

**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: MS-6MR-B028 . 03

(C) MISSION:

FIRST FAILURE - NO EFFECT.

(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 REDUNDANT CONTROL SIGNALS - NO EFFECT. 2) LOSS OF SECOND CONTROL SIGNAL - LOSS OF CAPABILITY TO MOVE RING TO PERFORM 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 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 RING MOTORS DIRECTLY FROM THE FEED-THROUGH CONNECTORS IN THE EXTERNAL AIRLOCK USING THE ORBITER BREAKOUT BOX. HOWEVER, WORST CASE, CREW WOULD ABORT DOCKING SINCE THIS WORKAROUND REQUIRES A GREAT DEAL OF TIME TO PERFORM.

- APPROVALS -

PRODUCT ASSURANCE ENGR
DESIGN ENGINEER
NASA SS/MA
NASA SUBSYSTEM MANAGER

M. NIKOLAYEVA
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NASA EPD&C SUBSYSTEM MANAGER:

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RSC
Energie

Proprietary Data