

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-6G-2130-X

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ATTACHMENT  
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SUBSYSTEM NAME: EPD&C - HYDRAULICS (02-6)

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	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
▣ LRU :	AFT MCA-1	V070-765410
▣ LRU :	AFT MCA-1	V070-765630
▣ SRU :	DIODE	JANTXV1N5551

PART DATA

- ▣ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
DIODE, ISOLATION (3 AMP) - LANDING GEAR EXTEND ISOLATION VALVE
- ▣ REFERENCE DESIGNATORS: 54V76A114(J4-4)
- ▣ QUANTITY OF LIKE ITEMS: 1  
ONE
- ▣ FUNCTION:  
CONDUCTS AND ISOLATES THE PANEL SWITCH FROM THE MCM COMMAND TO OPEN THE LANDING GEAR EXTEND ISOLATION VALVE.

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SUBSYSTEM: EPD&C - HYDRAULICS (02-6)  
LRU :AFT MCA-1  
ITEM NAME: DICDE

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CRITICALITY OF THIS  
FAILURE MODE:1R3

FAILURE MODE:  
SHORT (END TO END)

MISSION PHASE:  
DO DE-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 105 ENDEAVOUR 102 COLUMBIA

CAUSE:  
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION,  
ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY  
*104 Atlantis*  
*103 Discovery*

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

- REUNDANCY SCREEN A) FAIL
- B) FAIL
- C) PASS

PASS/FAIL RATIONALE:

A)  
REDUNDANCY SCREEN "A" FAILS BECAUSE THE REVERSE-CURRENT CHARACTERISTIC OF THIS DIODE IS NOT BEING MONITORED DURING GROUND TURNAROUND TEST WITHOUT INTRUSIVE TESTING.

B)  
REDUNDANCY SCREEN "B" FAILS BECAUSE A SECOND FAILURE (SWITCH SHORTS TO GROUND) IS REQUIRED TO DETECT SHORTED DIODE.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:  
LOSS OF CAPABILITY TO ISOLATE MDM COMMANDS FROM THE 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 AFTER THREE FAILURES - 1) THIS DIODE FAILS SHORT, 2) ASSOCIATED PANEL SWITCH SHORTS TO STRUCTURE LOSING ALL COMMAND CAPABILITY OF THE ISOLATION VALVE, AND 3) FAILURE OF A BACKUP LANDING GEAR UPLOCK PYRO CARTRIDGE RESULTING IN THE LOSS OF CAPABILITY TO DEPLOY THE LANDING GEAR.

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- DISPOSITION RATIONALE -  
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- (A) DESIGN:  
REFER TO APPENDIX F, ITEM NO. 4 - DIODE
- (B) TEST:  
REFER TO APPENDIX F, ITEM NO. 4 - DIODE  
  
GROUND TURNAROUND TEST - NONE
- (C) INSPECTION:  
REFER TO APPENDIX F, ITEM NO. 4 - DIODE
- (D) FAILURE HISTORY:  
REFER TO APPENDIX F, ITEM NO. 4 - DIODE
- (E) OPERATIONAL USE:  
NONE

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- APPROVALS -

RELIABILITY MANAGER	:	M. C. HOVE	:	<i>M. C. Hove</i> 10-21-91
RELIABILITY ENGINEERING	:	T. K. KIMURA	:	<i>T. Kimura</i> 10-8-91
DESIGN MANAGER	:	G. M. ANDERSON	:	<i>G. M. Anderson</i> 10-16-91
DESIGN ENGINEERING	:	G. A. FINNEMAN	:	<i>G. A. Finneman</i> 9/5/91
SUBSYSTEM MANAGER	:	B. J. VAN METER	:	<i>B. J. Van Meter</i> 10/24/91
QUALITY MANAGER	:	R. M. SPURLOCK	:	<i>R. M. Spurlock</i> 10/24/91
QUALITY ENGINEERING	:	W. R. HIGGINS	:	<i>W. R. Higgins</i> 10/24/91
NASA RELIABILITY	:		:	<i>[Signature]</i> 2/3/92
NASA SUBSYSTEM MANAGER	:		:	<i>Joyce M. Serial-Cruick</i> 2/4/92
NASA EPD&C RELIABILITY	:		:	<i>H. Sa'keen Dinsan</i> 12/3/91
NASA QUALITY ASSURANCE	:		:	<i>K. S. Cantor</i> 11/13/91
NASA EPD&C SUBSYS MGR	:		:	<i>[Signature]</i> for F.A. Lewis 12-3-91