FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER: M0-AD1-R01 -X

SUBSYSTEM NAME: REMOTELY OPERATED ELECTRICAL UMBILICAL
REVISION: 1 02/11/91

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
ASSY	: MID MCA-1	V070-764610
ASSY	: MID MCA-4	V070-764640
SRU	: RELAY, HYBRID	MC455-0135-0001
SRU	: RELAY, HYBRID	MC455-0135-0002

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

REFERENCE DESIGNATORS:
40V76A117 - K19
40V76A117 - K21
40V76A117 - K24
40V76A117 - K36
40V76A118 - K65
40V76A119 - K73
40V76A119 - K75
40V76A119 - K77

QUANTITY OF LIKE ITEMS: 8

FUNCTION:
PROVIDES CONTROL OF AC POWER APPLICATION TO DRIVE MOTOR FOR THE SWING ARM DRIVE FUNCTION. K77, K65, K36 AND K24 FOR SYSTEM 1, K19, K21, K73 AND K75 FOR SYSTEM 2.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE
NUMBER: M0-AD1-R01- 04

REVISION#: 2 01/07/02

SUBSYSTEM NAME: REMOTELY OPERATED ELECTRICAL UMBILICAL
LRU: **CRITICALITY OF THIS**
ITEM NAME: RELAY, HYBRID **FAILURE MODE:** 2R3

FAILURE MODE:
SHORTED, ANY TWO OR MORE SETS OF CONTACTS.

MISSION PHASE: OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY:
102 COLUMBIA
103 DISCOVERY
104 ATLANTIS
105 ENDEAVOUR

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

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN
A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)
PRELAUNCH CHECKOUT.

B)
TWO OR MORE PHASES WILL CAUSE MOTOR TO DRIVE. CANNOT CONFIRM RELAY FAILURE.

C)
PHYSICAL AND ELECTRICAL ISOLATION OF REDUNDANT ELEMENTS.

- FAILURE EFFECTS -

(A) SUBSYSTEM:
TWO OR MORE AC POWER PHASES WILL BE CONTINUOUSLY APPLIED TO ONE SWING ARM DRIVE MOTOR WHENEVER THREE PHASE AC POWER IS PRESENT.

(B) INTERFACING SUBSYSTEM(S):

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IF UNDETECTED MOTOR WILL DRIVE AGAINST STOPS, OVERHEAT, AND FAIL. MOTOR DRIVE FOR THE SELECTED FUNCTION WOULD BE AT HALF SPEED. IF THE RELAY FOR OPPOSITE MOTOR ROTATION IS ACTIVATED CIRCUIT BREAKER WILL TRIP.

(C) MISSION:
FIRST FAILURE - NO EFFECT.

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT. FIRST FAILURE

(E) FUNCTIONAL CRITICALITY EFFECTS:
LOSS OF REDUNDANT RELAY IN THIS MODE WILL FAIL BOTH SWING ARM ACTUATOR DRIVE MOTORS AND REQUIRE USE OF EVA MECHANICAL ACTUATION TO ACCOMPLISH SWING ARM MOTION.

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX C, ITEM 1.

(B) TEST:
REFER TO APPENDIX C, ITEM 1.

GROUND TURNAROUND:
OMRSD - ANY TURNAROUND TEST CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDING WITH OMRSD

(C) INSPECTion:
REFER TO APPENDIX C, ITEM 1.

(D) FAILURE HISTORY:
CURRENT DATA ON TEST FAILURES, FLIGHT FAILURE, UNEXPLAINED ANOMALIES, AND OTHER FAILURE EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATA BASE.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL **FAILURE MODE NUMBER: M0-AD1-R01- 04**

(E) OPERATIONAL USE:
EVA WORK AROUND CAN BE USED TO ACCOMPLISH SWING ARM MOTION.

- APPROVALS -

S&R ENGINEER.	:A. NGUYEN	:/s/A. Nguyen_____
CARGO/INTEG ITM.	:J. CAPALENI	:/s/J. Capaleni_____
DESIGN ENGINEERING	:D. HAEHLKE	:/s/D. Haehlke_____
SSM	:P. REESE	:/s/P. Reese_____
MOD	:K. SMITH	:/s/K. Smith_____
USA/SAM	:R. SMITH	:/s/S.R. Smith_____
USA CARGO/INTG ELEMENT	:H. MALTBY	:/s/H. Maltby_____
USA ORBITER ELEMENT	:S. LITTLE	:/s/S. Little_____