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PRINT DATE: 01/13/94

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
NUMBER: 05-6N-2074-X**

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT

REVISION: 2 01/13/94

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: AFT LCA 1	MC450-0057-0001
LRU	: AFT LCA 2	MC450-0058-0001
LRU	: AFT LCA 3	MC450-0059-0001
SRU	: CONTROLLER, HYBRID DRIVER	MC477-0264-0002

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
CONTROLLER, HYBRID DRIVER, HDC TYPE 4 - AUXILIARY POWER UNIT (APU) HEATERS,
FUEL PUMP/LINE 1, 2, AND 3 POWER CIRCUITS

REFERENCE DESIGNATORS: 54V76A121AR(J10-K)
54V76A121AR(J10-BB)
55V76A122AR(J10-K)
55V76A122AR(J10-BB)
56V76A123AR(J10-K)
56V76A123AR(J10-BB)

QUANTITY OF LIKE ITEMS: 6
SIX

FUNCTION:
CONDUCTS POWER TO THE APU 1, 2, AND 3 FUEL PUMP HEATERS.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL FAILURE MODE
NUMBER: 05-6N-2074-02**

REVISION# 2 01/13/94

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT

LRU: AFT LCA 1, 2, 3

CRITICALITY OF THIS
FAILURE MODE: 1R2

ITEM NAME: CONTROLLER, HYBRID DRIVER

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

MISSION PHASE:
PL PRELAUNCH
LO LIFT-OFF
OO ON-ORBIT
DO DE-ORBIT
LS LANDING SAFING

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
103 DISCOVERY
104 ATLANTIS
105 ENDEAVOUR

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

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)
B)
C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF AUTOMATIC THERMOSTAT HEATER CONTROL

(B) INTERFACING SUBSYSTEM(S):
LINE/PUMP/VALVE HEATERS CONTINUOUSLY POWERED ON WHEN APU HEATER "GAS
GEN/FUEL PUMP" SWITCH IS IN THE "AUTO" POSITION.

(C) MISSION:
NO EFFECT - FIRST FAILURE

(D) CREW, VEHICLE, AND ELEMENT(S):

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
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NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF CREW AND VEHICLE AFTER SECOND FAILURE (SWITCH FAILED CLOSED) POWERING HEATERS CONTINUOUSLY RESULTING IN FUEL DECOMPOSITION AND LINE RUPTURE.

-DISPOSITION RATIONALE-

(A) DESIGN:

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

(B) TEST:

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

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

(C) INSPECTION:

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

(D) FAILURE HISTORY:

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

(E) OPERATIONAL USE:

FIRST FAILURE - SELECT ALTERNATE HEATER

- APPROVALS -

EDITORIALLY APPROVED
EDITORIALLY APPROVED
TECHNICAL APPROVAL

: RI
: JSC
: VIA CR

Handwritten signature and date: 1/20/94
: 05-6N-2074-02