

SUBSYSTEM : EPD&C - AUXILIARY PWR FMEA NO 05-6N -2059-IM-2 REV:04/29/92

ASSEMBLY : AFT LCA 1,2,3 CRIT. FUNC: 1R
 P/N RI : MC477-0263-0002, MC477-0264-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104 105
 QUANTITY : 24 EFFECTIVITY: X 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 *[Signature]* SSM *[Signature]* 6-3-92
 REL T KIMURA REL *[Signature]* 5/4/92
 QE W R HIGGINS QE *[Signature]* 3/5/92
 EPD&C REL *[Signature]* 6-1-92
 EPD&C SSM *[Signature]* 6-1-92

ITEM:

CONTROLLER, HYBRID DRIVER, HDC TYPE 3 AND 4 - IMPROVED AUXILIARY POWER UNIT
 SUBSYSTEM (ZAPU) 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 COMPLETE 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 ENERGIZING ^A THE TANK/FUEL LINE HEATERS.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE CONTINUOUS ENERGIZING OF HEATERS RESULTING IN FUEL DECOMPOSITION AND LINE RUPTURE:

AFTER TWO OTHER FAILURES FOR THE DRAIN, AND SERVICE LINE HEATERS (HDC-3 FAILED "ON", HDC-4 FAILED "ON").

AFTER THREE OTHER FAILURES FOR THE FUEL LINE HEATERS (HDC-3 FAILED "ON", HDC-4 FAILED "ON", OVER TEMPERATURE THERMOSTAT CONTACTS FAIL CLOSED).

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EFFECT(S) ON (CONTINUED):

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

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
DURING ORBITER MAINTENANCE DOWN PERIOD (OMDP) NOT TO EXCEED 10 FLIGHT
INTERVALS.

(E) OPERATIONAL USE

NONE