FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER: M5-6MR-B003-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-8 (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 "POWER-OFF" COMMAND.

REFERENCE DESIGNATORS: 36V73A8A3SB1-B3
36V73A8A3SB1-B4

QUANTITY OF LIKE ITEMS: 2
(TWO)

FUNCTION:
PROVIDE THE "POWER-OFF" COMMAND TO THE POWER SWITCHING UNIT (PSU.) THE PSU PROVIDES THE LOGIC BUSES TO THE DSCU, DMCU, PACU, AND THE LACU. THESE LOGIC BUSES ARE REQUIRED TO IMPLEMENT ALL DOCKING AND UNDOCKING OPERATIONS.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: M5-6MR-B003- 02

REVISION# 0 OCT, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM
LRU: MC621-0087-0009 **CRITICALITY OF THIS**
ITEM NAME: PUSH BUTTON SWITCH **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:
THE STATUS OF THE APDS SYSTEM BUSES IS DISPLAYED ON THE PANEL.

MASTER MEAS. LIST NUMBERS: V53X0785E

CORRECTING ACTION:
NONE

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF SWITCH CONTROL CAPABILITY FOR THE APDS "POWER-OFF" COMMAND.

(B) INTERFACING SUBSYSTEM(S):
UNWANTED "POWER OFF" COMMAND TO THE PSU.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: M5-6MR-B003-02

(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 FOUR FAILURES. 1) ONE OF TWO ASSOCIATED SWITCHES FAILS CLOSED (MULTIPLE CONTACTS) DURING THE AUTOMATIC DOCKING SEQUENCE (AFTER CAPTURE. BUT PRIOR TO HOOKS ENGAGED.) ENABLES TWO OF THREE COMMAND CHANNELS. UNWANTED "POWER OFF" COMMAND TO THE PSU. TEMPORARY LOSS OF CAPABILITY TO COMPLETE DOCKING AND OPEN CAPTURE LATCHES TO SEPARATE. CREW WOULD PERFORM AN APDS LOGIC BUS DROP TO RECOVER DOCKING FUNCTIONS.

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

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:
SECOND FAILURE (INABILITY TO DISABLE AFFECTED APDS LOGIC BUS) - LOSS OF CAPABILITY TO RECOVER FUNCTION.
THIRD FAILURE (INABILITY TO PERFORM IFM TO DRIVE THE CAPTURE LATCHES OPEN) - LOSS OF CAPABILITY TO SEPARATE.
FOURTH FAILURE (FAILURE OF EVA TO REMOVE 96 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: 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 96 BOLT EVA OR DISABLE AFFECTED BUS.
HAZARDS REPORT NUMBER(S): ORBI 401A
HAZARD DESCRIPTION:
INABILITY TO SEPARATE ORBITER AND MIR.

- APPROVALS -

PRODUCT ASSURANCE ENGR : M. NIKOLAYEVA

DESIGN ENGINEER : B. VAKULIN

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