

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

NUMBER:05-6PH-24825 -X

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

REVISION: 1 08/24/97

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	:PANEL A1A1	VO70-730348
SRU	:TOGGLE SWITCH	ME452-0102-7201

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

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

REFERENCE DESIGNATORS: 38V73A1A1S6

QUANTITY OF LIKE ITEMS: 1
ONE

FUNCTION:

ENABLES GROUND (SOFTWARE) CONTROL OF THE KU-BAND COMM SYSTEM AND TAGS BY ENABLING ALL THE GCIL "COMMAND" DRIVERS THAT CONTROL THOSE SYSTEMS AND DISABLING THE CORRESPONDING "PANEL" CONTROL DRIVERS. THIS IS DONE IN THE "CMD" POSITION BY SENDING TWO REDUNDANT "COMMAND" SIGNALS TO THE GCIL.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-6PH-24825-01

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

LRU: PANEL A1A1

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.

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- 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, 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

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(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	: <u>J. Kumura 8/24/97</u>
EDITORIALLY APPROVED	: JSC	: <u>D. Conway 9/30/97</u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	96-CIL-018_05-6PH