

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
NUMBER: 05-6MA-2100 -X

SUBSYSTEM NAME: EPD&C - ELEC PWR GENERATION:FUEL CELL (04-1A)
REVISION: 0 04/16/96

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: PANEL O14	V070-730394
LRU	: PANEL O15	V070-730395
LRU	: PANEL O16	V070-730396
SRU	: RESISTOR	RWR80S1211FR

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
RESISTOR, CURRENT LIMITING (1.2 K, 2W) - FCP NO. 1, 2 AND 3 CONTROL POWER.

REFERENCE DESIGNATORS: 33V73A14A6R1
 33V73A15A5R1
 33V73A15A6R1

QUANTITY OF LIKE ITEMS: 3
THREE, 1/FCP CONTROL POWER CIRCUIT

FUNCTION:
PROVIDES CURRENT LIMITING/CIRCUIT PROTECTION FOR THE CONTROL POWER
ENERGIZING CIRCUIT FROM AN ESS BUS TO THE ASSOCIATED FUEL CELL POWER
PLANT (FCP) CONTROL POWER CIRCUIT.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-6MA-2100-01

REVISION#: 0 04/16/96

SUBSYSTEM NAME: EPD&C - ELEC PWR GENERATION:FUEL CELL (04-1A)

LRU: PANEL O14, O15, & O16

CRITICALITY OF THIS

ITEM NAME: RESISTOR

FAILURE MODE: 1R2

FAILURE MODE:

OPEN

MISSION PHASE: LO LIFT-OFF

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

CAUSE:

STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

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 ASSOCIATED FUEL CELL CONTROL POWER

(B) INTERFACING SUBSYSTEM(S):

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LOSS OF POWER TO COOLANT PUMP AND H2 PUMP LEADING TO FCP OVERHEATING/
FLOODING AND OUTPUT VOLTAGE DEGRADATION. TIME CRITICAL

(C) MISSION:

NO EFFECT - MINIMUM DURATION FLIGHT. LOSS OF FUEL CELL REDUNDANCY
(CAPABILITY EXISTS FOR SAFE RETURN ON ONE OF THREE FCP).

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

FIRST FCP LOSS NO EFFECT - SECOND FCP SHUTDOWN DURING ASCENT LOSES
CRITICAL FUNCTIONS AND MAY RESULT IN CREW/VEHICLE LOSS. FAILURE TO REMOVE
LOAD FROM AFFECTED FCP WITHIN 9 MINUTES MAY RESULT IN OVERTEMP AND
SUBSEQUENT EXTERNAL REACTANT LEAKAGE, CAUSING POSSIBLE LOSS OF
VEHICLE/CREW.

(E) FUNCTIONAL CRITICALITY EFFECTS:

FIRST FCP LOSS NO EFFECT - SECOND FCP SHUTDOWN DURING ASCENT LOSES
CRITICAL FUNCTIONS AND MAY RESULT IN CREW/VEHICLE LOSS. FAILURE TO REMOVE
LOAD FROM AFFECTED FCP WITHIN 9 MINUTES MAY RESULT IN OVERTEMP AND SUB-
SEQUENT EXTERNAL REACTANT LEAKAGE, CAUSING POSSIBLE LOSS OF
VEHICLE/CREW.

-DISPOSITION RATIONALE-

(A) DESIGN:

REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(B) TEST:

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

(C) INSPECTION:

REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(D) FAILURE HISTORY:

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. THE FAILURE HISTORY DATA PROVIDED IN
APPENDIX E IS NO LONGER BEING KEPT UP-TO-DATE.

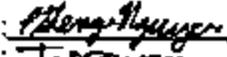
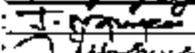
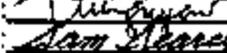
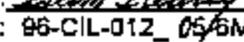
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(E) OPERATIONAL USE:

CREW ACTION REQUIRED TO SHUTDOWN AFFECTED FCP DURING FLIGHT. ONBOARD PROCEDURES MANAGE POWER FOR LOSS OF ONE FCP.

- APPROVALS -

PAE MANAGER	: P. STENGER-NGUYEN	
PRODUCT ASSURANCE ENGR	: J. NGUYEN	
DESIGN ENGINEERING	: T. D. NGUYEN	
EDITORIALLY APPROVED	: JSC	
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-012_05/6MA