FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: 05-6ED-2251A-X

SUBSYSTEM NAME: EPD&C - ET UMBILICAL DOORS
REVISION : 4 05/21/91

| | | PART NAME<br>VENDOR NAME | PART NUMBER<br>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, ISOLATION

REFERENCE DESIGNATORS: 54V76A114A2CR38
: 54V76A114A2CR39
: 54V76A114A2CR51
: 54V76A114A2CR52
: 55V76A115A1CR80
: 55V76A115A1CR81
: 56V76A116A2CR39
: 56V76A116A2CR40

QUANTITY OF LIKE ITEMS: 8
EIGHT

FUNCTION:
PROVIDES AND ISOLATES REDUNDANT POWER PATH TO CENTERLINE LATCH HYBRID RELAY (STOW) FOR USE DURING MANUAL MODE OPERATION. ALSO, ISOLATES THE LOGIC POWER FROM THE CONTROL POWER, WHICH IS CONTINUOUSLY SUPPLIED BY A DC BUS, TO PREVENT AN INADVERTENT STOW OPERATION OF THE CENTERLINE LATCH.

PRINT DATE: 05/22/91

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6ED-2251A-02

REVISION# 4 05/21/91 R

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

CRITICALITY OF THIS FAILURE MODE:1R2

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FAILURE MODE:
SHORT (END TO END)

MISSION PHASE:
LO LIFT-OFF
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

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REDUNDANCY SCREEN A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

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- FAILURE EFFECTS -

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(A) SUBSYSTEM:
FIRST FAILURE - ENERGIZES ONE OF TWO SERIES RELAYS TO STOW A CENTERLINE LATCH

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

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6ED-2251A-02

(C) MISSION:
FIRST FAILURE - NO EFFECT

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
AFTER SECOND FAILURE (REDUNDANT DIODE SHORTS END-TO-END), LOSS/DAMAGE OF DOOR COULD OCCUR DUE TO PREMATURE STOWING (RELEASING) ONE OF TWO CENTERLINE LATCHES DURING ASCENT WHICH WOULD SUBJECT THE LESS RESTRAINED ET DOORS TO THE BOOST ENVIRONMENT OF VIBRATION AND ATMOSPHERIC WINDAGE. POSSIBLE LOSS OF CREW/VEHICLE DUE TO STRUCTURAL DAMAGE CAUSED BY THERMAL EFFECTS DURING RE-ENTRY.

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- DISPOSITION RATIONALE -

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

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

GROUND TURNAROUND TEST
PROPER DIODE FUNCTION IS VERIFIED THROUGH ET DOOR CENTERLINE LATCH UNLOCK/STOW MOTOR 1 & 2 (MANUAL) TEST. MCA OPERATIONAL STATUS IS VERIFIED ON WHEN NO STOW COMMANDS ARE GIVEN. TESTS ARE PERFORMED IN-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

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6ED-2251A-02

- APPROVALS -

| | | |
|---|---|---|
| RELIABILITY ENGINEERING | T. AI | |
| DESIGN ENGINEERING | T. POCKLINGTON | |
| QUALITY ENGINEERING | W. R. HIGGINS | |
| NASA RELIABILITY | | |
| NASA SUBSYSTEM MANAGER | | |
| NASA EPD&C RELIABILITY | | |
| NASA QUALITY ASSURANCE | | |
| NASA EPD&C SUBSYS MGR | | |