

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE**NUMBER: M5-5MB-2259-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	: 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 - OPEN POSITION

REFERENCE DESIGNATORS: 40V76A25A1CR16
 40V76A25A1CR18
 40V76A26A1CR15
 40V76A26A1CR17

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 OPENING OF THE O2 MANIFOLD 1 AND 2 ISOLATION VALVES.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: M5-6MB-2259-G-02

REVISION#: 10 08/09/96

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

LRU: MID PCA 1

CRITICALITY OF THIS

ITEM NAME: DIODE

FAILURE MODE: 2R3

FAILURE MODE:

SHORT (END TO END)

MISSION PHASE:

LO LIFT-OFF
OO ON-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)

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

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF ISOLATION FOR THE GROUND MDM FROM THE O2 MANIFOLD SWITCH "OPEN"
COMMAND.

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(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 EARLY MISSION TERMINATION DUE TO THE FOLLOWING SCENARIO: 1) DIODE SHORTS (NO EFFECT), AND 2) SHORT UPSTREAM OF DIODE (RESULTS IN LOSS OF CAPABILITY TO OPEN AFFECTED MANIFOLD VALVE) - AFFECTED O2 MANIFOLD VALVE FAILS CLOSED RESULTING IN ONE TANK BEING ISOLATED TO A SINGLE FUEL CELL. MISSION TERMINATED WHEN THE OXYGEN IN THAT TANK IS CONSUMED.

DESIGN CRITICALITY (PRIOR TO DOWNGRADE, DESCRIBED IN (F)): 1R3

(F) RATIONALE FOR CRITICALITY DOWNGRADE:
MANIFOLD OVERPRESSURE DUE TO TRAPPED CRYOGENIC FLUID IS NOT CREDIBLE. THEREFORE, WORSE FUNCTIONAL EFFECT IS LOSS OF MISSION.

-DISPOSITION RATIONALE-

(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

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

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

- APPROVALS -

EDITORIALLY APPROVED : RI
EDITORIALLY APPROVED : JSC
TECHNICAL APPROVAL : VIA JSC

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