SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2707 -1 REV:05/03/88

ASSEMBLY :PANEL MA73C
P/N RI :RWR80S1211FR
P/N VENDOR:
QUANTITY :3
:THREE
:

CRIT.FUNC: 1R
CRIT. HDW: 2

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

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

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

PREPARED BY:
DES R PHILLIPS
REL M HOVE
QE J COURSEN

APPROVED BY:
DES
REL
QE

APPROVED BY (NASA):
SSM
REL
QE

ITEM:
RESISTOR, CURRENT LIMIT, WIRE WOUND, 1.2K OHM - FORWARD MCA 1, 2 AND 3 DC BUS A, B AND C CONTROL CIRCUIT

FUNCTION:
PROVIDES CURRENT LIMITING/CIRCUIT PROTECTION FOR THE CONTROL CIRCUITS FOR DC BUSES A, B AND C RELAY LOGIC POWER INPUTS TO FORWARD MOTOR CONTROL ASSEMBLIES 1, 2 AND 3 FOR CONTROL OF REACTION CONTROL SYSTEM ISOLATION MOTOR VALVES AND VENT DOOR, AIR DATA PROBE DEPLOY AND STAR TRACKER DOOR MOTORS, ATMOSPHERIC REVITALIZATION SYSTEM H2O LOOP 1 PUMPS A AND B AND GSE CONTROL OF AVIONICS BAY FANS. 85V73A129A1R1, A2R1, A4R1

FAILURE MODE:
OPEN

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

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

(A) LOSS OF MAIN DC BUS RELAY LOGIC POWER INPUT TO THE ASSOCIATED FORWARD MOTOR CONTROL ASSEMBLY.

(B) LOSS OF INTERFACE REDUNDANCY. NO EFFECT FOR FIRST FAILURE. FOR THE FORWARD RCS, CAPABILITY TO OPERATE THE ISOLATION VALVES CONTROLLED BY THE ASSOCIATED FORWARD MOTOR CONTROL ASSEMBLY IS LOST; HOWEVER, REDUNDANT VALVES ARE PROVIDED FOR REQUIRED ISOLATION FUNCTIONS. FOR VENT DOOR, AIR DATA PROBE AND STAR TRACKER FUNCTIONS, THE REDUNDANT MOTOR CONTROLLED THROUGH A DIFFERENT RESISTOR COMPLETES THE FUNCTION.

(C,D) FIRST FAILURE - NO EFFECT.

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2707 -1 REV:05/03/88

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE VIA THE FOLLOWING SCENARIO:

(1) LEAK IN FORWARD RCS MANIFOLD 2 DURING EARLY ASCENT PHASE NECESSITATING CLOSURE OF ALL FORWARD RCS TANK AND MANIFOLD ISOLATION VALVES TO ISOLATE LEAK.
(2) FAILURE OF RESISTOR A1R1 OR A4R1 TO CONDUCT RESULTING IN LOSS OF ALL FORWARD RCS FOR SAFE ET/ORB SEPARATION.

ALSO, POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (LOSS OF REDUNDANT MOTOR OR POWER/CONTROL CIRCUIT) DUE TO INABILITY TO OPEN VENT DOOR DURING DESCENT (RESULTS IN VEHICLE STRUCTURAL DAMAGE DUE TO PRESSURE DIFFERENTIALS). LEFT AND RIGHT VENT DOORS ARE NOT CONSIDERED TO BE REDUNDANT TO EACH OTHER. "B" SCREEN PASSES SINCE THE FAILURE CAN BE DETECTED BY CREW MONITORING STAR TRACKER DOOR OPERATION TIMES OR BY LOSS OF MCA OPERATIONAL STATUS MEASUREMENTS AVAILABLE TO GROUND PERSONNEL.

DISPOSITION & RATIONALE:
(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

A,B,C,D) DISPOSITION AND RATIONALE
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR, WIRE WOUND.

B) GROUND TURNAROUND TEST
VERIFY MCA OPERATIONAL STATUS INDICATORS ARE "ON" (ALL MOTOR CONTROL RELAYS RESET) DURING NO OPERATION OF THE AC MOTOR MECHANISMS. TEST IS PERFORMED FOR ALL FLIGHTS.

E) OPERATIONAL USE
FOR LOSS OF REDUNDANT VENT DOOR OPEN CAPABILITY, OPEN VENT DOORS PRIOR TO ENTRY.