

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER: 05-6PG-23529 -X

SUBSYSTEM NAME: EPD&C - COMM. & TRACK.

REVISION: 0 01/05/88

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: PNL A1A2	
SRU	: DIODE	JANTXV1N4246

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

DIODE, SW ASSY PWR CONT POWER CONTROL DIODE, S-BAND ANTENNA SWITCH ASSEMBLY AND SBGA POWER CONTROL UNIT.

REFERENCE DESIGNATORS: 36V73A1A2A19CR1
36V73A1A2A19CR2

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:

IN CASE OF SWITCH (S5) FAILURE, PREVENTS UNWANTED INPUTS TO THE GCIL COMMAND MODE DRIVERS DUE TO REVERSE LEAKAGE CURRENT FLOW THROUGH THE CONTROL BUS AND INTO THE COMMAND DRIVERS.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-EPG-23529- 02

REVISION#: 1 08/15/97

SUBSYSTEM NAME: EPD&C - C&T; S-BAND COMMUNICATIONS (05-2G)

LRU: PANEL A1A2

CRITICALITY OF THIS

ITEM NAME: DIODE

FAILURE MODE: 2R3

FAILURE MODE:

FAILS SHORT CIRCUIT (END TO END).

MISSION PHASE:

- LO LIFT-OFF
- OO ON-ORBIT
- DO DE-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY:

- 102 COLUMBIA
- 103 DISCOVERY
- 104 ATLANTIS
- 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) FAIL
- B) N/A
- C) PASS

PASS/FAIL RATIONALE:

A)

FAILS SCREEN "A" BECAUSE SHORTED DIODES CANNOT BE DETECTED DURING GROUND TURNAROUND TESTING.

B)

N/A FOR SCREEN "B" BECAUSE THE SWITCH FAILURE CAN BE DETECTED BY LOSS OF SWITCH FUNCTION EVEN THOUGH THE SHORTED DIODES CANNOT BE DETECTED DURING FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

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NO EFFECT ON EPDC. LOSS OF PROTECTION FOR GCIL DRIVERS IN CASE OF SWITCH FAILURE. AFTER A SECOND DIODE FAILURE LOSS OF PROTECTION FOR BOTH ANTENNA SWITCH ASSEMBLY AND SWITCH BEAM CONTROL ASSEMBLY POWER CONTROL DRIVERS.

(B) INTERFACING SUBSYSTEM(S):
NO EFFECT

(C) MISSION:
NO EFFECT

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
AFTER THREE FAILURES (TWO DIODES AND ONE SWITCH SHORT TO GROUND) LOSS OF ANTENNA AND BEAM SELECTION CAPABILITY FOR THE S-BAND PM QUAD ANTENNAS. POSSIBLE LOSS OF PRIME MISSION OBJECTIVE SINCE ATTITUDE CONTROL IS REQUIRED TO MAINTAIN TDRS COMMUNICATIONS.

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX F, ITEM #3, DIODE.

(B) TEST:
REFER TO APPENDIX F, ITEM #3, DIODE.

GROUND TURNAROUND TEST - UNABLE TO DETECT SHORTED DIODES DURING GROUND TURNAROUND.

(C) INSPECTION:
REFER TO APPENDIX F, ITEM #3, DIODE.

(D) FAILURE HISTORY:
CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATA BASE.

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(E) OPERATIONAL USE:
CREW CAN USE REMAINING SWITCH ASSEMBLY AND SWITCH BEAM TO CONTROL
ASSEMBLY TO MAINTAIN ANTENNA/BEAM SELECTION CAPABILITY.

- APPROVALS -

EDITORIALLY APPROVED	: BNA	: <u>J. Kumpala 8/18/97</u>
EDITORIALLY APPROVED	: JSC	: <u>Jason Danner 9/23/97</u>
TECHNICAL APPROVAL	: VIA APPROVAL FORM	: 96-CIL-015_05-6PG