

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. FHD is not subject to time limits. Vacuum drying of MPCs may be subject to time limits, from the end of bulk water removal until the start of helium backfill, as shown in Table 3-1.

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
	<p><u>AND</u></p> <p>A.2 Develop and initiate corrective actions necessary to return the MPC to compliance with Table 3-1.</p>	30 days

SR 3.1.2	Verify all OVERPACK inlets and outlets are free of blockage from solid debris or floodwater.	Table 3-5
	<u>OR</u> 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.	Table 3-5

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

Fuel Burnup (MWD/MTU)	MPC Heat Load (kW)	Method of Moisture Removal (Notes 1, 2, and 3)
All Assemblies \leq 45,000	≤ 26 (MPC-24/24E/24EF, MPC-32/32F, MPC-68/68F/68FF)	VDS ^{Note 5} or FHD ^{Note 6}
	≤ 36.9 (MPC-68M) ^{Note 6}	VDS or FHD
	≤ 42.8 (MPC-68M) ^{Note 7}	VDS or FHD
All Assemblies \leq 45,000	≤ 36.9 (MPC-24/24E/24EF, MPC-32/32F, MPC-68/68F/68FF) ^{Note 6}	VDS ^{Note 8} or FHD
One or more assemblies > 45,000	≤ 29 (MPC-68M)	VDS ^{Note 4}
One or more assemblies > 45,000	≤ 36.9 (MPC-24/24E/24EF/MPC-32/32F/MPC-68/68F/68FF) ^{Note 6}	VDS ^{Note 8} or FHD
	≤ 36.9 (MPC-68M) ^{Note 6}	VDS ^{Note 8} or FHD
	≤ 42.8 (MPC-68M) ^{Note 7}	VDS ^{Note 8} or FHD

Notes:

- VDS means a vacuum drying system. The acceptance criterion when using a VDS is MPC cavity pressure shall be ≤ 3 torr for ≥ 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 $\leq 21^{\circ}\text{F}$ for ≥ 30 minutes or the gas dew point exiting the MPC shall be $\leq 22.9^{\circ}\text{F}$ for ≥ 30 minutes.
- 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 1.083 kW (MPC-24/24E/24EF), 0.812 kW (MPC-32/32F) and 0.382 kW (MPC-68/68F/68FF).
- Maximum per assembly allowable heat loads under uniform or regionalized storage defined in Appendix B, Section 2.4.1 or 2.4.2.
- 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. Applies when any one assembly heat load is greater than 0.426 kW.

Table 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	
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-68M

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

MPC Heat Load Limits
Table 3-3

Table 3-5: Completion Time for Actions to Restore SFSC Heat Removal System Operable

MPC Material	MPC Type	Decay Heat Limits per Storage Location	Condition B Completion Time	Condition C Completion Time	Surveillance Frequency
Alloy X Except Duplex ¹	MPC-24/24E/24EF	Appendix B, Section 2.4	8 hrs	24 hrs	24 hrs
	MPC-32/32F				
	MPC-68/68F/68FF/68M				
	MPC-68M	Appendix B, Figure 2.4-1			
Alloy X	MPC-24/24E/24EF	Appendix B, Section 2.4	8 hrs	16 hrs	16 hrs
	MPC-32/32F				
	MPC-68/68F/68FF/68M				
Alloy X	MPC-68M	Appendix B, Figure 2.4-1	4 hrs	12 hrs	12 hrs
Alloy X Except Duplex ¹	MPC-24	Appendix A, Table 3-3 (Regionalized)	8 hrs	64 hrs	24 hrs
	MPC-24E/EF	OR			
	MPC-32/32F	Appendix A, Table 3-4 (Uniform)			
	MPC-68/68F/68FF/68M				
Alloy X	MPC-24	Appendix A, Table 3-3 (Regionalized)	8 hrs	24 hrs	24 hrs
	MPC-24E/EF	OR			
	MPC-32/32F	Appendix A, Table 3-4 (Uniform)			
	MPC-68/68F/68FF/68M				
Alloy X	MPC-24/24E/24EF	0.791 kW	24 hrs	64 hrs	30 days
	MPC-32/32F	0.5 kW			
	MPC-68/68F/68FF/68M	0.279 kW			

Note

1) If any component of the MPC is made of duplex, these completion times are not applicable.