

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CRITICAL HARDWARE
NUMBER: M5-6MR-8008-X**

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

REVISION: 1 SEPT 1, 1995

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: ENERGIA POWER PANEL RSC-E	MC621-0087-0009 CJIXIO.488.312.001
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 - AFDS "CLOSE LATCHES" COMMAND.

REFERENCE DESIGNATORS: 36V73A8A3SB2-B5
36V73A8A3SB2-B6

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

FUNCTION:
PROVIDE THE "CLOSE LATCHES" COMMAND STIMULI TO CLOSE THE APPROPRIATE CONTACTS IN THE DSCU TO IMPLEMENT THE "CLOSE LATCHES" FUNCTION. NOMINALLY, THE LATCHES ARE OPENED AND CLOSED AS PART OF THE AUTOMATIC DOCKING SEQUENCE. THE "CLOSE LATCHES" SIGNAL IS ROUTED BY THE DSCU TO THE LATCH ACTUATOR CONTROL UNIT (LACU) TO ENABLE THE CIRCUITS WHICH INITIATE THE CLOSE LATCH MOTIONS. ONE MOTOR FOR EACH LATCH (M1, M2, AND M3.)



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

NUMBER: MS-6MR-0008-01

- FAILURE EFFECTS -

(A) SUBSYSTEM:

PARTIAL LOSS OF SWITCH CONTROL CAPABILITY FOR THE APDS "CLOSE LATCHES" COMMAND.

(B) INTERFACING SUBSYSTEM(S):

LOSS OF COMMAND REDUNDANCY.

(C) MISSION:

NO EFFECT FOR FIRST DOCKING ATTEMPT. ONLY SUBSEQUENT ATTEMPTS TO DOCK DURING THE SAME MISSION WOULD BE AFFECTED. THE LATCHES ARE LAUNCHED IN THE CLOSED CONFIGURATION.

(D) CREW, VEHICLE, AND ELEMENT(S):

NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECTS:

LOSS OF MISSION OBJECTIVES AFTER TWO FAILURES. FIRST FAILURE (ONE OF TWO ASSOCIATED SWITCHES FAILS OPEN) - NO EFFECT. SECOND FAILURE (SECOND ASSOCIATED SWITCH FAILS OPEN) - LOSS OF CAPABILITY TO RE-CLOSE THE LATCHES RESULTING IN LOSS OF CAPABILITY TO ATTEMPT SECOND DOCKING.

DESIGN CRITICALITY (PRIOR TO OPERATIONAL DOWNGRADE, DESCRIBED IN F): 2R3

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:

N/A



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FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE
NUMBER: M5-6MR-0008-01

-DISPOSITION RATIONALE-

(A) DESIGN:

REFER TO APPENDIX C, ENERGIA HARDWARE.

(B) TEST:

REFER TO APPENDIX C, ENERGIA HARDWARE.

APDS PANEL OPERATION IS VERIFIED DURING GROUND CHECKOUT. ANY TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:

REFER TO APPENDIX I, ENERGIA HARDWARE.

(D) FAILURE HISTORY:

REFER TO APPENDIX I, ENERGIA HARDWARE.

(E) OPERATIONAL USE:

AFTER SECOND FAILURE, CREW COULD PERFORM AN IN-FLIGHT MAINTENANCE TO DRIVE THE CAPTURE LATCH MOTORS (TO THE CLOSED POSITION) DIRECTLY FROM THE FEED-THROUGH CONNECTORS IN THE EXTERNAL AIRLOCK, USING THE ORBITER BREAKOUT BOX. HOWEVER, SINCE CAPTURE LATCHES WOULD HAVE TO BE DRIVEN CLOSED TO PERFORM THE SECOND DOCKING AND THEN, DRIVEN OPEN TO PERFORM SEPARATION, DOCKING WOULD PROBABLY NOT BE ATTEMPTED.

- APPROVALS -

PRODUCT ASSURANCE ENGR : M. NIKOLAYEVA
DESIGN ENGINEER : B. YAKULIN
NASA SS/MA :
NASA SUBSYSTEM MANAGER :
NASA EPD&C SUBSYSTEM MANAGER:

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