SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :CREW MODULE SEALS   FMEA NO 01-4 -CS49 -1   REV:03/29

ASSEMBLY :CREW MODULE AFT BULKHEAD/ARPCS   CRIT. FUNC:
P/N RI :   CRIT. HDW:
P/N VENDOR:MD261-0002-0138   VEHICLE 102 103 104
QUANTITY :1   EFFECTIVITY: X X X
:ONE   PHASE(S): PL LO X OO X DO X LS

REDUNDANCY SCREEN: A-FAIL B-FAIL C-PA

PREPARED BY:			APPROVED BY:	APPROVED BY (NASA):
DES	M.	FULLER	DES W. B. Henry 7/20/88	SSM DE [illegible]
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ITEM:
SEAL, AFT BULKHEAD - VACUUM VENT ISOLATION VALVE

FUNCTION:
SEAL PREVENTS LEAKAGE OF CREW MODULE ATMOSPHERE AT THE MOUNTING INTERFACE OF THE VACUUM VENT ISOLATION VALVE IN THE AFT BULKHEAD FEEDTHROUGH PANEL.

FAILURE MODE:
LEAKAGE

CAUSE(S):
LOW TEMPERATURE, MATERIAL DEGRADATION, CONTAMINATION

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

(A) FAILURE OF SINGLE SEAL WOULD RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(B) FAILURE OF A SINGLE SEAL WOULD RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(C) FAILURE OF A SINGLE SEAL WOULD RESULT IN LOSS OF CREW MODULE CONSUMABLES, HOWEVER, THIS WOULD NOT EXCEED THE MAKEUP CAPABILITY OF T ARPCS BUT WOULD POSSIBLY RESULT IN EARLY TERMINATION OF MISSION.

(D) FAILURE OF SINGLE SEAL AND AN ADDITIONAL SEAL FAILURE WITHIN THE CREW MODULE COULD RESULT IN A LEAK RATE EXCEEDING THE ARPCS MAKEUP CAPABILITY RESULTING IN LOSS OF CREW/VEHICLE.

REDUNDANCY SCREENS: SEAL FAILS SCREENS "A" AND "B" BECAUSE LEAK TEST O EACH SEAL INDIVIDUALLY IS NOT FEASIBLE.

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

(A) DESIGN
STANDARD O-RING FACE SEAL IS CAPTIVE IN A GROOVE IN THE MOUNTING FLANG OF THE VALVE. SEAL IS ADJACENT TO STRUCTURAL ATTACH BOLTS OF VALVE TO BULKHEAD FEEDTHROUGH PANEL. SEAL IS COMPRESSED UNTIL METAL TO METAL

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :CREW MODULE SEALS FMEA NO 01-4 -CS49 -1 REV:03/29/8

CONTACT IS OBTAINED AT FEEDTHROUGH PANEL TO VALVE INTERFACE. SEAL MATERIAL IS SILICONE RUBBER.

(B) TEST
ACCEPTANCE TESTS: CREW MODULE HIGH PRESSURE TEST TO 14.7 PSID AND LOW PRESSURE TEST TO 3.2 PSID.

QUALIFICATION TESTS: QUALIFICATION TESTS WERE NOT PERFORMED CERTIFICATIC IS BASED ON ACCEPTANCE TESTS AND SEAL MATERIALS DATA.

OMRSD: GROUND TURNAROUND INCLUDES PRE-LIFTOFF PRESSURIZATION TEST AT 2 PSID; HOWEVER, IT IS UNLIKELY TO DETECT INTERFACE SEAL LEAKAGE.

(C) INSPECTION

RECEIVING INSPECTION
RECEIVING INSPECTORS EXAMINE SEALS FOR DAMAGE AND FOR QUALITY OF WORKMANSHIP. THEY ALSO VERIFY THAT SUPPLIER SUBMITTED THE REQUIRED REPORTS.

CONTAMINATION CONTROL
RECEIVING INSPECTORS VISUALLY EXAMINE SEALS FOR ADHERENCE TO CLEANLINESS REQUIREMENTS. THEY ALSO VERIFY, PRIOR TO INSTALLATION, THAT THE SEAL AN SEALING SURFACE MEET THE CLEANLINESS REQUIREMENTS OF MA0106-328.

ASSEMBLY/INSTALLATION
THE SEALS ARE INSTALLED PER MA0106-328. PRIOR TO INSTALLATION, INSPECTORS VERIFY THAT THE SEAL AND THE SEALING SURFACE ARE NOT DAMAGED

TESTING
THE RECEIVING INSPECTOR VERIFIES THE ACCEPTANCE TESTS.

HANDLING/PACKAGING
THE RECEIVING INSPECTORS VERIFY THAT EACH SEAL IS PACKAGED SO AS TO PRECLUDE DAMAGE DURING HANDLING AND STORAGE.

(D) FAILURE HISTORY
STANDARD PRESSURE BULKHEAD SEALS HAVE EXTENSIVE USE IN AEROSPACE APPLICATIONS WITH NO FAILURE HISTORY.

(E) OPERATIONAL USE
IF LEAKAGE OCCURS, LOSS OF CREW MODULE CONSUMABLES CAN BE MONITORED AND ASSESSED FOR FEASIBILITY OF CONTINUING THE MISSION PER CABIN LEAK PROCEDURES AND FLIGHT RULES.