 PRINT DATE: 02/24/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL HARDWARE
NUMBER: 05-6-2804 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 1 02/06/95

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	.	MID PCA 1	V070-764400
LRU	.	MID PCA 2	V070-764430
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 - MID MCA 3 AND 2 DC BUS A AND C POWER CONTROL

REFERENCE DESIGNATORS: 40V76A27RPC10
40V76A25RPC12

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
FOLLOWING A CREW INITIATED COMMAND, EACH REMOTE POWER CONTROLLER (RPC) CONDUCTS DC BUS A OR C POWER TO MIDBODY MOTOR CONTROL ASSEMBLY #3 AND #2 FOR VENT DOOR, PAYLOAD BAY DOOR LATCH, RADIATOR DEPLOY/LATCH, REMOTE MANIPULATOR LATCH AND KU-BAND ANTENNA STOW/DEPLOY 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: 05-6-2804 -X

- APPROVALS -

PRODUCT ASSURANCE MGR	: K. L. PRESTON	K. L. Preston 4/4/95
PRODUCT ASSURANCE ENGR	: N. HAFEZIZADEH	N Hafez
DESIGN ENGINEERING	: R. L. PHAN	R Phan
NASA EPD&C SUBSYS MGR	:	for F. ALLOUIS 3/4/95
NASA SUBSYS MGR	:	N/A
NASA EPD&C SSMA	:	[illegible] 3-10-95
NASA SSMA	:	N/A

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2804 -1 REV:05/03/88

ASSEMBLY :MID PCA 1,2 CRIT.FUNC: 1R
P/N RI :MC450-0017-1050 CRIT. HDW: 2
P/N VENDOR:
QUANTITY :2
:TWO
:

VEHICLE EFFECTIVITY:	102	103	104
PHASE(S): PL LO X OO X DO X LS	X	X	X

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

PREPARED BY:			APPROVED BY:	APPROVED BY (NASA):
DES	R	PHILLIPS	DES for R. Bourne	SSM W. C. Stacy 5/6/88
REL	M	HOVE	REL Howard Clayton 5-6-88	REL DD [illegible] 5/6/88
QE	J	COURSEN	QE J. J. Coursen 5/6/88	QE [illegible]

ITEM:
CONTROLLER, REMOTE POWER, 5 AMP - MID MCA 3 AND 2 DC BUS A AND C POWER CONTROL

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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 ONE OF TWO MAIN DC BUS RELAY LOGIC POWER INPUTS TO THE ASSOCIATED MID MOTOR CONTROL ASSEMBLY.

(B) LOSS OF INTERFACE REDUNDANCY. NO EFFECT FOR FIRST FAILURE - THE REDUNDANT MOTOR CONTROLLED BY A DIFFERENT RPC COMPLETES THE FUNCTION.

(C) POSSIBLE EARLY MISSION TERMINATION DUE TO LOSS OF REDUNDANCY FOR LATCHING PAYLOAD BAY DOOR CENTERLINE LATCHES.

(D) FIRST FAILURE - NO EFFECT.

UBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2804 -1 REV:05/03/88

FFECT(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 INABILITY TO LATCH PAYLOAD BAY DOORS (RESULTING IN AERODYNAMIC STRUCTURAL DAMAGE DURING ENTRY) AND/OR TO OPEN VENT DOORS DURING DESCENT (DOOR FAILED CLOSED 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 MECHANISM OPERATION TIMES OR BY LOSS OF MCA OPERATIONAL STATUS MEASUREMENTS AVAILABLE TO GROUND PERSONNEL.

ISPOSITION & 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. TEST IS PERFORMED FOR ALL FLIGHTS.

E) OPERATIONAL USE
CONSIDERATION WILL BE GIVEN TO STOWING MECHANISMS WITH THE LOSS OF REDUNDANCY. LOSS OF REDUNDANCY FOR CLOSING CENTERLINE PLED LATCHES INVOKES A MINIMUM DURATION FLIGHT. FOR LOSS OF REDUNDANT VENT DOOR OPEN CAPABILITY, OPEN VENT DOORS PRIOR TO ENTRY.