

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-6ED-2251B-X

SUBSYSTEM NAME: EPD&C - ET UMBILICAL DOORS

REVISION : 2 08/06/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	AFT MCA-1	V070-765410
LRU :	AFT MCA-2	V070-765420
LRU :	AFT MCA-3	V070-765430
LRU :	AFT MCA-3	V070-765600
LRU :	AFT MCA-2	V070-765620
LRU :	AFT MCA-1	V070-765630
SRU :	DIODE	JANTXV1M4246

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, ISOLATION

REFERENCE DESIGNATORS: 54V76A114A2CR25
 : 54V76A114A2CR26
 : 54V76A114A2CR57
 : 54V76A114A2CR58
 : 55V76A115A1CR73
 : 55V76A115A1CR74
 : 56V76A116A2CR25
 : 56V76A116A2CR26

QUANTITY OF LIKE ITEMS: 8
 EIGHT

FUNCTION:
 PROVIDES POWER PATH TO THE HYBRID RELAY (STOW) DURING GPC MODE. ALSO
 ISOLATES REDUNDANT POWER TO CENTERLINE LATCH RELAYS (STOW) DURING MANUAL
 OPERATION.

EXPEDITE
 PROCESSING

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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6ED-22518-02

REVISION# 2 09/07/90 R

SUBSYSTEM: EPD&C - ET UMBILICAL DOORS
LRU :AFT MCA-1
ITEM NAME: DIODE

CRITICALITY OF THIS
FAILURE MODE:1R3

■ FAILURE MODE:
SHORT (END-TO-END)

MISSION PHASE:
DD DE-ORBIT

■ VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
: 103 DISCOVERY
: 104 ATLANTIS
: 105 ENDEAVOUR

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

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

■ REDUNDANCY SCREEN A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)

■ B)
FAILURE IS NOT DETECTABLE DURING FLIGHT DUE TO SERIES REDUNDANCY.

C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
FIRST FAILURE - LOSS OF ISOLATION BETWEEN DC POWER SOURCE AND MANUAL
PANEL SWITCH

■ (B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - NO EFFECT

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW/VEHICLE THROUGH LOSS OF ALL ET CENTERLINE LATCH CONTROL CAPABILITY AND INABILITY TO CLOSE DOORS RESULTING IN STRUCTURAL DAMAGE CAUSED BY THERMAL EFFECTS DURING RE-ENTRY. REQUIRES MULTIPLE FAILURES (1. DC BUS SHORTS TO GROUND AND IF/WHEN S47 AND S48 ARE CLOSED FUSE FROM THE CONTROL BUS WILL OPEN, 2. LOSS OF REDUNDANT MOTOR CIRCUIT) BEFORE EFFECT IS MANIFESTED.

- DISPOSITION RATIONALE -

- (A) DESIGN:
REFER TO APPENDIX F, ITEM NO. 3 - DIODE
- (B) TEST:
REFER TO APPENDIX F, ITEM NO. 3 - DIODE

GROUND TURNAROUND TEST
VERIFY POWER DIODE FUNCTION BY: 1) REMOVE AFT MCA POWER (AC AND DC),
2) MANUALLY PROVIDE STOW COMMAND SIGNAL, 3) CHECK FOR PROPER MDM
INDICATION. TESTS ARE PERFORMED EVERY FIFTH FLIGHT AND LRU RETEST PER
TABLE V56Z00.000.
- (C) INSPECTION:
REFER TO APPENDIX F, ITEM NO. 3 - DIODE
- (D) FAILURE HISTORY:
REFER TO APPENDIX F, ITEM NO. 3 - DIODE
- (E) OPERATIONAL USE:
NONE

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- APPROVALS -

RELIABILITY ENGINEERING:	T. AI	:	<i>T. AI</i>	<i>8/9/90</i>
DESIGN ENGINEERING	: J. KRAGER	:	<i>J. Krager</i>	<i>8/16/90</i>
QUALITY ENGINEERING	: W. R. HIGGINS	:	<i>W. R. Higgins</i>	<i>8-29-90</i>
NASA RELIABILITY	:	:	<i>Dr. M. ...</i>	<i>10/20/90</i>
NASA SUBSYSTEM MANAGER	:	:	<i>R. M. ...</i>	<i>10/25/90</i>
NASA EPD&C RELIABILITY	:	:	<i>...</i>	<i>10-24-90</i>
NASA QUALITY ASSURANCE	:	:	<i>R. O. ...</i>	<i>9/28/90</i>
NASA EPD&C SUBSYS MGR	:	:	<i>...</i>	<i>...</i>

EXPEDITE
PROCESSING