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PRINT DATE: 06/08/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: MO-AA1-420-X

S050250L
ATTACHMENT -
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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-2	V070-764620
ASSEM :	MID MCA-3	V070-764630
ASSEM :	MID MCA-4	V070-764640
SRU :	RELAY, HYBRID	MC455-0135-0001
■ SRU :	RELAY, HYBRID	MC455-0135-0002

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

REFERENCE DESIGNATORS: 40V76A117 - K37
: 40V76A117 - K53
: 40V76A118 - K20
: 40V76A119 - K44
: 40V76A119 - K56
: 40V76A120 - K66

QUANTITY OF LIKE ITEMS: 6

■ FUNCTION:

K37, K66 PROVIDE CONTROL OF AC POWER APPLICATION TO DRIVE MOTOR FOR THE REBERTH FUNCTION. K37, K66 FOR SYSTEM 1/PRIMARY PEDESTAL. K20, K56 FOR SYSTEM 2/PRIMARY PEDESTAL. K53 AND K44 PERFORM THE SAME FUNCTION FOR THE SECONDARY PEDESTAL.

DETAIL DISCUSSION OF THE REBERTH OPERATIONS ARE INCLUDED IN THE FRONT SECTION OF REPORT STS87-0120. FOR THIS REBERTH OPERATIONAL MODE TO BE NECESSARY, EARLIER FAILURES WILL HAVE OCCURRED. AN UNSUCCESSFUL DEPLOYMENT OF PAYLOAD REQUIRES THE USAGE OF THE REBERTH RELAYS.

FAILURE MODES EFFECTS ANALYSIS (FMEA) — CRITICAL FAILURE MODE
NUMBER: MO-AA1-420-04

SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM
ITEM NAME: RELAY, HYBRID
REVISION# 2 06/08/90
CRITICALITY OF THIS FAILURE MODE: 2R3

- FAILURE MODE:
SHORTED, ANY TWO OR MORE 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? N

- 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 PEDESTAL DRIVE MOTOR. WHENEVER THREE PHASE AC POWER IS PRESENT.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA1-420-04

- (B) INTERFACING SUBSYSTEM(S):
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:
NO EFFECT. FIRST FAILURE
- (D) CREW, VEHICLE, AND ELEMENT(S):
FIRST FAILURES - NO EFFECT
- (E) FUNCTIONAL CRITICALITY EFFECTS:
LOSS OF BOTH RELAYS IN THIS MODE WOULD PREVENT DEPLOYMENT USING PRIMARY PEDESTAL AND REQUIRING TRANSFER TO THE SECONDARY PEDESTAL. LOSS OF ALL REBERTH RELAYS IN THIS MODE WOULD RESULT IN LOSS OF THE REBERTH FUNCTION. LOSS OF SECONDARY PEDESTAL DRIVE CAPABILITY WOULD RESULT 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 -A, -C
S0790A.260 -A, -C
S0790A.270 -B
S0790A.280 -B.
- (C) INSPECTION:
REFER TO APPENDIX C, ITEM 1.
- (D) FAILURE HISTORY:
REFER TO APPENDIX C, ITEM 1.
- (E) OPERATIONAL USE:
FAILURE OF BOTH PRIMARY PEDESTAL MOTORS WOULD RESULT IN NEED FOR PEDESTAL DRIVE TRANSFER TO SECONDARY PEDESTAL.

FAILURE MODES EFFECTS ANALYSIS (FMEA) — CRITICAL FAILURE MODE
NUMBER: MO-AA1-420-04

- APPROVALS -

RELIABILITY ENGINEERING:	W. R. MARLOWE	<i>W.R. Marlowe</i>	<i>4/14/90</i>
DESIGN ENGINEERING	: T. TAUFER	<i>T. Tauffer</i>	<i>6/14/90</i>
QUALITY ENGINEERING	: M. F. Mergen	<i>M.F. Mergen</i>	<i>6/14/90</i>
NASA RELIABILITY	:	<i>G.E.</i>	<i>9/17/90</i>
NASA SUBSYSTEM MANAGER	:	<i>M.S. Dinsdale</i>	<i>9/18/90</i>
NASA EPD&C RELIABILITY	:	<i>M.S. Dinsdale</i>	<i>9/18/90</i>
NASA QUALITY ASSURANCE	:	<i>F. Alanis</i>	<i>9/20/90</i>
NASA EPD&C SUBSYS MGR	:		