

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE

NUMBER: M5-6MB-2030-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 - O2 MANIFOLD VALVES 1 AND 2

REFERENCE DESIGNATORS: 32V73A1A2S2
32V73A1A2S5

QUANTITY OF LIKE ITEMS: 2
TWO, ONE PER O2 MANIFOLD VALVE CIRCUIT

FUNCTION:

PROVIDES THE CREW WITH THE CAPABILITY TO MANUALLY "OPEN" OR "CLOSE" O2
MANIFOLD VALVES 1 AND 2.

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SUBSYSTEM: ELECTRICAL POWER GENERATION - CRYO, GENERIC
 LRU PANEL R1A2
 ITEM NAME: SWITCH, TOGGLE
 CRITICALITY OF THIS
 FAILURE MODE: 1R2

FAILURE MODE:

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

MISSION PHASE:

LO LIFT-OFF
 OO ON-ORBIT
 DO DE-ORBIT
 LS LANDING SAFING

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) PASS
 B) PASS
 C) PASS

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

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

(B) INTERFACING SUBSYSTEM(S):

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

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

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
(CRIT 1R2) POSSIBLE LOSS OF CREW/VEHICLE AFTER ONE OTHER FAILURE (ASSOCIATED O2 TANK CHECK VALVE FAILS CLOSED) RESULTING IN INSUFFICIENT OXYGEN FLOW FOR THE ASTRONAUTS' LAUNCH/ENTRY (LES) SUITS.

- DISPOSITION RATIONALE -

(A) DESIGN:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

(B) TEST:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

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

(E) OPERATIONAL USE:
CREW WILL REMOVE ASSOCIATED TANK FROM PAIRED HEATER OPERATION.

- APPROVALS -

PRODUCT ASSURANCE MGR	:	T. J. EAVENSON	:	<i>T. J. Eavenson 9/10/92</i>
PRODUCT ASSURANCE ENG	:	T. K. KIMURA	:	<i>T. K. Kimura 9/14/92</i>
DESIGN ENG TEAM LEADER	:	G. M. ANDERSON	:	<i>G. M. Anderson 9/16/92</i>
DESIGN ENGINEERING	:	T. D. NGUYEN	:	<i>T. D. Nguyen 9/16/92</i>
NASA RELIABILITY	:		:	<i>m.m. 12/16/92</i>
NASA SUBSYSTEM MANAGER	:		:	<i>David L. ... 12/16/92</i>
NASA EPD&C RELIABILITY	:		:	<i>David L. ... 12/14/92</i>
NASA QUALITY ASSURANCE	:		:	<i>R. KO ... 12/16/92</i>
NASA EPD&C SUBSYS MGR	:		:	<i>... 14 Dec 92</i>