FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: 05-6-2802 -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 RCS/OMS DC BUSES AB, BC AND CA INPUT POWER CONTROL

REFERENCE DESIGNATORS: 54V76A134RPC23
55V76A135RPC23
56V76A136RPC23

QUANTITY OF LIKE ITEMS: 3
THREE

FUNCTION:
FOLLOWING A CREW INITIATED COMMAND, EACH REMOTE POWER CONTROLLER (RPC) CONDUCTS THE ASSOCIATED MAIN DC BUS A, B OR C POWER TO THE RELATED AFT MCA 1, 2 OR 3 RCS/OMS SUB-BUS AB, BC OR CA FOR CONTROL OF REACTION CONTROL SYSTEM/ORBITAL MANEUVERING SYSTEM (RCS/OMS) ISOLATION, CROSSFEED AND INTERCONNECT MOTOR VALVES. THE RPC DESIGN INCORPORATES OVERCURRENT TRIP PROTECTION PLUS TIMED CURRENT LIMITING FOR TRANSIENT CONDITIONS. REMOTE RESET IS ACCOMPLISHED THROUGH CONTROL SIGNAL REMOVAL AND REAPPLICATION.

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- APPROVALS -

PRODUCT ASSURANCE MGR	: K. L. PRESTON	: K.L. Preston 4/6/95
PRODUCT ASSURANCE ENGR	: N. HAFEZIZADEH	: N. Hafez
DESIGN ENGINEERING	: R. L. PHAN	: R Phan
NASA EPD&C SUBSYS MGR	:	: for F. ALVAREZ 3/14/96
NASA SUBSYS MGR	:	: N/A
NASA EPD&C SSMA	:	: 3-19-96
NASA SSMA	:	: N/A

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2802 -1 REV:05/03/88

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

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

PREPARED BY:			APPROVED BY:	APPROVED BY (NASA):
DES	R	PHILLIPS	DES	SSM
REL	M	HOVE	REL	REL
QE	J	COURSEN	QE	QE

ITEM:
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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 A REDUNDANT MAIN DC BUS POWER INPUT TO TWO ASSOCIATED AFT MOTOR CONTROL ASSEMBLY RCS/OMS SUB-BUSES.

(B) LOSS OF REDUNDANCY. NO EFFECT FOR FIRST FAILURE. RCS/OMS SUB-BUSES ARE POWERED FROM TWO SEPARATE SOURCES.

(C,D) FIRST FAILURE - NO EFFECT.

SUBSYSTEM:ELECT POWER DIST & CONT FMEA NO 05-6 -2802 -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 VIA THE FOLLOWING SCENARIO:

(1) LEAK IN AFT RCS MANIFOLD 3 OR 4 DURING EARLY ASCENT PHASE NECESSITATING CLOSURE OF ALL AFT RCS TANK AND MANIFOLD ISOLATION VALVES TO ISOLATE LEAK.
(2,3) FAILURE OF REDUNDANT RPC'S SUPPLYING RCS/OMS SUB-BUS CA RESULTING IN LOSS OF ABILITY TO REOPEN RCS PROPELLANT SUPPLY TO ANY AFT RCS PRIMARY MANIFOLD. RESULTS IN LOSS OF ALL AFT RCS JETS REQUIRED FOR SAFE ORB/ET SEPARATION.

FAILS "B" SCREEN BECAUSE NEITHER RCS/OMS SUB-BUSES NOR STATUS OF RPC'S SUPPLYING THEM ARE INSTRUMENTED.

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 AND "OFF" WHILE RCS/OMS VALVES ARE BEING CYCLED. TEST IS PERFORMED FOR ALL FLIGHTS.

(E) OPERATIONAL USE
NONE