

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: Rate Gyro Assemblies 1 (LSRB), 3 (LSRB), 2 (RSRB) and 4 (RSRB)

PART NO.: MC493-0015-0105
MC493-0015-0106 (Alt.)

FM CODE: A06

ITEM CODE: 50-03-02, 50-03-03

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 2 in each SRB

DATE: March 1, 2002

CRITICAL PHASES: Separation

SUPERCEDES: March 1, 1995

FMEA PAGE NO.: D-196B

ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3

APPROVED: S. Parvathaneni

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FAILURE MODE AND CAUSES: Loss of Orbiter Bus A&C or Bus B&C power caused by:

- o Connector pin short to ground
 - o RFI filter shorted
 - o Wiring harness shorted
 - o Power supply module shorted

FAILURE EFFECT SUMMARY: Loss of Orbiter Bus A&C or Bus B&C power would cause null outputs from two chamber pressure sensors. If these failures occur before L + 100 seconds and the other SRM reaches <50 psi by L + 105.5 seconds, or after L + 100 seconds and within 5.5 seconds of the time the other SRM reaches <50 psi, a premature separation cue could be given, leading to possible premature separation and SRB recontact, resulting in loss of mission, vehicle and crew. (One success path remains after the first failure.)

REDUNDANCY SCREENS AND MEASUREMENTS:

- 1) Pass - During preflight bench testing, power to return and power to chassis isolation tests are performed.
- 2) Pass - Bus voltage measurements B76V1601C, B76V2601C, B47P1(2)300C, B47P1(2)301C, and 47P1(2)302C.
- 3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. Design per Appendix F, Section #1 and 2.

B. TESTING

- 1) VENDOR RELATED per Appendix F, Section #3,

2) KSC RELATED (GFE Item)

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

RGA ACO power-on, SMRD and rate gyro null and torque test are verified per 10REQ-0021, para. 1.2.2.19.1 and 1.2.2.19.3 (All Causes)

An All Systems Up test is performed on the forward assembly and RGAs per 10REQ-0021, para. 1.2.3 and 1.2.3.1.4. Power circuit isolation from ground is verified per 10REQ-0021, para. 1.2.1.2.3. (All Causes)

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A simulated ascent requirements test is conducted by USA SRBE per 10REQ-0021, para. 1.2.3.2 and 1.2.3.2.3.

SPC conducts Power Bus Isolation Test per OMRSD File V, Vol. I requirement B75BU0.010.

SPC conducts rate gyro power-on SMRD and null test per OMRSD File II, Volume I Requirement Number S00000.640.

SPC conducts RGA positive and negative torque and rate gyro polarity test per OMRSD File II, Vol. I Requirement Numbers S00000.643 and .645.

SRB rate gyro power activation and RGA torque testing is performed during launch countdown per OMRSD File II, Vol. I Requirement Numbers S00FF0.215 and .230.

The above referenced OMRSD testing is performed every flight.

C. INSPECTION

1) VENDOR RELATED per Appendix F, Section #4.

2) KSC RELATED per Appendix F, 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

None