CRITICAL ITEMS LIST (CIL)

SYSTEM:	Venting	FUNCTIONAL CRIT:	1
SUBSYSTEM:	LO2/LH2 Cable Tray	PHASE(S):	b
REV & DATE:	J, 12-19-97	HAZARD REF:	S.03
DCN & DATE:			
ANALYSTS:	P. Ghandhi/E. Howell		

FAILURE MODE: Excessive Leak Area

FAILURE EFFECT: b) Loss of mission and vehicle/crew due to debris impacting Orbiter.

TIME TO EFFECT: Minutes

FAILURE CAUSE(S): A: Improper Installation or Omission of Rubber Dam
B: Undersize Rubber Dam
C: Oversize Rubber Dam Openings
D: Structural Failure

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: Restricts airflow through the LO2 cable tray.

FMEA ITEM CODE(S)	PART NO.	PART NAME	QTY	EFFECTIVITY
7.3.1.1	80911001213-001	LO2 Cable Tray Rubber Dam (around ET Station 384)	1	LWT-54 & Up

REMARKS:

SYSTEM: Venting
SUBSYSTEM: LO2/LH2 Cable Tray
FMEA ITEM CODE(S): 7.3.1.1

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

RATIONALE FOR RETENTION

DESIGN:

The purpose of the silicone rubber dam is to prevent over-heating of the LO2 electrical cable tray during the ascent phase by reducing the air flow through the cable tray. The cable tray venting analysis is a zero pressure lag multiple compartment venting problem. The mass flow rate through the LO2 tank cable tray is directly proportional to the rubber dam leakage area. The maximum mass flow rate criteria of 0.001 slugs per second at 100 seconds flight time will not be exceeded as long as the rubber dam leakage area is kept to 25% or less of the LO2 tank cable tray cross-sectional area.

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 80911001212) assure that a rubber dam will be installed in the LO2 tank cable tray around ET Station 384.

B: Engineering requirements (drawing 80911001213) assure that the rubber dam will be manufactured to the correct dimensions.

C: Engineering requirements (drawing 80911001213) assure that the rubber dam openings will be manufactured to the correct dimensions.

D: The maximum predicted dam differential pressure for this dam is 2.6 PSID. The LWT silicone rubber dams are designed to a Delta pressure of 5.5 PSID. Materials selected for this part are in accordance with MMC-ET-SE16.

TEST:

The LO2 Cable Tray Rubber Dam (around ET Station 384) is certified. Reference HCS MMC-ET-TM08-L-S152 (LWT-54 thru 88) and HCS MMC-ET-TM08-L-S510 (LWT-89 & Up).

Functional tests were conducted on lightweight tank cable tray rubber dams (Test report number 826-2270). The LO2 cable tray dams were tested to maintain a pressure of 10 PSID.

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

B, C: Inspect dimensions (drawing 80911001213).

D: Verify material selection and verification controls (MMC-ET-SE16, drawing 80911001213).

MAF Quality Inspection:

A: Verify installation (drawing 80911001212).

A: Inspect for existence of dam (MMC-ET-TMC4k and drawing 809C0G00008).

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.