

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE  
NUMBER: 05-6-2214 -X**

**SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL  
REVISION: 0 05/03/88**

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**PART DATA**

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	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: PANEL R1A1	V070-730275
SRU	: SWITCH, TOGGLE	ME452-0102-7301

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
SWITCH, TOGGLE, 3PDT - MAIN DC BUS TO ESSENTIAL BUS RPC CONTROL**

**REFERENCE DESIGNATORS:** 32V73A1A1S4  
32V73A1A1S5  
32V73A1A1S6

**QUANTITY OF LIKE ITEMS: 3**  
**THREE REQUIRED - ONE PER ESSENTIAL BUS.**

**FUNCTION:**  
PROVIDES REMOTE MANUAL CONTROL CAPABILITY TO CONNECT TWO MAIN DC BUSES TO OR ISOLATE FROM AN ESSENTIAL BUS. THIRD CONTACT SUPPLIES ESSENTIAL BUS POWER FOR FLIGHT DECK PANELS R1, R2, R12, F9, C3, O6, O7, O8, O14, O15, O16 AND A11.

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

NUMBER: 05-6-2214-01

REVISION#: 1 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION &amp; CONTROL

LRU: PANEL R1A1

CRITICALITY OF THIS

ITEM NAME: SWITCH, TOGGLE

FAILURE MODE: 1R3

**FAILURE MODE:**

FAILS OPEN, PREMATURELY OPENS (ONE POLE ONLY)

**MISSION PHASE:**

PL	PRE-LAUNCH
LO	LIFT-OFF
OO	ON-ORBIT
DO	DE-ORBIT
LS	LANDING/SAFING

<b>VEHICLE/PAYLOAD/KIT EFFECTIVITY:</b>	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

<b>REDUNDANCY SCREEN</b>	A) PASS
	B) N/A
	C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

"B" SCREEN IS "N/A" BECAUSE FAILURE OF AT LEAST TWO REMAINING PATHS IS READILY DETECTABLE IN FLIGHT (LOSS OF SECOND SOURCE TO THE SAME FLIGHT DECK ESSENTIAL BUS, LOSS OF REACTANT CONTROL VALVE).

C)

**- FAILURE EFFECTS -****(A) SUBSYSTEM:**

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE**  
**NUMBER: 05-6-2214-01**

LOSS OF ONE OF TWO PATHS TO SUPPLY ASSOCIATED ESSENTIAL BUS POWER TO THE FLIGHT DECK PANELS.

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

FIRST FAILURE - NO EFFECT. ONE PATH REMAINS TO SUPPLY CRITICAL LOADS ON THE ASSOCIATED FLIGHT DECK ESSENTIAL BUS.

**(C) MISSION:**

FIRST FAILURE - NO EFFECT. ANOTHER FAILURE MUST OCCUR BEFORE THE AFFECTED FLIGHT DECK ESSENTIAL BUS LOADS ARE LOST.

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

SAME AS (C)

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

POSSIBLE LOSS OF CREW/VEHICLE DUE TO INABILITY TO SAFE A FUEL CELL VIA THE FOLLOWING SCENARIO:

- (1) OPEN CONTACT ON SWITCH TO FLIGHT DECK PANEL ESSENTIAL BUS.
- (2) LOSS SECOND SOURCE TO THE SAME FLIGHT DECK ESSENTIAL BUS RESULTING IN LOSS OF ASSOCIATED FUEL CELL CONTROLLER AND CONSEQUENTLY THE FUEL CELL COOLANT PUMP.
- (3) LOSS OF ASSOCIATED FUEL CELL REACTANT CONTROL VALVE NECESSITATING REMOVAL OF FUEL CELL FROM ITS ASSOCIATED MAIN DC BUS IN ORDER TO SAFE IT.
- (4) ASSOCIATED FUEL CELL TO MAIN DC BUS POWER CONTACTOR FAILED CLOSED.

INABILITY TO REMOVE THE BUS LOAD FROM THE FUEL CELL UNDER THESE CIRCUMSTANCES WILL RESULT IN FUEL CELL OVERHEATING WITH SUBSEQUENT RUPTURE AND/OR EXPLOSION/FIRE.

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**- APPROVALS -**

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EDITORIALLY APPROVED  
 TECHNICAL APPROVAL

: BNA  
 : VIA APPROVAL FORM

: *J. Kemura 7-26-99*  
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