

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: M5-6MR-B015-X**

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

REVISION: 1 OCT, 1995

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	ENERGIA POWER PANEL RSC-E	MC621-0087-0009 СНУКО.468.312.001
SRU	PUSH BUTTON SWITCH	PKZ-4 (AGO.360.212.TU)

PART DATA

EXTENDED DESCRIPTION (PART UNDER ANALYSIS)
 PUSH-BUTTON SWITCHES (TWO DOUBLE POLE SWITCHES UNDER A SINGLE COVER
 CAP.) TWO POLE, MOMENTARY - APDS "ACTIVE HOOKS FIRING" COMMAND.

REFERENCE DESIGNATORS: 36V73A8A3S86-B1
 36V73A8A3S86-B2

QUANTITY OF LIKE ITEMS: 2
 (TWO)

FUNCTION:
 PROVIDE THE "ACTIVE HOOKS FIRING" COMMAND STIMULI TO CLOSE THE
 APPROPRIATE RELAY COILS IN THE PYROTECHNIC FIRE CONTROL UNIT (PFCU.)

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

NUMBER: M5-6MR-8015- 01

REVISION# 0 OCT, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

LRU: MC621-0087-0009

ITEM NAME: PUSH BUTTON SWITCH

CRITICALITY OF THIS

FAILURE MODE: 1R3

FAILURE MODE:

FAILS OPEN (MULTIPLE CONTACTS WITHIN ONE SWITCH)

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 1M 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)

PYROTECHNIC SEPARATION SYSTEM IS CONSIDERED STAND-BY

C)

METHOD OF FAULT DETECTION:

NONE.

MASTER MEAS. LIST NUMBERS:

NONE

CORRECTING ACTION:

NONE.

- FAILURE EFFECTS -

(A) SUBSYSTEM:

PARTIAL LOSS OF SWITCH CONTROL CAPABILITY FOR THE PFCU "ACTIVE HOOKS FIRING" COMMAND.

(B) INTERFACING SUBSYSTEM(S):

LOSS OF COMMAND REDUNDANCY.

75

ORIGINAL

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE
NUMBER: M5-SMR-8015-01**

(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 FOUR FAILURES. 1) ONE OF TWO ASSOCIATED SWITCHES FAILS OPEN. NO EFFECT. DEGRADED COMMAND IMPLEMENTATION REDUNDANCY. 2) ASSOCIATED SWITCH FAILS OPEN. LOSS OF CAPABILITY TO IMPLEMENT THE "ACTIVE HOOKS FIRING" COMMAND. LOSS OF PYROTECHNIC SEPARATION CAPABILITY FOR THE ACTIVE HOOKS. 3) ONE OF TWELVE HOOKS FAILS TO OPEN (REF. M8-1MR-BM001-04.). LOSS OF CAPABILITY TO IMPLEMENT NOMINAL SEPARATION.

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

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:
NONE. CRITICALITY UNCHANGED. WORKAROUNDS ADD TO REDUNDANCY.

4) FAILURE OF EVA TO REMOVE 98 BOLTS - LOSS OF ALL UNDOCKING CAPABILITY.

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: DAYS

TIME FROM FAILURE OCCURRENCE TO DETECTION: HOURS

TIME FROM DETECTION TO COMPLETED CORRECTIVE ACTION: MINUTES

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 EVA.

HAZARDS REPORT NUMBER(S): ORBI 401A

HAZARD DESCRIPTION:
INABILITY TO SEPARATE ORBITER AND MIR.

- APPROVALS -

**PRODUCT ASSURANCE ENGR
DESIGN ENGINEER**

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