

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: 05-6ED-2252B-X

1430

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	JANTXV1N4246

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, BLOCKING LEFT AND RIGHT DOOR CLOSE CONTROL STIMULI CIRCUIT ISOLATION

REFERENCE DESIGNATORS: 54V76A114A2CR65
: 55V76A115A1CR70
: 56V76A116A2CR18
: 56V76A116A2CR23

QUANTITY OF LIKE ITEMS: 4
FOUR

FUNCTION:
CONDUCTS REDUNDANT POWER TO THE HYBRID RELAY AND ISOLATES THE ARM
COMMAND LOGIC POWER FROM THE MANUAL SWITCH CONTROL BUS POWER.

PAGE: 2

PRINT DATE: 08/07/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6ED-2252B-02

1461

REVISION# 2 09/18/90 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:
00 DE-ORBIT

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

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

CRITICALITY I/I DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)

■ B)
FAILS "B" SCREEN BECAUSE DIODE SHORT (END TO END) IS NOT DETECTABLE
INFLIGHT.

C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
FIRST FAILURE - LOSS OF ISOLATION BETWEEN CONTROL POWER BUSES THROUGH
MCA BUS POWER HYBRID RELAYS AND MANUAL PANEL SWITCHES

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1462

- (B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - NO EFFECT
- (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 ET DOOR CLOSE CONTROL CAPABILITY RESULTING IN STRUCTURAL DAMAGE CAUSED BY THERMAL EFFECTS DURING RE-ENTRY. REQUIRES THREE OTHER FAILURES (FAIL CLOSE OF MCA BUS POWER RELAY, MCA CONTROL BUS SHORTS TO GROUND CAUSING FUSE TO OPEN, FAILURE OF ASSOCIATED REDUNDANT MOTOR) 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 DIODE FUNCTION THROUGH ET DOOR DRIVE ISOLATION DIODE CHECK.
MAN/GPC COMMANDS ARE SENT WITHOUT AFT MCA AC POWER AND MONITOR PROPER OPERATIONAL STATUS. TESTS ARE PERFORMED FOR 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 8/24/90</i>
DESIGN ENGINEERING	: J. KRAGER	:	<i>J. Krager 9/11/90</i>
QUALITY ENGINEERING	: W. R. HIGGINS	:	<i>W. R. Higgins 8-29-90</i>
NASA RELIABILITY	:	:	<i>10/24/90</i>
NASA SUBSYSTEM MANAGER	:	:	<i>10/25/90</i>
NASA EPD&C RELIABILITY	:	:	<i>10-24-90</i>
NASA QUALITY ASSURANCE	:	:	<i>9/28/90</i>
NASA EPD&C SUBSYS MGR	:	:	<i>10/24/90</i>