

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6KA-2252 -3 REV:11/03/87

ASSEMBLY :AFT PCA 1,2,3 CRIT. FUNC: 1R  
 P/N RI :JANTX1N1204RA CRIT. HDW: 3  
 F/N VENDOR:  
 QUANTITY :8 VEHICLE 102 103 104  
 EFFECTIVITY: X X X  
 PHASE(S): PL LO X OO X LO X LS

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
 DES D SOVEREIGN DES *D.S. R. Burns* SSM  
 REL J BEEKMAN REL *John C. ... 11-14-87* REL *...*  
 QE QE *...* QE R *...*

ITEM:

ISOLATION DIODE (12 AMP) - LEFT AND RIGHT AFT RCS HELIUM ISOLATION VALVE A AND B SOLENOID POWER CIRCUIT.

FUNCTION:

PROVIDES ISOLATION BETWEEN TWO POWER INPUT CIRCUITS TO THE "OPEN" SOLENOID COIL OF HELIUM ISOLATION VALVES A AND B FOR THE LEFT AND RIGHT AFT RCS PRESSURIZATION SYSTEMS.

- OV-102 - 54V76A131A2CR5,6. 54V76A131A3CR4,5.
- 55V76A132A3CR22,23. 56V76A133A2CR15,16.
- OV-103 & SUBS - 54V76A131A2CR14,15. 54V76A131A3CR4,3.
- 55V76A132A2CR22,A3CR23. 56V76A133CR15,16.

FAILURE MODE:

SHORT TO GROUND

CAUSE(S):

CONTAMINATION, VIBRATION (MOUNTING SURFACE)

EFFECT(S) ON:

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

(A) LOSS OF REDUNDANCY - THE UPSTREAM SIDE OF ONE OF TWO DIODES FEEDING A COMMON POINT IS GROUNDED AND LOST AS A VOLTAGE SOURCE. ALSO THE ASSOCIATED REMOTE POWER CONTROLLER WILL TRIP OFF WITH A DEAD SHORT TO GROUND.

(B) LOSS OF INTERFACE REDUNDANCY - ONE OF TWO MEANS OF POWERING THE OPENING SOLENOID COIL OF THE AFFECTED ISOLATION VALVE IS LOST.

(C,D) NO EFFECT.

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(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO LACK OF PRESSURIZATION TO PERFORM NOMINAL ENTRY. TWO OTHER FAILURES (SAME DIODE INTERNAL SHORT, "B" LEG REGULATOR CLOSES) ARE REQUIRED BEFORE TANK PRESSURIZATION FUNCTION IS LOST AND A NOMINAL ENTRY CANNOT BE PERFORMED. FAILURE IS NOT DETECTABLE IN-FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

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 - STUD MOUNTED POWER DIODE.

(B) GROUND TURNAROUND TEST

COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND. THE TESTING CONSISTS OF CYCLING VALVE MANUAL SWITCHES AND/OR SENDING GENERAL PURPOSE COMPUTER (GPC) COMMANDS TO CYCLE VALVES OR HEATERS WHILE MONITORING VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. IF VALVE FAILS TO OPEN, USE REDUNDANT FLOW PATH.