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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: MO-AA1-415-X

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM
REVISION : 2 06/08/90

| | PART NAME VENDOR NAME | PART NUMBER VENDOR NUMBER |
|---------|--------------------------|------------------------------|
| ASSEM : | MID MCA-1 | V070-764610 |
| ASSEM : | MID MCA-3 | V070-764630 |
| SRU : | RELAY, HYBRID | MC455-0135-0001 |
| ■ SRU : | RELAY, HYBRID | MC455-0135-0002 |

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

■ REFERENCE DESIGNATORS: 40V76A117 - K25
: 40V76A117 - K73
: 40V76A119 - K31
: 40V76A119 - K43

QUANTITY OF LIKE ITEMS: 4

■ FUNCTION:

PROVIDES CONTROL OF AC POWER APPLICATION TO DRIVE MOTOR FOR THE PRIMARY PEDESTAL STOW FUNCTION. K25 FOR SYSTEM 1/PRIMARY PEDESTAL, K31 FOR SYSTEM 2/PRIMARY PEDESTAL. K43 AND K73 PERFORM THE SAME FUNCTION FOR THE SECONDARY PEDESTAL.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA1-415-03

SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM REVISION# 2 06/08/90

ITEM NAME: RELAY, HYBRID CRITICALITY OF THIS FAILURE MODE:2R3

■ FAILURE MODE:
SHORTED. ANY SINGLE SET OF CONTACTS.

MISSION PHASE:
00 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) ONE PHASE WILL NOT CAUSE MOTOR TO DRIVE. CANNOT CONFIRM RELAY FAILURE.
- C) PHYSICAL AND ELECTRICAL ISOLATION OF REDUNDANT ELEMENTS.

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
ONE AC POWER PHASE WILL BE CONTINUOUSLY APPLIED TO THE ASSOCIATED DRIVE MOTOR. WHENEVER THREE PHASE AC POWER IS PRESENT.

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NUMBER: MO-AA1-415-03

- (B) INTERFACING SUBSYSTEM(S):
THE DRIVE MOTOR COULD OVER HEAT AND FAIL. A FAILED MOTOR WOULD CAUSE A PEDESTAL FUNCTION TO BE AT HALF SPEED. IF THE RELAY FOR OPPOSITE MOTOR ROTATION IS ACTIVATED CIRCUIT BREAKER COULD TRIP.
- (C) MISSION:
NO EFFECT. FIRST FAILURE.
- (D) CREW, VEHICLE, AND ELEMENT(S):
FIRST FAILURE - NO EFFECT.
- (E) FUNCTIONAL CRITICALITY EFFECTS:
LOSS OF ALL CONTROL SYSTEMS ON THE PRIMARY PEDESTAL WILL REQUIRE A TRANSFER TO THE SECONDARY PEDESTAL. LOSS OF SECONDARY DRIVE CAPABILITY RESULTS IN INABILITY TO DEPLOY PAYLOAD.

- DISPOSITION RATIONALE -

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

OMRSD; GROUND TURNAROUND;
FREQUENCY OF CHECKOUT IS MISSION DEPENDENT. 3-PHASE AC MOTOR CIRCUITS;
VERIFY PROPER PHASE ROTATION AND MOTOR PHASE VOLTAGE
S0790A.250-B
S0790A.260-B
S0790A.270-A
S0790A.280-A
- (C) INSPECTION:
REFER TO APPENDIX C, ITEM 1.
- (D) FAILURE HISTORY:
REFER TO APPENDIX C, ITEM 1.
- (E) OPERATIONAL USE:
NONE

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA1-415-03

- APPROVALS -

| | | | | |
|--------------------------|----------------|------|------------------------------|---------|
| RELIABILITY ENGINEERING: | W. R. MARLOWE | OK'd | W. R. Marlowe | 6/4/90 |
| DESIGN ENGINEERING | : T. TAUFER | OK'd | T. Tauffer | 6/14/90 |
| QUALITY ENGINEERING | : M. F. MERGEN | OK'd | M. F. Mergen | 6/14/90 |
| NASA RELIABILITY | : | G.E. | M. F. Mergen | 9/25/90 |
| NASA SUBSYSTEM MANAGER | : | | M. F. Mergen | 9/25/90 |
| NASA EPD&C RELIABILITY | : | | M. S. Dussan for J. Woodward | 9/12/90 |
| NASA QUALITY ASSURANCE | : | | M. S. Dussan | 9/12/90 |
| NASA EPD&C SUBSYS MGR | : | | M. S. Dussan for F. Alami | 9/20/90 |