

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: Integrated Electronic Assembly (IEA), Aft (Logic and Networks Distributor and OF Signal Conditioner)

PART NO.: 10400-0328

FM CODE: A06

ITEM CODE: 50-01-01-03

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Seconds

NO. REQUIRED: 1

DATE: March 1, 2002

CRITICAL PHASES: Boost

SUPERCEDES: March 31, 1998

FMEA PAGE NO.: D-52

ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3

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FAILURE MODE AND CAUSES: Loss of Orbiter C Bus and Orbiter A or B Bus caused by:

- o Wiring harnesses, open or shorted
- o EMC filter, shorted (A or B Bus)
- o PBISs, shorted (A or B Bus)
- o Solid state switch, shorted (A or B Bus)
- o Transorb lightning suppression diode, shorted (A or B Bus)
- o APU BITE card (A or B Bus) failure
- o APU controller card (A or B Bus) failure

FAILURE EFFECT SUMMARY: Loss of two SRM chamber pressure sensors leads to erroneous separation cue resulting in SRB recontact and loss of mission, vehicle and crew.

One success paths remain after the first failure. Operation is not affected until two paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass - SRM pressure measurements B47P1300C, B47P1301C and B47P1302C and Bus Voltage measurements B76V1600C(H) and B76V1601C(H).
- 2) Pass - Same as screen No. 1
- 3) Fail- Wire harness only. A and C power is routed together in the same harness assembly within the IEA.

RATIONALE FOR RETENTION:

A. DESIGN:

1. System Description

See Appendix B, Section 1, Paragraph (s) A(1) & K

2. Component Description

See Appendix B, Section 2, Paragraph (s) A,B(3),C,D,E(1)(2),F(1),G,H

B. TESTING

1) VENDOR RELATED:

See Appendix B, Section 3, Paragraph(s) A(1), B

2) KSC RELATED:

See Appendix B, Section 3, Paragraph B

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

Assembly Checkout (ACO) - ACO Aft Skirt stand alone test - The SRB electrical equipment power-up and bus redundancy are verified per 10REQ- 0021, paras. 2.2.2.1 and 2.2.2.2. These tests verify Orbiter A and B bus power. (All Failure Causes)

Prelaunch Tests

Shuttle Interface Test (SIT) - The tranfere of power from Orbiter to SRB A and B buses is verified per OMRSD File II, Vol. 1, Requirement Number S00000.470. The transfer of power from Orbiter to SRB C bus is verified per OMRSD File II, Vol. 1, Requirement Numbers S00000.475. The SRM chamber pressure sensor functions and rate gyro assembly power-on test is verified by OMRSD File II, Vol. 1, Requirement Numbers S00000.450 and S00000.640. These tests verify Orbiter A, B, and C power busses. (All Failure Causes)

Terminal Countdown Demonstration Test (TCDT) - The SRB Aft IEA MDM functional redundancy and A and B bus power separation are verified per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185 and S00FE0.230. The SRB chamber pressure sensor functions and rate gyro assembly power-on are verified per OMRSD File II, Vol. 1, Requirement Numbers S00FF0.180 and S00FF0.215. These tests verify Orbiter A, B, and C bus power. (All Failure Causes)

Launch Countdown - The SRB Aft IEA MDM functional redundancy and A and B bus power separation are verified per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185 and S00FE0.230. The SRB chamber pressure sensor functions and rate gyro assembly power-on are verified per OMRSD File II, Vol. 1, Requirement Numbers S00FF0.180 and S00FF0.215. These tests verify Orbiter A, B, and C bus power. (All Failure Causes)

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Last Test of Failure Mode Prior to Launch - Launch Countdown tests per OMRSD File II, Vol. I, Requirement Numbers S00FE0.185 and S00FE0.230.

C. INSPECTION

1) VENDOR RELATED:

See Appendix B, Section 4, Paragraph(s) A,B,C,D,E,F,G,H

2) KSC RELATED:

See Appendix B, Section 5, Paragraph(s) A.(1).(2)(a)(b)(c),B.(1)(a)(b)(c)

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.

F. WAIVERS/DARS

See Appendix E, Paragraph 2, 3, 4, 5, 7-15.