

FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL HARDWARE
NUMBER: M5-6SS-8020-X

SUBSYSTEM NAME: E - DOCKING SYSTEM

REVISION: 0 DEC, 1996

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: ENERGIA POWER PANEL RSC-E	MC621-0087-0009 SLTYU.468312.001
SRU	: CIRCUIT BREAKER	AZ2-2 (P:3,619,242 TU)

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

PNL A8A3, CIRCUIT BREAKER (4.2 AMPS TRIPPING CURRENT,) APDS (+Ap, +Bp, +Cp)
PFCU LOGIC BUS CONTROL

REFERENCE DESIGNATORS: 36V73A8A3F2
36V73A8A3F6
36V73A8A3F10

QUANTITY OF LIKE ITEMS: 3
(THREE)

FUNCTION:

PROVIDE PROTECTION, CONTROL AND DISTRIBUTION FOR THE APDS PYROTECHNIC SEPARATION LOGIC BUSES (+Ap, +Bp, +Cp). THESE BUSES ARE PROVIDED TO THE PYROTECHNIC FIRING CONTROL UNIT (PFCU). WITHIN THE PFCU, THE BUSES ARE DISTRIBUTED TO CONFIGURE THE PYROTECHNIC SEPARATION ELEMENTS (ACTIVE AND PASSIVE HOOKS). IN ADDITION, THE BUSES ARE ENERGIZED WHEN PYROTECHNIC CIRCUIT CHECKOUT IS REQUIRED.

FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE
NUMBER: M5-6SS-B020-02

REVISION# 0 FEBDEC, 19976

SUBSYSTEM NAME: E - DOCKING SYSTEM
LRU: MC621-0087-0009
ITEM NAME: CIRCUIT BREAKER

CRITICALITY OF THIS
FAILURE MODE: 1R3

FAILURE MODE:

FAILS CLOSED, FAILS TO OPEN, INADVERTENTLY CLOSES, SHORTS CONTACT TO CONTACT

MISSION PHASE:

OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 103 DISCOVERY
104 ATLANTIS
105 ENDEAVOUR

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)

C) METHOD OF FAULT DETECTION:

"PYROTECHNIC BUS STATUS (+Ap, +Bp, +Cp) * INDICATION IN THE D&C PANEL

MASTER MEAS. LIST NUMBERS: NONE

CORRECTING ACTION:

NONE

- FAILURE EFFECTS -

(A) SUBSYSTEM:

INADVERTENT POWER ON COMMAND FOR THE PYROTECHNIC CONTROL BUSES (+Ap, +Bp, +Cp)

FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE
NUMBER: M5-6SS-B020-02

(B) INTERFACING SUBSYSTEM(S):
LOSS OF CAPABILITY TO REMOVE POWER FOR ONE OF THREE PYROTECHNIC CONTROL BUSES

(C) MISSION:
NO EFFECT.

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
SHUTTLE MECHANISM CONTROL: POSSIBLE LOSS OF CREW OR VEHICLE AFTER FOUR FAILURES.
1) ONE CIRCUIT BREAKER FAILS CLOSED. LOSS OF CAPABILITY TO REMOVE POWER FOR ONE OF THREE PYROTECHNIC CONTROL BUSES. 2) ONE OF TWO "ACTIVE HOOKS FIRING" SWITCHES FAILS CLOSED. POTENTIAL "ACTIVE HOOKS FIRING" COMMAND TO THE PFCU. 3) ONE RPC PYRO INITIATION BUS FAILS ON RESULTING IN POWER BEING PROVIDED TO THE PFCU. 4) INTERNAL PFCU SWITCHING DEVICE INADVERTENTLY TRANSFERS AND PROVIDES POWER TO THE PYRO INITIATION BUSES RESULTING IN AN INADVERTENT PYRO FIRING. POSSIBLE VEHICLE SEPARATION OR LOSS OF HABITABLE VOLUME DUE TO UNWANTED "PYRO FIRE" COMMAND.

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

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:
N/A

• TIME FRAME •

TIME FROM FAILURE TO CRITICAL EFFECT: DAYS

TIME FROM FAILURE OCCURRENCE TO DETECTION: HOURS

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

PAGE: 7

PRINT DATE: 11.02.97

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
NUMBER: M5-6SS-9020-02

HAZARDS REPORT NUMBER(S) : ORBI 511

HAZARD DESCRIPTION:
LOSS OF PRESSURE IN HABITABLE VOLUME.

- APPROVALS -

PRODUCT ASSURANCE ENGR
DESIGN ENGINEER

: M. NIKOLAYEVA
: B. VAKULIN

M. Nikolayeva
B. Vakulin