

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2652 -1 REV:05/03/88

ASSEMBLY :PANEL MA73C				CRIT.FUNC: 1R
P/N RI :ME452-0102-7101				CRIT. HDW: 3
P/N VENDOR:		VEHICLE	102 103 104	
QUANTITY :3		EFFECTIVITY:	X X X	
:THREE		PHASE(S):	PL LO X OO X DO X LS	
:				

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES R PHILLIPS	DES <u>R. Bassman</u>	SSM <u>Alk. Stan 5/12/88</u>
REL M HOVE	REL <u>W. J. Cansen 5-6-88</u>	REL <u>W. J. Cansen 5/14/88</u>
QE J COURSEN	QE <u>J. J. Cansen 7/6/88</u>	QE <u>W. J. Cansen 7/6/88</u>

ITEM:

SWITCH, TOGGLE, SP2P - AFT MCA 1,2 AND 3 RCS/OMS DC BUS AB, BC, CA
"ON/OFF" CONTROL

FUNCTION:

PROVIDES THE "ON/OFF" MANUAL CAPABILITY TO CONTROL MAIN DC BUS INPUT POWER TO THE RCS/OMS DC SUB-BUSES AB, BC AND CA IN AFT MOTOR CONTROL ASSEMBLIES (MCA'S) 1, 2 AND 3 FOR CONTROL OF REACTION CONTROL SYSTEM/ORBITAL MANEUVERING SYSTEM (RCS/OMS) ISOLATION, CROSSFEED AND INTERCONNECT MOTOR VALVES. 85V73A129S15, S16 AND S17

FAILURE MODE:

FAILS OPEN, PREMATURELY OPENS, SHORTS TO GROUND

CAUSE(S):

PIECE PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, PROCESSING ANOMALY

EFFECT(S) ON:

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

(A) LOSS OF A REDUNDANT MAIN DC BUS POWER INPUT TO TWO ASSOCIATED AFT MOTOR CONTROL ASSEMBLY RCS/OMS SUB-BUSES.

(B) LOSS OF REDUNDANCY. NO EFFECT FOR FIRST FAILURE. RCS/OMS-SUB-BUSES ARE POWERED FROM TWO SEPARATE SOURCES.

(C,D) FIRST FAILURE - NO EFFECT.

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SYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2652 -1 REV:05/03/88

EFFECT(S) ON (CONTINUED):

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

(E) POSSIBLE LOSS OF CREW/VEHICLE VIA THE FOLLOWING SCENARIO:

(1) LEAK IN AFT RCS MANIFOLD 3 OR 4 DURING EARLY ASCENT PHASE
NECESSITATING CLOSURE OF ALL AFT RCS TANK AND MANIFOLD ISOLATION
VALVES TO ISOLATE LEAK.

(2,3) FAILURE OF SWITCHES SUPPLYING REDUNDANT CONTROL BUS POWER FOR
RCS/OMS SUB-BUS CA RESULTING IN LOSS OF ABILITY TO REOPEN RCS
PROPELLANT SUPPLY TO ANY AFT RCS PRIMARY MANIFOLD. RESULTS IN LOSS
OF ALL AFT RCS JETS REQUIRED FOR SAFE ORB/ET SEPARATION.

FAILS "B" SCREEN BECAUSE NEITHER RCS/OMS SUB-BUSES NOR STATUS OF
SWITCHES SUPPLYING THEM ARE INSTRUMENTED.

DISPOSITION & RATIONALE:

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

(B,C,D) DISPOSITION AND RATIONALE

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

(E) GROUND TURNAROUND TEST

VERIFY MCA OPERATIONAL STATUS INDICATORS ARE "ON" (ALL MOTOR CONTROL
RELAYS RESET) DURING NO OPERATION OF THE AC MOTOR MECHANISMS AND "OFF"
WHILE RCS/OMS VALVES ARE BEING CYCLED. TEST IS PERFORMED FOR ALL
FLIGHTS.

(E) OPERATIONAL USE

NONE