

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE**

NUMBER:05-6PH-24820 -X

SUBSYSTEM NAME: EPD&C - GROUND COMMAND INTERFACE LOGIC (GCIL)

REVISION: 1 08/24/97

**PART DATA**

	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	:PANEL A7A1	VO7D-730358
SRU	:TOGGLE SWITCH	ME452-0102-7201

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**

SWITCH, TV CONTROL. TOGGLE SWITCH, 2 POLE, 2 POSITION. TV CONTROL. POSITIONS ARE - CMD, PNL.

REFERENCE DESIGNATORS: 36V73A7A1S52

QUANTITY OF LIKE ITEMS: 1

ONE - 2 POLES PROVIDE DUAL REDUNDANCY

**FUNCTION:**

ENABLES GROUND (SOFTWARE) CONTROL OF THE CCTV REMOTE CONTROL UNIT POWER CIRCUITS (2) BY ENABLING THE GCIL "COMMAND" DRIVERS THAT CONTROL THOSE CIRCUITS AND DISABLING THE CORRESPONDING "PANEL" DRIVERS THAT TRANSFER THE PANEL CONTROL SIGNALS. THIS IS DONE IN THE CMD POSITION BY SENDING TWO REDUNDANT "COMMAND" DRIVER ENABLE SIGNALS TO THE GCIL.

## FAILURE MODES EFFECTS ANALYSIS FMEA - GIL FAILURE MODE

NUMBER: 05-6PH-24820-01

REVISION#: 1 08/24/97

SUBSYSTEM NAME: EPD&amp;C - GROUND COMMAND INTERFACE LOGIC (GCIL)

LRU: PANEL A7A1

CRITICALITY OF THIS

ITEM NAME: TOGGLE SWITCH

FAILURE MODE: 2/2

## FAILURE MODE:

FAILS SHORTED CASE TO GROUND. ANY TERMINAL SHORTS TO CASE (GROUND).  
CATASTROPHIC SWITCH FAILURE.

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) N/A  
B) N/A  
C) N/A

## PASS/FAIL RATIONALE:

A)

B)

C)

## REMARKS/RECOMMENDATIONS:

"CATASTROPHIC TOGGLE SWITCH FAILURE MODE" - IF A CONTAMINANT OR LOOSE  
PART MOVES AND SHORTS TO GROUND THE INPUT TERMINALS, THE TWO GCIL  
POWER CIRCUITS ARE NOT BLOWN PERMANENTLY BECAUSE THEY ARE PROTECTED  
BY CIRCUIT BREAKERS, NOT FUSES.

## FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: 05-6PH-24820-01

---

**- FAILURE EFFECTS -**

---

**(A) SUBSYSTEM:**

CATASTROPHIC SWITCH FAILURE RESULTS IN LOSS OF THE TWO REDUNDANT GCIL POWER CIRCUITS (MAIN BUS CIRCUIT BREAKERS 44, 49 OPEN), WORST CASE. GCIL DRIVERS FAIL SAFE TO THE PANEL CONTROL MODE.

**(B) INTERFACING SUBSYSTEM(S):**

COMMAND CAPABILITY LOST FOR PM, FM, TV, KU AND P/L. AFTER THIS ONE FAILURE, LOSE CAPABILITY TO POWER BOTH NSP'S BY THE GCIL "COMMAND" MODE. THE NSP'S CAN ONLY BE ACTIVATED BY THE "PANEL" MODE. ONE ADDITIONAL FAILURE (NSP ACTIVATE SWITCH) IS REQUIRED BEFORE ALL CAPABILITY IS LOST FOR ACTIVATING EITHER NSP.

**(C) MISSION:**

POSSIBLE LOSS OF MISSION DUE TO MINIMUM DURATION FLIGHT DECISION AFTER LOSS OF "COMMAND" ACTIVATION OF BOTH NSP'S.

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

NO EFFECT - FIRST FAILURE.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

AFTER LOSS OF "COMMAND" ACTIVATION OF BOTH NSP'S THE MISSION WOULD BE REDUCED TO MDF. IF THE "PANEL" ACTIVATION OF BOTH NSP FAILED, A NEXT PLS WOULD BE DECLARED.

---

**-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**

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

**(C) INSPECTION:**

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

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE  
NUMBER: 05-6PH-24820-01

(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.

(E) OPERATIONAL USE:

NONE NECESSARY. THE REDUNDANT GCIL POWER CIRCUIT AND SWITCH \*COMMAND\* DRIVER ENABLE SIGNAL PERFORM THE FUNCTION OR THE SYSTEM REVERTS TO \*PANEL\* CONTROL OF SYSTEM FUNCTIONS.

- APPROVALS -

EDITORIALLY APPROVED : BNA  
EDITORIALLY APPROVED : JSC  
TECHNICAL APPROVAL : VIA APPROVAL FORM

J. Kamura 8/24/97  
D. Arnold 9/30/97  
05-CIL-018\_05-6PH