

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Watertight Reusable Cable X21W1R P1/P2 and X21W2R P1/P2 (SRB Ignition Fire Commands; Separation Arm/Fire Commands)

PART NO.: 10400-0046
10400-0047

FM Code: AD1

ITEM CODE: 50-04-X21

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-697

ANALYST: R. Smith/A. Craft

SHEET 1 OF 2

APPROVED: P. Kalita

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 cause 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 Separation PIC A and B Arm commands. PIC Cap Volt measurements B55V1605C through B55V1616C.

Pass -for SRM Ignition PIC A and PIC B fire commands PIC cap voltage measurements B55V1603C and B55V1604C.

3) Pass - No credible cause.

RATIONALE FOR RETENTION:

A. DESIGN Per Appendix A Section # II

B. TESTING

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

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

3) **SYSTEM/ UNIQUE FUNCTIONAL**

Cables are tested per OMRSD File II, Vol. 1, requirement number S00000.510 and .525. (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 # II

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.