

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - COMM. & TRACK. FMEA NO 05-6PJ-236006-2 REV: 01/05/88

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|--------------------------|--------------|------------------|
| ASSEMBLY : FLCA2 & FLCA3 | | CRIT. FUNC: 2R |
| P/N RI : JANTXV1N4246 | | CRIT. HDW: 3 |
| P/N VENDOR: | VEHICLE | 102 103 104 |
| QUANTITY : 8 | EFFECTIVITY: | X X X |
| : EIGHT | PHASE(S): | PL LO OO X DO LS |
| : 2 FOR EACH DRIVER | | |

| | | |
|--|--------------------------------|-------------------------------------|
| PREPARED BY: | REDUNDANCY SCREEN: | A-FAIL B-FAIL C-PASS |
| DES <u>M. Zelon</u> 1/5/88 M ZELON | APPROVED BY: | APPROVED BY (NASA): |
| REL <u>M. Alvarez</u> 1/5/88 M ALVAREZ | DES <u>[Signature]</u> 1/7/85 | SSM <u>[Signature]</u> 1/6/88 |
| QE <u>[Signature]</u> COURSEN | REL <u>[Signature]</u> 1-12-83 | REL <u>[Signature]</u> 7/2 |
| | QE <u>[Signature]</u> | QE RT <u>[Signature]</u> |
| | | EPDC SSM <u>[Signature]</u> 1-26-88 |
| | | EPDC REL <u>[Signature]</u> |

ITEM:
DIODE, RF POLARIZATION POWER CIRCUIT.

FUNCTION:
PROVIDES REVERSE CURRENT PROTECTION OF THE HYBRID DRIVERS WHICH ACTIVATE THE S-BAND PAYLOAD INTERROGATOR POLARIZATION SWITCH COILS TO SELECT ANTENNA POLARIZATION (PANEL OR GCIL). FLCA2 82V76A17CR (J5-N & J5-M), FLCA3 83V76A18CR (J5-N & J5-M).

FAILURE MODE:
FAILS SHORT CIRCUIT (END TO END).

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

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) NO EFFECT ON EPDC.

(B) AFTER TWO DIODE FAILURES, CAUSING THE LOSS OF TWO DRIVERS (ON DIFFERENT BUSES), LOSS OF POLARIZATION SELECTION CAPABILITY (VIA THE RF SWITCH) FOR BOTH PAYLOAD INTERROGATORS. POLARIZATION MUST BE SELECTED BY SELECTING PAYLOAD INTERROGATOR.

(C) AFTER THREE FAILURES (2 DIODES, 1 LRU) POSSIBLE LOSS OF PRIME MISSION OBJECTIVE FOR THOSE MISSIONS WHICH REQUIRE RF COMMUNICATION WITH A PAYLOAD.

(D) NO EFFECT.

CRITICALITY 2R BECAUSE LOSS OF POLARIZATION SELECTION MAY DISABLE RF COMMUNICATIONS WITH A PAYLOAD.

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

FAILS SCREEN "B" BECAUSE SHORTED DIODES CANNOT BE DETECTED DURING FLIGHT.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY

(A, B, C, D) REFER TO APPENDIX F, ITEM #3, DIODE.

(B) TEST

GROUND TURNAROUND TEST - NO TESTS ARE AVAILABLE TO DETECT SHORTED DIODES DURING GROUND TURNAROUND.

(E) OPERATIONAL USE

AFTER TWO DIODE FAILURES POLARIZATION MUST BE SELECTED BY SELECTING A PAYLOAD INTERROGATOR. AFTER THREE FAILURES (2 DIODE, 1 LRU), NO CREW CORRECTIVE ACTION AVAILABLE.