SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2244 -1 REV:11/04/87

ASSEMBLY :AFT LCA-2, 3 CRIT. FUNC: 1R
P/N RI :MC477-0263-0002 CRIT. HDW: 3
P/N VENDOR: VEHICLE 102 103 104
QUANTITY :4 EFFECTIVITY: X X X
:FOUR PHASE(S): PL X LO X OO DO LS
:2 PER LH2/LO2 FEED DISCONNECT VALVE

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

PREPARED BY:		APPROVED BY:		APPROVED BY (NASA):	
DES	J BROWN	DES		EPDC SSM	
				MPS SSM	
REL	F DEFENSOR	REL	12-5-87	EPDC REL	
				MPS REL	
QE	D MASAI	QE		QE	

ITEM:
CONTROLLER, HYBRID DRIVER (HDC), TYPE III, LH2/LO2 17-INCH FEEDLINE DISCONNECT VALVE OPEN SOLENOID POWER

FUNCTION:
CONDUCTS POWER TO THE OPEN SOLENOID IN EACH REDUNDANT CIRCUIT FOR THE LH2/LO2 TANK FEED DISCONNECT VALVE. THE HDC IS IN SERIES WITH A RPC AND DIODE IN EACH CIRCUIT. 56V76A123AR-J3(69), (71); 55V76A122AR-J3(69), (71).

FAILURE MODE:
LOSS OF OUTPUT, FAILS OPEN, FAILS TO CONDUCT.

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

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

(A) LOSS OF ONE OF TWO POWER PATHS FOR FEED DISCONNECT VALVE OPEN SOLENOID.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF SECOND POWER PATH TO OPEN SOLENOID, BISTABLE FEATURE MAINTAINS DISCONNECT VALVE IN OPEN POSITION. THIRD FAILURE - PREMATURE ACTUATION OF CLOSE 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 REDUNDANT POWER PATH MASKS 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 B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER.

(B) GROUND TURNAROUND TEST
COMPLETE ELECTRICAL VERIFICATION, V41ABC.150C, E; 160C, E EVERY FLIGHT.

(E) OPERATIONAL USE
NO CREW ACTION CAN BE TAKEN.