

PAGE: 1

PRINT DATE: 06/08/90

SDSQ250L  
ATTACHMENT -  
Page 1 of 152

FAILURE MODES EFFECTS ANALYSIS (FMEA) — CRITICAL HARDWARE

NUMBER: MO-AA1-410-X

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM

REVISION : 2 06/08/90

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	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

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PART DATA

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REFERENCE DESIGNATORS: 40V76A117 - K13  
: 40V76A117 - K41  
: 40V76A117 - K49  
: 40V76A117 - K61  
: 40V76A118 - K8  
: 40V76A119 - K33  
: 40V76A119 - K45  
: 40V76A119 - K46  
: 40V76A119 - K58  
: 40V76A120 - K54

QUANTITY OF LIKE ITEMS: 10

FUNCTION:

PROVIDES CONTROL OF AC POWER APPLICATION TO DRIVE MOTOR FOR THE PEDESTAL DEPLOY FUNCTION. K13, K49, AND K54 FOR SYSTEM 1/PRIMARY PEDESTAL. K8, K33 AND K58 FOR SYSTEM 2/PRIMARY PEDESTAL. K41, K61, K45 AND K46 PERFORM THE SAME FUNCTION FOR SECONDARY PEDESTAL.

PAGE: 4

PRINT DATE: 06/08/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE  
NUMBER: MO-AA1-410-03

REVISION# 2 06/08/90  
SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM  
ITEM NAME: RELAY, HYBRID  
CRITICALITY OF THIS FAILURE MODE: 1R3

■ FAILURE MODE:  
SHORTED - ANY SINGLE SET OF CONTACT.

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.

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

■ (B) INTERFACING SUBSYSTEM(S):  
THE DRIVE MOTOR COULD OVERHEAT AND FAIL. A FAILED MOTOR WOULD CAUSE

**FAILURE MODES EFFECTS ANALYSIS (FMEA) — CRITICAL FAILURE MODE  
NUMBER: MO-AA1-410-03**

PEDESTAL FUNCTIONS 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):  
NO EFFECT - FIRST FAILURE.
- (E) FUNCTIONAL CRITICALITY EFFECTS:  
LOSS OF ALL CONTROL RELAYS IN THIS MODE MAY FAIL BOTH DRIVE MOTORS WHICH WOULD REQUIRE A TRANSFER TO THE SECONDARY PEDESTAL. LOSS OF SECONDARY DRIVE CAPABILITY RESULTING IN PAYLOAD IN MID DEPLOYMENT WOULD CAUSE INABILITY TO CLOSE PAYLOAD BAY DOORS. RESULTING IN POSSIBLE LOSS OF CREW AND VEHICLE.

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- DISPOSITION RATIONALE -  
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- (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, -B, -C  
S0790A.260-A, -B, -C  
S0790A.270-A, -B, -C  
S0790A.280-A, -B, -C
- (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-AA1-410-03

- APPROVALS -

RELIABILITY ENGINEERING:	W. R. MARLOWE	<i>W.R. Marlowe</i>	6/14/90
DESIGN ENGINEERING :	T. TAUFER	<i>T. Tauffer</i>	6/14/90
QUALITY ENGINEERING :	M. F. MERGEN	<i>M.F. Mergen</i>	6/14/90
NASA RELIABILITY :		<i>G.E.</i>	
NASA SUBSYSTEM MANAGER :		<i>G. E. ...</i>	9/17/90
NASA EPD&C RELIABILITY :		<i>...</i>	9/25/90
NASA QUALITY ASSURANCE :		<i>...</i>	9/18/90
NASA EPD&C SUBSYS MGR :		<i>...</i>	9/20/90