

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: Forward OF MDM or Forward OF EMDM

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

FM CODE: A14

ITEM CODE: 50-02-01-04

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-163

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SHEET 1 OF 3

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FAILURE MODE AND CAUSES: Unscheduled SRM Ignition Safe and Arm Assembly SAFE 1 and SAFE 2 commands caused by:

- o DOL module (shorted)

FAILURE EFFECT SUMMARY:

- o Loss of ignition for one SRB leading to loss of mission, vehicle and crew caused by thrust imbalance.
- o One success path remains after the first failure. Operation is not affected until two paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass -Ignition Safe & Arm Assembly position measurements B55X1842X and B55X1843X.
- 2) Fail -Unscheduled SRM ignition Safe and Arm Assembly Safe 1 and Safe 2 commands are not detectable.
- 3) Pass -No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN:

1. System Description

See Appendix D, Section 1, Paragraph (s) B, E

2. Component Description

See Appendix D, Section 2, Paragraph E.

B. TESTING

1) VENDOR RELATED:

See Appendix D, Section 3, Paragraph(s) A and B

2) KSC RELATED:

See Appendix D, Section 3, Paragraph C

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

Forward Skirt ACO Test - verification of the SRB Forward MDM (EMDM) data buses, Operational Modes, MDM Lock/Unlock, and Ignition Safe and Arm Device circuits are performed, including control of SRM ignition S&A assembly per 10REQ-0021, para. 1.2.2.1.2, 1.2.2.2.1, 1.2.2.2.2.1, 1.2.2.9.2, and 1.2.2.9.3. (DOL Module Shorted)

Shuttle Interface Test - SRB MDM (EMDM) Ignition Safe and Arm Device circuits and MDM Lock/Unlock verification is performed per OMRSD File V, Vol. 1, Requirement Numbers B75MD0.011 and B75MD0.020. (DOL Module Shorted)

Ordnance Installation - SRB MDM (EMDM) Safe and Arm Device circuits are functionally verified per OMRSD File V, Vol. I, Requirement number B47SAO.070. (DOL Module Shorted)

Terminal Countdown Demonstration Test - SRB MDM (EMDM) pre-launch verification and MDM Lock are performed per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185 and S00FNO.040. (DOL Module Shorted)

Launch Countdown to requirements of Launch Commit Criteria - SRB MDM (EMDM) pre-launch verification and MDM Lock are performed per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185 and S00FN0.040. (DOL Module Shorted)

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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 DOL Module BITE tests of the MDM (EMDM) are conducted at T-2 Hrs, 30 Min. per OMRSD File II, Vol. 1 Requirement Number S00FE0.185. (DOL Module Shorted)

The above referenced OMRSD testing is performed every flight.

C. INSPECTION

1) VENDOR RELATED:

See Appendix D, Section 4.

2) KSC RELATED:

See Appendix D, 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.