

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: A41

ITEM CODE: 50-01-01-03

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-82

ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3

APPROVED: S. Parvathaneni

CN 044

FAILURE MODE AND CAUSES: Loss of two of four TVC rock commands to the TVC rock actuator caused by:

- o Wiring harnesses (open or shorted)

FAILURE EFFECT SUMMARY: Loss of capability to gimbal SRB nozzle caused by all TVC actuator servovalves being bypassed leading to loss of vehicle control and breakup resulting in loss of mission, vehicle and crew. (Second failure occurs before FDIR deselects first failure.) One success path remains after the first failure. Operation is not affected until two paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass - Rock Actuator Position Measurement B58H1150C.

Rock Secondary Delta Pressure Measurements B58P1311A through B58P1314A.

- 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) F(1) & K

2. Component Description

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

B. TESTING

1) VENDOR RELATED:

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

2) KSC RELATED:

See Appendix B, Section 3, Paragraph B

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

Assembly Checkout (ACO) - ACO Aft Skirt Stand Alone Test - The SRB TVC Servoactuator tests are verified per 10REQ-0021, para. 2.3.14. These tests verify wire harness operation.

Prelaunch Test -

Shuttle Interface Test (SIT) - The SRB TVC Servoactuator Position, Individual Position Null, Individual Channel Ramp, Frequency Response, and Step Response tests are verified per OMRSD File II, Vol. 1, requirement numbers S00000.650, S00000.670, S00000.680, S00000.720 and S00000.750. These tests verify wire harness operation. (Wiring Harness)

Launch Countdown - The SRB TVC Gimbal test at t-10 seconds timeframe is verified per OMRSD File II, Vol. 1, requirement number S00FS0.030. This test verify wire harness operation. (Wiring Harness)

Last Test Failure Mode Prior to Launch - Nozzle Gimbal test in Launch Countdown per OMRSD File II, Vol. 1, requirement number S00FS0.030 is the last test of TVC command channels prior to launch. Shuttle Interface Test per OMRSD File II, Vol. 1, requirement numbers S00000.650, S00000.670, S00000.680, S00000.720 and S00000.750 is the last test of all servoactuator circuits prior to launch. (Wiring Harness)

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C. INSPECTION

1) VENDOR RELATED:

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

2) KSC RELATED:

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

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, 5, 7-15.