SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6KA-2254F -2 REV:11/03/87

ASSEMBLY :AFT MCA 1,2
P/N RI :JANTXV1N4246
P/N VENDOR:
QUANTITY :8
:EIGHT
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

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

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

PREPARED BY:
DES D SOVEREIGN
REL J BEEKMAN
QE

APPROVED BY:
DES
REL 11-14-87
QE

APPROVED BY (NASA):
SSM
REL
QE

ITEM:
BLOCKING DIODE (1 AMP) - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER TANK ISOLATION VALVES 3/4/5 A AND B CONTROL CIRCUITS (MANUAL CLOSE/OPEN INHIBIT).

FUNCTION:
PROVIDES BLOCKING BETWEEN DUAL STIMULI (FROM GENERAL PURPOSE COMPUTER (GPC) CLOSE AND MANUAL SWITCH CLOSE) TO HYBRID RELAY INHIBIT LOGIC INPUTS FOR THE CONTROL OF 3 PHASE AC VOLTAGE TO THE FUEL AND OXIDIZER TANK ISOLATION VALVES 3/4/5 A AND B DRIVE MOTORS.
OV-102 - 54V76A114A2CR9,10,36,37. 55V76A115A1CR19,20,51,54.
OV-103 & SUBS - 54V76A114A1CR123,124. 54V76A114A2CR22,23.
55V76A115A1CR84,87. 55V76A115A2CR16,17.

FAILURE MODE:
SHORT, INTERNAL SHORT, LOW BACK RESISTANCE

CAUSE(S):
CONTAMINATION, THERMAL STRESS

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

(A) LOSS OR DEGRADATION OF STIMULI ISOLATION CAPABILITY.

(B) LOSS OF ISOLATION BETWEEN THE VALVE "OPEN" LIMIT SWITCH CIRCUIT AND MANUAL SWITCH "CLOSE" COMMAND CIRCUIT - NO EFFECT, SINCE "CLOSE" RELAY IS INHIBITED WHEN THE MANUAL SWITCH IS IN THE "OPEN" POSITION.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - VALVE WILL CHATTER OFF THE OPEN STOP. POSSIBLE LOSS OF CREW/VEHICLE DUE TO CONTINUOUS MOTOR OPERATION IN CONJUNCTION WITH A POSSIBLE BELLOWS LEAK LEADING TO VALVE RUPTURE AND PROPELLANT RELEASE. REQUIRES 2 OTHER FAILURES (DIODE OPEN, 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.