Types

Fuel Burnup (MWD/MTU)	MPC Heat Load (kW)	Method of Moisture Removal (Notes 1, and 2, 3 and 93)
All Assemblies \leq 45,000	\leq 2630 (MPC-24/24E/24EF, MPC-32/32F, MPC-68/68F/68FF) \leq 36.9 (MPC-68M)	VDS ^{Note 5} or FHD ^{Note 6}
	\leq 36.9 (MPC-68M) ^{Note 6}	VDS or FHD
	\leq 42.8 (MPC-68M) ^{Note 7}	VDS or FHD
All Assemblies \leq 45,000	\geq 30 \leq 36.9 (MPC-24/24E/24EF, MPC-32/32F, MPC-68/68F/68FF) ^{Note 6}	VDS ^{Note 8} or FHD ^{Note 6}
One or more assemblies > 45,000	\leq 29 (MPC-68M)	VDS ^{Note 4} or FHD ^{Note 6}
One or more assemblies > 45,000	\leq 36.9 (MPC-24/24E/24EF/MPC-32/32F/MPC-68/68F/68FF/ MPC-68M) ^{Note 6}	VDS ^{Note 8} or FHD ^{Note 6}
	\leq 36.9 (MPC-68M) ^{Note 6}	VDS ^{Note 8} or FHD or LPD
	\leq 42.83 (MPC-68M) ^{Note 7} Note 7	VDS ^{Note 8} or FHD or LPD

Notes:

- VDS means a vacuum drying system. The acceptance criterion when using a VDS is MPC cavity pressure shall be \leq 3 torr for \geq 30 minutes.
- FHD means a forced helium dehydration system. The acceptance criterion when using an FHD system is the gas temperature exiting the demister shall be \leq 21°F for \geq 30 minutes or the gas dew point exiting the MPC shall be \leq 22.9°F for \geq 30 minutes.
- ~~Deleted~~ Vacuum drying of the system must be performed with the annular gap between the MPC and the TRANSFER CASK filled with water.
- The maximum allowable decay heat per fuel storage location is 0.426 kW.
- Maximum allowable storage cell heat load is 1.~~08325~~ kW (MPC-24/24E/24EF), 0.~~812937~~ kW (MPC-32/32F) and 0.~~382444~~ kW (MPC-68/68F/68FF).

MPC Cavity Drying Limits
Table 3-1

6. Maximum per assembly allowable heat loads under uniform or regionalized storage defined in Appendix B, Section 2.4.1 or 2.4.2.
7. Maximum per assembly allowable heat loads defined in Appendix B Figure 2.4-1.
8. Vacuum drying of the MPC must be performed using cycles of the drying system, according to the guidance contained in ISG-11 Revision 3. The time limit for these cycles shall be determined based on site specific conditions.
9. LPD means an open loop drying method. The acceptance criteria is MPC cavity pressure shall be ≤ 3 torr for ≥ 30 minutes or gas dew point exiting the MPC shall be $\leq 22.9^{\circ}\text{F}$ for ≥ 30 minutes.

MPC Helium Backfill Limits
Table 3-2Table 3-2
MPC Helium Backfill Limits¹

MPC MODEL	LIMIT
MPC-24/24E/24EF	
i. Cask Heat Load ≤ 27.77 kW (MPC-24) or ≤ 28.17 kW (MPC-24E/EF) - uniformly distributed per Table 3-4 or regionalized loading per Table 3-3	0.1212 +/-10% g-moles/l <u>OR</u> ≥ 29.3 psig and ≤ 48.5 psig
ii. Cask Heat Load >27.77 kW (MPC-24) or > 28.17 kW (MPC-24E/EF) - uniformly distributed or greater than regionalized heat load limits per Table 3-3	≥ 45.5 psig and ≤ 48.5 psig
MPC-68/68F/68FF/68M	
i. Cask Heat Load ≤ 28.19 kW - uniformly distributed per Table 3-4 or regionalized loading per Table 3-3	0.1218 +/-10% g-moles/l <u>OR</u> ≥ 29.3 psig and ≤ 48.5 psig
ii. Cask Heat Load > 28.19 kW - uniformly distributed or greater than regionalized heat load limits per Table 3-3	≥ 45.5 psig and ≤ 48.5 psig
MPC-32/32F	
i. Cask Heat Load ≤ 28.74 kW - uniformly distributed per Table 3-4 or regionalized loading per Table 3-3	≥ 29.3 psig and ≤ 48.5 psig
ii. Cask Heat Load >28.74 kW - uniformly distributed or greater than regionalized heat load limits per Table 3-3	≥ 45.5 psig and ≤ 48.5 psig

¹ Helium used for backfill of MPC shall have a purity of $\geq 99.995\%$. Pressure range is at a reference temperature of 70°F

MPC Helium Backfill Limits
Table 3-2

MPC-68M	
i. Cask Heat Load ≤ 28.19 kW - uniformly distributed per Table 3-4 or regionalized loading per Table 3-3	0.1218 +/-10% g-moles/l <u>OR</u> ≥ 29.3 psig and ≤ 48.5 psig
ii. Cask Heat Load > 28.19 kW - uniformly distributed or greater than regionalized heat load limits per Table 3-3	≥ 45.5 psig and ≤ 48.5 psig
iii. Cask Heat Load ≤ 42.8 kW Regionalized Loading Pattern shown in Appendix B, Figures 2.4-1 and 2.4-2	≥ 43.5 psig and ≤ 46.5 psig