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PRINT DATE: 01/13/94

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
NUMBER: 05-6N-2051-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,
LUBE OIL LINE, 1, 2, AND 3 POWER CIRCUITS

REFERENCE DESIGNATORS: 54V76A121AR(J10-n)
54V76A121AR(J10-DD)
55V76A122AR(J10-n)
55V76A122AR(J10-DD)
56V76A123AR(J10-n)
56V76A123AR(J10-DD)

QUANTITY OF LIKE ITEMS: 6
SIX (2 PER APU)

FUNCTION:
WITH A SIGNAL FROM THE APU LUBE OIL HEATER SWITCH OR PREFLIGHT TEST BUS,
THE HDC CONDUCTS THE GROUND PATH MAIN BUS POWER FROM THE OIL LINE
HEATERS.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL FAILURE MODE
NUMBER: 05-6N-2051-02**

REVISION# 2 01/13/94

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT

LRU: AFT LCA 1, 2, 3

ITEM NAME: CONTROLLER, HYBRID DRIVER

CRITICALITY OF THIS

FAILURE MODE: 1R3

FAILURE MODE:

FAILS "ON", INADVERTENT OUTPUT, 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) FAIL
 C) PASS

PASS/FAIL RATIONALE:

A)

B)

FIRST FAILURE NOT DETECTABLE IN FLIGHT SINCE THE OUTPUT OF THE HDC-4
DRIVER IS NOT MONITORED.

C)

- FAILURE EFFECTS -**(A) SUBSYSTEM:**

DEGRADATION OF REDUNDANCY AGAINST ENERGIZING OF LUBE OIL LINE HEATERS

(B) INTERFACING SUBSYSTEM(S):

NO EFFECT - FIRST FAILURE. HEATER STAYS ON AFTER TWO FAILURES.

(C) MISSION:NO EFFECT - FIRST FAILURE. ABORT DECISION REQUIRED AFTER TWO FAILURES DUE
TO LOSS OF ONE APU.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL FAILURE MODE
NUMBER: 05-6N-2051-02**

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE AFTER TWO OTHER FAILURES (HDC-3 FAILED ON ENERGIZING HEATER CONTINUOUSLY WHICH DEGRADES THE LUBE OIL PREVENTING LUBRICATION AND CAUSING LOSS OF ONE APU, LOSS OF SECOND APU) DUE TO LOSS OF TWO OF THREE APUS.

-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 LUBE OIL HEATER CIRCUIT TESTS PERFORMED EVERY OMDP OR AFTER CIG-RETEST.

(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:
NONE

- APPROVALS -

EDITORIALLY APPROVED : RI
EDITORIALLY APPROVED : JSC
TECHNICAL APPROVAL : VIA CR

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01/13/94 - 350274