FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL HARDWARE
NUMBER:M5-6SS-0113 -X

SUBSYSTEM NAME: ISS DOCKING SYSTEM

REVISION: 0 02/27/98

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	:MID PCA-1	VO70-764400
LRU	:MID PCA-2	VO70-764430
SRU	:REMOTE POWER CONTROLLER	MC450-0017-X200

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
REMOTE POWER CONTROLLER, 20 AMP - PFCU "FIRE" POWER CIRCUIT

REFERENCE DESIGNATORS:
40V76A25RPC18
40V76A25RPC31
40V76A27RPC37
40V76A27RPC38

QUANTITY OF LIKE ITEMS: 4
FOUR

FUNCTION:
THE REMOTE POWER CONTROLLERS PROVIDE POWER DISTRIBUTION AND CIRCUIT PROTECTION ACTIVATION OF THE PFCU "FIRE" (MN A, MN C) POWER CIRCUITS.

REFERENCE DOCUMENTS:
1) VS70-953103, INTEGRATED SCHEMATIC - 53PA, PFCU POWER DISTRIBUTION CONTROL CIRCUIT

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: M5-6SS-0113-02

REVISION#: 0 02/27/98

SUBSYSTEM NAME: ISS DOCKING SYSTEM
LRU: MID PCA-1, 2
ITEM NAME: REMOTE POWER CONTROLLER

CRITICALITY OF THIS FAILURE MODE: 1R3

FAILURE MODE:
INADVERTENT OUTPUT, FAILS TO TURN "OFF", FAILS "ON"

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) N/A
C) PASS

PASS/FAIL RATIONALE:
A)

B)
N/A - PYROTECHNIC SEPARATION IS CLASSIFIED AS STANDBY REDUNDANCY.

C)

METHOD OF FAULT DETECTION:
TELEMETRY CAN BE USED TO VERIFY POWER ON OR OFF FOR THE PSU 20 AMP BUSES. "PYROTECHNIC BUS STATUS (AP, BP, AND CP)" AND "PYRO CIRCUIT PROTECT CIRCUIT OFF" INDICATIONS IN THE APDS D&C PANEL.

MASTER MEAS. LIST NUMBERS: V53X0765E

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
NUMBER: M5-6SS-0113-02

V53X0766E
V53X0797E
V53X0798E
V53X0796E

CORRECTING ACTION: NONE

CORRECTING ACTION DESCRIPTION:
DESIGN FAULT TOLERANCE: PFCU KQ1 OR KQ2 RELAYS PROVIDE SERIES REDUNDANCY AGAINST INADVERTENT PYROTECHNIC SEPARATION.

REMARKS/RECOMMENDATIONS:
V53X0765E PYRO CKT PROTECT OFF CHANNEL 1
V53X0766E PYRO CKT PROTECT OFF CHANNEL 2
V53X0797E PYRO LOGIC POWER BUS A
V53X0798E PYRO LOGIC POWER BUS B
V53X0796E PYRO LOGIC POWER BUS C

- FAILURE EFFECTS -

(A) SUBSYSTEM:
DEGRADATION OF REDUNDANCY AGAINST INADVERTENT PYROTECHNIC SEPARATION.

(B) INTERFACING SUBSYSTEM(S):
UNWANTED COMMAND - ONE OF TWO POWER CIRCUITS ALWAYS ENERGIZED.

(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 FOUR FAILURES:
1) RPC FAILS "ON".
2) PFCU KQ1 OR KQ2 RELAYS FAIL CLOSED - DEGRADED REDUNDANCY AGAINST PYROTECHNIC SEPARATION.
3) PYRO LOGIC BUS "B" CIRCUIT BREAKER FAILS CLOSED (DETECTABLE). DEGRADED REDUNDANCY AGAINST PYROTECHNIC SEPARATION.
4) HOOKS PYRO FIRE SWITCH MULTIPLE CONTACT FAILURE. POSSIBLE VEHICLE SEPARATION OR LOSS OF HABITABLE VOLUME DUE TO UNWANTED PYRO "FIRE" COMMAND.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
NUMBER: M5-6SS-0113-02

- 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:
THE CREW CAN OPEN THE ASSOCIATED PYRO LOGIC BUS CIRCUIT BREAKER TO PREVENT AN UNCOMMANDED PYRO "FIRE" COMMAND.

HAZARD REPORT NUMBER(S): ORBI 511

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

- APPROVALS -

SS&PAE	: T. K. KIMURA	: T. Kimura 4-13-98
DESIGN ENGINEERING	: C. J. ARROYO	: