

PAGE: 1

PRINT DATE: 05/17/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
 NUMBER: 05-6EB-2001-X

SUBSYSTEM NAME: EPD&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	ME452-0102-7356

 PART DATA

- EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
 SWITCH, TOGGLE (3P3P) - PAYLOAD BAY DOOR (PLBD) CONTROL
- REFERENCE DESIGNATORS: 32V73A13A253
- QUANTITY OF LIKE ITEMS: 1
 ONE

FUNCTION:
 PROVIDES MANUAL CONTROL FOR OPENING AND CLOSING THE PAYLOAD BAY DOORS.
 CONNECTS CONTROL BUSES POWER THRU TO THE MDM FOR ENABLING THE PAYLOAD
 BAY DOORS OPERATION.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6EB-2001-02

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

REVISION# 2 05/16/90 R

CRITICALITY OF THIS
FAILURE MODE:1R3

■ FAILURE MODE:
FAILS CLOSED, PREMATURE CLOSURE, CONTACT-TO-CONTACT SHORT (MULTIPLE CONTACT SET)

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) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)

B)
FIRST FAILURE IS NOT DETECTABLE IN FLIGHT SINCE: 1) OPERATIONAL STATUS OF THIS SWITCH IS NOT READILY AVAILABLE, AND 2) THERE WILL BE NO FUNCTIONAL EFFECT UNTIL SECOND FAILURE OCCURS AND ENERGIZES THE RELAYS.

C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
FIRST FAILURE - LOSS OF MANUAL SWITCHING CAPABILITY

1375

PAGE: 6

PRINT DATE: 05/17/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6EB-2001-02

- (B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - NO EFFECT

(C) MISSION:
FIRST FAILURE - NO EFFECT

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

- (E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF MISSION AND/OR CREW/VEHICLE THROUGH LOSS OF ALL PLBD CONTROL CAPABILITY. FAILURE TO OPEN PLBD WOULD RESULT IN LOSS OF MISSION (2R3). FAILURE TO CLOSE PLBD WOULD RESULT IN UNSAFE CONFIGURATION FOR ENTRY (1R3). REQUIRES TWO OTHER FAILURES (LOSS OF KEYBOARD COMMAND CAPABILITY FOR BOTH ASSOCIATED ACTUATOR CIRCUITS) BEFORE EFFECT IS MANIFESTED.

- DISPOSITION RATIONALE -

(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
VERIFY CONTROL BUS PATHS BY ACTIVATING ALL CONTROL BUSES, COMMANDING PAYLOAD BAY DOOR SWITCH, AND OBSERVING SWITCH SCAN DATA. 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:
USE SOFTWARE SWITCH BYPASS FOR PAYLOAD BAY DOOR OPERATIONS. EVA CAPABILITY EXISTS TO CLOSE PAYLOAD BAY DOORS AFTER MULTIPLE FAILURES.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6EB-2001-02

- APPROVALS -

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

: TB W. R. Higgins 6-22-90
: ~~W. R. Higgins~~
: ~~W. R. Higgins~~
: ~~W. R. Higgins~~
: K. M. Bakerman 8/23/90
: ~~W. R. Higgins~~ 1 AUG 90
: ~~W. R. Higgins~~ for F. Alanis 26 Aug 90
: D. C. Coy for J. Woodard 8/22/90