SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6KA-2254A -1 REV:11/03/87

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

ABORT, RTLS,TAL

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

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

CRIT. FUNC: 2R
CRIT. HDW: 3

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

PREPARED BY:
DES D SOVEREIGN
REL J BEEKMAN
QE

APPROVED BY:
DES
REL
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 (GPC CLOSE).

FUNCTION:
PROVIDES BLOCKING BETWEEN DUAL STIMULI (FROM GENERAL PURPOSE COMPUTER (GPC) CLOSE AND MANUAL SWITCH CLOSE) TO HYBRID RELAY 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. UNIQUE TO INTACT ABORT.
OV-102 - 54V76A114A2CR18,19,51,52. 55V76A115A1CR10,11,40,41.
OV-103 & SUBS - 54V76A114A1CR106,107. 54V76A114A2CR1,2. 55V76A115A1CR99,100. 55V76A115A2CR1,2.

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 CIRCUIT THROUGH GENERAL PURPOSE COMPUTER (GPC).

(B) THE AFFECTED LOGIC INPUT (GPC) CANNOT COMMAND THE FUNCTION, HOWEVER A REDUNDANT COMMAND CAN BE INITIATED FROM A CREW OPERATED MANUAL SWITCH THROUGH A SEPARATE DIODE PROTECTED CIRCUIT.

(C) NO EFFECT

(D) NO EFFECT FOR NOMINAL MISSION - CRITICALITY INCREASED TO 1/1 DURING RTLS AND TAL ABORT. GPC COMMAND UTILIZED BY MCA OPTIMIZATION SOFTWARE IN "LANDING HEAVY" CONDITION. WILL ALSO RESULT IN CONTROL PROBLEMS DURING ENTRY. RESULTS IN LOSS OF 12 AFT RCS THRUSTERS BEING USED DURING THE OMS DUMP.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE MISSION LOSS DUE TO INABILITY TO PERFORM OMS TO RCS INTERCONNECT IF MANUAL CAPABILITY IS LOST. REQUIRES 1 OTHER FAILURE (MANUAL SWITCH CAPABILITY LOSS) BEFORE EFFECT IS MANIFESTED.

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
USE MANUAL SWITCH CAPABILITY.