FAILURE ɔES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER: M5-6MR-B012-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 "OPEN LATCHES" COMMAND.

REFERENCE DESIGNATORS: 36V73A8A3SB4-B3
36V73A8A3SB4-B4

QUANTITY OF LIKE ITEMS: 2
(TWO)

FUNCTION:
PROVIDE THE "OPEN LATCHES" COMMAND STIMULI TO CLOSE THE APPROPRIATE CONTACTS IN THE DSCU TO IMPLEMENT THE "OPEN LATCHES" FUNCTION. THE "OPEN LATCHES" SIGNAL IS ROUTED BY THE DSCU TO THE LATCH ACTUATION CONTROL UNIT (LACU) WHICH IMPLEMENTS THE OPERATION OF THE THREE CAPTURE LATCHES (M1, M2, AND M3.)

59 ORIGINAL

PRINT DATE: 12/27/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: M5-6MR-B012-02

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 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) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

METHOD OF FAULT DETECTION:
NONE

MASTER MEAS. LIST NUMBERS: NONE

CORRECTING ACTION:
NONE.

-- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF SWITCH CONTROL CAPABILITY FOR THE APDS "OPEN LATCHES" CIRCUITS.

(B) INTERFACING SUBSYSTEM(S):
UNWANTED "OPEN LATCHES" COMMAND TO THE DSCU.

G-2 ORIGINAL

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: M5-6MR-B012-02

(C) MISSION:
FIRST FAILURE - NO EFFECT.

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW OR VEHICLE AFTER THREE FAILURES. 1) ONE OF TWO ASSOCIATED "OPEN LATCHES" SWITCHES FAILS CLOSED. ENABLES TWO OF THREE PANEL COMMAND SIGNALS. 2) ONE OF TWO "APDS CIRC PROT OFF" SWITCHES FAILS CLOSED. THREE CAPTURE LATCHES INADVERTENTLY OPEN DURING DYNAMIC CAPTURE OPERATION.

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 FIRE RCS JETS.

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

C3 ORIGINAL