

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AUXILIARY PWR FMEA NO 05-6N -2059 -2 REV:08/02/90

ASSEMBLY : APT LCA 1,2,3 CRIT. FUNC: 1
 P/N RI : MC477-0263-0002, MC477-0264-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 24 EFFECTIVITY: X X X
 : TWENTY FOUR/12-TYPE 3, PHASE(S): PL X LO X OO X DO X LS X
 : 12-TYPE 4

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES T NGUYEN DES Walter Scott 9/6/90 SSM Walter Scott 9/6/90
 REL T KIMURA REL Adrian Clifton 8-21-90 REL Walter Scott 9/6/90
 QE J T COURSEN QE Walt Courson 8/5/90 QE Walter Scott 9/6/90

EPD&C REL Walter Scott 8/30/90
 #PD&C SSM Walter Scott 9-5-

ITEM:
 CONTROLLER, HYBRID DRIVER, HDC TYPE 3 AND 4 - AUXILIARY POWER UNIT (APU)
 HEATERS, TANK/FUEL LINE 1, 2, AND 3 (A AND B) POWER CIRCUITS

FUNCTION:
 WITH THE PROPER STIMULI AND LOGIC, THE HDC TYPE 3 AND 4 DRIVERS COMPLETES THE CIRCUITS FOR THE TANK/FUEL LINE HEATERS.

- HDC TYPE 3, MC477-0263-0002:
 54V76A121AR(J3-13), (J3-29), (J3-13, J10-JJ), (J3-29, J10-t);
 55V76A122AR(J3-13), (J3-29), (J3-13, J10-JJ), (J3-29, J10-t);
 56V76A123AR(J3-13), (J3-29), (J3-13, J10-JJ), (J3-29, J10-t)
 HDC TYPE 4, MC477-0264-0002:
 54V76A121AR(J10-u), (J10-kk), (J3-14, J10-HH), (J3-30, J10-s);
 55V76A122AR(J10-u), (J10-kk), (J3-14, J10-HH), (J3-30, J10-s);
 56V76A123AR(J10-u), (J10-kk), (J3-14, J10-HH), (J3-30, J10-s)

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

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

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

(A) LOSS OF ONE LEVEL OF SERIES REDUNDANCY IN PREVENTING THE INADVERTENT ENERGIZATION OF THE TANK/FUEL LINE HEATERS.

(B,C,D) NO EFFECT - FIRST FAILURE

(E) POSSIBLE LOSS OF MISSION, CREW AND VEHICLE AFTER TWO OTHER FAILURES (HDC-3 FAILED ON, HDC-4 FAILED ON) POWERING HEATERS CONTINUOUSLY RESULTING IN FUEL DECOMPOSITION AND LINE RUPTURE.

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FIRST FAILURE NOT DETECTABLE IN FLIGHT SINCE THE OUTPUTS OF EACH OF THE SERIES DRIVERS (HDC-3 OR HDC-4) ARE NOT MONITORED.

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) TEST

GROUND TURNAROUND TEST - APU 1/2/3 FUEL HEATER CIRCUIT TESTS PERFORMED EVERY FIFTH FLOW OR AFTER CIG RETEST.

(E) OPERATIONAL USE

NONE