

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
NUMBER: M5-6MR-B028-X**

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

REVISION: 1 OCT, 1995

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	DSCU RSC-E	MC521-0087-1002 33Y.5212.005

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
LINE REPLACEABLE UNIT (LRU) DSCU - DOCKING SYSTEM CONTROL UNIT.

REFERENCE DESIGNATORS: 40V53A1A2

QUANTITY OF LIKE ITEMS: 1
(ONE)

FUNCTION:

THE DSCU IS USED TO IMPLEMENT THE AUTOMATED DOCKING SEQUENCE AND TO RECEIVE AND PROCESS THE COMMANDS FROM THE APDS CONTROL PANEL. THE UNIT PROVIDES TELEMETRY TO THE DCUs AND STATUS INDICATION TO THE APDS CONTROL PANEL.

OUTPUT FUNCTIONS:

1. PROVIDES HI-ENERGY DAMPERS POWER AND CONTROL.
2. PROVIDES CONTROL FOR DOCKING RING EXTENSION AND RETRACTION.
3. PROVIDES FIXERS POWER AND CONTROL.
4. PROVIDES HOOKS OPENING AND CLOSING CONTROL.
5. PROVIDES CAPTURE LATCHES OPENING AND CLOSING CONTROL.
6. PROVIDES TELEMETRY TO THE DCUs AND STATUS INDICATION TO THE APDS PANEL.

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE
NUMBER: M5-6MR-8028-13

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
 POSSIBLE LOSS OF MISSION AFTER TWO FAILURES. 1) LOSS OF ONE OF THREE
 "CAPTURE LATCH CLOSE" CONTROL SIGNALS - NO EFFECT.
 2) LOSS OF SECOND ASSOCIATED "CAPTURE LATCH CLOSE" CONTROL SIGNAL - LOSS OF
 CAPABILITY TO RE-CLOSE THE LATCHES RESULTING IN LOSS OF CAPABILITY TO
 ATTEMPT SECOND DOCKING

DESIGN CRITICALITY (PRIOR TO OPERATIONAL DOWNGRADE, DESCRIBED IN F): 2R3

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:
 N/A

-DISPOSITION RATIONALE-

(A) DESIGN:
 REFER TO APPENDIX I, ENERGIA HARDWARE.

(B) TEST:
 REFER TO APPENDIX I, ENERGIA HARDWARE.

DSCU CAPTURE LATCHES CIRCUIT OPERATION IS VERIFIED DURING GROUND
 CHECKOUT. ANY TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:
 REFER TO APPENDIX I, ENERGIA HARDWARE.

(D) FAILURE HISTORY:
 REFER TO APPENDIX I, ENERGIA HARDWARE.

(E) OPERATIONAL USE:
 AFTER SECOND FAILURE, CREW COULD PERFORM AN IN-FLIGHT MAINTENANCE TO
 DRIVE THE CAPTURE LATCH MOTORS (TO THE CLOSED POSITION) DIRECTLY FROM THE
 FEED-THROUGH CONNECTORS IN THE EXTERNAL AIRLOCK, USING THE ORBITER
 BREAKOUT BOX. HOWEVER, SINCE CAPTURE LATCHES WOULD HAVE TO BE DRIVEN
 CLOSED TO PERFORM THE SECOND DOCKING AND THEN, DRIVEN OPEN TO PERFORM
 SEPARATION, DOCKING WOULD PROBABLY NOT BE ATTEMPTED.

-APPROVALS-

PRODUCT ASSURANCE ENGR : M. NIKOLAYEVA
 DESIGN ENGINEER : B. VAKULIN
 NASA SSMA :
 NASA SUBSYSTEM MANAGER :
 NASA EPDEC SUBSYSTEM MANAGER :

[Handwritten signatures and dates]
 9/21/95
 9/22/95



RSC
 Energia

Proprietary Data