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PRINT DATE: 04/23/92

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-6DS-2007A-X

SUBSYSTEM NAME: EPD&C-DRAG CHUTE

REVISION : 1 04/23/92

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	DRAG CHUTE CONTROLLER ASSY	V070-765440
■ SRU :	DIODE	JANTXV1N4246

PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, ISOLATION - PRIMARY PATH (JETTISON)

■ REFERENCE DESIGNATORS: 50V76A214A1CR1
: 50V76A214A1CR7
: 50V76A214A1CR15
: 50V76A215A1CR1
: 50V76A215A1CR7
: 50V76A215A1CR15

■ QUANTITY OF LIKE ITEMS: 6
THREE PER ASSEMBLY NO. 1 & NO. 2

■ FUNCTION:
ISOLATES HYBRID DRIVER CONTROLLERS (HDC) FROM SHORTING TO GROUND IF
PUSHBUTTON SWITCH SHORTS TO GROUND.

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FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-GDS-2007A-02

SUBSYSTEM: EPD&C-DRAG CHUTE
LRU :DRAG CHUTE CONTROLLER ASSY
ITEM NAME: DIODE

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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, 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 SCREEN "B" BECAUSE NO CAPABILITY TO DETECT A FAILED DIODE
 INFLIGHT.

■ C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
LOSS OF ISOLATION BETWEEN HDC AND SWITCH

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

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**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6DS-2007A-02**

- (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 DUE TO INABILITY TO JETTISON A PREMATURE DEPLOYED DRAG CHUTE. REQUIRES THREE ADDITIONAL FAILURES (ONE POLE FROM THE ASSOCIATED SWITCH SHORTS TO GROUND, LOSS OF REMAINING PIC, PILOT MORTAR CARTRIDGE PREMATURELY OPERATED CAUSING A PREMATURE DEPLOYMENT OF DRAG CHUTE) BEFORE EFFECT IS MANIFESTED.

NOTE: FAILURE SCENARIO IS CREDIBLE ONLY AT ALTITUDES OF 40 TO 135 FEET.

- 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 DIODES FOR SHORT END-TO-END CONDITION BY: 1) ACTIVATE ALL LATCHING DRIVERS WITHIN ONE OF TWO DRAG CHUTE CONTROLLER ASSEMBLIES WHILE THE POWER OF THE OTHER ASSEMBLY IS OFF, 2) SEQUENTIALLY, PROVIDE POWER TO THE LATCHING DRIVERS IN THE OTHER ASSEMBLY, AND 3) VERIFY THE PIC VOLTAGES OF THAT ASSEMBLY BEFORE/AFTER EACH COMMAND. TESTS ARE PERFORMED EVERY FLOW IF DRAG CHUTE IS INSTALLED AND FOR LRU RETEST PER TABLE V55Z00.000.

- (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: 05-60S-2007A-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 :

: T.A. T. J. Anderson 4/24/92
 : John T. Pocklington 4-24-92
 : W. R. Higgins
 : Raytheon 5/19/92
 : H. S. Deen 5/11/92
 : RO Dant 5/6/92
 : R. Chappin 5-17-92