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PRINT DATE: 02/24/95

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

SUBSYSTEM NAME: EPD&C - AFT REACTION CONTROL (03-2A)

REVISION: 1 02/05/95

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: AFT PCA 1	V070-765200
LRU	: AFT PCA 2	V070-765220
LRU	: AFT PCA 3	V070-765240
LRU	: AFT PCA 1	V070-765310
LRU	: AFT PCA 2	V070-765320
LRU	: AFT PCA 3	V070-765330
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-1200
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-2200
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-3200
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-4200

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

REMOTE POWER CONTROLLER (20 AMP) - LEFT AND RIGHT AFT RCS REACTION JET DRIVER 1 AND 2 (MANIFOLD 1 THROUGH 4) DRIVER POWER CIRCUIT.

REFERENCE DESIGNATORS: 54V76A131RPC21
54V76A131RPC22
54V76A131RPC23
55V76A132RPC17
55V76A132RPC18
56V76A133RPC16
56V76A133RPC37
56V76A133RPC39

QUANTITY OF LIKE ITEMS: 8
EIGHT

FUNCTION:

UPON RECEIVING A STIMULUS FROM THE ASSOCIATED CONTROL DRIVER, THE REMOTE POWER CONTROLLER CONDUCTS AND ENERGIZES THE REACTION JET DRIVER AFT 1 AND 2 (MANIFOLD 1 THROUGH 4) RCS DRIVER POWER CIRCUIT.

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

- APPROVALS -

PAE MANAGER	:	K. L. PRESTON
PRODUCT ASSURANCE ENGR	:	N. HAFEZIZADEH
DESIGN ENGINEERING	:	D. SOVEREIGN
NASA EPD&C SUBSYS MGR	:	
NASA SUBSYS MGR	:	
NASA EPD&C SSMA	:	
NASA SSMA	:	

<i>K.L. Preston</i>	<i>4/2/95</i>
<i>N. Hafezizadeh</i>	
<i>D. Sovereign</i>	
<i>Donald LaFalans</i>	<i>3/11/96</i>
<i>WJA</i>	
<i>John Daniger</i>	<i>3-16-96</i>
<i>WJA</i>	

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2179 -2

REV: 11/03/87

ASSEMBLY : AFT PCA 1,2,3
 P/N RI : MC450-0017-1200
 P/N VENDOR:
 QUANTITY : 8
 : EIGHT
 :

	VEHICLE	102	103	104
CRIT. FUNC:				1R
CRIT. HDW:				3
EFFECTIVITY:		X	X	X
PHASE(S):	PL	LO	X OO	X DO X LS

PREPARED BY:
 DES D SOVEREIGN
 REL J BEEKMAN
 QE

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 APPROVED BY: APPROVED BY (NASA):
 DES D. J. Q. Buss SSM [Signature]
 REL Melvin C. [Signature] 11-14-87 REL [Signature]
 QE [Signature] QE [Signature]
 80016 554 [Signature]

ITEM:

REMOTE POWER CONTROLLER (20 AMP) - LEFT AND RIGHT AFT RCS REACTION JET DRIVER 1 AND 2 (MANIFOLD 1 THROUGH 4) DRIVER POWER CIRCUIT.

FUNCTION:

UPON RECEIVING A STIMULUS FROM THE ASSOCIATED CONTROL DRIVER, THE REMOTE POWER CONTROLLER CONDUCTS AND ENERGIZES THE REACTION JET DRIVER AFT 1 AND 2 (MANIFOLD 1 THROUGH 4) RCS DRIVER POWER CIRCUIT.

54V76A131RPC21,22,23. 55V76A132RPC17,18. 56V76A133RPC16,37,39.

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) DEGRADATION OF REDUNDANCY AGAINST INADVERTENT CIRCUIT POWERING.

(B) NO EFFECT - REACTION JET DRIVER AFT 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.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS

FMEA NO 05-6KA-2179 -2

REV:11/03/87

(E) FUNCTION CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF PROPELLANT RESERVES, NECESSARY FOR CRITICAL FUNCTIONS, AFTER AN UNCONTROLLABLE THRUSTER FIRING HAS OCCURRED. IF THRUSTERS ARE IN VERNIER MODE, ALLOWABLE VEHICLE SPIN RATES COULD BE EXCEEDED. REQUIRES 5 OTHER FAILURES (MAIN BUS FAILS ON, REACTION JET DRIVER COMMAND, MANIFOLD VALVE FAILED OPEN, TANK ISOLATION FAILED OPEN, REACTION JET DRIVER BUS FAILED ON) BEFORE THE 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'S (GN&C) OPERATIONAL 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 FAILURE BY CLOSING ASSOCIATED MANIFOLD VALVE.