

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER: 05-6-2188 -X**

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

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: MDCA 1	V070-764200
LRU	: MDCA 2	V070-764220
LRU	: MDCA 3	V070-764230
SRU	: DIODE	JANTX1N1188R

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, ISOLATION, 35 AMP - MAIN DC BUS TO ESSENTIAL BUS ISOLATION

REFERENCE DESIGNATORS: 40V76A31CR2
40V76A31CR3
40V76A32CR2
40V76A32CR3
40V76A33CR2
40V76A33CR3

QUANTITY OF LIKE ITEMS: 6
SIX REQUIRED - ONE PER MAIN BUS POWER CIRCUIT

FUNCTION:
ISOLATES EACH MAIN DC BUS FEEDER TO THE ESSENTIAL BUS FROM THE OTHER
POWER SOURCES OF THE ESSENTIAL BUS.

FAILURE MODES EFFECTS ANALYSIS FMEA - NON-CIL FAILURE MODE

NUMBER: 05-6-2186-01

REVISION#: 1 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL

LRU: MDCA 1, 2, 3

CRITICALITY OF THIS

ITEM NAME: DIODE

FAILURE MODE: 1R3

FAILURE MODE:

OPENS, FAILS TO CONDUCT, SHORT TO STRUCTURE (GROUND)

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 (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, 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 DURING FLIGHT (LOSS OF LAST ESSENTIAL BUS SOURCE, POWER CONTACTOR, REDUNDANT REACTANT VALVE CLOSURE).

C)

- FAILURE EFFECTS -**(A) SUBSYSTEM:**

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
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LOSS OF ONE OF THREE SOURCES TO AN ESSENTIAL BUS (ONE MAIN DC BUS SOURCE).

(B) INTERFACING SUBSYSTEM(S):

FIRST FAILURE - NO EFFECT. TWO OTHER FAILURES (LOSS OF OTHER MAIN DC BUS FEED AND FUEL CELL FEED) ARE REQUIRED BEFORE ESSENTIAL BUS POWER IS LOST.

(C) MISSION:

SAME AS (B)

(D) CREW, VEHICLE, AND ELEMENT(S):

SAME AS (B)

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF CREW/VEHICLE AFTER FIFTH FAILURE (ASSOCIATED POWER CONTACTOR FAILED CLOSED) DUE TO INABILITY TO "SAFE" A FUEL CELL. LOSS OF AN ESSENTIAL BUS (REQUIRES THREE FAILURES) RESULTS IN LOSS OF THE ASSOCIATED FUEL CELL COOLANT PUMP AS WELL AS REDUNDANT 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 REDUNDANTLY CLOSE REACTANT VALVES OR 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
TECHNICAL APPROVAL

: BNA
: VIA APPROVAL FORM

: J. Komura 7-26-99
: 98-CIL-025_05-6