

**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-B026-02

REVISION# 1 SEPT 1, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM
LRU: MC621-0087-1002
ITEM NAME: DSCU

CRITICALITY OF THIS
FAILURE MODE: 2R3

FAILURE MODE:
INADVERTENT ACTIVATION OF ONE OF THREE CONTROL SIGNALS TO THE HI-ENERGY DAMPERS.

MISSION PHASE:
OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS

CAUSE:
MULTIPLE INTERNAL COMPONENT FAILURES

CRITICALITY 1R1 DURING INTACT ABORT ONLY? NO

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

REDUNDANCY SCREEN A) PASS
 B) FAILS
 C) PASS

PASS/FAIL RATIONALE:
A)
B)
FAILURE "MASKED" BY REDUNDANT CONTROL SIGNAL
C)

METHOD OF FAULT DETECTION:
NONE.

MASTER MEAS. LIST NUMBERS: NONE

CORRECTING ACTION:
NONE

- FAILURE EFFECTS -

(A) SUBSYSTEM:
ONE OF THREE HIGH ENERGY DAMPER CONTROL SIGNALS CONTINUALLY ACTIVATED.

(B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - NO EFFECT.



FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: M5-6MR-B028-02

(C) MISSION:
FIRST FAILURE - NO EFFECT.

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF MISSION AFTER TWO FAILURES OCCURING WITHIN FIVE SECONDS AFTER CAPTURE. 1) INADVERTENT ACTIVATION OF ONE OF THREE HI-ENERGY DAMPER CONTROL SIGNALS - NO EFFECT. 2) INADVERTENT ACTIVATION OF SECOND ASSOCIATED CONTROL SIGNAL - ALL THREE DAMPERS ACTIVATED. MECHANISM IS STIFFENED DURING INITIAL CAPTURE, WHICH MAY CAUSE EXCESSIVE AXIAL TENSION LOADS RESULTING IN DAMAGE TO THE MECHANISM. POTENTIAL LOSS OF MISSION DUE TO EXCESSIVE LOADS ON THE MECHANISMS WHICH MAY PRECLUDE DOCKING.

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

PRODUCT ASSURANCE ENGR : M. NIKOLAYEVA
DESIGN ENGINEER : B. VAKULIN
NASA SSMA :
NASA SUBSYSTEM MANAGER :
NASA EP&C SUBSYSTEM MANAGER :

Hardaway
9/21/95
John P. McManis 9/22/95
9/21/95

RSC
Energia

Proprietary Data