

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2170 -1 REV:04/27/88

ASSEMBLY : D & C PANEL C3A1		CRIT. FUNC:	1R
P/N RI : MC451-0018-0300		CRIT. HDW:	2
P/N VENDOR:	VEHICLE	102	103 104
QUANTITY : 6	EFFECTIVITY:	X	X X
: SIX	PHASE(S):	PL	LO X OO DO LS

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <u>J BROWN</u>	DES <u>A Brown</u>	EPDC SSM <u>Low level primary power supply</u>
REL <u>F DEFENSOR</u>	REL <u>J Kamata 6/27/88</u>	MPS SSM <u>...</u>
QE <u>DWM D MASAI</u>	QE <u>S.A. Brown 6/27/88</u>	EPDC REL <u>...</u>
		MPS REL <u>...</u>
		QE <u>Jason M. ...</u>

ITEM:

FUSE (3 AMP), MAIN ENGINE SHUTDOWN CIRCUIT.

FUNCTION:

PROVIDES CONTROL BUS PROTECTION IN THE EVENT OF SSME LIMIT SHUTDOWN CONTROL CIRCUIT FAULTS. 35V73A3A1F8, 9, 10, 11, 12, 13.

FAILURE MODE:

FAILS OPEN, FAILS TO CONDUCT.

CAUSE(S):

STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS.

EFFECT(S) ON:

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

(A) LOSS OF ONE OF TWO COMMANDS (A OR B) TO SWITCH REDUNDANCY MANAGEMENT (RM).

(B) LOSS OF MANUAL SHUTDOWN AND SAFING COMMAND CAPABILITY.

(C,D) NO EFFECT - FIRST FAILURE.

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- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE. TIME FRAME - ASCENT.
1) FUSE FAILS OPEN, RESULTING IN LOSS OF MANUAL SHUTDOWN AND SAFING COMMAND CAPABILITY.
2) ASSOCIATED SSME EXPERIENCES UNCONTAINED SHUTDOWN, INCLUDING DAMAGE WHICH CAUSES LOSS OF DATA PATH.

FOR ENGINE-OUT FAILURE INCLUDING LOSS OF DATA PATH, CREW USES SHUTDOWN PUSHBUTTON SWITCH TO INITIATE PREVALVE CLOSURE SEQUENCE WHICH ISOLATES PROPELLANT SUPPLY. FIRST FAILURE RESULTS IN LOSS OF THIS CAPABILITY. SECOND FAILURE THEN RESULTS IN PROPELLANT LEAKAGE INTO THE AFT COMPARTMENT, OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF CRITICAL ADJACENT FUNCTIONS DUE TO CRYOGENIC EXPOSURE. POSSIBLE LOSS OF CREW/VEHICLE.

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE

REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN TYPE.

(B) GROUND TURNAROUND TEST

SSME SHUTDOWN SWITCH VERIFICATION V41AFC.270 EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

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