

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE  
NUMBER: 05-6-2755 -X**

**SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL**  
**REVISION: 1**      **07/26/99**

**PART DATA**

	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: MID MCA-3	V070-764550
LRU	: MID MCA-3	V070-764630
SRU	: RELAY, GENERAL PURPOSE	MC455-0129-0001

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

**REFERENCE DESIGNATORS:**    40V76A119K65  
    40V76A119K77

**QUANTITY OF LIKE ITEMS:**    2  
TWO

**FUNCTION:**  
UPON CREW INITIATED SWITCH COMMANDS, THE CONTACTS OF TWO SERIES RELAYS CONNECT MID MOTOR CONTROL ASSEMBLY #3 AC BUS AC2 (PHASE A, B, AND C) TO PAYLOAD BAY MECHANICAL (PLBM) AC BUS 2 FOR PAYLOAD RETENTION LATCH MOTORS.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2755 -2 REV:05/03/88

ASSEMBLY :M-MCA-3				CRIT.FUNC: 1R	
P/N RI :MC455-0129-0001				CRIT. HDW: 2	
P/N VENDOR:		VEHICLE	102	103	104
QUANTITY :2		EFFECTIVITY:	X	X	X
:TWO		PHASE(S):	PL	LO	-OO X DO X LS
:					

PREPARED BY:		REDUNDANCY SCREEN:	A-PASS	B-PASS	C-PASS
DES R PHILLIPS		APPROVED BY:			
REL M HOVE		DES <i>S. A. Burns</i>			APPROVED BY (NASA):
QE J COURSEN		REL <i>M. D. Ch. Don 5-6-88</i>			SSM <i>W. C. Starn 5/12/88</i>
		QE <i>J. J. Lauer 5/6/88</i>			REL <i>D. J. ... 5/14/88</i>
					QE <i>RJ</i>

ITEM:

RELAY, GENERAL PURPOSE, 4 POLE - MID MCA 3 THREE-PHASE PLBM AC BUS 2

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FAILURE MODE:

SHORTS TO GROUND (CONTACT), SHORTS POLE-TO-POLE

CAUSE(S):

PIECE PART FAILURE, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY EFFECT:

(A) LOSS OF MID MOTOR CONTROL ASSEMBLY #3 THREE-PHASE AC BUS 2 DUE TO TRIPPING OF CBS ON PANEL MA73C. RESULTS IN LOSS OF PLBM AC BUS 2.

(B) LOSS OF REDUNDANCY FOR FUNCTIONS POWERED BY AC BUS 2 IN MID MOTOR CONTROL ASSEMBLY #3. ALL CRITICAL FUNCTIONS HAVE REDUNDANT MOTORS POWERED FROM A DIFFERENT AC BUS IN A DIFFERENT MID MOTOR CONTROL ASSEMBLY.

(C) POSSIBLE EARLY MISSION TERMINATION.

(D) FIRST FAILURE - NO EFFECT.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :ELECT POWER DIST & CONT FMEA NO 05-6 -2755 -2 REV:05/03/88

EFFECT(S) ON (CONTINUED):

(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE (E)FUNCTIONAL  
CRITICALITY EFFECT:

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (LOSS OF  
REDUNDANT MOTOR OR POWER/CONTROL CIRCUIT) DUE TO INABILITY OPEN VENT  
DOORS DURING DESCENT (DOOR FAILED CLOSED RESULTS IN VEHICLE STRUCTURAL  
DAMAGE DUE TO PRESSURE DIFFERENTIALS) OR INABILITY TO SAFELY  
LATCH/RELEASE PAYLOADS. LEFT AND RIGHT VENT DOORS ARE NOT CONSIDERED  
TO BE REDUNDANT TO EACH OTHER. "B" SCREEN PASSES SINCE THE FAILURE  
CAN BE DETECTED BY CREW MONITORING MECHANISM OPERATION TIMES.

DISPOSITION & RATIONALE:

(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A,B,C,D) DISPOSITION AND RATIONALE

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

(B) GROUND TURNAROUND TEST

VERIFY MCA OPERATIONAL STATUS INDICATORS ARE "ON" (ALL MOTOR CONTROL  
RELAYS RESET) DURING NO OPERATION OF THE AC MOTOR MECHANISMS. TEST IS  
PERFORMED FOR ALL FLIGHTS.

(E) OPERATIONAL USE

CONSIDERATION WILL BE GIVEN TO STOWING MECHANISMS WITH THE LOSS OF  
REDUNDANCY. FOR LOSS OF REDUNDANT VENT DOOR OPEN CAPABILITY, OPEN  
VENT DOORS PRIOR TO ENTRY.