SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Watertight Reusable Cable X13W3R P1/P2 and X13W12R P1/P2 (APU B, MPU 1 and MPU 2 Speed Control Signals)

PART NO.: 10400-0019
10400-0027

FM CODE: A08

ITEM CODE: 50-04-X13

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE March 1, 1995

CRITICAL PHASES: Final Countdown, Boost

SUPERCEDES: March 1, 1994

FMEA PAGE NO.: D-667

ANALYST: R. Smith/A. Craft

SHEET 1 OF 2

APPROVED: P Kalia

FAILURE MODE AND CAUSES: Loss of APU B MPU No. 1 and MPU No. 2 speed control signals in both cables due to:

- One pin or wire open caused by: open crimp, 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 caused by: connector not fully mated, improperly safety wired, improperly torqued, defective threads, mechanical overstress.

FAILURE EFFECT SUMMARY: Final Countdown: Loss of both turbine speed signals for APU B will cause the turbine to overspeed resulting in turbine wheel fragmenting. The wheel fragments could penetrate hydrazine and hydraulic components or damage the turbine housing resulting in a fire in the aft skirt leading to loss of mission, vehicle and crew.

Boost: Loss of both turbine speed signals for APU B will cause the turbine to overspeed resulting in turbine wheel fragmenting. The wheel fragments could penetrate hydrazine and hydraulic components or damage the turbine housing resulting in a fire in the aft skirt or loss of TVC leading to loss of mis- sion, 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 - All cables are system tested during ground turnaround sequence.

2) Pass - APU turbine speed sensors, B46R1407C and B46R1409C.

3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN Per Appendix A Section # II

B. TESTING

1) VENDOR RELATED Per Appendix B Section # I

2) KSC RELATED Per Appendix B Section # IIB

3) SYSTEM/ UNIQUE FUNCTIONAL

Cables are tested per OMRSD File V, Vol. 1, requirement number B42APO.050 (APU Resistance BITE Tests) in SIT and Final Countdown. (Open, Short or Loss of Connector)

The last time cables are tested is during final countdown per OMRSD File V, Vol. 1, requirement number S00FR0.070 (Start SRB APU and Verify) at T-28 sec. (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 # IIB

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.