SRB CRITICAL ITEMS LIST

SUBSYSTEM: STRUCTURES AND MISCELLANEOUS ITEMS

ITEM NAME: Booster Cartridge Assembly

PART NO.: 10307-0001-801

FM CODE: A03

ITEM CODE: 60-04-02

REVISION: Basic

CRITICALITY CATEGORY: 1

REACTION TIME: Immediate

NO. REQUIRED: 8

DATE: March 31, 1997 | DCN032

CRITICAL PHASES: Final Countdown

SUPERCEDES: March 1, 1996 | DCN032

FMEA PAGE NO.: E-54

ANALYST: H.Longani | DCN032

SHEET 1 OF 4

APPROVED: P.Kalia

FAILURE MODE AND CAUSES: Premature operation caused by:

- O High temperature
- O Shock/Vibration
- O Increased sensitivity due to contamination

FAILURE EFFECT SUMMARY: Premature operation of a booster cartridge would result in release of one SRB/MLP holddown assembly. This would result in vehicle instability on the pad during SSME thrust build-up resulting in an ET fire and explosion and loss of mission, vehicle and crew.

RATIONALE FOR RETENTION:

A. DESIGN

O Design Specification USBI 10SPC-0031

- o No autoignition below 340°F. para. 3.2.5.2 (High Temperature)
- o Leakage control per para. 4.4.2.3.1 (Contamination)
- o Vibration levels per para. 3.4.1.3 (Vibration)

| DCN032

O Predicted temperature will not exceed +120°F, per SRB Thermal Design Data Book, SE-019-068-2H, Table 4.9.1.1 (High Temperature)

O Explosive material RDX, Type II, Class 7, certified to MIL-R-398 (Contamination)

O Hermetically sealed device prevents entry of contaminants following manufacture. (Contamination)

O Qualification

- o 8 and 40 foot Drop (Shock)
- o Vibration
- o Operating High temperature (+150^{0}F)
- o Qualification documented in Space Ordnance Systems Test Report QTR 8660, 3F-1884-10 and 3F-1918-10; and HTL/Energy Systems QTR 2-501270 and ER-PYR-91-002.
- o Qualification documented in COQ A-PYR-6120 and A-PYR-6121.

DCN032

B. TESTING

O Lot acceptance test per Space Ordnance Systems Test Procedure TP8794 or HTL/energy systems division test procedure ATP 2-501270. (Contamination)

- o Helium Leak Test of entire lot.
- o N-ray radiography examination of entire lot.

C. INSPECTION

VENDOR RELATED INSPECTION

O RECEIVING

Receiving Inspection: All explosive material certification and test reports are verified by USBI Quality Assurance and Contractor Quality Assurance per: (Contamination)

- o USBI SIP 1363
- o Space Ordnance System Manufacuring Procedure 114848-3
- o HTL/Energy Systems Division Manufacturing Procedure MP 2-501270

OAssembly Operation

- o Loading and Weighing Explosive Material: Explosive material moisture content determination, loading and weighing process and tare weight are witnessed one hundred percent by Contractor Quality Assurance and verified by USBI Quality Assurance per: (Contamination)
  - USBI SIP 1363
  - Space Ordnance System Manufacturing Procedure 114848-3
  - HTL/Energy Systems Division Manufacturing Procedure MP 2-501270

O Lot Acceptance Test

- o Lot Acceptance Testing is witnessed one hundred percent by USBI Quality Assurance and Contractor Quality Assurance personnel per: (Contamination)

- o USBI SIP 1363
- o Space Ordnance System Acceptance Test Procedure TP8794.
- o HTL/Energy Systems Division Acceptance Test Procedure ATP 2-501270.
- o N-ray: Each N-ray film is examined by Vendor Quality and verified by USBI QAR for the following: (Contamination)
  - Evidence of contamination in explosive material.
  - Manufacturing residue in explosive material.
  - Processing debris or other extraneous contamination in explosive material.

O Lot review and certification per USBI Plan 10PLN-0031. (Improper Material)

O Critical Processes/Inspections:

The following critical processes/inspections are used to assure that explosive material does not have contamination, manufacturing residue, or processing debris. (Improper Material)

- o X-ray (Qualification lots only) (Manufacturing Residue or Processing Debris)
  - Per document 8794, Space Ordnance System Acceptance Test Procedure.
  - Per document ATP-2-501270 HTL/Energy Systems Division Acceptance Test Procedure.
- o N-ray (Contamination)
  - Per document 8794, Space Ordnance System Acceptance Test Procedure.
  - Per document ATP-2-501270 HTL/Energy Systems Division Acceptance Test Procedure.
- o Helium Leak Test (Improper Manufactrue/Installation)
  - Per document 8794, Space Ordnance System Acceptance Test Procedure.
  - Per document ATP-2-501270 HTL/Energy Systems Division Acceptance Test Procedure.

KSC RELATED INSPECTION

O Receiving Inspection

- o Visual inspection of pyrotechnic device is performed for evidence of damage, contamination, degradation, corrosion, misalignment or moisture per OMRSD File V, Vol. 1 Requirement, Number B000PL.005. (Contamination)

O Installation Inspection

- o Ordnance device installation is witnessed and verified by SPC Quality Assurance. (Contamination)

D. FAILURE HISTORY

- o Criticality Category 1:
  - Failure histories may be obtained from the PRACA database.

E. OPERATIONAL USE

- o Not applicable to this failure mode.