FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL HARDWARE
NUMBER: 05-6-3013 -X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
REVISION: 10 07/26/99

PART DATA

	PART NAME / **VENDOR NAME**	**PART NUMBER** / **VENDOR NUMBER**
LRU	: MID PCA 1	V070-764400
LRU	: MID PCA 2	V070-764430
SRU	: DIODE	JANTX1N1204RA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, ISOLATION, 12 AMP - GROUND MDM "OFF" CONTROL CIRCUIT FOR MAIN DC BUS ("A" OR "B") TO PALLET POWER CONTACTOR

REFERENCE DESIGNATORS: 40V76A25CR9
40V76A26CR10

QUANTITY OF LIKE ITEMS: 2
TWO; ONE PER POWER CONTACTOR CONTROL CIRCUIT, TWO POWER CONTACTORS

FUNCTION:
PROVIDES ISOLATION FROM CREW COMMANDS AND CONNECTS GROUND "OFF" COMMANDS VIA THE MDM-CONTROLLED RPC IN THE CONTROL CIRCUIT OF THE PALLET POWER CONTACTOR.

PRINT DATE: 07/26/99

FAILURE MODES EFFECTS ANALYSIS FMEA -- NON-CIL FAILURE MODE
NUMBER: 05-6-3013- 03

REVISION#: 9 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
LRU: MID PCA 1
ITEM NAME: DIODE
CRITICALITY OF THIS FAILURE MODE: 1R3

FAILURE MODE:
SHORT TO STRUCTURE (GROUND)

MISSION PHASE: OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY:

EDO MISSION ONLY
102 COLUMBIA
105 ENDEAVOUR

CAUSE:
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN

A) PASS
B) N/A
C) PASS

PASS/FAIL RATIONALE:
A)

B)
"B" SCREEN IS "N/A" BECAUSE FAILURE OF AT LEAST TWO REMAINING PATHS IS READILY DETECTABLE DURING FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF ABILITY TO CONDUCT GROUND MDM COMMANDS TO OPEN THE AFFECTED PALLET POWER CONTACTOR.

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(B) INTERFACING SUBSYSTEM(S):
NO EFFECT - FIRST FAILURE. AFTER FOURTH FAILURE, WHEN THE SECOND SERIES RPC FAILS "ON", AN LO2 TANK HEATER CAN BE CONTINUOUSLY ENERGIZED. EARLY DEPLETION OF LO2 AND POSSIBLE DAMAGE TO THE AFFECTED TANK CAN OCCUR IF THE THERMAL DESIGN LIMIT IS EXCEEDED. TIME TO EFFECT IS APPROXIMATELY 9 HOURS ONCE THE AFFECTED LO2 TANK HAS REACHED A RESIDUAL LEVEL OF 9 PERCENT. DISCONNECTION OF THE RELATED MAIN DC BUS PRECLUDES THE CONTINUOUS HEATING OF THE AFFECTED LO2 TANK.

(C) MISSION:
NO EFFECT - FIRST FAILURE

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE FOLLOWING SCENARIO: 1) DIODE SHORTS TO STRUCTURE, 2) SAME DIODE SHORTS (END-TO-END) - LOSS OF ABILITY TO OPEN THE AFFECTED PALLET POWER CONTACTOR, 3) FIRST SERIES RPC USED TO CONTROL LO2 TANK HEATER FAILS "ON", 4) SECOND SERIES RPC FAILS "ON" - LO2 TANK HEATER FAILS "ON", AND 5) PLUGGED RELIEF PORT, RESULTING IN OVERPRESSURE AND POSSIBLE TANK RUPTURE.

- APPROVALS -

EDITORIALLY APPROVED	: BNA	: J. Kamura 7-26-99
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-025_05-6