SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2003 -1 REV:05/03/88

ASSEMBLY :MAIN DC DIST ASSY 1,2,3 ABORT: RTLS CRIT.FUNC: 1R
P/N RI :MC455-0126-0001 CRIT. HDW: 2

P/N VENDOR:
QUANTITY :3
:THREE REQUIRED - ONE PER
:FUEL CELL CIRCUIT

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

PHASE(S): PL LO X OO DO X LS

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

PREPARED BY:			APPROVED BY:	APPROVED BY (NASA):
DES	R	PHILLIPS	DES	SSM
REL	M	HOVE	REL	REL
QE	J	COURSEN	QE	QE

ITEM:
CONTACTOR, POWER - FUEL CELL CONTACTOR - MOTOR DRIVEN (FUEL CELL 1, 2, AND 3)

FUNCTION:
CONNECTS FUEL CELL TO OR ISOLATES FUEL CELL FROM THE MAIN DC BUS. 40V76A31S2, 40V76A32S2, 40V76A33S2

FAILURE MODE:
FAILS OPEN OR INADVERTENTLY TRANSFERS OPEN

CAUSE(S):
PIECE PART 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 POWER TO THE AFFECTED BUS.

(B) LOSS OF POWER TO LOADS CONNECTED EXCLUSIVELY TO THE AFFECTED BUS. TOTAL POWER CAPABILITY REDUCED BY ONE THIRD.

(C) POSSIBLE MISSION MODIFICATION.

(D) FIRST FAILURE - NO EFFECT. SECOND FAILURE DURING FIRST STAGE FLIGHT COULD RESULT IN LOSS OF SRB CONTROL. SECOND FAILURE DURING ASCENT OR ENTRY COULD RESULT IN UNDERVOLTAGE CONDITION TO CRITICAL LOADS. CRIT 1 FOR RTLS ABORT IF THE TIME REQUIRED TO PERFORM BUS TIE LEAVES INSUFFICIENT TIME AVAILABLE TO ACCOMPLISH A COMPLETE OMS FUEL DUMP THROUGH THE RCS JETS.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF SECOND MAIN DC BUS OR CONTACTOR DURING ASCENT OR ENTRY. FOR ON-ORBIT MISSION PHASE THE HARDWARE CRITICALITY BECOMES CRIT 3 (FUNCTIONAL CRITICALITY REMAINS 1R).

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SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2003 -1 REV:05/03/88

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

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. 6 - POWER CONTACTOR

(B) GROUND TURNAROUND TEST
VERIFY POWER TRANSFER CAPABILITY FROM FUEL CELL 1 (2, 3) TO MAIN DC BUS A (B, C) RESPECTIVELY. CYCLE MAIN DC BUS A (B, C) ON/OFF SWITCH WHILE MONITORING STIMULI COMMANDS, DISCRETE EVENTS, FUEL CELL AND MAIN BUS VOLTAGES. TEST IS PERFORMED FOR ALL FLIGHTS.

(E) OPERATIONAL USE
AFTER SRB SEPARATION, POWERDOWN AND RECONFIGURE ELECTRICAL LOADS. PRESENT FLIGHT RULES DO NOT PERMIT BUS TIEING TO A DEAD BUS UNTIL AFTER SRB SEPARATION. ONBOARD PROCEDURES MANAGE POWER FOR LOSS OF ONE FUEL CELL/MAIN DC BUS.