

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE  
NUMBER: M5-6MR-B026-X**

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

REVISION: 0 OCT, 1995

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	LACU RSC-E	MC621-0087-1004 33Y.5212.007

---

**PART DATA**

---

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**  
LINE REPLACEABLE UNIT (LRU) LATCH ACTUATOR CONTROL UNIT (LACU) - CAPTURE  
LATCH MOTORS LOGIC AND POWER CONTROL

**REFERENCE DESIGNATORS:** 40V53A2A1

**QUANTITY OF LIKE ITEMS:** 1  
(ONE)

**FUNCTION:**  
PROVIDES CAPTURE LATCHES ACTUATORS CONTROL. THE UNIT PROVIDES LATCH  
MOTOR CONTROL VIA COMMANDS FROM THE DSCU FOR AUTOMATIC SEQUENCE  
IMPLEMENTATION, OR COMMANDS FROM THE CONTROL PANEL FOR MANUAL  
OPERATIONS.

**OUTPUT FUNCTIONS:**

- 1) LATCH MOTOR CONTROL: PLUS/MINUS POWER FOR LATCH CLOSING/OPENING.
- 2) LATCHES "OPEN" FEEDBACK SIGNAL TO INITIATE AUTOMATIC "RING IN"  
OPERATION (AFTER HOOK CLOSURE.)
- 3) SIGNALS TO THE DCU AND CONTROL PANEL FEEDBACKS THROUGH THE DSCU:  
MOTORS ON, LATCHES CLOSED/OPEN.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE**  
**NUMBER: M5-8MR-8026-02**

REVISION# 0 OCT, 1995

**SUBSYSTEM NAME: ORBITER DOCKING SYSTEM**  
**LRU: MC621-0087-1004**  
**ITEM NAME: LATCH ACTUATION CONTROL UNIT**

**CRITICALITY OF THIS FAILURE MODE: 1R3**

**FAILURE MODE:**  
 INADVERTENT ACTIVATION OF CAPTURE LATCH OPEN CONTROL SIGNAL FOR ALL CAPTURE LATCHES.

**MISSION PHASE:**  
 OO ON-ORBIT

**VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS**

**CAUSE:**  
 INTERNAL COMPONENT FAILURE(S)

**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)
- C)

**METHOD OF FAULT DETECTION:**  
 NONE.

**MASTER MEAS. LIST NUMBERS:**      NONE

NONE.

**- FAILURE EFFECTS -**

**(A) SUBSYSTEM:**  
 DEGRADATION OF REDUNDANCY FOR CONTROL OF THE CAPTURE LATCH MOTORS.

**(B) INTERFACING SUBSYSTEM(S):**  
 NO EFFECT.

**ORIGINAL**

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE  
NUMBER: M5-6MR-8026-02**

**(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 THREE FAILURES. 1) ONE OF THREE INADVERTENT CONTROL SIGNALS. DEGRADATION OF CONTROL AGAINST UNWANTED COMMAND. 2) SECOND INADVERTENT ASSOCIATED CONTROL SIGNAL RESULTING IN SIMULTANEOUS OPENING OF ALL CAPTURE LATCHES.

**DESIGN CRITICALITY (PRIOR TO OPERATIONAL DOWNGRADE, DESCRIBED IN F): 1R2**

**(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:**  
THIRD FAILURE (INABILITY TO PERFORM FIRING RCS JETS TO ENABLE SEPARATION) - POTENTIALLY CAUSING A COLLISION BETWEEN THE TWO VEHICLES.

---

**- TIME FRAME -**

---

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

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

**TIME FROM DETECTION TO COMPLETED CORRECTIVE ACTION: HOURS**

**TIME REQUIRED TO IMPLEMENT CORRECTIVE ACTION LESS THAN TIME TO EFFECT?**  
YES

**RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT:**  
CREW WOULD HAVE SUFFICIENT TIME TO PERFORM RCS JET FIRING.

**HAZARDS REPORT NUMBER(S) : ORBI 402A**

**HAZARD DESCRIPTION:**  
UNCONTROLLED/INADVERTENT COLLISION BETWEEN ORBITER AND MIR.

---

**- APPROVALS -**

---

**PRODUCT ASSURANCE ENGR**

**: M. NIKOLAYEVA**

**DESIGN ENGINEER**

**: B. VAKULIN**