CRITICAL ITEMS LIST (CIL)

SYSTEM:	Venting	FUNCTIONAL CRIT:	1
SUBSYSTEM:	Intertank	PHASE(S):	a
REV & DATE:	J, 12-19-97	HAZARD REF:	S.01, S.05
DCN & DATE:			
ANALYSTS:	P. Ghanchi/E. Howell		

FAILURE MODE: Blockage

FAILURE EFFECT: a) Loss of mission and vehicle/crew due to excessive delta pressure across LH2 tank forward dome resulting in fire/explosion.

TIME TO EFFECT: Seconds

FAILURE CAUSE(S): Foreign Obstruction

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: Provides venting for intertank during prelaunch purge operations and ascent phase.

FMEA ITEM CODE(S)	PART NO.	PART NAME	QTY	EFFECTIVITY
7.2.5.1	80913010029-009	Installation - Aero Vent	1	LWT-54 thru 88
	-409	(Aero Vent Hole)	1	LWT-89 & Up
7.2.6.1	80913010029-010	Installation - Aero Vent	1	LWT-54 thru 88
	-410	(Aero Vent Hole)	1	LWT-89 & Up

REMARKS: The two aero vent holes are grouped as the failure mode, causes, and effects are the same.

SYSTEM: Venting
SUBSYSTEM: Intertank
FMEA ITEM CODE(S): 7.2.5.1, 7.2.6.1

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

RATIONALE FOR RETENTION

DESIGN:

The Intertank min-max vent/leak areas (compartment venting reports MMC-ET-SE05-95 and MMC-ET-SE05-579) are designed to provide an acceptable compromise between ascent-phase venting and ground purge constraints. A hydrogen dome wall collapse pressure of .21 psid (MMMA Memo 3512-82-032) limits the Intertank compartment overpressure during ground purge operations. Allowable air ingestion is limited to that volume of air which will not cause the Intertank oxygen concentration to exceed 4.0 percent of the Intertank volume.

External pressure coefficients and discharge coefficients applied at the aero vent holes are documented in MMC-ET-SE05-95 and MMC-ET-SE05-579.

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).

Intertank cleanliness is verified by MPP 80913001005. Heated GN2 purge precludes ice build-up around the vent. The aero vent holes are designed to preclude rain ingestion when the ET is in the vertical position.

MPTA tests in 1978 (MMC-ET-SE05-86) verified the min-max vent/leak area predictions, discharge coefficients and the purge math model.

TEST:

The Installation - Aero Vent (Aero Vent Hole) is certified. Reference KCS MMC-ET-TM08-L-S150 (LWT-54 thru 88) and KCS MMC-ET-TM08-L-S502 (LWT-89 & Up).

DFI flight data (FEWG Flight Evaluation Report) updated and verified the Intertank ascent venting model.

INSPECTION:

MAF Quality Inspection:

Inspect (visually) Intertank internal cleanliness during post installation shakedown inspection (MPP 80913001005).

Inspect (visually) vent area for freedom of obstruction (MMC-ET-TM04k and drawing 80900000008).

Launch Site:

Inspect (visually) Intertank internal cleanliness (OMRSD File IV).

Inspect (visually) vent area for freedom of obstruction (OMRSD File IV and 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.