SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Throwaway Cables X17W1 P1/P2 and X17W2 P1/P2 (Aft Diagonal/Middle Strut Separation Bolt PIC A and PIC B Output to Aft Diagonal/Middle Strut Separation Bolt NSI A and NSI B)

PART NO.: 10400-0042
10400-0043

FM CODE: A02

ITEM CODE: 50-04-X17

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE: March 1, 2001
DCN 042

CRITICAL PHASES: Separation

SUPERCEDES: March 1, 1995
DCN 042

FMEA PAGE NO.: D-693

ANALYST: R. Smith/S. Parvathaneni
DCN 042

SHEET 1 OF 3

APPROVED: S. Parvathaneni
DCN 042

FAILURE MODE AND CAUSES: Loss of Aft Diagonal/Middle Strut Separation Bolt PIC A and PIC B outputs to Aft Diagonal/Middle Strut Separation Bolt NSI A and NSI B in both cables due to:

- One pin or wire open caused by: open crimp or solder, open wire, broken/bent pin, unseated pin, broken pin locking mechanism, corroded pin.
- One pin or wire short to ground caused by: bent pin, contamination in connector, insulation breakdown, frayed shielding, abraded or cut insulation.
- Loss of connector P1 caused by: connector not fully mated, improperly safety wired, improperly torqued, defective threads, mechanical overstress.
- Loss of connector P2 caused by: failure of locking mechanism, connector not fully mated, mechanical overstress.

FAILURE EFFECT SUMMARY: Loss of mission, vehicle and crew due to the loss of Aft Diagonal/Middle Strut separation leading to recontact between SRB and the 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 # IIB

3) SYSTEM/ UNIQUE FUNCTIONAL

Cable X17W1 has an NSI bridgewire test performed after installation in diagonal/middle strut per 10REQ-0021, para. 4.3.5.3. (Open, Short or Loss of Con-nector)

Cable X17W2 is tested for continuity, isolation and DWV, per ACO OMRSD 10REQ-0021, para. 2.2.1.1.1., 2.2.1.1.2, 2.2.1.1.4 after etch prior to installation. After installation a NSI bridgewire test is performed per 10REQ-0021, para. 4.3.5.3. (Open, Short or Loss of Connector)

After installation, cables are tested in series with other strut NSI cables X13W29 and X13W28 for NSI bridge-wire continuity and isolation. (Open, Short or Loss of Connector)

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

The last time the cables are checked is 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 and Soldered Connector)

2) KSC RELATED

1) Connector P2 (Bayonet type) is inspected, connected and verified by USBI per 10REQ-0021 para. 4.3.5 (Open, Short or Loss of connector)

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2) Connector P1 (X17W2) threaded type is inspected, connected, torqued and lockwired by SPC per FileV, Vol. I B75GEN.011, B75GEN.020, and B75GEN.040 (Open, Short or Loss of connector)

3) Connector P1 (X17W1) threaded type is inspected, mated and torqued by SPC per File V, Vol. I B75GEN.010 and B75GEN.030 lockwired with X17W2,P1 (Open, Short or Loss of connector)

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.