

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : PURGE, VENT & DRAIN FMEA NO 01-5 -332404-5 REV: 09/28/67

ASSEMBLY : WCCS				
P/N RI : V070-381120				CRIT. FUNC: 1
P/N VENDOR:				CRIT. HDW: 1
QUANTITY : 6	VEHICLE	102	103	104
: SIX	EFFECTIVITY:	-X	X	X
:	PHASE(S) :	PL	LO X OO	DO X LS

PREPARED BY:		REDUNDANCY SCREEN:	A-N/A	B-N/A	C-N/A
DES	F A FERRIS	APPROVED BY:			
REL	J S MULLEN	DESIGN	APPROVED BY (NASA):		
QE	<i>W.S. Smith</i>	REL	SSM	<i>[Signature]</i>	
		QE	REL	<i>[Signature]</i>	
			QE	<i>[Signature]</i>	

ITEM: DESICCANT/FILTER ASSY

FUNCTION: THESE ITEMS ACT TO CONDITION AMBIENT AIR INGESTED FROM THE ATMOSPHERE.

FAILURE MODE: LEAKAGE (SIDE/OVERHEAD WINDOW OUTER CAVITY SYSTEM)

CAUSE(S): LOOSE FITTING, FAILED RUBBER SEAL.

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
 (A) RESULTS IN ADDITIONAL FLOW PATH INTO THE WINDOW CAVITY VOLUME.
 (B) MAY CONTAMINATE WINDOW SURFACES.

(C, D) MAY AFFECT RATES OF VENTING/REPRESS OF THE OUTER WINDOW CAVITIES. LEAK RATE MAY RESULT IN OVERPRESSURE OF SIDE AND OVERHEAD WINDOW THERMAL PANES. SUBSEQUENT LOSS OF REDUNDANT AND PRESSURE PANES RESULTS IN LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:
 (A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A) DESIGN
 THE DESICCANT/FILTER ASSEMBLY IS INSTALLED BY MEANS OF DYNATUBE FITTINGS WHICH ARE NOT PRONE TO LEAKAGE (REFERENCE JSC TEST REPORT WTS/M597 DATED 3/31/77). THERE ARE RUBBER SEALS LOCATED AT EACH END OF THE CANISTER WHERE THE END ASSEMBLY MATES TO THE LEXAN TUBE. THE FACTOR OF SAFETY (F.O.S.) IS 96 BY ANALYSIS FOR THE ULTIMATE HOOP STRESS OF 6.32 PSI. THE F.O.S. IS 36 BY ANALYSIS FOR THE ULTIMATE CRUSH PRESSURE OF 6.96 PSID.

(B) TEST
 A TYPICAL DESICCANT/FILTER ASSEMBLY UNDERWENT CERTIFICATION TESTS SUBJECTING THE HARDWARE TO THE DESIGN RANDOM VIBRATION ENVIRONMENT FOR THE EQUIVALENT OF 400 MISSIONS. THE ASSEMBLY WAS ALSO SUBJECTED TO THE

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20G DESIGN SHOCK PULSE AND THEN SUCCESSFULLY COMPLETED FUNCTIONAL LEAK TESTS. THE CANISTER ASSEMBLY UNDERGOES A PRESSURE DECAY TEST EACH TURNAROUND PER THE OMRSD WHILE INSTALLED IN THE DESICCANT/CHECK VALVE ASSEMBLY TO VERIFY THE CANISTER AND INSTALLATION DYNATUBE FITTINGS PRIOR TO REINSTALLATION IN THE VEHICLE. IN ADDITION, THE DESICCANT/ FILTER ASSEMBLY IS DISASSEMBLED, CLEANED, RETESTED AND CHECKED FOR THE LEAKAGE EACH TIME THE DESICCANT IS REPLACED. THE DESICCANT/FILTER ASSEMBLY IS CERTIFIED UNDER CR 14-381120F.

(C) INSPECTION

RECEIVING INSPECTION

MATERIAL AND PROCESS CERTIFICATIONS ARE VERIFIED BY RECEIVING INSPECTION.

CONTAMINATION CONTROL

CLEANLINESS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

ASSEMBLY OF CANISTER BODY COMPONENTS VERIFIED BY INSPECTION.

INSTALLATION OF THREADED FASTENERS, SAFETY WIRE AND TORQUING VERIFIED BY INSPECTION. DESICCANT LOADING VERIFIED BY INSPECTION.

TESTING

UNIT TESTING VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

NO FAILURES DUE TO LEAKAGE HAVE BEEN EXPERIENCED TO DATE.

(E) OPERATION USE

OPERATIONAL EFFECTS - DURING THE ASCENT PHASE, IF ALL REDUNDANCY TO THIS FUNCTION IS LOST AND THE THERMAL PANE RUPTURES AN RTLS WILL BE DECLARED DEPENDING ON THE FLIGHT STAGE.

CREW ACTION - NONE. MISSION CONSTRAINT - NONE.