CRITICAL ITEMS LIST (CIL)

SYSTEM:	Venting	FUNCTIONAL CRIT:	1
SUBSYSTEM:	Aft Cable Trays	PHASE(S):	b
REV & DATE:	J, 12-19-97	HAZARD REF:	E.01
DCN & DATE:			
ANALYSTS:	P. Ghandhi/E. Howell		

FAILURE MODE: Excessive Leak Area

FAILURE EFFECT: b) Loss of mission and vehicle/crew due to loss of SRB command signals.

TIME TO EFFECT: Seconds

FAILURE CAUSE(S): A: Improper Installation or Omission of Flow Restrictor
B: Undersized Flow Restrictor

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: Provides venting and flow restriction for the aft SRB fairing cable tray compartment during the ascent phase.

FMEA ITEM CODE(S)	PART NO.	PART NAME	QTY	EFFECTIVITY
7.4.21.2	80911019139-039	Fairing Instl, Upper, Aft ET/SRB - KSC (RH Aft SRB Fairing Circular Shaped Flow Restrictor Vent/Leak Area)	1	LWT-54 & Up
7.4.22.2	80911019139-040	Fairing Instl, Upper, Aft ET/SRB - KSC (LH Aft SRB Fairing Circular Shaped Flow Restrictor Vent/Leak Area)	1	LWT-54 & Up

REMARKS: These items are grouped as the failure mode, causes and effects are the same.

SYSTEM: Venting
SUBSYSTEM: Aft Cable Trays
FMEA ITEM CODE(S): 7.4.21.2, 7.4.22.2

REV & DATE: J, 12-19-97
DCN & DATE:

RATIONALE FOR RETENTION

DESIGN:

The system of cable trays on the ET/ORB/SRB aft attachment is a network of interlocking individual cable tray compartments. In order to model the pressure conditions at a vent/leak location, the space between the overlapping trays were divided into three distinct areas. These areas were defined according to whether they experience windward, leeward, or tangential flow. External pressure coefficients and discharge coefficients are documented in MMC-ET-SE05-95 and MMC-ET-SE05-579. The aft SRB fairing circular shaped flow restrictor vent/leak area is defined by the gap formed between the circular shaped flow restrictor and the upper ET/SRB strut. The circular shaped flow restrictor is manufactured in two halves. It is formed out of two layers of nomex cloth 0.028 inch thick, one layer of fiberglass 0.022 inch thick, one layer of rubber 0.01 inch thick and one rubber ablative layer 0.04 inch thick. The total thickness of the flow restrictor is 0.136 inch. The two halves of the flow restrictor are bolted to the fairing to prevent overheating of electrical wires due to excessive air mass flow during ascent.

Vent system performance verification is by analysis (MMC-ET-SE05-95 for LWT-54 thru 88 and MMC-ET-SE05-579 for LWT-89 & Up).

A: Engineering requirements (drawing 80911009125) assure that the circular shaped flow restrictor will be installed in both RH and LH aft upper SRB fairings.

B: Engineering requirements (drawing 80911009135) assure that the circular shaped flow restrictors will be manufactured to the correct dimensions within drawing tolerances.

TEST:

The Fairing Instl, Upper, Aft ET/SRB KSC (RH & LH Aft SRB Fairing Circular Shaped Flow Restrictor Vent/Leak Area) is certified. Reference MCS MMC-ET-TM08-1-S160 (LWT-54 thru 88) and MCS MMC-ET-TM08-L-S522 (LWT-89 & Up).

Functional tests conducted in 1984 (MMC-3512-84-017) verified that the flow restrictor can withstand a maximum burst pressure of 6.0 psid without any detrimental effects and will not allow a leakage rate greater than 0.25 lbm/sec at 1.5 psid.

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

B: Verify materials selection and verification controls (MMC-ET-SE16 and drawing 80911009135).

B: Inspect dimensions (drawing 80911009135).

Launch Site:

A: Verify assembly and installation (drawings 80971009442 and 80911019139).

A, B: Inspect for existence of flow restrictors (drawing 80901019008).

FAILURE HISTORY:

Current data on test failures, unexplained anomalies and other failures experienced during ground processing activity can be found in the PRACA data base.