

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Throwaway Cables X33W2 J1/J2 and X33W3 J1/J2 (Forward BSM PIC A and PIC B Output to Forward BSM NSI A and NSI B)

PART NO.: 10400-0092, 10400-0093

FM CODE: A01

ITEM CODE: 50-04-X33

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE: March 1, 1996

CRITICAL PHASES: Separation

SUPERCEDES: March 1, 1995

FMEA PAGE NO.: D-765

ANALYST: R. Smith/J.Duggan

SHEET : OF 3

APPROVED: P. Kalia

FAILURE MODE AND CAUSES: Loss of Forward BSM PIC A and PIC B outputs to Forward BSM NSI A and NSI B in both cables due to:

- o One pin or wire open caused by: open crimp, open wire, broken/bent pin, unseated pin, broken pin locking mechanism, corroded pin.
- o One pin or wire short to ground caused by: bent pin, contamination in connector, insulation breakdown, frayed shielding, abraded or cut insulation.
- o Loss of connector J2 caused by: connector not fully mated, mechanical overstress, failure of locking mechanism.
- o Loss of connector J1 caused by: connector not fully mated. (Pull-Away Type)

FAILURE EFFECT SUMMARY: Loss of mission, vehicle, and crew due to loss of ability to fire the Forward Separation Motors at separation. Loss of separation thrust will lead to vehicle damage caused by recontact between SRB and ET/Orbiter. One success path remains after the first failure. Operation is not affected until both paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS:

- 1) Pass - All cables are system tested during ground turnaround sequence.
- 2) Fail - Not verified.
- 3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN Per Appendix A Section # IV

B. TESTING

1) **VENDOR RELATED** Per Appendix B Section # IB

2) **KSC RELATED** Per Appendix B Section # IIA

3) **SYSTEM/ UNIQUE FUNCTIONAL**

Cables are subjected to electrical continuity isolation and DWV test per OMRSD 10REQ-0021 para. 1.2.1.1.1, 1.2.1.1.2, and 1.2.1.1.8 after the Frustum has been mated to the SRB Forward Skirt. (Open, Short or Loss of Connector)

Cables are tested during ACO per 10REQ-0021, paras. 1.2.2.7.2 and 1.2.2.7.3 (BSM System A and B Circuitry Verification). (Open, Short or Loss of Connector)

After cables are transferred to SPC, a Firing Line Continuity Test is performed. (Open, Short or Loss of Connector)

Cables are tested after Final Ordnance Installation and Connection per OMRSD File II, Vol. 1, requirement number S00000.410 (PIC Resistance Test). (Open, Short or Loss of Connector)

Last time cables are checked is at T-4 hours during Final Countdown per OMRSD File II, Vol. 1, requirement number S00FA0.015 ("GO" PIC Resistance Test). (Open, Short or Loss of Connector)

C. INSPECTION

1) **VENDOR RELATED** Per Appendix C Section # I (Crimped Connector)

2) **KSC RELATED** Per Appendix C Section # IIA and IIB

Additional: Connector J1 is pullaway type, connector clearance is measured to verify connector is fully mated (Loss of Connector)

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.