SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :CREW MODULE SEALS FMEA NO 01-4 -CS34 -1 REV:03/29/8

ASSEMBLY :CREW MODULE/ETS PYRO LINE FITTINGS CRIT. FUNC: 1
P/N RI : CRIT. HDW: 3
P/N VENDOR:M83248/1-214, 1-223 VEHICLE 102 103 104
QUANTITY :8 EFFECTIVITY: X X X
:TWO SEALS PER FITTING PHASE(S): PL LO X OO X DO X LS
:TWO FITTINGS PER VEHICLE

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

PREPARED BY:			APPROVED BY:		APPROVED BY (NASA):	
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ITEM:
SEAL, CREW MODULE, ETS PYRO LINE FITTINGS

FUNCTION:
THESE SEALS PREVENT LEAKAGE OF CREW MODULE ATMOSPHERE.

FAILURE MODE:
LEAKAGE

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

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

(A) FAILURE OF SINGLE SEAL HAS NO EFFECT. LOSS OF REDUNDANT SEAL WOULD RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(B) FAILURE OF A SINGLE SEAL HAS NO EFFECT. LOSS OF REDUNDANT SEAL WOU RESULT IN THE LOSS OF CREW MODULE CONSUMABLES.

(C) FAILURE OF A SINGLE SEAL HAS NO EFFECT. LOSS OF THE REDUNDANT SEAL WOULD RESULT IN LOSS OF CREW MODULE CONSUMABLES, HOWEVER, THIS WOULD NO EXCEED THE MAKEUP CAPABILITY OF THE ARPCS BUT WOULD POSSIBLY RESULT IN EARLY TERMINATION OF MISSION.

(D) FAILURE OF SINGLE SEAL HAS NO EFFECT. LOSS OF THE REDUNDANT SEAL A AN ADDITIONAL SEAL FAILURE WITHIN THE CREW MODULE COULD RESULT IN A LEA RATE EXCEEDING THE ARPCS MAKEUP CAPABILITY RESULTING IN LOSS OF CREW/VEHICLE.

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

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

(A) DESIGN
ON OV-103 AND OV-104 THESE REDUNDANT SEALS PREVENT LEAKAGE OF CREW MODU ATMOSPHERE BY PROVIDING INTERFACE SEALING BETWEEN THE CREW MODULE FLIGH

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DECK OVERHEAD SKIN PANEL AND THE ENERGY TRANSFER SYSTEM (ETS) PYRO LI FITTING FOR THE EMERGENCY ESCAPE OVERHEAD WINDOW. ON OV-102 THE SEAL IS BETWEEN THE CREW MODULE AFT BULKHEAD AND THE ENERGY TRANSFER SYSTE PYRO LINE FITTING. DUAL O-RING FACE SEALS ARE INSTALLED IN SEPARATE GROOVES IN THE ETS PYRO LINE FITTING. THE ETS PYRO LINE FITTING CLAM RING OR NUT ENSURES UNIFORM COMPRESSION AROUND THE SEALS PERIPHERY, W METAL TO METAL CONTACT AT SEALED INTERFACE. DIRECTION OF PRESSURE DIFFERENTIAL ASSISTS SEALS. SEAL MATERIAL IS FLUOROCARBON ELASTOMER (VITON).

(B) TEST

ACCEPTANCE TESTS: TESTS CONSIST OF CREW MODULE HIGH PRESSURE TEST TO PSID AND LOW PRESSURE TEST TO 3.2 PSID ON OV-103 AND OV-104. TESTS A NOT APPLICABLE ON OV-102.

QUALIFICATION TESTS: QUALIFICATION TESTS WERE NOT PERFORMED CERTIFICA IS BASED ON ACCEPTANCE TESTS ON OV-103 AND OV-104. ON OV-102 CERTIFICATION IS BASED ON SIMILARITY WITH OV-103 AND OV-104 CREW MODU UPPER FUSELAGE STRUCTURE ETS PYRO LINE FITTING SEALS.

OMRSD: CREW MODULE LEAK TEST AT 2 PSID UNLIKELY TO DETECT DUAL SEAL LEAKAGE.

(C) INSPECTION

RECEIVING INSPECTION
RECEIVING INSPECTORS INSPECT FOR DAMAGE AND WORKMANSHIP AND VERIFY SIN PIECE MOLDED CONSTRUCTION. RECEIVING INSPECTORS CHECK IDENTIFICATION WALL CROSS-SECTIONAL DIAMETER ON A S-3 SAMPLING BASIS. RECEIVING INSPECTORS VERIFY THAT SUPPLIER SUBMITTED REQUIRED REPORTS.

CONTAMINATION CONTROL
RECEIVING INSPECTION VISUALLY INSPECTS SEAL FOR CLEANLINESS. INSPECTO ALSO VERIFY, BEFORE INSTALLATION, THAT THE SEAL AND SEALING SURFACE AR CLEAN.

ASSEMBLY/INSTALLATION
THE SEALS ARE INSTALLED PER MA0106-328. PRIOR TO INSTALLATION AN INSPECTION IS PERFORMED TO VERIFY THAT THE SEALING SURFACE IS NOT DAMAGED.

TESTING
INSPECTOR VERIFIES CREW MODULE HIGH PRESSURE TEST TO 14.7 PSID AND LOW PRESSURE TEST TO 3.2 PSID.

HANDLING/PACKAGING
THE RECEIVING INSPECTORS VERIFY THAT THE SEAL IS INDIVIDUALLY PACKAGED WITH PART NUMBER, MANUFACTURER NAME, COMPOUND NUMBER AND CURE DATE. RECEIVING INSPECTORS ALSO VERIFY THAT THE SEAL IS PACKAGED IN A WAY THA WILL PROTECT IT DURING STORAGE.

(D) FAILURE HISTORY

STANDARD BOSS SEAL AND BONDED ELASTOMER SEAL HAVE EXTENSIVE USE IN AEROSPACE APPLICATIONS WITH NO FAILURE HISTORY.

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(E) OPERATIONAL USE

IF INTERFACE 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.