

FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL HARDWARE  
 NUMBER:05-3-12316 -X

SUBSYSTEM NAME: DISPLAYS &amp; CONTROLS

REVISION: 2

12/18/95

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 PART DATA
 

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	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	:PANEL C3A5	VO70-730283
SRU	:SWITCH, TOGGLE	ME452-0102-7306
SRU	:SWITCH, TOGGLE	ME452-0102-7806

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EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
 C&W MODE TOGGLE SWITCH, 3P3P

REFERENCE DESIGNATORS: 35V73A3A5S7

QUANTITY OF LIKE ITEMS: 1

## FUNCTION:

PROVIDES MEANS FOR SELECTING THE MODE OF OPERATION FOR THE CAUTION &  
 WARNING UNIT: ACK, NORM, ASCENT.

## FAILURE MODES EFFECTS ANALYSIS FMEA - NON-CIL FAILURE MODE

NUMBER: 05-3-12316-02

REVISION#: 2 12/18/95

SUBSYSTEM NAME: DISPLAYS &amp; CONTROLS

LRU: PANEL C3A5

ITEM NAME: SWITCH, TOGGLE

CRITICALITY OF THIS

FAILURE MODE: 1R3

FAILURE MODE:  
SHORT TO GROUND.MISSION PHASE: PL PRE-LAUNCH  
LO LIFT-OFF  
OO ON-ORBIT  
DO DE-ORBIT  
LS LANDING/SAFINGVEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA  
103 DISCOVERY  
104 ATLANTIS  
105 ENDEAVOURCAUSE:  
CONTAMINATION, INTERNAL STRUCTURAL FAILURE, 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)

CORRECTING ACTION: MANUAL

CORRECTING ACTION DESCRIPTION:

THE FLIGHT CREW MUST CONTINUALLY MONITOR FAULT SUMMARY MESSAGES ON THE  
DISPLAY UNIT (CRT) FOR ESSENTIAL 2CA BUS LOSS UNTIL C&W POWER SUPPLY B IS

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REDUNDANTLY POWERED THROUGH AN IFM PROCEDURE, OR UNTIL FUEL CELL 2 IS PLACED IN STANDBY.

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**- FAILURE EFFECTS -**

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**(A) SUBSYSTEM:**

LOSS OF PRIMARY CAUTION & WARNING. LOSS OF POWER TO THE PRIMARY C&W POWER SUPPLY DUE TO ACTIVATION OF ESSENTIAL BUS OVERLOAD CIRCUIT PROTECTION (PANEL 013, CB1 TRIP).

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

NO EFFECT, FIRST FAILURE.

**(C) MISSION:**

NO EFFECT, FIRST FAILURE.

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

NO EFFECT, FIRST FAILURE.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

IF THE SECONDARY C&W POWER SUPPLY OR ESSENTIAL BUS 2CA FAILS, THE RESULT WILL BE THE LOSS OF ALL C&W AURAL AND VISUAL ALARMS. LOSS OF ALL C&W REQUIRES THE ORBITER TO EXECUTE NEXT PLS DEORBIT. THE LOSS OF CREW/VEHICLE MAY RESULT IF A TIME CRITICAL CONDITION IS NOT ANNUNCIATED, I.E. ESSENTIAL BUS FAILURE WILL SIMULTANEOUSLY INTERRUPT FUEL CELL COOLANT PUMP OPERATION, CREATING A TIME CRITICAL EMERGENCY CONDITION. THE CREW MUST TAKE REMEDIAL ACTION WITHIN NINE MINUTES OF ESSENTIAL BUS FAILURE TO AVOID A CATASTROPHIC FUEL CELL FAILURE.

**DESIGN CRITICALITY (PRIOR TO DOWNGRADE, DESCRIBED IN (F)): 1R2**

**(F) RATIONALE FOR CRITICALITY DOWNGRADE:**

AFTER THE FIRST FAILURE THE CREW WILL PERFORM AN IFM TO REDUNDANTLY POWER C&W POWER SUPPLY B AND PRECLUDE A SINGLE FAILURE (ESSENTIAL 2CA BUS LOSS) FROM RESULTING IN AN UNANNUNCIATED TIME CRITICAL CATASTROPHIC FUEL CELL FAILURE.

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- APPROVALS -

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EDITORIALLY APPROVED	: RI	: <u>Amk 12/19/95</u>
EDITORIALLY APPROVED	: JSC	: <u>Ann Nancy 1-2-96</u>
TECHNICAL APPROVED	: APPROVAL FORM	: 95-CIL-003-RI