

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - ATCS/FES FMEA NO 05-6WE-1006 -2 REV: 06/10/88

ASSEMBLY : APT LD CNTL ASSY 1,2,43
 P/N RI : MC477-0263-0002, CRIT. FWC: 12
 P/N VENDOR: CRIT. HDW: 3
 QUANTITY : 6 (SIX), VEHICLE 102 103 104
 : TWO PER CONTROLLER EFFECTIVITY: X X X
 : PHASE(S): PL LO X OO DO X LS

PREPARED BY: J BROWN APPROVED BY: [Signature] REDUNDANCY SCREEN: A-FAIL B-FAIL C-PASS
 DES REL QE J BROWN M HOVE J COURSEN APPROVED BY: [Signature] SSM REL QE [Signature] [Signature]

ITEM: HYBRID DRIVER CONTROLLER, TYPE III. FES CONTROLLER POWER AND CONTROL CIRCUITS.

FUNCTION:
 HYBRID DRIVERS (IN SERIES) PROVIDE POWER TO THE FES CONTROLLERS:
 54V76A121AR (ZONE-19,19) 55V76A122AR (ZONE-21,21) 56V76A121B (ZONE-17,17)

FAILURE MODE:
 INADVERTENT OUTPUT, FAILS "ON", FAILS TO TURN "OFF"

CAUSE(S):
 CONTAMINATION, VIBRATION, PIECE PART FAILURE, MECHANICAL SHOCK, THERMAL STRESS, PROCESSING ANOMALY

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

(A) DRIVE THAT IS FAILED "ON" WILL NOT HAVE AN EFFECT ON THE CONTROLLER SINCE BOTH DRIVERS MUST BE "ON" TO POWER THE CONTROLLER.

(B,C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - LOSS OF ALL ORBITER COOLING RESULT IN LOSS OF CREW AND VEHICLE BASED ON THE FOLLOWING SCENARIO:

- 1) REDUNDANT HYBRID DRIVER FAILING ON WILL CAUSE LOSS OF RESET CAPABILITY FOR ONE OF THREE FES CONTROLLERS.
- 2/3) LOSS OF TWO REDUNDANT CONTROLLERS OR LOSS OF TWO FEEDWATER LINES WILL CAUSE LOSS OF FES COOLING.
- 4) LOSS OF ANY REMAINING FREON COOLANT LOOP HEAT REJECTION CAPABILITY (E.G., COLD-SOAKED RADIATORS, FREON LOOP OR AMMONIA BOILER).

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HYBRID DRIVER FAILS SCREENS A AND B BECAUSE DRIVER FAILURE CANNOT BE DETECTED WITH TWO DRIVERS IN SERIES.

DISPOSITION & RATIONALE:

(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A-D) DISPOSITION AND RATIONALE

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER.

(B) GROUND TURNAROUND TEST

NONE FOR FIRST FAILURE.

(E) OPERATIONAL USE

NONE FOR FIRST FAILURE. SECOND FAILURE (REDUNDANT DRIVER FAILED ON) WILL CAUSE LOSS OF CONTROLLER RESET CAPABILITY IN EVENT OF A FES SHUTDOWN. SWITCH FES CONTROL TO REDUNDANT CONTROLLER.