

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2251 -2 REV: 11/04/87

ASSEMBLY : AFT PCA-2 CRIT. FUNC: 1R
 P/N RI : JANTX1N1204RA CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 2 EFFECTIVITY: X X X
 : TWO PHASE(S): PL X LO X OO DO LS
 : 1 PER LH2/LO2 FEED DISCONNECT VALVE

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

PREPARED BY:	DES	J BROWN	APPROVED BY:	DES	<i>[Signature]</i>	APPROVED BY (NASA):	EPDC SSM	<i>[Signature]</i>
REL	F DEFENSOR	REL	<i>[Signature]</i>	12/4/87	EPDC REL	<i>[Signature]</i>	<i>[Signature]</i>	
QE	D MASAI	QE	<i>[Signature]</i>	11/9/87	MPS REL	<i>[Signature]</i>	<i>[Signature]</i>	

ITEM:
 DIODE, CROSSOVER (12 AMP), LH2/LO2 17-INCH FEEDLINE DISCONNECT VALVE,
 CLOSE SOLENOID POWER.

FUNCTION:
 PREVENTS INADVERTENT MDM COMMAND OR PREMATURE HDC-I OUTPUT FROM ACTUATING
 CLOSE SOLENOID PREMATURELY. DIODE ISOLATES REDUNDANT POWER BUSES WHICH
 ENERGIZE THE CLOSE SOLENOID FOR THE LH2/LO2 TANK FEED DISCONNECT VALVE.
 ISOLATES REDUNDANT POWER BETWEEN RPC OUTPUTS. 55V76A132A2CR13, A3CR5.

FAILURE MODE:
 SHORT, INTERNAL SHORTS, CURRENT LEAKAGE

CAUSE(S):
 PIECE PART MECHANICAL FAILURE, CONTAMINATION, MECHANICAL SHOCK,
 VIBRATION, THERMAL STRESS.

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

(A) DEGRADATION OF REDUNDANCY AGAINST INADVERTENT CLOSING OF FEED
 DISCONNECT VALVE.

(B,C,D) NO EFFECT - FIRST FAILURE.

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(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - PREMATURE CLOSE-COMMAND B OR HDC-I OUTPUT PREMATURELY ACTUATING CLOSE SOLENOID. THIRD FAILURE - PREMATURE DEACTUATION OF OPEN SOLENOID) RESULTING IN PREMATURE DISCONNECT VALVE CLOSURE WHILE ENGINES ARE RUNNING. SURGE PRESSURE FROM VALVE CLOSURE MAY CAUSE DAMAGE OR RUPTURE TO THE MPS AND/OR ET SYSTEM, DEPENDING ON THE RATE OF CLOSURE. SHUTDOWN OF ALL THREE SSMEs SIMULTANEOUSLY. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE. NOTE - LATCH IS NOT DESIGNED OR CERTIFIED TO HOLD PNEUMATICALLY-CLOSED FLAPPER UNDER FLOW CONDITIONS, THEREFORE, NOT CONSIDERED A VALID SUCCESS PATH FOR THIS SCENARIO.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX F, ITEM NO. 2 - DIODE, POWER-STUD MOUNTED.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V41ABO.150I, 160I EVERY FLIGHT

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

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