

PAGE: 1

PRINT DATE: 05/17/90

## FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-6EB-2010-X

SUBSYSTEM NAME: EPD&amp;C - PAYLOAD BAY DOORS

REVISION : 2 05/16/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	PANEL R13A2	V070-730338
SRU :	SWITCH, TOGGLE	NE452-0102-7301

## PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
SWITCH, TOGGLE (3P2P) PAYLOAD BAY DOOR (PLBD) ENABLE

REFERENCE DESIGNATORS: 32V73A13A2S13  
: 32V73A13A2S14

QUANTITY OF LIKE ITEMS: 2  
TWO

FUNCTION:  
PROVIDES MANUAL SWITCHING OF POWER TO THE HYBRID RELAYS TO ENABLE THE  
OPENING AND CLOSING OF THE PAYLOAD BAY DOORS.

FAILURE MODES EFFECTS ANALYSIS (FMEA) — CRITICAL FAILURE MODE  
NUMBER: 05-6EB-2010-02

1393

SUBSYSTEM: EPD&C - PAYLOAD BAY DOORS  
LRU :PANEL R13A2  
ITEM NAME: SWITCH, TOGGLE

REVISION# 2 07/16/90 R

CRITICALITY OF THIS  
FAILURE MODE:1R2

- FAILURE MODE:  
FAILS CLOSED, PREMATURE CLOSED, CONTACT-TO-CONTACT SHORT

MISSION PHASE:

00 ON-ORBIT  
00 DE-ORBIT

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

- 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:  
FIRST FAILURE - CONTROL BUS POWER IS INADVERTENTLY CONNECTED TO RELAY.
- (B) INTERFACING SUBSYSTEM(S):  
FIRST FAILURE - NO EFFECT

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE

1394

NUMBER: 05-6EB-2010-02

- (C) MISSION:  
FIRST FAILURE - NO EFFECT
- (D) CREW, VEHICLE, AND ELEMENT(S):  
FIRST FAILURE - NO EFFECT
- (E) FUNCTIONAL CRITICALITY EFFECTS:  
POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (PREMATURE SIGNAL TO THREE RELAYS FROM BFS OR PRIMARY SM COMPUTER WHICH CAUSES PREMATURE OPENING OR CLOSING OF PLBD) DUE TO STRUCTURAL DAMAGE CAUSED BY INADVERTENT DOOR OPERATION.

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

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

GROUND TURNAROUND TEST  
 SWITCH FUNCTIONS ARE VERIFIED BY CHECKING INITIAL MCA STATUS, CYCLING THE SWITCH FROM ENABLE TO DISABLE AND BACK, AND REVERIFYING MCA STATUS AFTER EACH POSITION CHANGE. TESTS ARE PERFORMED EVERY FLIGHT AND LRU RETEST PER TABLE V37200.000.

(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:  
 OPEN AC CIRCUIT BREAKERS TO ASSOCIATED MOTOR CONTROL ASSEMBLIES ON-ORBIT (CLOSE WHEN NEEDED)

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 - APPROVALS -  
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RELIABILITY ENGINEERING: T. AI  
 DESIGN ENGINEERING : T. BANHIDY  
 QUALITY ENGINEERING : W. R. HIGGINS  
 NASA RELIABILITY :  
 NASA SUBSYSTEM MANAGER :  
 NASA QUALITY ASSURANCE :  
 NASA EPD+C SUBSYS MGR  
 NASA EPDC Reliability

*JA Nelson* 6-22-90  
*Jim Anderson*  
*W. R. Higgins*  
*W. R. Higgins* 8/23/90  
*L. Anderson* 1 AUG 20  
*L. Anderson* 20 Aug 90  
*L. D. Cogan* for S. Wadaad 8/22/90