FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER: 05-6-2603 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 0 05/03/88

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	ME451-0009-1005

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
FUSE, 10 AMP - FUEL CELL TO ESSENTIAL BUS DUAL INPUT CIRCUITS

REFERENCE DESIGNATORS:
40V76A31F30
40V76A31F32
40V76A32F32
40V76A32F33
40V76A33F29
40V76A33F30

QUANTITY OF LIKE ITEMS: 6
SIX, TWO PER BOX

FUNCTION:
PROVIDES CIRCUIT PROTECTION FOR PARALLEL FEEDERS TO THE ESSENTIAL BUS FROM THE ASSOCIATED FUEL CELL.

PRINT DATE: 07/26/99

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 05-6-2603- 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:

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: 05-6-2603- 01

LOSS OF REDUNDANCY. LOSS OF ESSENTIAL BUS INPUT FROM THE AFFECTED FEEDER LINE.

(B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - NO EFFECT. THE REMAINING FUEL CELL TO ESSENTIAL BUS FEED AS WELL AS BOTH MAIN DC BUSES CONTINUE TO SUPPLY THE AFFECTED ESSENTIAL BUS.

(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 THE SIXTH FAILURE (LOSS OF REDUNDANT REACTANT VALVE CLOSURE CAPABILITY) DUE TO INABILITY TO "SAFE" A FUEL CELL; THE FIFTH FAILURE IS THE ASSOCIATED POWER CONTACTOR FAILED CLOSED. LOSS OF AN ESSENTIAL BUS (REQUIRES FOUR FAILURES) RESULTS IN LOSS OF THE ASSOCIATED FUEL CELL COOLANT PUMP AS WELL AS CONTROL OF THAT FUEL CELL'S REACTANT VALVES. THIS NECESSITATES REMOVAL OF ALL LOAD FROM THE FUEL CELL IN ORDER TO RENDER IT SAFE. INABILITY TO REMOVE THE BUS LOAD FROM THE FUEL CELL UNDER THESE CIRCUMSTANCES, 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