

PAGE: 4

PRINT DATE: 12/27/95

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

NUMBER: MS-6MR-8013-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	PUSH BUTTON SWITCH	PKZ-4 (AGO.360.212.TU)

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

PUSH-BUTTON SWITCHES (TWO DOUBLE POLE SWITCHES UNDER A SINGLE COVER CAP.) TWO POLE, MOMENTARY - APDS "PYRO CIRCUIT PROTECTION OFF" COMMAND.

REFERENCE DESIGNATORS: 35V73A&A3SB5-B1
35V73A&A3SB5-B2

QUANTITY OF LIKE ITEMS: 2
(TWO)

FUNCTION:

PROVIDE THE "PYRO CIRCUIT PROTECTION OFF" COMMAND STIMULI TO CLOSE THE APPROPRIATE CONTACTS IN THE PYROTECHNIC FIRE CONTROL UNIT (PFCU.)

REFERENCE DOCUMENTS: 1) ECN 104-25012A. ODS ELECTRICAL CHANGE NOTICE.
2) CKB>=468312=001 _J"P. SCHEMATIC DIAGRAM - ANDROGYNOUS PERIPHERAL DOCKING SYSTEM (APDS) CONTROL PANEL PU-APSS SCHEMATIC.
3) 33Y.5212.005. *3. APDS CONTROL UNIT ELECTRICAL SCHEMATIC.
4) VS70-953104. ODS INTEGRATED SCHEMATIC.
5) I7RC=10> 2601F _J "P. PYRO FIRING CONTROL UNIT ELECTRICAL

04

ORIGINAL

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

NUMBER: M5-6MR-8013-02

REVISION# 0 OCT, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

LRU: MC521-0087-0009

ITEM NAME: PUSH BUTTON SWITCH

CRITICALITY OF THIS

FAILURE MODE: 1R3

FAILURE MODE:

FAILS CLOSED (MULTIPLE CONTACTS WITHIN ONE SWITCH,) SHORTS TO GROUND

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 REATER) WITH AT LEAST NO REMAINING OPERATIONAL STATUS VERIFIED IN F

C)

METHOD OF FAULT DETECTION:

"PYROTECHNIC BUS STATUS (+A, +B)" AND "PYRO CIRCUIT PROTECTION OFF" INDICATIONS IN THE D&C PANEL

MASTER MEAS. LIST NUMBERS:

V53X0765E

V53X0768E

CORRECTING ACTION:

NONE

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

LOSS OF SWITCH CONTROL CAPABILITY FOR THE APDS "PYRO CIRCUIT PROTECTION OFF" CIRCUITS.

07

ORIGINAL

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE
NUMBER: M5-6MR-8013- 02**

(B) INTERFACING SUBSYSTEM(S):

UNWANTED "PYRO CIRCUIT PROTECTION OFF" COMMAND 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 FIVE FAILURES. 1) ONE OF TWO ASSOCIATED SWITCHES FAILS CLOSED (MULTIPLE CONTACTS.) UNWANTED "PYRO CIRCUIT PROTECTION OFF" COMMAND TO THE PFCU. DEGRADED PROTECTION AGAINST ACCIDENTAL PYROTECHNIC SEPARATION. 2) ONE "ACTIVE" OR "PASSIVE" HOOKS FIRING SWITCH FAILS CLOSED (MULTIPLE CONTACTS.) 3) & 4) TWO OF THREE PYROTECHNIC POWER CIRCUIT BREAKERS FAILS CLOSED. DEGRADED PROTECTION AGAINST ACCIDENTAL PYROTECHNIC SEPARATION. 5) A7A3 PYRO POWER SWITCH FAILS CLOSED (MULTIPLE CONTACTS.) POSSIBLE VEHICLE SEPARATION OR LOSS OF HABITABLE VOLUME DUE TO UNWANTED "PYRO FIRE" COMMAND.

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

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:

N/A

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: HOURS .

TIME FROM FAILURE OCCURRENCE TO DETECTION: SECONDS

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 (NO CORRECTIVE ACTION)

HAZARDS REPORT NUMBER(S) : ORBI 511

HAZARD DESCRIPTION:

LOSS OF PRESSURE IN HABITABLE VOLUME.

- APPROVALS -

PRODUCT ASSURANCE ENGR

: M. NIKOLAYEVA

DESIGN ENGINEER

: B. VAKULIN

65

ORIGINAL