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PRINT DATE: 10/26/95

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NONCRITICAL HARDWARE  
NUMBER: M5-6MR-0024-X**

**SUBSYSTEM NAME: ORBITER DOCKING SYSTEM**

**REVISION: 1 SEP 30, 1995**

	<b>PART NAME VENDOR NAME</b>	<b>PART NUMBER VENDOR NUMBER</b>
LRU	: DOCKING SYSTEM POWER PANEL	V828-730150
SRU	: TOGGLE SWITCH	MC452-0102-7801

**PART DATA**

**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:**  
SWITCH, TOGGLE, 3P/2P, MAINTAINED ON - PYRO PWR MN A AND MN C CONTROL  
CIRCUIT.

**REFERENCE DESIGNATORS:** 36V73A7A3S3  
36V73A7A3S4

**QUANTITY OF LIKE ITEM: 2**  
(TWO)

**FUNCTION:**  
THE SWITCHES PROVIDE MANUAL ACTIVATION OF THE PYROTECHNIC LOGIC AND  
FIRE CIRCUITS ROUTED TO THE PFCU.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NONCRITICAL FAILURE MODE  
NUMBER: M5-6MR-0024- 01**

REVISION# 0 SEP 30, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM  
LRU: MC452-0102-7801  
ITEM NAME: TOGGLE SWITCH

CRITICALITY OF THIS  
FAILURE MODE: 1R3

**FAILURE MODE:**

FAILS OPEN IN THE "ON" POSITION, FAILS CLOSED IN THE "OFF" POSITION. POLE-TO-POLE SHORT, SHORT TO CASE, SHORT TO GROUND

**MISSION PHASE:**

OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS

**CAUSE:**

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

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

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REDUNDANCY SCREEN      A) PASS  
   B) N/A  
   C) PASS

**PASS/FAIL RATIONALE:**

A)

B)

PYROTECHNIC SEPARATION CLASSIFIED AS STAND-BY REDUNDANCY.

C)

**METHOD OF FAULT DETECTION:**

N/A

MASTER MEAS. LIST NUMBERS:      NONE

**CORRECTING ACTION:**

USE SYSTEM IN DEGRADED STATE.

EMERGENCY SEPARATION CAN BE IMPLEMENTED IN A DEGRADED MODE.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NONCRITICAL FAILURE MODE  
NUMBER: M5-6MR-0024-01**

**- FAILURE EFFECTS -**

**(A) SUBSYSTEM:**

LOSS OF CAPABILITY TO ACTIVATE ONE OF THE TWO PFCU FIRE CIRCUITS.

**(B) INTERFACING SUBSYSTEM(S):**

DEGRADED REDUNDANCY FOR PYROTECHNIC SEPARATION CAPABILITY. LOSS OF ONE OF TWO PYROTECHNIC SEPARATION "FIRE" CURRENT BUSES. LOSS OF ONE OF TWO LOGIC BUSES TO THE PFCU.

**(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 FOURTHREE FAILURES. 1) SWITCH FAILS. DEGRADED REDUNDANCY FOR PYROTECHNIC SEPARATION. 2) SWITCH IN THE REDUNDANT CIRCUIT FAILS OPEN. LOSS OF PFCU LOGIC. LOSS OF PYROTECHNIC UNDOCKING CAPABILITY. 3) ONE OF TWELVE HOOKS FAILS TO OPEN (REF. M8-1MR-BM001-04.) LOSS OF CAPABILITY TO IMPLEMENT NOMINAL SEPARATION. LOSS OF NOMINAL AND PYROTECHNIC SEPARATION CAPABILITY. PERFORM EVA TO REMOVE 96 BOLTS HOLDING DOCKING BASE TO EXTERNAL AIRLOCK. 4) FAILURE OF EVA TO REMOVE BOLTS. LOSS OF ALL UNDOCKING CAPABILITY

**- TIME FRAME -**

TIME FROM FAILURE TO CRITICAL EFFECT: DAYS

TIME FROM FAILURE OCCURRENCE TO DETECTION: MINUTES

TIME FROM DETECTION TO COMPLETED CORRECTIVE ACTION: MINUTES

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

**HAZARDS: DM20HA04(F).**

INABILITY TO SAFELY SEPARATE ORBITER FROM DOCKING MODULE OR MIR.

**- APPROVALS -**

PRODUCT ASSURANCE ENGINEERING  
PRODUCT ASSURANCE MANAGER

:R. BLACKWELL :  
:T. NGUYEN :

*R. Blackwell*  
*T. Nguyen*