

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER: M5-6MB-2076-G -X

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

REVISION: 9 09/09/92

PART DATA

PART NAME	PART NUMBER
VENDOR NAME	VENDOR NUMBER
LRU : PANEL R1A2	V070-730276
SRU : RESISTOR	RWR80S1211FR

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

RESISTOR, CURRENT LIMIT, 1.2K OHM, 2 WATT - FUEL CELL POWER PLANT (FCP) 1, 2, AND 3 REACTANT SUPPLY CONTROL

REFERENCE DESIGNATORS: 32V73A1A2A1R1
 32V73A1A2A1R5
 32V73A1A2A1R11
 32V73A1A2A1R14
 32V73A1A2A2R10
 32V73A1A2A2R32

QUANTITY OF LIKE ITEMS: 6
 SIX

FUNCTION:

PROVIDES CURRENT LIMITING PROTECTION FOR THE CONTROL CIRCUITRY OF FCP'S 1, 2, AND 3 REACTANT SUPPLY VALVES.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
 NUMBER: M5-6MB-2076-G-01

REVISION# 9 09/09/92

SUBSYSTEM: ELECTRICAL POWER GENERATION - CRYO, GENERIC
 LRU PANEL R1A2
 ITEM NAME: RESISTOR
 CRITICALITY OF THIS
 FAILURE MODE: 1R3

FAILURE MODE:
 OPEN

MISSION PHASE:

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), ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
 B) FAIL
 C) PASS

PASS/FAIL RATIONALE:

A)

B)

FAILURE MODE IS NOT DETECTABLE DURING FLIGHT SINCE ASSOCIATED VALVES ARE NORMALLY OPEN.

C)

 - FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF ABILITY TO COMMAND ASSOCIATED DRIVERS

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(B) INTERFACING SUBSYSTEM(S):
LOSS OF INTERFACE FUNCTION - LOSS OF ABILITY TO OPERATE (CLOSE OR OPEN) ASSOCIATED O2 AND H2 FCP SUPPLY VALVES. POSSIBLE INABILITY TO SHUT REACTANTS TO ONE FCP IN THE EVENT OF A CRITICAL INTERNAL FAILURE

(C) MISSION:
NO EFFECT - FIRST FAILURE

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT - FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE FOLLOWING SCENARIO: 1) CURRENT LIMITING RESISTOR FAILS OPEN - LOSS OF ABILITY TO OPERATE (OPEN OR CLOSE) ASSOCIATED LO2 AND LH2 FCP SUPPLY VALVES, 2) FCP REACTANT CROSSOVER (REF. CIL 04-1A-0101-09) OR EXTERNAL LEAKAGE OF REACTANTS (REF. CIL 04-1A-0101-09) OCCURRING IN THE ASSOCIATED FUEL CELL, AND 3) REDUNDANT VALVE CLOSURE CIRCUIT FAILS TO OPERATE.

- DISPOSITION RATIONALE -

(A) DESIGN:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(B) TEST:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

GROUND TURNAROUND TEST
CIRCUIT IS FUNCTIONALLY VERIFIED DURING FUEL CELL REACTANT VALVE TEST EVENT TURNAROUND.

(C) INSPECTION:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(D) FAILURE HISTORY:
REFER TO APPENDIX E, ITEM NO. 3 - RESISTOR

(E) OPERATIONAL USE:
NO CREW ACTION AFTER FIRST FAILURE.

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- APPROVALS -

PRODUCT ASSURANCE MGR	:	T. J. EAVENSON	:	<u>T. J. Eavenson 9/16/92</u>
PRODUCT ASSURANCE ENG	:	T. K. KIMURA	:	<u>T. K. Kimura 9/14/92</u>
DESIGN ENG TEAM LEADER	:	G. M. ANDERSON	:	<u>G. M. Anderson 9-15-92</u>
DESIGN ENGINEERING	:	T. D. NGUYEN	:	<u>T. D. Nguyen 9/15/92</u>
NASA RELIABILITY	:		:	<u>mmg 12/16/92</u>
NASA SUBSYSTEM MANAGER	:		:	<u>Reviewed by Thomas 12/16/92</u>
NASA EPD&C RELIABILITY	:		:	<u>Wainwright Corp For S. Woodard 12/14/92</u>
NASA QUALITY ASSURANCE	:		:	<u>HE KO 12/14/92</u>
NASA EPD&C SUBSYS MGR	:		:	<u>Thomas 12/14/92</u>