

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2165 -1 REV:04/26/88

ASSEMBLY : D & C PANEL C3 CRIT. FUNC: 1R
 P/N RI : ME452-0102-7306 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 1 EFFECTIVITY: X X X
 : ONE PHASE(S): PL LO X OO DO LS
 :

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <u>JNB J BROWN</u>	DES <u>R. Brown</u>	EPDC SSM <u>Available during for a 1st try 6/27/88</u>
REL <u>JF DEFENSOR</u>	REL <u>J. Kamm 6/27/88</u>	MPS SSM <u>6/27/88</u>
QE <u>DM D MASAI</u>	QE <u>Joe Roman 6/27/88</u>	EPDC RED <u>6/27/88</u>
		MPS RED <u>6/27/88</u>
		QE <u>Joe Roman 6/27/88</u>

ITEM:

SWITCH, TOGGLE (THREE POLES, THREE POSITIONS), MAIN ENGINE LIMIT SHUTDOWN CIRCUIT.

FUNCTION:

PROVIDES MANUAL CONTROL OF MAIN ENGINE LIMIT SHUTDOWN CIRCUIT BY SELECTING ENABLE, AUTO, OR INHIBIT COMMANDS TO MDMs.
 35V73A3A1S11.

FAILURE MODE:

CONTACT-TO-CONTACT SHORT (2 OR 3 "INHIBIT" POLES).

CAUSE(S):

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

EFFECT(S) ON:

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

(A) INADVERTENT MANUAL "INHIBIT" COMMAND TO MAIN ENGINE LIMIT SHUTDOWN CIRCUIT.

(B) LOSS OF SSME REDLINE PROTECTION.

(C,D) NO EFFECT - FIRST FAILURE.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2165 -1 REV:04/26/88

- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE. TIME FRAME - ASCENT.
1) SWITCH FAILS CLOSED ("INHIBIT" POSITION). SSMEs WILL NOT SHUT DOWN IF REDLINE IS EXCEEDED.
2) SSME EXCEEDS REDLINE.

FAILURES WILL RESULT IN UNCONTAINED ENGINE DAMAGE. POSSIBLE LOSS OF CREW/VEHICLE. MAIN ENGINE CONTROLLER HAS ACCESS TO NUMEROUS ENGINE OPERATING PARAMETERS AND HAS BEEN PROGRAMMED TO SENSE MAIN ENGINE OPERATING LIMITS WHICH WILL AUTOMATICALLY SHUT DOWN AFFECTED ENGINE IF LIMITS ARE EXCEEDED AND REDLINE SHUTDOWN CAPABILITY IS ENABLED. REDLINES ARE SET TO ADEQUATELY PROTECT ENGINE BY COMMANDING SSME SHUTDOWN IF AN OUT-OF-LIMITS CONDITION OCCURS.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE

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

(B) GROUND TURNAROUND TEST

SSME LIMIT SHUTDOWN SW VERIF V41AFO.280 EVERY FLIGHT.

(E) OPERATIONAL USE

MCC WILL MONITOR ENGINE REDLINE PARAMETERS AND ADVISE THE CREW TO MANUALLY SHUT DOWN AN ENGINE WITH REDLINE VIOLATIONS.

05-6J-274