PRINT DATE: 05/06/96

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE
NUMBER: M5-6MB-2026-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	: PANEL R1A2	V070-730276
SRU	: SWITCH, TOGGLE	ME452-0102-7205

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, TOGGLE, 2 POLE 2 POSITION, MOMENTARY - FUEL CELL POWER PLANT (FCP) 1, 2, AND 3 REACTANT SUPPLY CONTROL

REFERENCE DESIGNATORS: 32V73A1A2S1
32V73A1A2S4
32V73A1A2S7

QUANTITY OF LIKE ITEMS: 3
THREE

FUNCTION:
PROVIDES THE CREW WITH THE CAPABILITY TO OPEN OR CLOSE THE O2 AND H2 REACTANT VALVES FOR EACH OF THE RESPECTIVE FUEL CELL POWER PLANTS 1, 2, AND 3.

FAILURE MODES EFFECTS ANALYSIS FMEA – CIL FAILURE MODE
NUMBER: M5-6MB-2026-G- 03

REVISION#: 9 04/16/95
SUBSYSTEM NAME: ELECTRICAL POWER GENERATION - CRYO, GENERIC
LRU: PANEL R1A2 CRITICALITY OF THIS
ITEM NAME: SWITCH, TOGGLE FAILURE MODE: 1R2

FAILURE MODE:
CONTACT-TO-CONTACT SHORT (2 POLES) ON THE VALVE "CLOSE" POSITION

MISSION PHASE:
LO LIFT-OFF
OO ON-ORBIT
DO DE-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? YES
RTLS RETURN TO LAUNCH SITE
TAL TRANS-ATLANTIC LANDING

REDUNDANCY SCREEN
A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
INADVERTENT COMMANDS ARE INITIATED TO CLOSE SOLENOID VALVE.

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(B) INTERFACING SUBSYSTEM(S):
CHANGE-OF-STATE OF THE INTERFACING VALVES (NORMALLY OPEN IN FLIGHT). SHUTDOWN OF REACTANT SUPPLIES TO THE ASSOCIATED FCP (LOSS OF SUBSYSTEM REDUNDANCY). CRITICALITY 1 FOR ABORT: LOSS OF FCP1/BUS "A" IS LOSS OF OMS ENGINE PURGE CAPABILITY (REQUIRED FOR TAL) AND AFT COMPARTMENT MPS HELIUM PURGE CAPABILITY (REQUIRED FOR RTLS AND TAL).

(C) MISSION:
NO EFFECT AFTER LOSS OF ONE FUEL CELL. MINIMUM DURATION FLIGHT

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF TWO FCP'S DURING ASCENT. 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.

-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.

GROUND TURNAROUND TEST
SWITCH OPERATION IS VERIFIED DURING EVERY TURNAROUND.

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

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NUMBER: M5-6MB-2026-G- 03

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

(E) OPERATIONAL USE:
CREW WILL PERFORM MAIN BUS TIE AND SHUT DOWN AFFECTED FUEL CELL.

- APPROVALS -

PRODUCT ASSURANCE MGR	: P. STENGER-NGUYEN	:
PAE MANAGER	: J. NGUYEN	:
DESIGN ENGINEERING	: T. D. NGUYEN	:
EDITORIALLY APPROVED	: JSC	:
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-012_M5-6MB