FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER: 05-6-2276 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 1 07/26/99

PART DATA

	PART NAME / **VENDOR NAME**	**PART NUMBER** / **VENDOR NUMBER**
LRU	: MDCA 1	V070-764200
LRU	: MDCA 2	V070-764220
LRU	: MDCA 3	V070-764230
SRU	: FUSE	ME451-0009-1006

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
FUSE, 15 AMP, AXIAL LEAD/CARTRIDGE TYPE - ESSENTIAL BUS MDCA TO MPCA

REFERENCE DESIGNATORS: 40V76A31F3
40V76A32F3
40V76A34F3

QUANTITY OF LIKE ITEMS: 3
THREE-ONE PER MDCA

FUNCTION:
PROVIDES CIRCUIT PROTECTION BETWEEN AN ESSENTIAL BUS LOCATED IN THE MAIN DC DISTRIBUTION ASSEMBLY TO THE ONE IN THE MID PCA.

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NUMBER: 05-6-2276- 01

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SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
LRU: MDCA 1, 2, 3 **CRITICALITY OF THIS**
ITEM NAME: FUSE **FAILURE MODE:** 1R3

FAILURE MODE:
FAILS OPEN, FAILS TO CONDUCT

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, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF POWER TO THE ESSENTIAL BUS IN ONE OF THE THREE MID PCA'S.

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(B) INTERFACING SUBSYSTEM(S):
LOSS OF ESSENTIAL BUS POWER TO FUEL CELL CONTROLLER, COOLANT PUMP AND REACTANT VALVES NECESSITATING CREW ACTION TO DISCONNECT FUEL CELL FROM ASSOCIATED MAIN DC BUS.

(C) MISSION:
FIRST FAILURE - NO EFFECT

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
SECOND FAILURE - LOSS OF REDUNDANT REACTANT VALVE CLOSURE CAPABILITY. AFTER THIRD FAILURE (MOTOR SWITCH CONNECTING FUEL CELL TO MAIN DC BUS LOADS FAILS CLOSED) MAY CAUSE POSSIBLE LOSS OF CREW/VEHICLE DUE TO INABILITY TO SAFE FUEL CELL. LOSS OF FUEL CELL COOLANT PUMP AND REACTANT VALVE REDUNDANT CONTROL NECESSITATES REMOVAL OF ALL LOADS FROM THE FUEL CELL IN ORDER TO RENDER IT SAFE. INABILITY TO REMOVE THE BUS LOAD FROM THE FUEL CELL WILL RESULT IN FUEL CELL OVERHEATING WITH SUBSEQUENT RUPTURE AND/OR EXPLOSION/FIRE.

- APPROVALS -

EDITORIALLY APPROVED	: BNA	: J. Kimura 7-26-99
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-6