

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE**  
**NUMBER: 05-6-2753 -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 | : MID MCA-2              | V070-764530          |
| LRU | : MID MCA-2              | V070-764620          |
| SRU | : RELAY, GENERAL PURPOSE | MC455-0129-0001      |

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**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**  
RELAY, GENERAL PURPOSE, 4 POLE - MID MCA 2 THREE-PHASE PLBM AC BUS 3

**REFERENCE DESIGNATORS:** 40V76A118K61  
40V76A118K63

**QUANTITY OF LIKE ITEMS:** 2  
TWO

**FUNCTION:**  
UPON CREW INITIATED SWITCH COMMANDS, THE CONTACTS OF TWO SERIES RELAYS CONNECT MID MOTOR CONTROL ASSEMBLY #2 AC BUS AC3 (PHASE A, B, AND C) TO PAYLOAD BAY MECHANICAL (PLBM) AC BUS 3 FOR FREON RADIATOR DEPLOY/LATCH, REMOTE MANIPULATOR LATCH, AND KU-BAND DEPLOY/STOW MOTORS.

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

NUMBER: 05-6-2753- 01

REVISION#: 1 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION &amp; CONTROL

LRU: MID MCA-2

CRITICALITY OF THIS

ITEM NAME: RELAY, GENERAL PURPOSE

FAILURE MODE: 1R2

## FAILURE MODE:

OPEN, FAILS TO CONDUCT, FAILS TO TRANSFER (TO CLOSE), INADVERTENTLY OPENS,  
SHORTS TO GROUND (COIL)MISSION PHASE: OO ON-ORBIT  
DO DE-ORBITVEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA  
103 DISCOVERY  
104 ATLANTIS  
105 ENDEAVOUR

## CAUSE:

CONTAMINATION, PIECE PART FAILURE, VIBRATION, MECHANICAL SHOCK, THERMAL  
STRESS, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS  
B) PASS  
C) PASS

## PASS/FAIL RATIONALE:

A)

B)

C)

**- FAILURE EFFECTS -**

## (A) SUBSYSTEM:

LOSS OF ONE OF TWO SERIES RELAYS CAUSING LOSS OF PLBM AC BUS 3 IN MID MOTOR  
CONTROL ASSEMBLY #2. ALSO, FOR SHORT TO GROUND (COIL) ASSOCIATED CIRCUIT  
PROTECTION FUSES TO ONE POLE OF THE PAYLOAD BAY MECHANICAL POWER (SYSTEM  
1) SWITCH WILL OPEN CAUSING LOSS OF PLBM AC BUS 1 IN MID MOTOR CONTROL  
ASSEMBLY #1.

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

LOSS OF REDUNDANCY. ALL CRITICAL FUNCTIONS HAVE REDUNDANT MOTORS POWERED FROM A DIFFERENT AC BUS IN A DIFFERENT MID MOTOR CONTROL ASSEMBLY AND PLBM AC BUS 1 IN MID MOTOR CONTROL ASSEMBLY #1 DOES NOT POWER MOTORS FOR THE SAME CRITICAL FUNCTIONS.

**(C) MISSION:**

POSSIBLE EARLY MISSION TERMINATION

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

FIRST FAILURE - NO EFFECT

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (LOSS OF REDUNDANT MOTOR OR POWER/CONTROL CIRCUIT) DUE TO THE LOSS OF CAPABILITY TO STOW THE PORT OR STARBOARD FREON RADIATOR (RESULTS IN INABILITY TO CLOSE PAYLOAD BAY DOORS WHICH CAUSE AERODYNAMIC STRUCTURAL DAMAGE DURING ENTRY).

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY

**(B) TEST:**

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY

**GROUND TURNAROUND TEST**

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

**(C) INSPECTION:**

REFER TO APPENDIX C, ITEM NO. 2 - GENERAL PURPOSE RELAY

**(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.

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(E) OPERATIONAL USE:  
CONSIDERATION WILL BE GIVEN TO STOWING MECHANISMS WITH THE LOSS OF  
REDUNDANCY.

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- APPROVALS -

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EDITORIALLY APPROVED  
TECHNICAL APPROVAL

: BNA  
: VIA APPROVAL FORM

: J. Kamura 7-26-99  
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