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PRINT DATE: 01/13/94

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE  
NUMBER: 05-6N-2030A-X**

**SUBSYSTEM NAME: EPD&C - AUXILIARY POWER UNIT**

**REVISION: 2 01/14/94**

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|     | <b>PART NAME<br/>VENDOR NAME</b> | <b>PART NUMBER<br/>VENDOR NUMBER</b> |
|-----|----------------------------------|--------------------------------------|
| LRU | : AFT PCA 1                      | V070-765200                          |
| LRU | : AFT PCA 2                      | V070-765220                          |
| LRU | : AFT PCA 3                      | V070-765240                          |
| LRU | : AFT PCA 1                      | V070-765310                          |
| LRU | : AFT PCA 2                      | V070-765320                          |
| LRU | : AFT PCA 3                      | V070-765330                          |
| SRU | : FUSE                           | ME451-0018-0300                      |

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**PART DATA**

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

FUSE (3 AMP) - AUXILIARY POWER UNIT (APU) 1 AND 2 FUEL ISOLATION CONTROL CIRCUIT

**REFERENCE DESIGNATORS:** 54V76A131F32  
55V76A132F29

**QUANTITY OF LIKE ITEMS:** 2  
TWO

**FUNCTION:**

TO PROVIDE OVERCURRENT PROTECTION FOR THE APU 1 AND 2 FUEL TANK ISOLATION VALVE INHIBIT CONTROL CIRCUIT

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CRITICAL FAILURE MODE  
NUMBER: 05-6N-2030A-01**

**SUBSYSTEM NAME:** EPD&C - AUXILIARY POWER UNIT  
**LRU:** AFT PCA 1, 2, 3  
**ITEM NAME:** FUSE

**REVISION#** 2      **01/13/94**  
**CRITICALITY OF THIS  
FAILURE MODE:** 1R3

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**FAILURE MODE:**  
 FAILS OPEN, FAILS TO CONDUCT

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

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

**CAUSE:**  
 STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK,  
 PROCESSING ANOMALY, THERMAL STRESS

**CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO**

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**REDUNDANCY SCREEN**      A) PASS  
    B) FAIL  
    C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

FIRST FAILURE NOT DETECTABLE IN FLIGHT SINCE THE AVAILABILITY OF MAIN BUS VOLTAGE DOWNSTREAM OF THIS FUSE IS NOT BEING MONITORED.

C)

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**- FAILURE EFFECTS -**

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**(A) SUBSYSTEM:**

LOSS OF ABILITY TO PROVIDE CONTROL POWER TO HDC TYPE 1 DRIVER WHICH UPON RECEIVING OVERSPEED/UNDERSPEED SIGNALS PROVIDES FUEL ISOLATION VALVE INHIBIT COMMAND.

**(B) INTERFACING SUBSYSTEM(S):**

LOSS OF ABILITY TO AUTOMATICALLY CLOSE FUEL ISOLATION VALVE AFTER APU OVERSPEED/UNDERSPEED CONDITION OCCURS.

**(C) MISSION:**

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE  
NUMBER: 05-6N-2030A-01**

NO EFFECT - FIRST FAILURE

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

**(E) FUNCTIONAL CRITICALITY EFFECTS:**  
POSSIBLE LOSS OF CREW/VEHICLE AFTER FOUR OTHER FAILURES (TWO CONTACT-TO-CONTACT SHORTS IN SWITCH, HDC-4 GROUND DRIVER FAILS "ON", FUEL LEAK) DUE TO LOSS OF ABILITY TO ISOLATE A FUEL LEAK (CLOSING ISOLATION VALVES DOES NOT PREVENT OVERSPEED).

**-DISPOSITION RATIONALE-**

**(A) DESIGN:**  
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN TYPE

**(B) TEST:**  
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN TYPE

GROUND TURNAROUND TEST - APU 1/2/3 CONTROLLER TEST THROUGH GROUND CONNECTION PERFORMED EVERY FLOW OR AFTER LRU RETEST OF APU ASSEMBLY, AFTER LRU RETEST OF CONTROLLER ASSEMBLY OR AFTER CIG RETEST.

**(C) INSPECTION:**  
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN TYPE

**(D) FAILURE HISTORY:**  
REFER TO APPENDIX D, ITEM NO. 4 - FUSE, PLUG-IN TYPE

**(E) OPERATIONAL USE:**  
NONE

**- APPROVALS -**

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

*Handwritten signature and date:*  
01/20/94  
35026L