SRB CRITICAL ITEMS LIST

SUBSYSTEM: STRUCTURES & MISCELLANEOUS ITEMS

ITEM NAME: Aft IEA Covers

PART NO.: 10170-0295, 10170-0390
10170-0389, 10170-0178

FM CODE: A01

CN 044

ITEM CODE: 60-02-08

REVISION: Basic

CRITICALITY CATEGORY: 1

REACTION TIME: Immediate

NO. REQUIRED: 3

DATE: March 1, 2002

CRITICAL PHASES: Boost, Separation

SUPERCEDES: March 1, 1994

FMEA PAGE NO.: E-16

ANALYST: C. Reynolds/S. Parvathaneni

SHEET 1 OF 3

APPROVED: S. Parvathaneni

CN 044

FAILURE MODE AND CAUSES: Structural failure of covers caused by:

o Aerodynamic loading combined with Improper fabrication, Improper material, Improper heat treatment, Improper installation or unusual environment.

FAILURE EFFECT SUMMARY: Loss of mission, vehicle and crew due to generated debris, loss of required thrust at separation or loss of vehicle control.

RATIONALE FOR RETENTION:

A. DESIGN

O The Aft IEA Covers are welded assemblies of formed 2219 aluminum plate. The covers are mechanically fastened to the ET Attach Ring using standard aerospace hardware. All joints are sealed to preclude leakage. They provide aerodynamic protection for the IEA on ascent and structural protection during splashdown/towback.

O The materials used in the design were selected in accordance with 10PLN-0150 (Materials Control and Verification Program Management Plan for SS SRB Program) and MSFC-SPEC-522 (Design Criteria for Controlling Stress Corrosion Cracking). CN 044

O The design allowables are in compliance with MSFC-HDBK-505 (Structural Strength Program Requirements) and MIL-HDBK-5 (Metallic Materials and Elements for Aerospace Vehicle Structures).

O The fasteners are installed in accordance with MSFC-STD-486 (Threaded Fasteners, Torque Limits for).

O The welding is in compliance with MSFC-SPEC-504 (Specification: Welding, AluminumAlloys), Class II . X-ray of welds is not required. Weld wire controls are in compliance with MSFC-SPEC-655 (Standard Weld Filler, Control of).

O The heat treat operations are in compliance with MIL-H-6088 (Heat Treatment of Aluminum Alloys).

O The covers were qualified by analysis as documented in USA SRBE Certificate of Qualification A-STR-7114.

O Analysis shows that an ultimate factor of safety of (+2.01) exists between the design of the Aft IEA Covers and the predicted maximum loading during ascent. (Ref. BPC-ANAL-003-87).

B. TESTING

O No testing is performed during each flow applicable to this failure mode.

C. INSPECTION

VENDOR RELATED INSPECTION

O USA SRBE SIP 1453 controls the USA SRBE QAR inspection criteria at the vendor's facility. (Improper Fabrication)

O Materials are accepted on the basis of supplier certifications. Certifications are verified by USA SRBE QAR per SIP 1453. (Improper Material)

O Welding and aging data is verified by USA SRBE QAR per SIP 1453. (Improper Fabrication)

Critical Processes/Inspections:

- o Welding was performed per MSFC-SPEC-504. (Improper Fabrication)
- o Heat treat operations are performed per MIL-H-6088. (Improper Heat Treatment)

ASSEMBLY/CHECKOUT RELATED INSPECTIONS

O After each flight visual inspection is performed by USA SRBE QA. Any physical damage, leaks, corrosion, saltwater intrusion, stains, raised metal, cuts, dents, gouges, cracks, damaged threads and rounding of nut corners, or unusual condition are recorded, photographed, documented, and repaired as required. The inspection criteria is contained in 10SPC-0131 (Refurbishment Engineering Specifications for Space Shuttle Solid Rocket Booster Assembly Project). (Unusual Environments)

PRELAUNCH CHECKOUT RELATED INSPECTIONS

O The covers are installed including verification of proper torque per OMRSD File V, Vol. 1, requirement number B08GEN.010. (Improper Installation)

O Visual inspection, in accordance to OMRSD File V, Vol I requirement number B08ST0.010. (Improper Installation)

D. FAILURE HISTORY

O Criticality Category 1:

O Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

o Not applicable to this failure mode.