

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - AFT-RCS FMEA NO 05-6KA-2185 -2 REV:11/03/87

ASSEMBLY :AFT LCA-2 CRIT. FUNC: 1R  
P/N RI :MC477-0263-0002 CRIT. HDW: 3  
P/N VENDOR: VEHICLE 102 103 104  
QUANTITY :2 EFFECTIVITY: X X X  
:TWO 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 D SOVEREIGN DES [Signature] SSM [Signature]  
REL J BEEKMAN REL [Signature] 11-14-87 REL [Signature]  
QE QE 1.8 [Signature] 11/17/87 QE [Signature]  
EPD&C SSM [Signature]  
FMEA NO 05-6KA-2185

ITEM:  
HYBRID DRIVER CONTROLLER (HDC) TYPE III - RIGHT AFT RCS REACTION JET DRIVER 2 VERNIER JETS.

FUNCTION:  
CONTROLS MAIN BUS "B" POWER TO REACTION JET DRIVER AFT 2. THE HYBRID DRIVERS ARE IN SERIES TO PROVIDE REDUNDANCY AGAINST INADVERTENT POWER TO THE AFT RIGHT, RCS VERNIER JETS. 55V76A122 (J6-X,X).

FAILURE MODE:  
INADVERTENT OUTPUT, SHORTS, CONDUCTS PREMATURELY

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

EFFECT(S) ON:  
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE  
(A) DEGRADATION OF REDUNDANCY AGAINST INADVERTENT CIRCUIT POWERING.  
(B) LOSS OF INTERFACE REDUNDANCY - FIRST FAILURE NO EFFECT. THE SECOND DRIVER IN SERIES PREVENTS INADVERTENT POWERING OF THE REACTION JET DRIVER BOX.  
(C,D) NO EFFECT.  
(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO INADVERTENT VERNIER THRUSTER FIRING CAUSING LOSS OF PROPELLANT REQUIRED FOR ENTRY. REQUIRES 5 OTHER FAILURES (HYBRID DRIVER, REACTION JET DRIVER COMMAND, 2 ISOLATION VALVES FAIL OPEN, MAIN BUS FAIL ON) BEFORE EFFECT IS MANIFESTED. FIRST FAILURE OF STRING NOT DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

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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. 1 - HYBRID DRIVER.

(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.