

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: A26

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-70

ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3

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CN 044

FAILURE MODE AND CAUSES: Loss of fuel shut off valve (secondary) control signal (valve open) to APU A and APU B caused by:

- o APU controller failures
- o Solid state switches (A2/B2 start) fail open (loss of power to APU controllers)
- o Wiring harnesses (open or shorted)
- o EMC Filters (open)
- o APU BITE module (shorts)

FAILURE EFFECT SUMMARY: Loss of fuel flow to APUs leads to loss of capability to gimbal SRB nozzle, loss of vehicle control, and vehicle breakup resulting in loss of mission, vehicle and crew.

REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass - APU Turbine Speed Measurements B46R1406C, B46R1407C, B46R1408C, B46R1409C.
APU Fuel Shut Off Valve position measurements B46X1861X, B46X1863X.
- 2) Pass - Same as Screen No. 1.
- 3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN:

1. System Description

See Appendix B, Section 1, Paragraph (s) D(3) & K

2. Component Description

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

B. TESTING

1) VENDOR RELATED:

See Appendix B, Section 3, Paragraph(s) A(5), B

2) KSC RELATED:

See Appendix B, Section 3, Paragraph B

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

SRB Aft Skirt Assembly Checkout (ACO) - The APU BITE interlock test and the TVC Hot Fire test are verified per 10REQ-0021, paras. 2.3.4.3 and 2.3.16.2. These tests verify the Fuel Shut Off Valve (FSOV) functions. (All Failure Causes)

Prelaunch Tests -

Shuttle Interface Test (SIT) - The APU A/B BITE resistance and frequency tests are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. These tests verify the FSOV functions. (All Failure Causes)

Terminal Countdown Demonstration Test (TCDDT) - The APU A/B BITE resistance and frequency tests are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. These tests verify the Fuel Shut Off Valve (FSOV) functions. (All Failure Causes)

Launch Countdown - The APU A/B BITE resistance and frequency tests are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. APU nominal start-up is verified per OMRSD File II, Vol. 1, requirement number S00FR0.070. These test verify the FSOV functions. (All Failure Causes)

Last Test of Failure Mode Prior to Launch - Launch Countdown is the last test of this failure mode prior to launch. The APU A/B BITE resistance and frequency tests are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. APU nominal start-up is verified per OMRSD File II, Vol. 1, requirement number S00FR0.070. These tests verify the Fuel Shut Off Valve (FSOV) functions. (All Failure Causes)

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C. INSPECTION

1) VENDOR RELATED:

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

2) KSC RELATED:

See Appendix B, Section 5, Paragraph(s) A.(1),(2)(f),B.(1)(f).

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, Paragraphs 2, 5, 7-15.