

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: Aft OF MDM or AFT OF EMDM

PART NO.: 10400-0452-802 or
10400-0941-801

FM CODE: A19

ITEM CODE: 50-02-01-03

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1

DATE: March 1, 2002

CRITICAL PHASES: Boost

SUPERCEDES: March 31, 1998

FMEA PAGE NO.: D-147

ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3

APPROVED: S. Parvathaneni

CN 044

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

- o DOL Modules (shorted)

FAILURE EFFECT SUMMARY:

- o Loss of A and B hydraulic pressure resulting in loss of TVC leading to vehicle breakup and loss of mission, vehicle and crew.
- o One success path remains after the first failure. Operation is not affected until two paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass - Hydraulic fluid supply pressure measurements B58P1303C and B58P1304C.
- 2) Pass - Same as Screen 1.
- 3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN:

1. System Description

See Appendix C, Section 1, Paragraph (s) B

2. Component Description

See Appendix C, Section 2.

B. TESTING

1) VENDOR RELATED:

See Appendix C, Section 3, Paragraph(s) A & B

2) KSC RELATED:

See Appendix C, Section 3, Paragraph C

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

Aft Skirt ACO Test - The SRB Aft Skirt electrical equipment power-up, redundancy, hydraulic power unit (HPU) BITE tests, and Hot Fire test are verified per 10REQ-0021, para. 2.2.2.1, 2.2.2.2, 2.3.4, and 2.3.16.2. These tests verify the DOL modules. (DOL Modules Shorted)

Shuttle Interface Test - APU BITE resistance, BITE frequency, MDM Operational Mode, and MDM Lock/Unlock tests are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050, B42AP0.060, B75MD0.011 and B75MD0.020. These tests verify the DOL modules. (DOL Modules Shorted)

Terminal Countdown Demonstration Test - The SRB Aft Skirt MDM pre-launch verification and HPU start-up are verified per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185, S00FR0.070. The SRB APU BITE resistance and BITE frequency tests are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. These tests verify the DOL modules. (DOL Modules Shorted)

Launch Countdown to requirements of Launch Commit Criteria - The SRB Aft Skirt MDM pre-launch verification and HPU start-up are verified per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185, S00FR0.070. The SRB APU BITE resistance and BITE frequency tests are verified per OMRSD File V, Vol. 1, Requirement Numbers B42AP0.050 and B42AP0.060. These tests verify the DOL modules. (DOL Modules Shorted)

CN 044

In addition, each time the MDM (EMDM) is powered up an initialization sequence verifies that the failure mode does not exist.

Last Test for Failure Mode Prior to Launch

The last test of this failure mode is conducted per OMRSD File II, Vol. I requirement number S00FR0.070 (APU Startup) and S00FE0.185 (MDM/EMDM BITE Test). (DOL Modules Shorted)

The above referenced OMRSD testing is performed every flight.

C. INSPECTION

1) VENDOR RELATED:

See Appendix C, Section 4.

2) KSC RELATED:

See Appendix C, Section 5.

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, 7-15.