FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER: 05-6-2279 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 2 07/26/99

PART DATA

	PART NAME / **VENDOR NAME**	**PART NUMBER** / **VENDOR NUMBER**
LRU	: MDCA 1	VO70-764200
LRU	: MDCA 2	VO70-764220
SRU	: FUSE	ME451-0009-1005

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
FUSE, 10 AMP - ESSENTIAL BUS PANEL POWER

REFERENCE DESIGNATORS: 40V76A31F10
40V76A32F10

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
PROVIDES CIRCUIT PROTECTION FOR ESSENTIAL BUSES 1BC AND 2CA IN PANELS O13 AND R15.

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 05-6-2279- 01

REVISION#: 1 07/26/99
SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
LRU: MDCA 1, 2 **CRITICALITY OF THIS**
ITEM NAME: FUSE **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:
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 ONE ESSENTIAL BUS FEEDER TO PANELS O13 AND R15.

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(B) INTERFACING SUBSYSTEM(S):
LOSS OF REDUNDANCY FOR AUDIO CONTROL CENTER, CRYO TANK PRESSURE CONTROL AND QUANTITY, MASTER TIMING UNIT (MTU), CAUTION AND WARNING ELECTRONICS (CWE) UNIT, REDUNDANT CONTROL OF ONE MAIN DC BUS, AND LOSS OF ONE AC BUS SENSOR.

(C) MISSION:
LOSS OF ONE OF THE POWER SOURCES TO THE CWE UNIT MAY RESULT IN LOSS OF MISSION.

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT - FIRST FAILURE. REDUNDANT ESSENTIAL BUS FEEDER PROVIDES POWER.

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE AFTER THE SECOND FAILURE: LOSS OF AN ESSENTIAL BUS (1BC IN MDA 1 OR 2CA IN MDA 2) WHICH PROVIDED THE REDUNDANT ESSENTIAL POWER SOURCE RESULTING IN THE LOSS OF ALL CAUTION AND WARNING AURAL AND VISUAL ALARMS. THE ESSENTIAL BUS FAILURE WILL SIMULTANEOUSLY INTERRUPT FUEL CELL COOLANT PUMP OPERATION, CREATING A TIME CRITICAL EMERGENCY CONDITION. THE CREW MUST TAKE REMEDIAL ACTION WITHIN 9 MINUTES OF ESSENTIAL BUS FAILURE TO AVOID A FUEL CELL EXPLOSION WHICH COULD CAUSE LOSS OF CREW/VEHICLE.

DESIGN CRITICALITY (PRIOR TO DOWNGRADE, DESCRIBED IN (F)): 1R2

(F) RATIONALE FOR CRITICALITY DOWNGRADE:
THE DESIGN CRITICALITY OF 1R2 HAS BEEN DOWNGRADED TO 1R3 AFTER WORKAROUNDS CONSIDERATION (ALLOWED PER CR S050107W) BECAUSE AFTER THE FIRST FAILURE, THE CREW WOULD INSTALL THE CAUTION AND WARNING POWER SOURCE INFLIGHT MAINTENANCE CABLES TO RESTORE CAUTION AND WARNING REDUNDANCY.

- APPROVALS -

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