

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER:M5-6SS-0116 -X**

SUBSYSTEM NAME: ISS DOCKING SYSTEM

REVISION: 0 02/27/98

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	:PANEL A6A3	V828-730150
SRU	:CIRCUIT BREAKER	MC454-0026-2075

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
CIRCUIT BREAKERS, 7.5 AMP - DOCKING SYSTEM POWER (MAIN A, MAIN B, MAIN C)

REFERENCE DESIGNATORS: 36V73A7A3CB11
36V73A7A3CB12
36V73A7A3CB13
36V73A7A3CB14
36V73A7A3CB15
36V73A7A3CB16

QUANTITY OF LIKE ITEMS: 6
SIX

FUNCTION:
PROVIDE OVERLOAD PROTECTION TO THE ORBITER MAIN A (MPCA-1) MAIN B (MPCA-2,) AND MAIN C (MPCA-3) FROM THE PANEL LOGIC BUS A, B, AND C CIRCUITS.

REFERENCE DOCUMENTS: 1) VS70-953103, INTEGRATED SCHEMATIC - 53A, MAIN A/MAIN B SYSTEM POWER AND APDS LOGIC BUSES

FAILURE MODES EFFECTS ANALYSIS FMEA – NON-CIL FAILURE MODE
NUMBER: M5-6SS-0116-02

REVISION#: 0 02/27/98

SUBSYSTEM NAME: ISS DOCKING SYSTEM
 LRU: PANEL A6A3
 ITEM NAME: CIRCUIT BREAKER

CRITICALITY OF THIS
 FAILURE MODE: 1R3

FAILURE MODE:
 FAILS CLOSED (FAILS TO OPEN MECHANICALLY)

MISSION PHASE: OO ON-ORBIT

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

CAUSE:

A) STRUCTURAL FAILURE, B) CONTAMINATION, C) VIBRATION, D) MECHANICAL SHOCK,
 E) PROCESSING ANOMALY

CRITICALITY 1R1 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)

N/A - AT LEAST TWO REMAINING PATHS ARE READILY DETECTABLE IN FLIGHT

C)

CORRECTING ACTION: NONE

CORRECTING ACTION DESCRIPTION:

DESIGN FAULT TOLERANCE: SWITCHES, CIRCUIT BREAKERS, AND RPC'S PROVIDE
 REDUNDANCY AGAINST THE INADVERTENT ENERGIZING OF HOOKS OPENING CIRCUITS
 RESULTING IN LOSS OF HABITABLE VOLUME.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: M5-6SS-0116-02**

- FAILURE EFFECTS -

(A) SUBSYSTEM:

INABILITY TO REMOVE POWER FROM THE ISS DOCKING MECHANISM LOGIC POWER BUSES.

(B) INTERFACING SUBSYSTEM(S):

FIRST FAILURE - NO EFFECT

(C) MISSION:

FIRST FAILURE - NO EFFECT

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

FIRST FAILURE - NO EFFECT

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF CREW/VEHICLE AFTER TEN FAILURES:

- 1,2) TWO MAIN BUS LOGIC CIRCUIT BREAKERS IN PANEL A6A3 FAIL CLOSED (FAILS TO OPEN - MECHANICALLY).
- 3,4) TWO APDS CONTROL PANEL POWER CIRCUIT BREAKERS FAIL CLOSED.
- 5,6) TWO APDS POWER (A7A2) CIRCUIT BREAKERS FAIL CLOSED.
- 7) ONE OF TWO ASSOCIATED "UNDOCKING" SWITCHES FAILS CLOSED.
- 8) ONE OF TWO ASSOCIATED "POWER ON" SWITCHES FAILS CLOSED.
- 9) ONE OF TWO ASSOCIATED "APDS CIRC PROT OFF" SWITCHES FAILS CLOSED.
- 10) ONE PSU MAIN POWER RPC FAILS ON RESULTING IN ALL HOOKS INADVERTENTLY OPENING. POSSIBLE LOSS OF HABITABLE ENVIRONMENT.

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: DAYS

TIME FROM FAILURE OCCURRENCE TO DETECTION: MINUTES

TIME FROM DETECTION TO COMPLETED CORRECTING ACTION: N/A

**IS TIME REQUIRED TO IMPLEMENT CORRECTING ACTION LESS THAN TIME TO EFFECT?
N/A**

RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT:

CREW CAN KEEP OPEN THE ASSOCIATED SWITCHES ("UNDOCKING", "POWER ON", "APDS CIRC PROT OFF") TO PREVENT INADVERTENT OPENING OF HOOKS RESULTING IN POSSIBLE LOSS OF HABITABLE ENVIRONMENT.

FAILURE MODES EFFECTS ANALYSIS (FMEA) - NON-CIL FAILURE MODE
NUMBER: M5-6SS-0116-02

HAZARD REPORT NUMBER(S): ORBI 511

HAZARD(S) DESCRIPTION:
LOSS OF HABITABLE ENVIRONMENT IN ODS/CREW MODULE.

- APPROVALS -

SS&PAE
DESIGN ENGINEERING

: T. K. KIMURA
: C. J. ARROYO

: *T. Kimura 4-13-98*
: *C. Arroyo*