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PRINT DATE: 02/24/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
NUMBER: 05-6-2801 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL

REVISION: 1 02/06/95

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: AFT PCA 4, 5, 6	V070-765280
SRU	CONTROLLER, REMOTE POWER	MC450-0017-1050
SRU	CONTROLLER, REMOTE POWER	MC450-0017-2050
SRU	CONTROLLER, REMOTE POWER	MC450-0017-3050
SRU	CONTROLLER, REMOTE POWER	MC450-0017-4050

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

CONTROLLER, REMOTE POWER, 5 AMP - AFT MCA 1, 2, AND 3 DC BUS A, B AND C
POWER CONTROL

REFERENCE DESIGNATORS: 54V76A134RPC24
55V76A135RPC24
56V76A136RPC24

QUANTITY OF LIKE ITEMS: 3
THREE

FUNCTION:

FOLLOWING A CREW INITIATED COMMAND, EACH REMOTE POWER CONTROLLER (RPC) CONDUCTS ASSOCIATED DC BUS A, B OR C POWER TO THE RELATED AFT MOTOR CONTROL ASSEMBLY 1, 2 AND 3 FOR VENT DOOR AND EXTERNAL TANK UMBILICAL DOOR MOTORS. THE RPC DESIGN INCORPORATES OVERCURRENT TRIP PROTECTION PLUS TIMED CURRENT LIMITING FOR TRANSIENT CONDITIONS. REMOTE RESET IS ACCOMPLISHED THROUGH CONTROL SIGNAL REMOVAL AND REAPPLICATION

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
NUMBER: 05-6-2801 -X

- APPROVALS -

PRODUCT ASSURANCE MGR : K L PRESTON
 PRODUCT ASSURANCE ENGR : N. HAFEZIZADEH
 DESIGN ENGINEERING : R. L. PHAN
 NASA EPD&C SUBSYS MGR :
 NASA SUBSYS MGR :
 NASA EPD&C SSMA :
 NASA SSMA :

KL Preston 4/2/95
 N. Hafezizadeh
 R. L. Phan
 R. L. Phan for F. ALKOUS 3/14/96
 R. L. Phan
 J. M. Boudry 3-17-96
 W/S

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2801 -1 REV:05/03/88

ASSEMBLY :AFT PCA 4,5,6 CRIT.FUNC: 1R
P/N RI :MC450-0017-1050 CRIT. HDW: 2
P/N VENDOR: VEHICLE 102 103 104
EFFECTIVITY: X X X
QUANTITY :3 PHASE(S): PL ° LO X OO X DO X LS
:THREE
:

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
PREPARED BY: APPROVED BY: APPROVED BY (NASA):
DES R PHILLIPS DES R. B. Burns SSM A.C. Starn 5/12/88
REL M HOVE REL Michael J. Han 5-6-88 REL Donna L. ... 5/14/88
QE J COURSEN QE R. Courson 5/6/88 QE [Signature]

ITEM:
CONTROLLER, REMOTE POWER, 5 AMP - APT MCA 1, 2 AND 3 DC BUS A, B AND C POWER CONTROL.

FUNCTION:
FOLLOWING A CREW INITIATED COMMAND, EACH REMOTE POWER CONTROLLER (RPC) CONDUCTS ASSOCIATED DC BUS A, B OR C POWER TO THE RELATED APT MOTOR CONTROL ASSEMBLY 1, 2 AND 3 FOR VENT DOOR AND EXTERNAL TANK UMBILICAL DOOR MOTORS. THE RPC DESIGN INCORPORATES OVERCURRENT TRIP PROTECTION PLUS TIMED CURRENT LIMITING FOR TRANSIENT CONDITIONS. REMOTE RESET IS ACCOMPLISHED THROUGH CONTROL SIGNAL REMOVAL AND REAPPLICATION.
54V76A134RPC24, 55V76A135RPC24, 56V76A136RPC24

FAILURE MODE:
LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON"

CAUSE(S):
PIECE PART FAILURE, CONTAMINATION, MECHANICAL SHOCK, THERMAL STRESS, VIBRATION, 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 APT MOTOR CONTROL ASSEMBLY.
(B) LOSS OF INTERFACE REDUNDANCY. NO EFFECT FOR FIRST FAILURE - RESULTS IN LOSS OF ONE OF TWO MOTORS FOR ET UMBILICAL DOOR CLOSE AND LATCH OR VENT DOOR FUNCTIONS.
(C,D) FIRST FAILURE - NO EFFECT.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2801 -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 (LOSS OF
REDUNDANT MOTOR OR POWER/CONTROL CIRCUIT) DUE TO LOSS OF EXTERNAL TANK
UMBILICAL DOOR CLOSE/LATCH CAPABILITY (RESULTS IN EXCESSIVE
AERODYNAMIC HEATING DURING ENTRY) OR LOSS OF VENT DOOR OPEN CAPABILITY
(RESULTS IN VEHICLE STRUCTURAL DAMAGE DUE TO PRESSURE DIFFERENTIALS
DURING DESCENT). 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 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 B, ITEM NO. 2 - REMOTE POWER CONTROLLER

B) GROUND TURNAROUND TEST

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

E) OPERATIONAL USE

FOR LOSS OF REDUNDANT VENT DOOR OPEN CAPABILITY, OPEN VENT DOORS PRIOR
TO ENTRY.