

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AUXILIARY PWR FMEA NO 05-6N -2072 -2 REV:08/02/00

ASSEMBLY : AFT LCA 1,2,3				CRIT. FUNC: 1
P/N RI : MC477-0261-0002				CRIT. HDW: 3
P/N VENDOR:	VEHICLE	102	103	104
QUANTITY : 6	EFFECTIVITY:	X	X	X
: SIX, TWO/APU	PHASE(S):	PL X LO X	OO X DO X	LS X

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:		APPROVED BY:		APPROVED BY (NASA):
DES	T NGUYEN	DES	<u>J.H. Woodruff</u>	SSM <u>Walt Smith</u> 7/16/90
REL	T KIMURA	REL	<u>Michael P. Howe</u> 8-14-90	REL <u>John D. ...</u>
QE	J T COURSEN	QE	<u>W.K. ...</u> 8-15-90	QE <u>R.D. ...</u>

EPD&C Rel K.A. ... 8/30/90  
 EPD&C SSM Woodruff 1-8-90

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

FUNCTION:  
 UPON GSE COMMAND FROM MDM LA1, POWER IS PROVIDED TO THE APU GAS GENERATOR/FUEL PUMP HEATER (A OR B).  
 54V76A121AR(J1-15), (J1-22);  
 55V76A122AR(J1-15), (J1-22);  
 56V76A123AR(J1-15), (J1-22)

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) DEGRADATION OF REDUNDANCY AGAINST INADVERTENT POWERING OF HEATERS
- (B,C,D) NO EFFECT - FIRST FAILURE
- (E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THREE OTHER FAILURES (TWO PREFLIGHT-TO-ESSENTIAL BUS DIODES FAIL SHORT WHICH ENERGIZES THE PREFLIGHT TEST BUS, THERMOSTAT FAILS CLOSED) POWERING HEATER CONTINUOUSLY CAUSING FUEL DECOMPOSITION AND POSSIBLE FUEL SYSTEM RUPTURE.

FAILS "B" SCREEN BECAUSE FIRST FAILURE NOT DETECTABLE SINCE THE PREFLIGHT TEST BUS IS NOT POWERED DURING FLIGHT UNLESS REQUIRED BY FLIGHT RULE 9-41.

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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 CONTROLLER

(B) TEST

GROUND TURNAROUND TEST - APU 1/2/3 FUEL PUMP AND GAS GENERATOR HEATER  
CIRCUIT TESTS PERFORMED EVERY FIFTH FLOW.

(E) OPERATIONAL USE

NONE