

**SHUTTLE CRITICAL ITEMS LIST - ORBITER**

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2143 -3 REV:05/03/88

ASSEMBLY	:AFT PCA-1 & 2	CRIT.FUNC:	1R
P/N RI	:MC455-0129-0001	CRIT. HDW:	3
P/N VENDOR:		VEHICLE	102 103 104
QUANTITY	:4	EFFECTIVITY:	X X X
	:FOUR	PHASE(S):	PL LO X OO DO LS

PREPARED BY:		REDUNDANCY SCREEN:	A-PASS B-FAIL C-PASS
DES	R PHILLIPS	APPROVED BY:	APPROVED BY (NASA):
REL	M HOVE	DES <i>R. Burns</i>	SSM <i>W.C. Ste...</i> 5/12/88
QE	J COURSEN	REL <i>John Cl...</i> 5-6-88	REL <i>John Cl...</i> 5/7/88
		QE <i>J. J. Conson</i> 5/6/88	QE <i>PT</i>

**ITEM:**

RELAY, GENERAL PURPOSE - MAIN DC POWER LEFT/RIGHT SRB BUS POWER

**FUNCTION:**

TRANSFERS POWER BETWEEN SEPARATE MAIN DC BUSES TO AN SRB BUS. ALLOWS REDUNDANT MAIN DC BUS POWER TO EACH SRB DC BUS. SUPPLIES ORB MAIN BUS A,B, OR C TO THE RIGHT AND LEFT SRB BUSES A AND B. 54V76A131K8, 9; 55V76A132K9, 10

**FAILURE MODE:**

FAILURE TO TRANSFER, FAILS TO CONDUCT - BACKUP CONTACTS, FAILS OPEN - PRIMARY CONTACTS

**CAUSE(S):**

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

**EFFECT(S) ON:**

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

(A) LOSS OF REDUNDANCY TO SUPPLY DC POWER FROM ORBITER AFT BUSES TO SRB DC BUS A OR B.

(B) LOSS OF REDUNDANCY FOR SRB DC BUS A OR B.

(C,D) NO EFFECT FOR FIRST FAILURE. SRB DC BUSES HAVE REDUNDANT SOURCES FROM THE ORBITER AS WELL AS A REDUNDANT SRB DC BUS TO PROVIDE REQUIRED FUNCTIONS.

(E) POSSIBLE LOSS OF CREW/VEHICLE VIA THE FOLLOWING SCENARIO: (1) LOSS OF AN ORBITER DC BUS FEED CIRCUIT TO ONE OF TWO SRB DC BUSES; (2) FAILURE OF RELAY TO CONNECT BACKUP ORBITER DC POWER TO THE SAME SRB BUS; (3) LOSS OF SECOND DC BUS ON THE SAME SRB RESULTING IN LOSS OF THRUST VECTOR CONTROL FOR ONE SRB. FAILS B SCREEN BECAUSE FAILURE TO TRANSFER IS NOT DETECTABLE UNTIL TRANSFER IS REQUIRED AFTER LOSS OF ONE ORBITER-SRB DC POWER FEED PATH.

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DISPOSITION & RATIONALE:

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

(A,B,C,D) DISPOSITION AND RATIONALE

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY

(B) GROUND TURNAROUND TEST

VERIFY ORB/SRB POWER INTERFACE BY ACTIVATING THE MASTER EVENT CONTROLLER  
SRB POWER COMMANDS AND MONITORING POWER STIMULI COMMANDS, DISCRETE  
EVENTS, AND OPERATIONAL BUS VOLTAGES. TEST IS PERFORMED FOR ALL FLIGHTS.

(E) OPERATIONAL USE

NONE