

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
NUMBER: 05-6N-2048 -X

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT (04-2)

REVISION: 0 11/21/87

PART DATA

| | PART NAME | PART NUMBER |
|-----|--------------------|----------------------|
| | VENDOR NAME | VENDOR NUMBER |
| LRU | : AFT LCA 1 | MC450-0057-0001 |
| LRU | : AFT LCA 2 | MC450-0058-0001 |
| LRU | : AFT LCA 3 | MC450-0059-0001 |
| SRU | : DIODE | JANTXV1N5551 |

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

DIODE, ISOLATION (3 AMP) - AUXILIARY POWER UNIT (APU) HEATERS, LUBE OIL LINE 1, 2, AND 3 POWER CIRCUITS

REFERENCE DESIGNATORS:

- 54V76A121(J3-15,J1-12)
- 54V76A121(J3-16,J1-12)
- 54V76A121(J3-31,J1-21)
- 54V76A121(J3-32,J1-21)
- 55V76A122(J3-15,J1-12)
- 55V76A122(J3-16,J1-12)
- 55V76A122(J3-31,J1-21)
- 55V76A122(J3-32,J1-21)
- 56V76A123(J3-15,J1-12)
- 56V76A123(J3-16,J1-12)
- 56V76A123(J3-31,J1-21)
- 56V76A123(J3-32,J1-21)

QUANTITY OF LIKE ITEMS: 12
 TWELVE (4 PER APU)

FUNCTION:

TO ISOLATE SWITCH SCAN CIRCUITS FROM THE HEATER CONTROL CIRCUITS OF LUBE OIL LINE 1, 2, AND 3.

FAILURE MODES EFFECTS ANALYSIS FMEA - NON-CIL FAILURE MODE

NUMBER: 06-8N-2048-02

REVISION#: 01 08/01/96

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT (04-2)

LRU: AFT LCA 1, 2, 3

ITEM NAME: DIODE

CRITICALITY OF THIS

FAILURE MODE: 1R3

FAILURE MODE:

SHORT (END TO END)

MISSION PHASE:

- PL PRE-LAUNCH
- 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:

STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN

- A) PASS
- B) N/A
- C) PASS

PASS/FAIL RATIONALE:

A)

B)

DIODE IS 2-FAULT TOLERANT WITH 2 REMAINING LEGS VERIFIABLE IN FLIGHT. OPERATION OF THERMOSTAT IS VERIFIABLE IN FLIGHT. STATUS OF REMAINING APU_R IS VERIFIABLE IN FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE
NUMBER: 05-8N-2048- 02**

NO EFFECT - FIRST FAILURE

(B) INTERFACING SUBSYSTEM(S):
NO EFFECT - FIRST FAILURE

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

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
LOSS OF CREW/VEHICLE AFTER THREE OTHER FAILURES (SWITCH CONTACT FAILS
CLOSED, THERMOSTAT CONTACTS FAIL CLOSED, LOSS OF SECOND APU) DUE TO LOSS
OF TWO OF THREE APUS.

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX F, ITEM NO. 4 - DIODE

(B) TEST:
REFER TO APPENDIX F, ITEM NO. 4 - DIODE

GROUND TURNAROUND TEST APU 1/2/3 LUBE OIL HEATER CIRCUIT TESTS PERFORMED
EVERY FLOW.

(C) INSPECTION:
REFER TO APPENDIX F, ITEM NO. 4 - DIODE

(D) FAILURE HISTORY:
REFER TO APPENDIX F, ITEM NO. 4 - DIODE

(FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE
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(E) OPERATIONAL USE:
NONE

- APPROVALS -

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

: *Diana H. James 8/10/96*
: *Tom & Nancy 8/23/96*
:96-CIL-010