

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE  
NUMBER: M5-6MB-2252-G-X

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC  
REVISION : 9 09/09/92

	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	: DIODE	JANTXV1N4246

- PART DATA -

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

DIODE, ISOLATION, 1 AMP - FUEL CELL POWER PLANT (FCP) 1, 2, AND 3 REACTANT SUPPLY CONTROL - CLOSE COMMAND

REFERENCE DESIGNATORS: 40V76A25A1CR36  
: 40V76A25A1CR38  
: 40V76A26A1CR36  
: 40V76A26A1CR38  
: 40V76A27A1CR20  
: 40V76A27A1CR22

QUANTITY OF LIKE ITEMS: 6  
SIX, TWO PER FCP REACTANT VALVE CIRCUIT

FUNCTION:

PROVIDES CIRCUIT ISOLATION FROM CREW INITIATED TOGGLE SWITCH COMMANDS AND CONDUCTS GROUND COMMANDS CONTROLLING FUEL CELLS 1, 2, AND 3 REACTANT SUPPLY VALVES TO CLOSE.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE  
 NUMBER: M5-6MB-2252-G-02

SUBSYSTEM: ELECTRICAL POWER GENERATION - CRYO, GENERIC  
 LRU MID PCA 1  
 ITEM NAME: DIODE

REVISION# 9 09/09/92  
 CRITICALITY OF THIS  
 FAILURE MODE: 1R3

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FAILURE MODE:  
 SHORT (END TO END)

MISSION PHASE:  
 PL PRELAUNCH  
 LO LIFT-OFF  
 OO ON-ORBIT  
 DO DE-ORBIT  
 LS LANDING SAFING

VEHICLE/PAYLOAD/KIT EFFECTIVITY:	102	COLUMBIA
	:	103
	:	104
	:	105
		DISCOVERY
		ATLANTIS
		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) FAIL  
 C) PASS

PASS/FAIL RATIONALE:

A)  
 B)  
 REDUNDANCY SCREEN "B" FAILS BECAUSE FIRST DIODE FAILURE IS NOT DETECTABLE.  
 C)

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- FAILURE EFFECTS -  
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(A) SUBSYSTEM:  
NO EFFECT - FIRST FAILURE

(B) INTERFACING SUBSYSTEM(S):  
NO EFFECT - FIRST 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) ISOLATION DIODE FAILS SHORTED, 2) SHORT UPSTREAM OF DIODE, 3) FCP REACTA  
CROSSOVER (REF. CIL 04-1A-0101-09) OR EXTERNAL LEAKAGE OF REACTANTS (REF. C  
04-1A-0101-04) OCCURRING IN THE ASSOCIATED FUEL CELL, AND 4) REDUNDANT VAL  
CLOSURE CIRCUIT FAILS TO OPERATE.

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- DISPOSITION RATIONALE -  
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(A) DESIGN:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE

(B) TEST:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE

GROUND TURNAROUND TEST  
NONE

(C) INSPECTION:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE

(D) FAILURE HISTORY:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE

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

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 - APPROVALS -  
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PRODUCT ASSURANCE MGR	:	T. J. EAVENSON	:	<u>T. J. Eavenson 9/10/92</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>W. P. ... 12/16/92</u>
NASA SUBSYSTEM MANAGER	:		:	<u>Frank ... 12/16/92</u>
NASA EPD&C RELIABILITY	:		:	<u>... 12/16/92</u>
NASA QUALITY ASSURANCE	:		:	<u>... 14/09/92</u>
NASA EPD&C SUBSYS MGR	:		:	<u>...</u>