

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: A20

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-169

ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3

APPROVED: S. Parvathaneni

CN 044

FAILURE MODE AND CAUSES: Unscheduled positive or negative torque commands to pitch or yaw gyro of two or more of four RGAs 1, 2, 3, and 4 caused by:

- o DOL Module(s) (shorted)

FAILURE EFFECT SUMMARY:

- o Loss of vehicle rate detection leading to loss of mission, vehicle and crew caused by vehicle flight instability.
- o One success path remains after the first failure. Operation is not affected until two paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass - RGA torque event measurements B79X1890X, B79X1891X, B79X1893X, B79X1894X, B79X1896X, B79X1897X, B79X1899X, and B79X1900X. RGA rate measurements B79R1410C through B79R1413C.
- 2) Pass - Rate measurements V95R4260C through V95R4263C and V95R4270C through V95R4273C.
- 3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN:

1. System Description

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

2. Component Description

See Appendix D, Section 2.

B. TESTING

1) VENDOR RELATED:

See Appendix D, Section 3, Paragraph(s) A & 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 integration, Ignition Safe & Arm Devices, RGA null and torque tests are performed per 10REQ-0021, para. 1.2.2.1.2, 1.2.2.2.1, 1.2.2.2.2.1, and 1.2.2.19.3. (DOL Module, Shorted)

Shuttle Interface Test - Verification of the SRB Forward RGA positive/negative torque, MDM Operational Modes, and MDM Lock/Unlock tests are performed per OMRSD File II, Vol. 1, Requirement Number S00000.643 and File V, Vol. 1, Requirement Numbers B75MD0.011 and B75MD0.020. (DOL Module, Shorted)

Terminal Countdown Demonstration Test - Verification of the SRB Forward MDM (EMDM) pre-launch and RGA torque tests are performed per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185 and S00FF0.230.(DOL Module, Shorted)

Launch Countdown to requirements of Launch Commit Criteria - Verifications of the SRB Forward MDM (EMDM) pre-launch and RGA torque tests are performed per OMRSD File II, Vol. 1, Requirement Numbers S00FE0.185 and S00FF0.230. (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 per OMRSD File II, Vol. 1 SOOFEO.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:

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.