

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
 NUMBER: 05-6-2010A-X

SUBSYSTEM NAME: ELECTRICAL POWER DISTRIBUTION & CONTROL
 REVISION : 6 07/03/91

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	AFT PCA 4, 5, 6	V070-765280
■ SRU :	FUSE, HIGH CURRENT	ME451-0016-0150

PART DATA

- EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
FUSE F3, 150 AMP, HIGH CURRENT - LOCATED IN AFT PCA 4
- REFERENCE DESIGNATORS: 54V76A134F3
- QUANTITY OF LIKE ITEMS: 1
ONE
- FUNCTION:
CONDUCTS ORBITER MAIN BUS A CURRENT AND PROVIDES OVERCURRENT PROTECTION FROM AFT POWER CONTROLLER ASSEMBLY (APCA) 4 TO APCAL.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6-2010A-01

SUBSYSTEM: ELECTRICAL POWER DISTRIBUTION & CONTROL
 LRU :AFT PCA 4, 5, 6
 ITEM NAME: FUSE, HIGH CURRENT

REVISION# 6 07/03/91 R
 CRITICALITY OF THIS FAILURE MODE:1R2

■ FAILURE MODE:
 FAILS OPEN, FAILS TO CONDUCT

MISSION PHASE:
 LO LIFT-OFF

■ VEHICLE/PAYLOAD/KIT EFFECTIVITY:

102	COLUMBIA
: 103	DISCOVERY
: 104	ATLANTIS
: 105	ENDEAVOUR

■ CAUSE:
 STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK,
 PROCESSING ANOMALY, THERMAL STRESS

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

■ REDUNDANCY SCREEN A) PASS
 ■ B) PASS
 ■ C) PASS

PASS/FAIL RATIONALE:

- A)
 "A" SCREEN PASSES BECAUSE FUSE FAILING OPEN IS DETECTABLE DURING GROUND TURNAROUND TEST.
- B)
 "B" SCREEN PASSES BECAUSE FUSE FAILING OPEN IS DETECTABLE DURING FLIGHT FROM AVAILABLE MEASUREMENT INDICATION.
- C)
 "C" SCREEN PASSES BECAUSE REDUNDANT FUSES ARE PHYSICALLY ISOLATED FROM EACH OTHER.

■ MASTER MEAS. LIST-NUMBERS: N/A

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6-2010A-01

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:

INABILITY TO CONDUCT ORBITER MAIN BUS A POWER FROM APC44 TO APC41.

■ (B) INTERFACING SUBSYSTEM(S):

LOSS OF POWER REDUNDANCY TO ORBITER RGA (ORGA) 1 AND OTHER LOADS.

■ (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 TWO FAILURES:

FIRST FAILURE (FUSE) WOULD CAUSE LOSS OF ORBITER MAIN BUS A POWER TO APC41. THIS WOULD RESULT IN LOSS OF REDUNDANT POWER TO ORGA1.

SECOND FAILURE (LOSS OF FUEL CELL 2) WOULD CAUSE LOSS OF ORBITER MAIN BUS B. THIS WOULD CAUSE SIMULTANEOUS TOTAL LOSS OF POWER TO ORGA1 AND ORGA2. THIS WOULD RESULT IN SIMULTANEOUS ERRONEOUS RATES ON BOTH ORGA'S DURING GYRO SPIN DOWN (LASTING APPROXIMATELY 10 SECONDS). AN ERRONEOUS RATE COULD BE THE INTERIM MID VALUE SELECT (IMVS) SELECTED RATE. THE CONDITION COULD RESULT IN LOSS OF CONTROL/VEHICLE.

- DISPOSITION RATIONALE -

■ (A) DESIGN:

REFER TO APPENDIX D, ITEM NO. 3 - FUSE, HIGH CURRENT

■ (B) TEST:

REFER TO APPENDIX D, ITEM NO. 3 - FUSE, HIGH CURRENT

GROUND TURNAROUND TEST - VERIFY FUSE BY MONITORING SRB BUS A VOLTAGE AND SRB BUS A, BACKUP C INDICATION (OFF).

■ (C) INSPECTION:

REFER TO APPENDIX D, ITEM NO. 3 - FUSE, HIGH CURRENT

■ (D) FAILURE HISTORY:

REFER TO APPENDIX D, ITEM NO. 3 - FUSE, HIGH CURRENT

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6-2010A-01

■ (E) OPERATIONAL USE:
NONE

- APPROVALS -

RELIABILITY MANAGER	:	M. C. HOVE	:	<i>M. C. Hove</i> 7-3-91
RELIABILITY ENGINEERING	:	T. K. KIMURA	:	<i>T. K. Kimura</i> 7/2/91
DESIGN MANAGER	:	G. M. ANDERSON	:	<i>G. M. Anderson</i> 7-3-91
DESIGN ENGINEERING	:	R. E. PHILLIPS	:	<i>R. E. Phillips</i> 7/3/91
DESIGN ENGINEERING	:	C. S. STRONG	:	<i>C. S. Strong</i> 7/11/91
SYSTEM MANAGER	:	G. CORTES	:	<i>G. Cortes</i> 7/11/91
QUALITY MANAGER	:	J. T. COURSEN	:	<i>J. T. Coursen</i> 7/12/91
QUALITY ENGINEERING	:	W. R. HIGGINS	:	<i>W. R. Higgins</i> 7-12-91
NASA RELIABILITY	:		:	<i>Al Johnson</i> 7/8/92
NASA SUBSYSTEM MANAGER	:		:	<i>Giuseppe</i> 10/15/92
NASA QUALITY ASSURANCE	:		:	<i>RO P. B. J. Hentton</i> 4/02/92