FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: 05-6KF-2179 -X

SUBSYSTEM NAME: EPD&C - FORWARD REACTION CONTROL (03-2A)
REVISION: 1 02/06/95

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	FWD PCA 1	V070-763320
LRU	:	FWD PCA 2	V070-763340
LRU	:	FWD PCA 3	V070-763360
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-1150
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-2150
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-3150
SRU	:	CONTROLLER, REMOTE POWER	MC450-0017-4150

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
REMOTE POWER CONTROLLER (15 AMP) - FORWARD RCS REACTION JET DRIVER 1 AND 2 (MAN FOLD 1 THROUGH 5) DRIVER POWER CIRCUIT.

REFERENCE DESIGNATORS: 81V76A22RPC39
82V76A23RPC36
83V76A24RPC39
83V76A24RPC40

QUANTITY OF LIKE ITEMS: 4
FOUR

FUNCTION:
UPON RECEIVING A STIMULUS FROM THE ASSOCIATED CONTROL DRIVER, THE REMOTE POWER CONTROLLER (RPC) CONDUCTS AND ENERGIZES THE REACTION JET DRIVER FORWARD (RJDF) 1 AND 2 (MANIFOLD 1 THROUGH 5) RCS DRIVER POWER CIRCUIT.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL FAILURE MODE
NUMBER: 05-6KF-2179 -X

- APPROVALS -

PAE MANAGER	: K. L. PRESTON	K.L. Preston 4/2/95
PRODUCT ASSURANCE ENGR	: N. HAFEZIZADEH	
DESIGN ENGINEERING	: D. SOVEREIGN	D. Sovereign
NASA EPD&C SUBSYS MGR	:	for F. Alexis 3/16/95
NASA SUBSYS MGR	:	
NASA EPD&C SSMA	:	for 3-16-95
NASA SSMA	:	

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - FWD-RCS FMEA NO 05-6KF-2179 -2 REV:11/03/87

ASSEMBLY :FWD PCA 1,2,3
P/N RI :MC450-0017-1150
P/N VENDOR:
QUANTITY :1
:FOUR
:

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL LO X OO DO LS

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

PREPARED BY:
DES D SOVEREIGN
REL J BEEKMAN
QE

APPROVED BY:
DES
REL
QE

APPROVED BY (NASA):
SSM
REL
QE

ITEM:
REMOTE POWER CONTROLLER (15 AMP) - FORWARD RCS REACTION JET DRIVER 1 AND 2 (MANIFOLD 1 THROUGH 5) DRIVER POWER CIRCUIT.

FUNCTION:
UPON RECEIVING A STIMULUS FROM THE ASSOCIATED CONTROL DRIVER, THE REMOTE POWER CONTROLLER (RPC) CONDUCTS AND ENERGIZES THE REACTION JET DRIVER FORWARD (RJDF) 1 AND 2 (MANIFOLD 1 THROUGH 5) RCS DRIVER POWER CIRCUIT. 81V76A22RPC39. 82V76A23RPC36. 83V76A24RPC39,40.

FAILURE MODE:
INADVERTENT OUTPUT, SHORT, INADVERTENTLY CONDUCTS.

CAUSE(S):
PIECE PART FAILURE, CONTAMINATION, MECHANICAL AND THERMAL SHOCK, VIBRATION.

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

(A) THE ASSOCIATED REACTION JET DRIVER FORWARD CIRCUIT IS ENABLED PREMATURELY.

(B) NO EFFECT - REACTION JET DRIVER FORWARD BUS MUST FIRST BE POWERED BEFORE THE JET DRIVER POWER INPUT IS ENERGIZED. ALSO THE JET DRIVER REQUIRES A SEPARATE INPUT FOR THE POWER SUPPLY AND LOGIC INPUT. PREMATURE THRUSTER FIRING REQUIRES MULTIPLE FAILURES.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF PROPELLANT RESERVES NECESSARY FOR TO PERFORM EXTERNAL TANK SEPARATION AFTER AN UNCONTROLLABLE THRUSTER FIRING HAS OCCURRED. REQUIRES 5 OTHER FAILURES (RJD BUS RELAY FAILS ON, RJD FAILS ON, MANIFOLD VALVE FAILS OPEN, TANK ISOLATION VALVE FAILS OPEN, MAIN BUS FAILS ON) BEFORE EFFECT IS MANIFESTED. FIRST FAILURE OF STRING NOT DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

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

(A-D) FOR DISPOSITION AND RATIONALE REFER TO APPENDIX B, ITEM NO. 2 - REMOTE POWER CONTROLLER.

(B) GROUND TURNAROUND TEST
COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND VIA THE GUIDANCE, NAVIGATION, AND CONTROL (GN&C) ORBITER MAINTENANCE REQUIREMENTS AND SPECIFICATIONS DOCUMENT (OMRSD) REQUIREMENTS FOR CHECKING THE PRIMARY AND VERNIER REACTION JET DRIVER POWER. THE TESTING CONSISTS OF CYCLING THRUSTER REACTION JET DRIVER LOGIC AND DRIVER SWITCHES WHILE MONITORING VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE
NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. IF JET FAILS ON, ISOLATE THE FAILURE BY CLOSING ASSOCIATED MANIFOLD VALVE.