

**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	PART NUMBER
	VENDOR NAME	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.

FAILURE MODES EFFECTS ANALYSIS FMEA - NON-CIL FAILURE MODE

NUMBER: 05-6-3013-02

REVISION#: 10 07/26/99

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL

LRU: MID PCA 1

CRITICALITY OF THIS

ITEM NAME: DIODE

FAILURE MODE: 1R3

FAILURE MODE:

SHORT (END-TO-END)

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 ISOLATION OF THE GROUND MDM POWER CONTACTOR "OFF" COMMAND FROM
THE CREW-INITIATED COMMAND.

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(B) INTERFACING SUBSYSTEM(S):

NO EFFECT - FIRST FAILURE. AFTER THE FOURTH FAILURE, WHEN THE SECOND 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 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 FAILS SHORTED, 2) SAME DIODE SHORTS TO STRUCTURE - LOSS OF ABILITY TO OPEN AFFECTED PALLET POWER CONTACTOR, 3) FIRST SERIES RPC USED TO CONTROL LO2 TANK HEATER FAILS "ON", 4) SECOND RPC FAILS "ON" - LO2 TANK HEATER FAILS "ON", AND 5) PLUGGED RELIEF PORT, RESULTING IN OVERPRESSURE AND POSSIBLE TANK RUPTURE.

- APPROVALS -

EDITORIALLY APPROVED
 TECHNICAL APPROVAL

: BNA
 : VIA APPROVAL FORM

: J. Kamura 7-26-99
 : 95-CIL-025_05-6