

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: A32

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-75

ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3

APPROVED: S. Parvathaneni

CN 044

FAILURE MODE AND CAUSES: Unscheduled hydraulic pump bypass valve control signals (open) to hydraulic system A and hydraulic system B caused by:

- o Solid state switches (fail shorted)

FAILURE EFFECT SUMMARY: Loss of A and B hydraulic pressure causes loss of capability to gimbal SRB nozzle leading to loss of vehicle control and vehicle breakup with loss of vehicle, mission and crew. One success path remains after the first failure. Operation is not affected until two paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass - Hydraulic pressure measurements B58P1303C, B58P1304C.
- 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) E, K

2. Component Description

See Appendix B, Section 2, Paragraph (s) A, F(3)

B. TESTING

1) VENDOR RELATED:

See Appendix B, Section 3, Paragraph(s) A(6), B

2) KSC RELATED:

See Appendix B, Section 3, Paragraph B

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

SRB Aft Skirt Assembly Checkout (ACO) - The Auxillary Power Unit (APU) BITE interlock test and Hot Fire test are verified per 10REQ-0021, paras. 2.3.4.3 and 2.3.16.2. These tests verify the operation of the Aft IEA solid state switches. (Solid State Switches)

Prelaunch Tests -

Shuttle Interface Test (SIT) - The APU BITE resistance test and APU frequency test are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. These tests verify the operation of the Aft IEA solid state switches. (Solid State Switches).

Terminal Countdown Demonstration Test (TCDDT) - The APU BITE resistance test and APU frequency test are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. These test verify the operation of the Aft IEA solid state switches. (Solid State Switches)

Launch Countdown - The APU BITE resistance test and APU frequency test are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. APU Start-up Operation is verified per OMRSD File II, Vol. 1, requirement number S00FR0.070. These tests verify the operation of the Aft IEA solid state switches. (Solid State Switches)

Last Test of Failure Mode Prior to Launch - Launch Countdown is the last test of this failure mode prior to launch. The APU BITE resistance test and APU frequency test are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. APU Start-up Operation is verified per OMRSD File II, Vol. 1, requirement number S00FR0.070. (Solid State Switches)

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C. INSPECTION

1) VENDOR RELATED:

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

2) KSC RELATED:

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

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, 4, 7-15.