

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
NUMBER: 05-6N-2057 -X

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT (04-2)
REVISION: 2 01/13/94

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, GSE ISOLATION (3 AMP) - AUXILIARY POWER UNIT (APU) HEATERS TANK/ FUEL
 LINE 1, 2, 3 (A AND B) POWER CIRCUIT

REFERENCE DESIGNATORS: 54V76A121(12)
 55V76A122(12)
 56V76A123(12)

QUANTITY OF LIKE ITEMS: 36
 THIRTY SIX

FUNCTION:
 PROVIDES ISOLATION BETWEEN THE PREFLIGHT TEST BUS AND COMMAND CONTROL
 CIRCUITS FOR THE TANK AND FUEL LINE HEATERS.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 05-6N-2057- 02

REVISION#: 03 08/01/96

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

LRU: AFT LCA 1, 2, 3

CRITICALITY OF THIS

ITEM NAME: DIODE

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) FAIL
 B) N/A
 C) PASS

PASS/FAIL RATIONALE:

A)

FIRST FAILURE NOT DETECTABLE DURING GROUND TURNAROUND SINCE THE SHORT FAILURE MODE OF THIS DIODE DOES NOT EFFECT THE FUNCTIONAL OPERATION OF THE SYSTEM UNLESS THERE ARE ADDITIONAL ASSOCIATED FAILURES.

B)

FIRST FAILURE NOT DETECTABLE DURING FLIGHT SINCE THE SHORT FAILURE MODE OF THIS DIODE DOES NOT AFFECT THE FUNCTIONAL OPERATION OF THE SYSTEM UNLESS THERE ARE ADDITIONAL ASSOCIATED FAILURES. SCREEN IS "N/A" SINCE OPERATIONAL STATUS OF HEATER SWITCH CONTACTS AND THERMOSTAT IS READILY VERIFIABLE.

C)

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE
NUMBER: 05-6N-2057- 02**

- FAILURE EFFECTS -

(A) SUBSYSTEM:

DEGRADATION OF REDUNDANCY AGAINST LOSS OF CONTROL BUS ISOLATION AND SWITCH COMMAND ISOLATION.

(B) INTERFACING SUBSYSTEM(S):

NO EFFECT - FIRST FAILURE

(C) MISSION:

NO EFFECT - FIRST FAILURE

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

NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF CREW/VEHICLE AFTER THREE OTHER FAILURES (SERIES GSE ISOLATION DIODE FAILS SHORT, ONE CONTACT SET OF THE SWITCH FAILS CLOSED, CONTACTS OF A THERMOSTAT FAILS CLOSED) WHICH POWERS HEATERS CONTINUOUSLY RESULTING IN FUEL DECOMPOSITION AND LINE RUPTURE.

-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 NONE. THE GSE ISOLATION DIODE IS A COMPONENT INTERNAL TO THE AFT LCA'S 1, 2, AND 3 WHICH WOULD REQUIRE DISASSEMBLY OF THE LCA'S FOR DIRECT OMRSD TESTING. THIS TYPE OF PROCEDURE IS IMPRACTICAL AND INVASIVE.

(C) INSPECTION:

REFER TO APPENDIX F, ITEM NO. 4 - DIODE

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE
NUMBER: 05-8N-2057-02**

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

(E) OPERATIONAL USE:
NONE

- APPROVALS -

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

Sandra G. Thomas 8/09/96
Sam Slaney 8-27-96
96-CIL-010