

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
 NUMBER: 05-6S-B9W3 -X

SUBSYSTEM NAME: EPD&C - DPS&C

REVISION: 0 04/12/96

 PART DATA

PART NAME	PART NUMBER
VENDOR NAME	VENDOR NUMBER
LRU : PANEL 06	VD70-730389
SRU : SWITCH, TOGGLE	ME452-0102-7201

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
 SWITCH, POWER, TOGGLE, 2P2P, "ON-OFF", MULTIPLEXER DEMULTIPLEXER (MDM)

REFERENCE DESIGNATORS: 33V73A6S20
 33V73A6S21
 33V73A6S22
 33V73A6S23
 33V73A6S24
 33V73A6S25
 33V73A6S26
 33V73A6S27
 33V73A6S28
 33V73A6S29
 33V73A6S52

QUANTITY OF LIKE ITEMS: 11
 ELEVEN ON PANEL 06.

FUNCTION:
 THE SWITCH PROVIDES CONTROL OF THE REMOTE POWER CONTROLLER(S) (RPC)
 WHICH CONNECT THE BUS VOLTAGE TO THE MDM'S (FLIGHT FORWARD (FF), FLIGHT
 AFT (FA) & PAYLOAD (PL)).

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-6S-B3W3-01

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SUBSYSTEM NAME: EPD&C - DPS&C

LRU: PANEL 06

ITEM NAME: SWITCH, TOGGLE

CRITICALITY OF THIS

FAILURE MODE: 1R2

FAILURE MODE:

FAILS OPEN, PREMATURE OPEN OR SHORTS TO CASE (GROUND). (BOTH CONTACTS)

MISSION PHASE:

- PL PRE-LAUNCH
- 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 AN MDM RESULTING FROM LOSS OF BOTH CONTROL SIGNALS TO ITS RPC'S.

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(B) INTERFACING SUBSYSTEM(S):

LOSS OF ONE-OF-FOUR FF OR ONE-OF-FOUR FA MDM'S. LOSS OF ONE-OF-TWO PAYLOAD MDM'S. REDUNDANCY AND/OR VOTING WILL PREVENT A SINGLE MDM FAILURE FROM DISRUPTING CRITICAL FUNCTIONS.

(C) MISSION:

LOSS OF MDM RESULTS IN EARLY MISSION TERMINATION DUE TO LOSS OF REDUNDANCY.

(D) CREW, VEHICLE, AND ELEMENT(S):

NO EFFECT FIRST FAILURE.

(E) FUNCTIONAL CRITICALITY EFFECTS:

CRITICALITY 1R2 BECAUSE OF THE FOLLOWING REASONS:

- (1) LOSS OF TWO PAYLOAD MDM'S RESULTS IN LOSS OF BOTH PATHS TO CLOSE PAYLOAD DOORS. CONTINGENCY EXTRA VEHICULAR ACTIVITY (EVA) WILL BE REQUIRED. REFERENCE FMEA 05-5-B03-5-1.
- (2) TWO FAILURES IN LIKE FA MDM'S WILL RESULT IN LOSS OF VEHICLE/CREW. REFERENCE FMEA 05-5-B03-1-1.
- (3) DURING IMPACT ABORT (RTL5, TAL OR AQA), CRITICALITY 1 IF UNABLE TO PURGE AFT FUSELAGE COMPARTMENTS OF POST MAIN ENGINE CUTOFF (MECO) GAS MIXTURE (BY OPENING HELIUM BLOW DOWN VALVE) RESULTING IN POSSIBLE FIRE/EXPLOSION AND MAY RESULT IN LOSS OF VEHICLE & CREW (FA3 OR FA4 MDM).

-DISPOSITION RATIONALE-

(A) DESIGN:

FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

(B) TEST:

FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

GROUND TURNAROUND TEST: ALL TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

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(C) INSPECTION:

FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

(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 DATABASE

FOR DISPOSITION AND RATIONALE, REFER TO APPENDIX A, ITEM NO. 1-TOGGLE SWITCH.

(E) OPERATIONAL USE:

FOR CONTINGENCY DEORBIT, ON THE SECOND RELATED FAILURE CAUSING LOSS OF CONTROL OF MOTORS ON THE SAME (RIGHT OR LEFT) PAYLOAD BAY DOOR, COULD PRECLUDE PROPER CLOSING/LATCHING OF THAT DOOR. OTHERWISE SECOND FAILURE CONDITION COULD RESULT IN NOT BEING ABLE TO ENTER SAFELY.

DURING NOMINAL DEORBIT, CONTINGENCY EVA OR PIN KIT IFM MAY BE USED FOR CLOSING/LATCHING DOORS.

- APPROVALS -

EDITORIALLY APPROVED

: RI

EDITORIALLY APPROVED

: JSC

TECHNICAL APPROVAL

: VIA APPROVAL FORM

[Signature]
[Signature] 5-2-96
 96-CIL-013_05,6S