FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL HARDWARE
NUMBER: 05-6N-2018-X

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT
REVISION: 1 08/30/93

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	AFT PCA 4, 5, 6	V070-765280
SRU	:	DIODE	JANTX1N1188R

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, BLOCKING (35 AMP) - AUXILIARY POWER UNIT (APU) CONTROLLER 1, 2, AND 3 POWER

REFERENCE DESIGNATORS: OV102:
54V76A134A4CR5
54V76A134A4CR6
55V76A135A4CR5
55V76A135A4CR6
56V76A136A4CR5
56V76A136A4CR6

OV-103 AND SUBS:
54V76A134A2CR5
54V76A134A2CR6
55V76A135A2CR5
55V76A135A2CR6
56V76A136A2CR5
56V76A136A2CR6

QUANTITY OF LIKE ITEMS: 6
SIX

FUNCTION:
PROVIDES MAIN BUS ISOLATION AND CONDUCTS CIRCUIT CURRENT IN REDUNDANT INPUTS TO APU CONTROLLERS 1, 2, AND 3.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL FAILURE MODE
NUMBER: 05-6N-2018-02

REVISION# 1 08/30/93

SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT
LRU: AFT PCA 4, 5, 6
ITEM NAME: DIODE

CRITICALITY OF THIS FAILURE MODE: 1R3

FAILURE MODE:
SHORT (END TO END)

MISSION PHASE:

PL	PRELAUNCH
LO	LIFT-OFF
DO	DE-ORBIT
OO	ON-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) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)
FAILURE NOT DETECTABLE DURING GROUND TURNAROUND DUE TO SERIES REDUNDANCY WITH DOWNSTREAM DIODE IN APU CONTROLLER - CONTROLLER STILL PROVIDING CIRCUIT ISOLATION.

B)
FAILURE NOT DETECTABLE DURING FLIGHT DUE TO SERIES REDUNDANCY WITH DOWNSTREAM DIODE IN APU CONTROLLER - CONTROLLER STILL PROVIDING CIRCUIT ISOLATION.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
DEGRADATION OF MAIN DC BUS POWER ISOLATION (DIODE INSIDE CONTROLLER STILL PROVIDES MAIN BUS ISOLATION).

(B) INTERFACING SUBSYSTEM(S):

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL FAILURE MODE
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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 (DIODE IN APU CONTROLLER FAILS SHORT, MAIN BUS UPSTREAM OF FAILED DIODE SHORTS TO GROUND WHICH TRIPS RPC IN REDUNDANT CIRCUIT RESULTING IN LOSS OF POWER TO APU CONTROLLER AND LOSS OF ONE APU, LOSS OF SECOND APU) DUE TO LOSS OF TWO OF THREE APU'S.

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX F, ITEM NO. 1 - DIODE, POWER - STUD MOUNTED

(B) TEST:
REFER TO APPENDIX F, ITEM NO. 1 - DIODE, POWER - STUD MOUNTED -

GROUND TURNAROUND TEST - NONE. THE BLOCKING DIODE IS A COMPONENT INTERNAL TO THE AFT PCA'S 4, 5, AND 6 WHICH WOULD REQUIRE DISASSEMBLY OF THE PCA'S FOR DIRECT OMRSD TESTING. THIS TYPE OF PROCEDURE IS IMPRACTICAL AND INVASIVE.

(C) INSPECTION:
REFER TO APPENDIX F, ITEM NO. 1 - DIODE, POWER - STUD MOUNTED

(D) FAILURE HISTORY:
REFER TO APPENDIX F, ITEM NO. 1 - DIODE, POWER - STUD MOUNTED

(E) OPERATIONAL USE:
NONE

- APPROVALS -

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