FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER: 05-6-2263 -X

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

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	: PANEL O14	V070-730299
LRU	: PANEL O15	V070-730300
LRU	: PANEL O16	V070-730301
SRU	: CIRCUIT BREAKER	MC454-0026-2050

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
BREAKER, CIRCUIT, 5 AMP - MAIN DC BUS A(B, C) CONTROL

REFERENCE DESIGNATORS: 33V73A14CB38
33V73A15CB36
33V73A16CB30

QUANTITY OF LIKE ITEMS: 3
THREE, ONE/MN DC BUS CONTROL A, B, C

FUNCTION:
PROVIDES OVERLOAD PROTECTION FOR REDUNDANT POWER USED IN THE CONTROL OF CONNECTING FUEL CELL 1 (2, 3) TO OR DISCONNECTING FUEL CELL 1 (2, 3) FROM MAIN DC BUS A (B, C) AND FOR MAIN DC BUS TIE FUNCTION, PAYLOAD PRIMARY POWER (FUEL CELL 3 AND MAIN BUS B AND C), AND AFT PAYLOAD POWER (MAIN DC BUS B AND C) FUNCTIONS.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE
NUMBER: 05-6-2263- 01

REVISION#: 1 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
LRU: PANEL O14 **CRITICALITY OF THIS**
ITEM NAME: CIRCUIT BREAKER **FAILURE MODE:** 1R3

FAILURE MODE:
OPEN, FAILS OPEN, INADVERTENTLY OPENS

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 SHOCK, VIBRATION, THERMAL STRESS
CONTAMINATION, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN

A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)

B)
"B" SCREEN FAILS BECAUSE CIRCUIT BREAKER STATUS NOT INSTRUMENTED.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF REDUNDANCY FOR FUEL CELL/MAIN DC BUS CONTROL

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(B) INTERFACING SUBSYSTEM(S):
LOSS OF REDUNDANCY (ABILITY TO REMOVE MAIN DC BUS LOADS FROM FUEL CELL) FOR SAFING FUEL CELL.

(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 (LOSS OF ASSOCIATED ESSENTIAL BUS) - POSSIBLE LOSS OF CREW/VEHICLE DUE TO INABILITY TO SAFE THE FUEL CELL. LOSS OF THE ASSOCIATED ESSENTIAL BUS 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 LOADS 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.

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX D, ITEM NO. 1 - CIRCUIT BREAKER

(B) TEST:
REFER TO APPENDIX D, ITEM NO. 1 - CIRCUIT BREAKER

GROUND TURNAROUND TEST
ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:
REFER TO APPENDIX D, ITEM NO. 1 - CIRCUIT BREAKER

(D) FAILURE HISTORY:

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CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATA BASE.

(E) OPERATIONAL USE:
NONE

- APPROVALS -

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