

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS

FMEA NO 05-6KA-2255F -1

REV:11/03/87

ASSEMBLY :AFT MCA 1,2,3

CRIT. FUNC: 1R

P/N RI :JANTXVIN4246

CRIT. HDW: 3

P/N VENDOR:

VEHICLE 102 103 104

QUANTITY :8

EFFECTIVITY: X X X

:EIGHT

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

PREPARED BY:

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

DES D SOVEREIGN

APPROVED BY:

APPROVED BY (NASA)

REL

J BEERMAN

DES

SSM

QE

REL

REL

QE

QE

ITEM:

BLOCKING DIODE - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER MANIFOLDS
1,2,3,4 ISOLATION VALVE CONTROL CIRCUIT (MANUAL CLOSE/OPEN INHIBIT).

FUNCTION:

PROVIDES BLOCKING BETWEEN DUAL STIMULI (FROM MANUAL SWITCH "CLOSE" CIRCUIT AND "OPEN" LIMIT SWITCHES) TO HYBRID RELAY INHIBIT LOGIC INPUTS FOR THE CONTROL OF 3 PHASE AC VOLTAGE TO THE FUEL AND OXIDIZER MANIFOLDS 1,2,3,4 ISOLATION VALVE CONTROL CIRCUITS.

OV-102 - 54V76A114A2CR14,69. 55V76A115A2CR59,65,69.

56V76A116A2CR19,30,42,43.

OV-103 & SUBS - 54V76A114A2CR14,29. 55V76A115A2CR25,28.

56V76A116A2CR12,28. 56V76A116A3CR22,37.

FAILURE MODE:

OPEN, FAILS TO CONDUCT, HIGH RESISTANCE

CAUSE(S):

THERMAL STRESS, MECHANICAL SHOCK, VIBRATION

EFFECT(S) ON:

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

(A) LOSS OR DEGRADATION OF ABILITY TO ENERGIZE THE AFFECTED VALVE DRIVE "OPEN" INHIBIT LOGIC CIRCUITRY WHEN THE MANUAL SWITCH IS IN THE "CLOSE" POSITION.

(B) NO EFFECT SINCE NO "OPEN" COMMAND IS PRESENT.

(C,D) NO EFFECT.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2255F -1

REV:11/03/87

(E) FUNCTIONAL CRITICALITY EFFECT - VALVE WILL CHATTER OFF THE CLOSE STOP. POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS MOTOR OPERATION IN CONJUNCTION WITH A BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES THREE OTHER FAILURES (SYSTEM LEAK - REASON TO CLOSE VALVE, MANUAL OPEN/CLOSE INHIBIT DIODE OPENS, BELLOWS LEAK) BEFORE THE EFFECT IS MANIFESTED. A BELLOWS LEAK IS UNDETECTABLE EXCEPT BY PERFORMING A SNIFF CHECK OF THE VALVE'S ACTUATOR ON THE GROUND.

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. 3 - 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 CONTINUOUS POWER SITUATION EXISTS, REMOVE POWER FROM RELAY BY PLACING MANUAL SWITCH IN GPC POSITION.