

## SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: Integrated Electronic Assembly (IEA), Forward (Logic and Networks Distributor and OF Signal Conditioner)

PART NO.: 10400-0329

FM CODE: A25

ITEM CODE: 50-01-01-02

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-22

ANALYST: C. Webster/ S. Finnegan

SHEET 1 OF 3

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CN 044

FAILURE MODE AND CAUSES: Loss of two SRM Ignition PIC outputs caused by:

- o Miscellaneous III Card (A) and Recovery Logic III card (B) fail (open)
- o Solid State Switches (Fire 1 or Fire 2, A and B) fail (open)
- o Wiring harnesses fail open or shorted
- o PIC Failure (A and B)

FAILURE EFFECT SUMMARY: Loss of Ignition of one SRB, leads to thrust imbalance, resulting in loss of mission, vehicle and crew. One success path remains after the first failure. Operation is not affected until both paths are lost.

### REDUNDANCY SCREENS AND MEASUREMENTS

- 1) Pass - Ignition PIC Load Test B55X1824X, B55X1825X.  
Ignition PIC Resistance Test B55X1806X, B55X1807X.
- 2) Pass - Ignition PIC capacitor voltage measurements B55V1603C and B55V1604C.
- 3) Pass - No credible causes.

### RATIONALE FOR RETENTION:

#### A. DESIGN:

1. System Description

See Appendix A, Section 1, Paragraph (s) D(1) & I

2. Component Description

See Appendix A, Section 2, Paragraph (s) A,E(2),F(2)(4),G,I

B. TESTING

1) VENDOR RELATED:

See Appendix A, Section 3, Paragraph(s) A(4)(5),B

2) KSC RELATED:

See Appendix A, Section 3, Paragraph B

3) SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

SRB Forward Skirt Assembly Checkout (ACO) - SRB Forward Skirt Stand Alone tests verify the operation of the SRM Ignition PIC Fire 1 and Fire 2 circuits in 10REQ-0021, para. 1.2.2.8.1.5 and 1.2.2.8.2.5. (All Failure Causes)

Prelaunch Tests -

Shuttle Interface Test (SIT) - The SRM Ignition A and B PIC circuits are verified per OMRSD File II, Vol. 1, Requirement Number S00000.510 and PIC to NSI interface wiring resistance is verified per OMRSD File V, Vol. I requirement number B75PI0.011. (All Failure Causes)

Ordnance Installation - The SRM Ignition A and B PIC circuits are verified in OMRSD File II, Vol. 1, Requirement Number S00000.525. (All Failure Causes) CN 044

Terminal Countdown Demonstration Test (TCDT) - The SRM ignition PIC to NSI interface wiring resistance, including that wiring internal to the Forward IEA, is verified per OMRSD File II, Vol. 1, Requirement Number S00FA0.015. (Wiring Harness)

Launch Countdown - The SRM ignition PIC to NSI interface wiring resistance, including that wiring internal to the Forward IEA, is verified per OMRSD File II, Vol. 1, Requirement Number S00FA0.015. (Wiring Harness)

Last Test of Failure Mode Prior to Launch - Ordnance Installation per OMRSD File II, Vol. 1, Requirement Number S00000.525 is the last verification of the SRM ignition A and B system level redundancy. (All Failure Causes)

C. INSPECTION

1) VENDOR RELATED:

See Appendix A, Section 4, Paragraph(s) A,E,F,G, H(3) and I

2) KSC RELATED:

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

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, 4-15.