

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Nonwatertight Reusable Cables 131W13R P1/J2 (231W13R P1/J2), and 131W14R (231W14R P1/J2) P1/J2 (SRM Ignition PIC Fire Command; Separation PIC Arm/Fire commands)

PART NO.: 10400-0103 (10400-0114)
10400-0949 (10400-0948)

FM CODE: A07, A08

ITEM CODE: 50-04-X31

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE: March 1, 1995

CRITICAL PHASES: Boost, Separation

SUPERCEDES: March 1, 1994

FMEA PAGE NO.: D-721, D-723

ANALYST: R. Smith/A. Craft

SHEET 1 OF 2

APPROVED: P. Kalia

FAILURE MODE AND CAUSES: Loss of SRM Ignition PIC A and PIC B *Fire #1/Fire #2 commands and/or loss of Separation PIC A and PIC B Arm/Fire commands 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 caused by: connector not fully mated, improperly safety wired, improperly torqued, defective threads, mechanical overstress.

FAILURE EFFECT SUMMARY: Boost: Loss of mission, vehicle and crew due to loss of SRM Ignition PIC A and PIC B Fire commands leading to ignition of one SRM without ignition of the other. Separation: Loss of mission, vehicle and crew due to loss of Separation PIC A and PIC B Arm and Fire commands leading to loss of SRB separation. 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 - For Separation PIC A and B Fire commands - not verified.

Pass - For SRM ignition PIC A and PIC B Fire commands - PIC cap volt measurement B55V1603C.
B55V1604C.

Pass - For separation PIC a and PIC B arm commands - PIC cap volt measurements B55V1605C through
B55V1616C.

3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN Per Appendix A Section # V

B. TESTING

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

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

3) **SYSTEM/ UNIQUE FUNCTIONAL**

Cables are tested during ACO per 10REQ-0021, para. 1.2.2.7 and 1.2.2.8. (open, short or loss of connector)

After transfer to SPC, cables are tested per OMRSD File II, Vol. 1, requirement number S00000.510 and .525 (SRM Ignition and Separation PIC Arm/Fire 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

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.