

## FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER: M5-6MB-2280-G -X

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

REVISION: 9 09/09/92

## PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
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 - O2 MANIFOLD 1 AND 2 ISOLATION VALVES, CLOSE POSITION

REFERENCE DESIGNATORS: 40V76A25A1CR20  
 40V76A25A1CR22  
 40V76A26A1CR20  
 40V76A26A1CR22

QUANTITY OF LIKE ITEMS: 4  
 FOUR, TWO PER O2 MANIFOLD VALVE CIRCUIT

## FUNCTION:

PROVIDES CIRCUIT ISOLATION FROM CREW INITIATED COMMANDS AND CONDUCTS GROUND INITIATED COMMANDS CONTROLLING CLOSING OF THE O2 MANIFOLD 1 AND 2 ISOLATION VALVES.

**FAILURE MODES EFFECTS ANALYSIS FMEA – CIL FAILURE MODE**

**NUMBER: M5-6MB-2260-G- 02**

**REVISION#: 9 04/16/96**

**SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC**

**LRU: MID PCA 1**

**CRITICALITY OF THIS**

**ITEM NAME: DIODE**

**FAILURE MODE: 1R3**

**FAILURE MODE:  
SHORT (END TO END)**

**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), 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)**

**FAILS "B" SCREEN BECAUSE COMMAND AND MONITOR CIRCUIT UPSTREAM OF DIODE IS NOT ACTIVE DURING FLIGHT (GROUND FUNCTION ONLY).**

**C)**

**- FAILURE EFFECTS -**

**(A) SUBSYSTEM:**

**LOSS OF FUNCTION - NO EFFECT UNLESS FAILURE IN ASSOCIATED PLUMBING REQUIRES ISOLATION OF SUBASSEMBLY. INABILITY TO CLOSE VALVE FOLLOWING**

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE  
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GROSS EXTERNAL LEAKAGE WOULD DEGRADE OR PRECLUDE OPERATION OF TWO FUEL CELL POWER PLANTS (FCP'S).

**(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 SHORTS, 2) SHORT UPSTREAM OF DIODE, 3) GROSS EXTERNAL LEAK STARVES TWO FCP'S (LOSS OF TWO FCP'S DURING ASCENT OR DESCENT 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.

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

**(D) FAILURE HISTORY:**

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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>
EDITORIALLY APPROVED	: JSC	: <u><i>Jim O'Searcy</i></u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-012_M5/6MB