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: A21

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-19   ANALYST: C. Webster/S. Finnegan

SHEET 1 OF 3   APPROVED: S. Parvathaneni

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FAILURE MODE AND CAUSES: Unscheduled safe command to SRM Ignition Safe & Arm (S&A) Assembly, caused by:

 o Solid State Switches (2 of 2) fail (shorted)

Failure must occur between last SRM ignition S&A Assembly position measurement prior to ignition of SRM and issuance of SRM ignition fire commands and ignition of SRM, less than two seconds.

FAILURE EFFECT SUMMARY: Loss of ignition to 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- SRM Ignition Safe and Arm Assembly position measurements, B55X1842X (armed), B55X1843X (safed).

2)   Fail - Not verified.

3)   Pass- No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN:

 1.   System Description

  See Appendix A, Section 1, Paragraph (s) <u>C</u> & <u>I</u>

DRD 1.4.2.1-b

2.   Component Description

See Appendix A, Section 2, Paragraph (s)   <u>A,E(3)</u>

B. TESTING

1)   VENDOR RELATED:

See Appendix A, Section 3, Paragraph(s) <u>A(3)</u> <u>B</u>

2)   KSC RELATED:

See Appendix A, Section 3, Paragraph   <u>B</u>

3)   SYSTEM FUNCTIONAL/FAILURE MODE UNIQUE:

SRB Forward Skirt Assembly Checkout (ACO) - SRB Forward Skirt Stand Alone tests verify the SRM Ignition S&A Assembly Safe-1 and Safe-2 switch circuits per 10REQ-0021, paras. 1.2.2.9.2 and 1.2.2.9.3. (solid state switches)

Prelaunch Tests:

Ordnance Installation - The SRB Ignition Safe and Arm Assembly functions, including the Safe 1 and Safe 2 commands, are verified per OMRSD File V, Vol. 1, Requirement Number B47SA0.070. (solid state switches)

Last Test of Failure Mode Prior to Launch - Ordnance installation/ connection per OMRSD File V, Vol. 1, Requirement Number B47SA0.070 is the final verification of the SRM Ignition Safe and Arm Assembly Safe-1 and Safe-2. (solid state switches)

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C. INSPECTION

1)   VENDOR RELATED:

See Appendix A, Section 4, Paragraph(s) <u>A,E</u>

2)   KSC RELATED:

See Appendix A, Section 5, Paragraph(s) <u>A.(1),A.(2)(c),B.(1)(c)</u>

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, Para. 2, 4, 7-15.