

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE**

NUMBER: M5-6MB-2266-G -X

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

REVISION: 9 09/09/92

**PART DATA**

	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: MID PCA 1	V070-764400
LRU	: MID PCA 2	V070-764430
SRU	: DIODE	JANTXV1N4246

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

DIODE, ISOLATION, 1 AMP - H2 MANIFOLD 1 AND 2 ISOLATION VALVES, CLOSE POSITION

REFERENCE DESIGNATORS: 40V76A25A1CR27  
 40V76A25A1CR29  
 40V76A26A1CR27  
 40V76A26A1CR29

QUANTITY OF LIKE ITEMS: 4  
 FOUR, TWO PER H2 MANIFOLD VALVE CIRCUIT

**FUNCTION:**

PROVIDES CIRCUIT ISOLATION FROM GROUND COMMANDS AND CONDUCTS CREW INITIATED TOGGLE SWITCH COMMANDS CONTROLLING CLOSING OF THE H2 MANIFOLD 1 AND 2 ISOLATION VALVES.

## FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: M5-6MB-2266-G- 01

REVISION#: 8 04/16/96

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

LRU: MID PCA 1

CRITICALITY OF THIS

ITEM NAME: DIODE

FAILURE MODE: 1R2

## FAILURE MODE:

OPEN, FAILS TO CONDUCT

## MISSION PHASE:

LO LIFT-OFF  
DO DE-ORBIT

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)

REDUNDANCY SCREEN "B" FAILS EVEN THOUGH THE FAILURE OF THIS DIODE IS  
DETECTABLE BECAUSE THE TIME FOR CORRECTIVE ACTION (ELECTRICAL LOAD  
RECONFIGURATION) EXCEEDS THE TIME TO EFFECT (MANIFOLD GROSS EXTERNAL  
LEAK STARVES TWO FCP'S DURING ASCENT/DESCENT).

C)

## - FAILURE EFFECTS -

## (A) SUBSYSTEM:

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LOSS OF FUNCTION - NO EFFECT UNLESS FAILURE IN ASSOCIATED PLUMBING REQUIRES ISOLATION OF SUBASSEMBLY. INABILITY TO CLOSE VALVE FOLLOWING GROSS EXTERNAL LEAKAGE WOULD DEGRADE OR PRECLUDE TWO FUEL CELL POWER PLANT (FCP) OPERATIONS.

**(B) INTERFACING SUBSYSTEM(S):**

SAME AS (A)

**(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) DIODE FAILS OPEN (LOSE ABILITY TO CLOSE MANIFOLD VALVE), AND 2) GROSS EXTERNAL LEAK STARVES TWO FCP'S (LOSS OF TWO FCP'S DURING ASCENT LOSES CREW/VEHICLE. LOSS OF A SECOND FCP DURING DESCENT LOSES CREW/VEHICLE IF INSUFFICIENT TIME IS AVAILABLE FOR AN ELECTRICAL LOAD RECONFIGURATION RESULTING IN THE INABILITY OF THE SINGLE REMAINING FUEL CELL TO SUPPLY ADEQUATE ELECTRICAL POWER.)

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

REFER TO APPENDIX F, ITEM NO. 3 - DIODE

**(B) TEST:**

GROUND TURNAROUND TEST

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD. THE OMRSD DATA PROVIDED BELOW IS NO LONGER BEING KEPT UP-TO-DATE. IF THERE IS ANY DISCREPANCY BETWEEN THE GROUND TESTING DATA PROVIDED BELOW AND THE OMRSD, THE OMRSD IS THE MORE ACCURATE SOURCE OF THE DATA.

CIRCUIT IS FUNCTIONALLY VERIFIED IN FLIGHT. PERFORM GROUND TURNAROUND TEST WHEN VALID VERIFICATION IS UNOBTAINABLE IN FLIGHT OR AFTER LRU REPLACEMENT.

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

(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 F IS NO LONGER BEING KEPT UP-TO-DATE.

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

- APPROVALS -

PAE MANAGER	: P. STENGER-NGUYEN	: <u><i>P. Stenger-Nguyen</i></u>
PRODUCT ASSURANCE ENGR	: J. NGUYEN	: <u><i>J. Nguyen</i></u>
DESIGN ENGINEERING	: T. D. NGUYEN	: <u><i>T. D. Nguyen</i></u>
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