

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER: 05-6-2805 -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	ME451-0009-1019

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
FUSE, 7.5 AMP - ESSENTIAL BUS TO D AND C PANELS**

REFERENCE DESIGNATORS: 40V76A31F2
40V76A31F4
40V76A32F2
40V76A32F4
40V76A33F2
40V76A33F4

QUANTITY OF LIKE ITEMS: 6
SIX, TWO PER BOX

FUNCTION:
PROVIDES CIRCUIT PROTECTION BETWEEN ESSENTIAL BUSES IN MAIN DISTRIBUTION
AND CONTROL ASSEMBLIES AND FLIGHT DECK PANELS R1, R2, R12, A11, O6, O7, O8,
O14, O15, O16, C3 AND F9.

**FAILURE MODES EFFECTS ANALYSIS FMEA – NON-CIL FAILURE MODE
NUMBER: 05-6-2605-01**

REVISION#: 1 07/26/99

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

FAILURE MODE:
FAILS OPEN

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

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) N/A
C) PASS

PASS/FAIL RATIONALE:

A)

B)

"B" SCREEN IS "N/A" BECAUSE FAILURE OF AT LEAST TWO REMAINING PATHS IS READILY DETECTABLE IN FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF REDUNDANCY - LOSS OF ONE OF TWO FEEDS TO FLIGHT DECK PANELS FOR ONE OF THREE ESSENTIAL BUSES.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
NUMBER: 05-6-2605- 01**

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

(C) MISSION:
FIRST FAILURE - NO EFFECT

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE AFTER FOUR FAILURES DUE TO INABILITY TO "SAFE"
A FUEL CELL VIA THE FOLLOWING SCENARIO:

- (1, 2) LOSS OF BOTH FUSES SUPPLYING AN ESSENTIAL BUS TO THE FLIGHT DECK PANELS RESULTING IN LOSS OF ASSOCIATED FUEL CELL CONTROLLER AND COOLANT PUMP. REQUIRES FUEL CELL SAFING BY EITHER CLOSING REACTANT VALVES OR REMOVING ALL LOADS FROM THE AFFECTED FUEL CELL.
- (3) INABILITY TO CLOSE REACTANT VALVES TO THE AFFECTED FUEL CELL.
- (4) LOSS OF REDUNDANT REACTANT VALVE CLOSURE CAPABILITY.
- (5) ASSOCIATED POWER CONTACTOR FAILED CLOSED. 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	: <u>J. Karmala 7-26-99</u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-6