

## FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL HARDWARE

NUMBER: M5-6MR-B019-X

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

REVISION: 0 OCT, 1995

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	ENERGIA POWER PANEL RSC-E	MC621-0087-0009 CKB>=468=312=001
SRU	CIRCUIT BREAKER	Az2-5 (S>3.619.242.TU)

## PART DATA

## EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

PNL A8A3, CIRCUIT BREAKER (8.5 AMPS TRIPPING CURRENT,) APDS (+Ac, +Cc, +Bc)  
POWER BUS CONTROL

REFERENCE DESIGNATORS: 36V73A8A3F1  
36V73A8A3F5  
36V73A8A3F9

QUANTITY OF LIKE ITEMS: 3  
(THREE)

## FUNCTION:

PROVIDE PROTECTION, CONTROL, AND DISTRIBUTION FOR THE APDS CONTROL LOGIC CIRCUITRY BUSES (+Ac, +Cc, +Bc.) THESE BUSES ARE PROVIDED TO THE POWER SWITCHING UNIT (PSU.) THE PSU DISTRIBUTES THEM AS +WA, +Wb, AND +WB TO THE DOCKING MECHANISM CONTROL UNIT (DMCU) FOR DOCKING RING MOTOR LOGIC CONTROL. THE PSU ALSO DISTRIBUTES THE BUSES (+WA, +Wb, +WB) TO THE LATCH ACTUATOR CONTROL ASSEMBLY (LACU) FOR LOGIC CONTROL OF THE CAPTURE LATCHES. THE (+WA, +Wb, +WB) BUSES ARE ALSO DISTRIBUTES TO THE PRESSURIZATION ACTUATOR CONTROL UNITS (PACUs 1 & 2) FOR LOGIC CONTROL OF THE HOOKS 1 & 2. ALSO, THESE BUSES ARE PROVIDED TO THE DSCU FOR COMMAND IMPLEMENTATION AND APDS ESSENTIAL AUTOMATIC AND MANUAL FUNCTIONS AND INITIALIZATION OF THE APDS SYSTEM.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE**

NUMBER: M5-6MR-B019-02

REVISION# 0 OCT, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

LRU: MC621-0087-0009

ITEM NAME: CIRCUIT BREAKER

CRITICALITY OF THIS

FAILURE MODE: 1R3

**FAILURE MODE:**

FAILS CLOSED, FAILS TO OPEN, INADVERTENTLY CLOSES, SHORTS CONTACT TO CONTACT

**MISSION PHASE:**

OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS

**CAUSE:**

A) PIECE PART FAILURE, B) CONTAMINATION, C) VIBRATION, D) MECHANICAL SHOCK, E) PROCESSING ANOMALY, F) THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

**REDUNDANCY SCREEN**

A) PASS

B) N/A

C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

FUNCTIONAL CRITICALITY 1R (FOUR FAULT TOLERANT OR GREATER) WITH AT LEAST TWO REMAINING OPERATIONAL STATUS VERIFIED IN FLIGHT.

C)

**METHOD OF FAULT DETECTION:**

PANEL INDICATIONS Ads, Bds, AND Cds

MASTER MEAS. LIST NUMBERS: NONE

**CORRECTING ACTION:**

NONE

**• FAILURE EFFECTS •****(A) SUBSYSTEM:**

INADVERTENT POWER ON COMMAND FOR ONE OF THREE APDS POWER BUSES (+Ac, +c, +Bc.)

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NUMBER: M5-6MR-8019-02**

**(B) INTERFACING SUBSYSTEM(S):**  
LOSS OF CAPABILITY TO REMOVE POWER FOR ONE OF THREE APDS POWER BUSES.

**(C) MISSION:**  
NO EFFECT

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

**(E) FUNCTIONAL CRITICALITY EFFECTS:**  
POSSIBLE LOSS OF CREW OR VEHICLE AFTER EIGHT FAILURES. 1, 2) TWO APDS POWER (ABA3) CIRCUIT BREAKERS FAIL CLOSED. 3, 4) TWO APDS CONTROL PANEL POWER (ABA3) CIRCUIT BREAKERS FAIL CLOSED. 5) ONE OF TWO ASSOCIATED "UNDOCKING" SWITCHES FAILS CLOSED. 6) ONE OF TWO ASSOCIATED "POWER ON" SWITCHES FAILS CLOSED. 7) ONE OF TWO ASSOCIATED "APDS CIRC PROT OFF" SWITCHES FAILS CLOSED. 8) ONE PSU MAIN POWER RPC FAILS ON RESULTING IN ALL HOOKS INADVERTENTLY OPENING. POSSIBLE LOSS OF HABITABLE ENVIRONMENT.

**DESIGN CRITICALITY (PRIOR TO OPERATIONAL DOWNGRADE, DESCRIBED IN F):** N/A

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

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**- TIME FRAME -**

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**TIME FROM FAILURE TO CRITICAL EFFECT: DAYS**

**TIME FROM FAILURE OCCURRENCE TO DETECTION: HOURS**

**TIME FROM DETECTION TO COMPLETED CORRECTIVE ACTION: N/A**

**TIME REQUIRED TO IMPLEMENT CORRECTIVE ACTION LESS THAN TIME TO EFFECT? N/A**

**RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT: N/A**

**HAZARDS REPORT NUMBER(S):** ORBI 511  
**HAZARD DESCRIPTION:**  
LOSS OF PRESSURE IN HABITABLE VOLUME.

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**- APPROVALS -**

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**PRODUCT ASSURANCE ENGR**  
**DESIGN ENGINEER**

**M. NIKOLAYEVA**  
  
**B. VAKULIN**  


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