FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NONCRITICAL HARDWARE
NUMBER: M5-6MR-0021-X

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM

REVISION: 1 SEP 30; 1995

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	MPCA-1	V070-764400
LRU	:	MPCA-2	V070-764430
SRU	:	REMOTE POWER CONTROLLER	MC450-0017-X200

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
REMOTE POWER CONTROLLER, TYPE III, CLASS B, 20 AMP - PSU POWER MN A AND MN B CONTROL CIRCUIT.

REFERENCE DESIGNATORS: 40V76A25RPC17
40V76A26RPC17

QUANTITY OF LIKE ITEM: 2
(TWO)

FUNCTION:
THE REMOTE POWER CONTROLLERS PROVIDE POWER DISTRIBUTION AND CIRCUIT PROTECTION ACTIVATION OF THE PSU POWER MN A AND MN B POWER CIRCUITS.

REFERENCE DOCUMENTS:
1) ECN 104-25012A, ODS ELECTRICAL CHANGE NOTICE.
2) CKB>=468912=001 _ J"P, SCHEMATIC DIAGRAM - ANDROGYNOUS PERIPHERAL DOCKING SYSTEM (APDS) CONTROL PANEL PU-APSS SCHEMATIC.
3) 33Y.5212.005."3, APDS CONTROL UNIT ELECTRICAL SCHEMATIC.
4) VS70-953104, ODS INTEGRATED SCHEMATIC.
5) V828-733002, SCHEMATIC DIAGRAM - D&C PANEL A7A3 AFT STATION

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NONCRITICAL FAILURE MODE
NUMBER: M5-6MR-0021- 01

REVISION# 1 SEP 30, 1995

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM
LRU: MC450-0017-X200 CRITICALITY OF THIS
ITEM NAME: REMOTE POWER CONTROLLER FAILURE MODE: 1R3

FAILURE MODE:
LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON"

MISSION PHASE:
OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS

CAUSE:
A) PIECE PART STRUCTURAL 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:
TELEMETRY CAN BE USED TO VERIFY POWER FOR THE PSU 20 AMP BUSES. INDICATION IS OBTAINED BY SECONDARY MEANS.

MASTER MEAS. LIST NUMBERS:
V53X0777E
V53X0778E
V53X0779E
V53X0780E
V53X0786E
V53X0787E
V53X0788E
V53X0789E

CORRECTING ACTION:
NONE

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NONCRITICAL FAILURE MODE
NUMBER: M5-6MR-0021-01

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF CAPABILITY TO ACTIVATE ONE OF THE TWO PSU POWER CIRCUITS.

(B) INTERFACING SUBSYSTEM(S):
DEGRADED APDS PERFORMANCE.

(C) MISSION:
NO EFFECT.

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW VEHICLE AFTER FIVE~~THREE~~ FAILURES. 1) RPC FAILS OPEN. LOSS OF ONE PSU POWER ENABLE CIRCUIT. DEGRADED UNDOCKING CAPABILITY. REDUNDANT PATHS REMAINS OPERATIONAL. 2) RPC IN OTHER POWER LEG FAILS OPEN. LOSS OF REMAINING PSU POWER ENABLE CIRCUIT. LOSS OF NOMINAL UNDOCKING CAPABILITY. 3) ONE PYROBOLT FAILS TO INITIATE RESULTING IN LOSS OF CAPABILITY TO IMPLEMENT PYROTECHNIC SEPARATION. LOSS OF NOMINAL AND PYROTECHNIC SEPARATION CAPABILITY. USE IFM TO DRIVE HOOKS OPEN THROUGH A BREAKOUT BOX. 4) FAILURE OF IFM TO OPEN HOOKS. PERFORM EVA TO REMOVE 96 BOLTS HOLDING DOCKING BASE TO EXTERNAL AIRLOCK. 5) FAILURE OF EVA TO REMOVE 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: N/A~~MINUTES~~

TIME REQUIRED TO IMPLEMENT CORRECTIVE ACTION LESS THAN TIME TO EFFECT?
N/A~~YES~~

HAZARDS: DM20HA04(F)~~ODS-18~~.
INABILITY TO SAFELY SEPARATE ORBITER FROM DOCKING MODULE OR ~~FROM~~ MIR.

- APPROVALS -

PRODUCT ASSURANCE ENGINEERING :R. BLACKWELL : R. Blackwell
DESIGN ENGINEERING :T. NGUYEN : T. Nguyen