FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER: 05-6-2756 -X

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

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	: MID MCA-4	V070-764500
LRU	: MID MCA-4	V070-764640
SRU	: RELAY, GENERAL PURPOSE	MC455-0129-0001

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

REFERENCE DESIGNATORS: 40V76A120K49
40V76A120K61

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
UPON CREW INITIATED SWITCH COMMANDS, THE CONTACTS OF TWO SERIES RELAYS CONNECT MID MOTOR CONTROL ASSEMBLY #4 AC BUS AC2 (PHASE A, B, AND C) TO PAYLOAD BAY MECHANICAL (PLBM) AC BUS 2 FOR FREON RADIATOR LATCH, REMOTE MANIPULATOR LATCH AND KU-BAND DEPLOY/STOW MOTORS.

FAILURE MODES EFFECTS ANALYSIS FMEA – NON-CIL FAILURE MODE
NUMBER: 05-6-2756- 01

REVISION#: 1 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
LRU: MID MCA-4 **CRITICALITY OF THIS**
ITEM NAME: RELAY, GENERAL PURPOSE **FAILURE MODE:** 1R3

FAILURE MODE:
OPEN, FAILS TO CONDUCT, FAILS TO TRANSFER (TO CLOSE), INADVERTENTLY OPENS, SHORTS TO GROUND (COIL)

MISSION PHASE:
OO ON-ORBIT
DO DE-ORBIT

VEHICLE/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 2 IN MID MOTOR CONTROL ASSEMBLY #4. ALSO, FOR SHORT TO GROUND (COIL) ASSOCIATED CIRCUIT PROTECTION FUSES TO ONE POLE OF THE PAYLOAD BAY MECHANICAL POWER (SYSTEM 2) SWITCH WILL OPEN CAUSING LOSS OF PLBM AC BUS 2 IN MID MOTOR CONTROL ASSEMBLY #3.

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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 2 IN MID MOTOR CONTROL ASSEMBLY #3 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 SAFELY LATCH/RELEASE PAYLOADS.

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

(F) RATIONALE FOR CRITICALITY DOWNGRADE:
THE DESIGN CRITICALITY OF 1R2 HAS BEEN DOWNGRADED TO 1R3 AFTER WORKAROUNDS CONSIDERATION (ALLOWED PER CR S050107W) BECAUSE AFTER THE SECOND FAILURE, EVA CAN BE PERFORMED TO MANUALLY LATCH/RELEASE THE PAYLOAD LATCHES.

- APPROVALS -

EDITORIALLY APPROVED	: BNA	: J. Kamura 7-26-99
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-6