

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AUXILIARY PWR FMEA NO 05-6N -203B -2 REV:08/02/90

ASSEMBLY : AFT LCA 1,2,3 CRIT. FUNC:
P/N RI : MC477-0261-0002 CRIT. HDW:
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 3 EFFECTIVITY: X X X
:THREE, ONE/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 NGUYENT DES W. H. King 8/15/90 SSM Walter S. ...
REL T KIMURA REL Robert ... 8-14-90 REL Bob ...
QE J T COURSEN QE John ... 8-15-90 QE RO ...

ITEM:
CONTROLLER, HYBRID DRIVER, HDC TYPE 1 - AUXILIARY POWER UNIT (APU) 1, 2 AND 3 GSE START COMMAND

FUNCTION:
UPON GSE COMMAND FROM MDM LA1, THE HDC PROVIDES A START COMMAND TO THE APU CONTROLLER.
54V76A121AR(J7-9);
55V76A122AR(J7-9);
56V76A123AR(J7-9)

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 APU START COMMAND
- (B,C,D) NO EFFECT - FIRST FAILURE
- (E) POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO OTHER FAILURES (TV PREFLIGHT-TO-ESSENTIAL BUS DIODES FAIL SHORT WHICH ENERGIZES THE PREFLIGHT TEST BUS ACTIVATING THE START COMMAND WHICH OPENS THE GG SHUTOFF VALVE) RESULTING IN THE POTENTIAL FOR AN INADVERTENT APU H RESTART (HYDRAZINE DETONATION) FOR THE TIME PERIOD BETWEEN APU SHUTDOWN AND CLOSING OF THE FUEL ISOLATION VALVE SWITCH AND BEFORE SUFFICIENT G GENERATOR INJECTOR COOLING IS ACHIEVED. ALSO, THE CONTROLLER POWER SWITCH MUST BE "ON" FOR THIS FAILURE SCENARIO TO OCCUR.

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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SUBSYSTEM : EPD&C - AUXILIARY PWR FMEA NO 05-6N -2038 -2 REV:08/02/90

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 OPERATE CIRCUIT TESTS PERFORMED EVERY FIFTH FLOW OR AFTER CIG RETEST.

(E) OPERATIONAL USE

NONE