

**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-B028-17

REVISIONS 1 SEPT 1, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

LRU: MC621-0087-1002

ITEM NAME: DSCU

CRITICALITY OF THIS
FAILURE MODE: 2R3

FAILURE MODE:

LOSS OF ONE OF THREE RING IN STOP CONTROL SIGNALS.

MISSION PHASE:

OO ON-ORBIT

VEHICLE/PAYLOAD/MT EFFECTIVITY: 104 ATLANTIS

CAUSE:

MULTIPLE INTERNAL COMPONENT FAILURES

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

CRITICALITY 1R2 DURING INTACT ABORT ONLY (AVIONICS ONLY)? NO

REDUNDANCY SCREEN

A) PASS

B) FAILS

C) FAILS

PASS/FAIL RATIONALE:

A)

B)

FAILURE OF ONE COMMAND IS "MASKED" BY REDUNDANT SIGNALS

C)

REDUNDANT FUNCTIONS ROUTED THROUGH THE SAME CONNECTOR.

METHOD OF FAULT DETECTION:

NONE

MASTER MEAS. LIST NUMBERS:

NONE

CORRECTING ACTION:

NONE

- FAILURE EFFECTS -

(A) SUBSYSTEM:

DEGRADATION OF REDUNDANCY FOR RING IN STOP ACTIVATION.

(B) INTERFACING SUBSYSTEM(S):

LOSS OF ONE OF THREE RING IN STOP SIGNALS TO THE DMCU.

(C) MISSION:



RSC
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Proprietary Data

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: M5-8MR-8028-17

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 RING IN STOP CONTROL SIGNAL TO THE DMCU. 2) LOSS OF SECOND ASSOCIATED RING IN STOP CONTROL SIGNAL TO THE DMCU RESULTING IN LOSS OF DOCKING RING CAPABILITY. POSSIBLE DOCKING RING MOTOR OVERHEATING WHICH MAY PRECLUDE DOCKING OPERATIONS.

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

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:

N/A (THERE ARE NO WORKAROUNDS TO CIRCUMVENT THIS FAILURE.)

-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:

NONE

-APPROVALS-

PRODUCT ASSURANCE ENGR	:	M. NIKOLAYEVA	:	<u>[Signature]</u>
DESIGN ENGINEER	:	B. VAKULIN	:	<u>[Signature]</u>
NASA SS/MA	:		:	<u>[Signature]</u> 9/21/95
NASA SUBSYSTEM MANAGER	:		:	<u>[Signature]</u> 9/22/95
NASA EPD&C SUBSYSTEM MANAGER:				<u>[Signature]</u> 9/18/95



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