

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE

NUMBER: M5-6MB-2031-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	: SWITCH, TOGGLE	ME452-0102-7205

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

SWITCH, TOGGLE, 2P3P, MOMENTARY - H2 MANIFOLD VALVES 1 AND 2

REFERENCE DESIGNATORS: 32V73A1A2S3
32V73A1A2S6

QUANTITY OF LIKE ITEMS: 2
TWO, ONE PER H2 MANIFOLD VALVE CIRCUIT

FUNCTION:

PROVIDES CREW WITH CAPABILITY TO MANUALLY "OPEN" OR "CLOSE" H2 MANIFOLD VALVES 1 AND 2.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: M5-6MB-2031-G-02

REVISION#: 9 04/16/96

SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC

LRU: PANEL R1A2

CRITICALITY OF THIS

ITEM NAME: SWITCH, TOGGLE

FAILURE MODE: 2/2

FAILURE MODE:

FAILS CLOSED ON VALVE "CLOSING" SIDE, FAILS OPEN ON VALVE "OPENING" SIDE

MISSION PHASE: OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY:	102	COLUMBIA
	103	DISCOVERY
	104	ATLANTIS
	105	ENDEAVOUR

CAUSE:

PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN	A) N/A
	B) N/A
	C) N/A

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF ABILITY TO OPEN AFFECTED MANIFOLD VALVE AFTER INADVERTENT OR COMMANDED VALVE CLOSURE.

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(B) INTERFACING SUBSYSTEM(S):
SAME AS (A)

(C) MISSION:

(CRIT 2/2) POSSIBLE LOSS OF MISSION - LOSS OF ABILITY TO OPEN ASSOCIATED MANIFOLD VALVE DUE TO ASSOCIATED MANIFOLD VALVE SWITCH FAILING CLOSED RESULTING IN ONE TANK BEING ISOLATED TO A SINGLE FUEL CELL. MISSION TERMINATED WHEN THE HYDROGEN IN THAT TANK IS CONSUMED.

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

(E) FUNCTIONAL CRITICALITY EFFECTS:

(CRIT 2/2) POSSIBLE LOSS OF MISSION - LOSS OF ABILITY TO OPEN ASSOCIATED MANIFOLD VALVE DUE TO ASSOCIATED MANIFOLD VALVE SWITCH FAILING CLOSED RESULTING IN ONE TANK BEING ISOLATED TO A SINGLE FUEL CELL. MISSION TERMINATED WHEN THE HYDROGEN IN THAT TANK IS CONSUMED.

-DISPOSITION RATIONALE-

(A) DESIGN:

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

(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.

SWITCH OPERATION IS VERIFIED DURING FLIGHT. PERFORM GROUND TURNAROUND TEST WHEN VALID VERIFICATION IS UNOBTAINABLE IN FLIGHT OR AFTER LRU REPLACEMENT.

(C) INSPECTION:

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

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

(E) OPERATIONAL USE:

CREW WOULD ATTEMPT TO REDISTRIBUTE LOAD TO THE OTHER FUEL CELLS TO EXTEND THE TIME ON-ORBIT.

 - APPROVALS -

PAE MANAGER	: P. STENGER-NGUYEN	: <i>P. Stenger-Nguyen</i>
PRODUCT ASSURANCE ENGR	: J. NGUYEN	: <i>J. Nguyen</i>
DESIGN ENGINEERING	: T. D. NGUYEN	: <i>T. D. Nguyen</i>
EDITORIALLY APPROVED	: JSC	: <i>J. Stacey</i>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-012_M5-6MB