

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2006 -1 REV:12/04/87
 ASSEMBLY : PANEL C3A1 ABORT,
 P/N RI : ME451-0009-1001 TAL, ATO CRIT. FUNC: 1R
 P/N VENDOR: VEHICLE 102 103 104 CRIT. HDW: 3
 QUANTITY : 4 EFFECTIVITY: X X X
 : FOUR PHASE(S): PL LO X OO DO X LS
 : (TWO PER ENGINE)

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES D SOVEREIGN DES *D. Si A. Bunn* SSM *John T. ...*
 REL F DEFENSOR REL *Melvin C. ... 12-5-87* REL *12-9-87*
 QE J COURSEN QE *12/11/87* QE *12/11/87*
SPDC SSM & B Compts for u.c. 5 to 35

ITEM:
 FUSE (1 AMP), LEFT AND RIGHT OMS - OMS ENGINE CONTROL.

FUNCTION:
 CONDUCTS CONTROL CIRCUIT POWER AND PROVIDES CIRCUIT PROTECTION FOR THE OMS "OFF/ARM" CONTROL CIRCUITS. LEFT - 3573A1F1, F2. RIGHT - 3573A1F3, F4.

FAILURE MODE:
 OPENS

CAUSE(S):
 CHEMICAL DEGRADATION, VIBRATION, THERMAL STRESS, MECHANICAL SHOCK.

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

(A) LOSS OF REDUNDANCY - LOSS OF ABILITY TO ENERGIZE ONE OF THE TWO REDUNDANT COILS OF THE ENGINE PRESSURE ISOLATION VALVE, 52V43LV002 (RIGHT), 51V43LV002 (LEFT). LOSS OF ABILITY TO ENERGIZE ONE OF THE TWO REDUNDANT COILS OF THE ENGINE CONTROL VALVES NO. 1 AND 2, 52V43LV005 AND 51V43LV006 (RIGHT), 51V43LV005 AND 51V43LV006 (LEFT).

(B) LOSS OF INTERFACE REDUNDANCY - NO EFFECT, REDUNDANT CIRCUIT PROVIDES REQUIRED CONTROL POWER TO COMPLETE FUNCTION. NEXT RELATED FAILURE PRECLUDES AFFECTED OMS ENGINE OPERATION.

(C) NO EFFECT.

(D) NO EFFECT. CRITICALITY 1 FOR ABORT - TAL AND ATO. LOSS OF POST-BURN PURGE (GENERAL PURPOSE COMPUTER SOFTWARE WILL NOT PERFORM POST-BURN PURGE WITH INPUT FROM ONE OF TWO ARM/PRESS CONTACTS OF THE OFF-ARM/PRESS-ARM SWITCH MISSING).

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(E) POSSIBLE LOSS OF CREW/ VEHICLE DUE TO LOSS OF CONTROL OF ELECTRICAL POWER NECESSARY FOR THE OPERATION OF ENGINE CONTROL VALVES AND PRESSURE ISOLATION VALVES. REQUIRES TWO OTHER FAILURES (FUSE FAILS OPEN ON REDUNDANT CIRCUIT, LOSS OF OTHER OMS ENGINE) AND INSUFFICIENT PROPELLANT RCS BACKUP DEORBIT BEFORE THE EFFECT IS MANIFESTED.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) DISPOSITION AND RATIONALE

REFER TO APPENDIX D, ITEM NO. 2 - FUSE, AXIAL LEAD CARTRIDGE.

(B) GROUND TURNAROUND TEST

V43CEC.100 PNEUMATIC SYSTEM ELECTRICAL CONTROL VERIFICATION; PERFORMED EACH FLIGHT. REDUNDANCY VERIFICATION OF CONTROL CIRCUIT PER FIGURE V43CAC.070-5.

S00FJC.040 POST ACTIVATION LEAK AND FUNCTIONAL; PERFORMED EACH FLIGHT. VERIFIES BOTH CONTACTS OF THE ARM/PRESS SWITCH POSITION AND OPERATION OF THE GN2 PRESSURE ISOLATION VALVE.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE. FOR SUBSEQUENT FAILURE, USE ALTERNATE POSITION TO FIRE OMS ENGINE FOR CRITICAL OMS BURNS. REDLINE ADDITIONAL PROPELLANT TO PROTECT RCS 4+X DEORBIT.