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PRINT DATE: 08/07/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
 NUMBER: 05-6ED-2257-X

SUBSYSTEM NAME: EPD&C - ET UMBILICAL DOORS

REVISION : 2 08/06/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	EPD&C DIODE BOX ASSY 1, 2 & 3	V070-765380
SRU :	DIODE	JANTXV1N4246

 PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
 DIODE, GENERAL PURPOSE 1A, 400V, ISOLATION, ET DOOR UNLOCK LATCH
 ACTUATOR CIRCUIT

REFERENCE DESIGNATORS: 54V76A208A2CR16
 : 55V76A208A3CR18
 : 55V76A208A3CR20
 : 56V76A209A1CR13

QUANTITY OF LIKE ITEMS: 4
 FOUR

FUNCTION:
 PROVIDES ISOLATION BETWEEN OR'ED LOGIC INPUT POWER (TOGGLE SWITCH FROM
 THE READY-TO-LATCH) FOR CLOSURE OF THE LEFT OR RIGHT ET DOOR LATCH.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6ED-2257-02

REVISION# 2 09/18/90 R

SUBSYSTEM: EPD&C - ET UMBILICAL DOORS
LRU: EPD&C DIODE BOX ASSY 1, 2 & 3
ITEM NAME: DIODE

CRITICALITY OF THIS
FAILURE MODE: 1R3

FAILURE MODE:
SHORT (END TO END)

MISSION PHASE:
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) 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 THE AFFECTED BUSES SUPPLYING
THE COMMON CIRCUIT

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- (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 ALL ET DOOR CLOSE LATCH CONTROL CAPABILITY RESULTING IN STRUCTURAL DAMAGE CAUSED BY THERMAL EFFECTS DURING RE-ENTRY. REQUIRES MULTIPLE FAILURES (1. CONTROL BUS SHORTS TO GROUND AND IF/WHEN S47 AND S50/S52 ARE CLOSED TWO FUSES 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 DIODE FUNCTION THAT ISOLATES ARM COMMAND LOGIC POWER FROM THE CONTROL LOGIC SIGNAL POWER. TESTS ARE PERFORMED TO VERIFY LEFT AND RIGHT READY-TO-LATCH OVERRIDE AND ASSOCIATED ON/OFF RESPONSE FROM HYBRID RELAY. VERIFY NO CHANGE IN MCA ON/OFF STATUS OTHER THAN THAT WHICH IS ASSOCIATED WITH EACH SOFTWARE COMMAND (STIMULI). TESTS ARE PERFORMED INFLIGHT AND LRU RETEST V56Z00.000. TESTS ARE ALSO PERFORMED IF VALID FLIGHT DATA IS UNAVAILABLE.

- (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>
DESIGN ENGINEERING	: J. KRAGER	:	<i>J. Krager</i>
QUALITY ENGINEERING	: W. R. HIGGINS	:	<i>W. R. Higgins</i>
NASA RELIABILITY	:	:	<i>[Signature]</i>
NASA SUBSYSTEM MANAGER	:	:	<i>[Signature]</i>
NASA EP&C RELIABILITY	:	:	<i>[Signature]</i>
NASA QUALITY ASSURANCE	:	:	<i>[Signature]</i>
NASA EP&C SUBSYS MGR	:	:	<i>[Signature]</i>