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. Chandhi/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 Rubber Dam
- B: Structural Failure
- C: Omission of Rubber Dam Stiffener
- D: RTV Sealant Adhesive Failure

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: Prevents airflow through the aft ET/SRB cable tray.

FMEA ITEM CODE(S)	PART NO.	PART NAME	QTY	EFFECTIVITY
7.4.20.1	80911031140-015	Rubber Dam Details, Aft ET/Orbiter Cable Tray (LH and RH Vertical Strut to SRB Fitting Dam)	2	LWT-54 & Up

REMARKS:

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM: Venting
SUBSYSTEM: Aft Cable Trays
FMEA ITEM CODE(S): 7.4.20.1

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. Most of the vent/leak locations occur at a juncture of these individual cable trays. Between each two leak locations, a seal (rubber dam) is placed to prevent over-heating of the electrical wires during the ascent phase by reducing the air flow through the cable tray. The rubber dam is bonded and sealed to the cable tray using RTV sealant. RTV sealant is applied to two sides and the bottom of each rubber dam. The rubber dam is compressed around cable bundles inside the cable tray perpendicular to the tray. A rubber dam stiffener is installed to prevent distortion under air pressure. RTV sealant is applied to fill the gap between the cable tray flange and the rubber dam corner chamfer for the width of the dam. Sealant is also applied to fill all cable slot openings. By sealing in this manner, eleven separate compartments are defined in the aft cable tray system.

The venting 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 80911031849) assure that a rubber dam will be installed near the right and left hand vertical strut to SRB fitting juncture.

B: The maximum predicted aft cable tray dam differential pressure is 5.5 psid for the largest dam cross-sectional area. The aft cable tray silicone rubber dams were tested to a delta pressure of 7.8 psid (Test Report No. 826-2270). Materials selected for this part are in accordance with MMC-ET-SE16.

C: Engineering requirements (drawing 80911031849) assure that a rubber dam stiffener will be installed.

D: Engineering requirements (drawing 80911031849) assure proper preparation and application of RTV sealant in appropriate locations.

TEST:

The Rubber Dam Details, Aft ET/Orbiter Cable Tray (LH and RH Vertical Strut to SRB Fitting Dam) is certified. Reference HCS MMC-ET-TM08-L-S159 (LWT-54 thru 88) and HCS MMC-ET-TM08-L-S517 (LWT-89 & Up).

Functional tests were conducted on lightweight tank cable tray rubber dams (Test report number 826-2270). The rubber dam maintained a delta pressure of 7.8 psid.

MAF:

D: Perform RTV sealant adhesion "tack free" test (STP7002).

MASTER

SYSTEM:	Venting	REV & DATE:	J, 12-19-97
SUBSYSTEM:	Aft Cable Trays	DCN & DATE:	
FMEA ITEM CODE(S):	7.4.20.1		

RATIONALE FOR RETENTION

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

B: Verify material selection and verification controls (MNC-ET-SE16 and drawing 80911031140).

MAF Quality Inspection

A, C: Verify assembly and installation (drawing 80911031849).

A, C: Inspect (visually) to assure dams are installed (MNC-ET-TM04k and drawing BD900000008).

D: Verify surface preparation and RTV application (drawing 80911031849).

D: Verify sealant cure (STP7002).

D: Witness RTV sealant adhesion "tack free" test (STP7002).

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.