

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER: 05-6-2387A -X**

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL

REVISION: 1 02/06/95

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: MID PCA 1	V070-764400
LRU	: MID PCA 2	V070-764430
LRU	: MID PCA 3	V070-764450
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-1075
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-2075
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-3075
SRU	: CONTROLLER, REMOTE POWER	MC450-0017-4075

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
CONTROLLER, REMOTE POWER, 7.5 AMP - FUEL CELL/MAIN BUS "OFF" GSE CONTROL

REFERENCE DESIGNATORS: 40V76A25RPC6
40V76A26RPC6
40V76A27RPC6

QUANTITY OF LIKE ITEMS: 3
THREE - ONE PER MID PCA

FUNCTION:
UPON COMMAND FROM A GSE CONTROLLED MULTIPLEXER/DEMULTIPLEXER (MDM), THE RPC CONNECTS PREFLIGHT TEST BUS POWER TO THE ASSOCIATED MOTOR SWITCH FOR OPENING THE FUEL CELL TO MAIN DC BUS POWER CONTACTOR.

FAILURE MODES EFFECTS ANALYSIS FMEA – NON-CIL FAILURE MODE

NUMBER: 05-6-2387A- 01

REVISION#: 1 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL

LRU: MID PCA 1

CRITICALITY OF THIS

ITEM NAME: CONTROLLER, REMOTE POWER

FAILURE MODE: 1R3

FAILURE MODE:

LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON"

MISSION PHASE: PL PRE-LAUNCH

VEHICLE/PAYLOAD/KIT EFFECTIVITY:	102	COLUMBIA
	103	DISCOVERY
	104	ATLANTIS
	105	ENDEAVOUR

CAUSE:

PIECE PART FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, 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 IN FLIGHT.

C)

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

LOSS OF REDUNDANCY. DURING PRELAUNCH THE ASSOCIATED FUEL CELL TO MAIN DC BUS POWER CONTACTOR CANNOT BE OPENED USING THE GSE MDM COMMAND.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
NUMBER: 05-6-2387A-01

(B) INTERFACING SUBSYSTEM(S):
 SAME AS (A)

(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 DUE TO INABILITY TO "SAFE" A FUEL CELL VIA THE
 FOLLOWING SCENARIO:

- (1) RPC FAILED "OFF"
- (2) THE ASSOCIATED FUEL CELL TO MAIN DC BUS SWITCH FAILED OPEN RESULTS IN
 LOSS OF ALL POWER CONTACTOR OPEN CONTROL.
- (3) LOSS OF REDUNDANT REACTANT VALVE CLOSURE CAPABILITY.
- (4) LOSS OF THE ASSOCIATED ESSENTIAL BUS 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	: <u>J. Kimura 7-26-99</u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-5