SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2039 -2 REV:04/25/88

ASSEMBLY :MID PCA-3
P/N RI :JANTX1N1204RA
P/N VENDOR:
QUANTITY :2
:TWO
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

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

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

PREPARED BY:
DES J BROWN
REL F DEFENSOR
QE D MASAI

APPROVED BY:
DES
REL Melvin Clifton 5-6-88
QE G.S. Conners 5-6-88

APPROVED BY (NASA):
EPDC SSM
MPS SSM
EPDC REL
MPS REL
QE

ITEM:
DIODE, BLOCKING (12 AMP), LO2/LH2 RELIEF SHUTOFF VALVE (PV7/8), RPC C OUTPUT.

FUNCTION:
ISOLATES REDUNDANT MAIN BUS A FROM MAIN BUS C POWER TO CLOSE SOLENOID. LOCATED AT MAIN BUS C RPC OUTPUT AHEAD OF CLOSE COMMAND C HDC. 40V76A27A4CR1, A4CR3.

FAILURE MODE:
SHORT (END-TO-END).

CAUSE(S):
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

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

(A) LOSS OF MAIN BUS ISOLATION. DEGRADATION OF REDUNDANCY AGAINST INADVERTENT DEACTUATION OF CLOSE SOLENOID.

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

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(E) 1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE.
TIME FRAME - PRELAUNCH AND ASCENT.
1) DIODE SHORTS.
2) FAILURE OF MAIN BUS TO SERIES RPC TRIPS PARALLEL RPC, CAUSING LO2/LH2 RELIEF SHUTOFF VALVE (FV7/8) TO OPEN. FEEDLINE RELIEF VALVE (RV5/6) WILL PREVENT OVERBOARD LEAKAGE OF LO2/LH2 (RELIEF VALVE CRACK PRESSURE IS ABOVE NOMINAL SYSTEM OPERATING PRESSURE).
3) RELIEF VALVE (RV5/6) FAILS TO REMAIN CLOSED.

LO2/LH2 WILL DUMP OVERBOARD RESULTING IN LOSS OF PROPELLANT AND POSSIBLE PREMATURE ENGINE SHUTDOWN. FIRE/EXPLOSION HAZARD EXTERIOR TO THE VEHICLE. POSSIBLE VIOLATION OF ET MINIMUM STRUCTURAL REQUIREMENTS DUE TO REDUCED ULLAGE PRESSURE. 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) DISPOSITION AND RATIONALE:
REFER TO APPENDIX F, ITEM NO. 2 - DIODE, STUD-MOUNT.

(B) GROUND TURNAROUND TEST
COMPLETE ELECTRICAL VERIFIGATION V41ABO.070 I, V41ABO.080 I EVERY FLIGHT.

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

GROUND: OMI S1003/S1004 (LO2/LH2 SYSTEM) SEQUENCE TITLED "EMERGENCY PROCEDURE FOR MAJOR LEAK OR FIRE . . . " CONTAINS SAFING SEQUENCE OF EVENTS FOR MAJOR LEAKS IN THE PROPELLANT SYSTEMS.