

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE
NUMBER: 05-6-2659 -X**

**SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 1 11/16/97**

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:PANEL F6A8 (PRE-MEDS)	V070-730259
LRU	:PANEL F6A4 (MEDS)	V070-730735
SRU	:SWITCH, PUSHBUTTON	ME452-0061-4187
SRU	:SWITCH, PUSHBUTTON	ME452-0061-7187

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, PUSHBUTTON, 4 POLE - ABORT (INITIATE) SWITCH**

REFERENCE DESIGNATORS: 34V73A6A8S2 (PRE-MEDS)
34V73A6A4S5 (MEDS CONFIGURATION)

**QUANTITY OF LIKE ITEMS: 1
ONE**

FUNCTION:

UNIQUE TO INTACT ABORT, PUSHBUTTON SWITCH IS USED TO INITIATE ABORT COMMAND VOLTAGES THROUGH ITS MULTIPLE POLES TO THE ABORT MODE SELECT ROTARY SWITCH IN SERIES. TWO OF THREE POLES (FOURTH POLE IS NOT CONNECTED) ARE REQUIRED TO INITIATE ABORT FUNCTION. THE PUSHBUTTON AND ROTARY SWITCHES CAN BE USED TO INITIATE RTL5, TAL, AND ATO ABORTS.

THIS SWITCH IS ALSO USED IN CONJUNCTION WITH THE ABORT MODE SELECT ROTARY SWITCH TO ENGAGE "BAILOUT" SOFTWARE DURING CONTINGENCY ABORTS BY PLACING THE ROTARY SWITCH IN THE "ATO" POSITION AND DEPRESSING THE PUSHBUTTON SWITCH. THIS IS THE ONLY METHOD OF ENGAGING THE "BAILOUT" SOFTWARE AND IS ACCEPTED ONLY IN ORBITER SOFTWARE MODES 305 (APPROACH AND LANDING) AND 603 (GRTLS APPROACH AND LANDING).

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-6-2659-01

REVISION#: 1 11/16/97

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL

LRU: PANEL F6A8 (PRE-MEDS), F6A4 (MEDS)

CRITICALITY OF THIS

ITEM NAME: SWITCH, PUSHBUTTON

FAILURE MODE: 1R3

FAILURE MODE:

FAILED CLOSED (JAMS)

MISSION PHASE: LO LIFT-OFF

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) FAIL
	C) PASS

PASS/FAIL RATIONALE:

A)

B)

"B" SCREEN FAILS SINCE THE FAILED CLOSED PUSHBUTTON SWITCH IS NOT DETECTABLE UNTIL THE ROTARY ABORT SELECT SWITCH IS ACTIVATED.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

ALL CONTACTS OF PUSHBUTTON SWITCH (S2) FAIL IN A CLOSED MODE.

(B) INTERFACING SUBSYSTEM(S):

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PREMATURE COMMANDS ARE SENT TO SERIES ABORT MODE SELECT ROTARY SWITCH (S1), NORMALLY IN THE "OFF" POSITION. FAILURE IS UNDETECTED UNTIL THE ROTARY SWITCH IS ROTATED FROM THE "OFF" POSITION.

(C) MISSION:

FIRST FAILURE - NO EFFECT. IF AN INADVERTENT "ATO" ABORT MODE IS SELECTED, CREW CAN RECOVER BY SELECTING THE APPROPRIATE ABORT MODE VIA KEYBOARD ENTRY.

(D) CREW, VEHICLE, AND ELEMENT(S):
SAME AS (C)

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE FOLLOWING SCENARIOS:

ABORT SCENARIO: (1) PUSHBUTTON SWITCH FAILED CLOSED WHICH RESULTS IN INITIATION OF AN ATO ABORT MODE WHEN THE ABORT MODE ROTARY SWITCH IS ROTATED THROUGH THIS POSITION, AND (2,3) INABILITY TO INITIATE THE DESIRED ABORT MODE (TAL) VIA EITHER KEYBOARD RESULTING IN UNDESIRE ABORT MODE SELECTION.

NORMAL ASCENT SCENARIO: (1) PUSHBUTTON SWITCH FAILED CLOSED, (2,3) ROTARY SWITCH FAILED CLOSED (TWO POLES - TWO FAILURES DUE TO ROTARY SWITCH DESIGN) RESULTING IN INADVERTENT SELECTION OF AN ABORT MODE WHEN AN ABORT IS NOT REQUIRED AND THE VEHICLE IS DOWNRANGE OF THE ABORT WINDOW.

-DISPOSITION RATIONALE-

(A) DESIGN:

REFER TO APPENDIX A, ITEM NO. 3 - PUSHBUTTON SWITCH

(B) TEST:

REFER TO APPENDIX A, ITEM NO. 3 - PUSHBUTTON SWITCH

GROUND TURNAROUND TEST

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:

REFER TO APPENDIX A, ITEM NO. 3 - PUSHBUTTON 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 DATABASE.

(E) OPERATIONAL USE:

THE ROTARY ABORT SWITCH IN CONJUNCTION WITH THE ABORT PUSHBUTTON SWITCH IS PRIME FOR SELECTING RTLS, ATO, AND TAL ABORTS AND IS THE ONLY MEANS OF ENGAGING THE "BAILOUT" MODE. RECOVERY FROM INADVERTENT SELECTION OF THE ATO ABORT WHEN ATTEMPTING THE TAL ABORT CAN BE ACCOMPLISHED VIA THE KEYBOARD.

- APPROVALS -

SS&PAE MANAGER	: P. STENGER-NGUYEN	: <i>P. Stenger-Nguyen</i> 12/18/97
SS&PAE	: T. AI	: <i>T. Ai</i> 11/17/97
DESIGN ENGINEERING	: T. D. NGUYEN	: <i>T. D. Nguyen</i> 12-15-97
MEDS SYSTEM	: M. B. WARNER	: <i>M. B. Warner</i> 12/11/97
MEDS HARDWARE	: R. SITAPARA	: <i>R. Sitapara</i> 1/20/98
JSC MOD	:	: <i>[Signature]</i> 4-10-98