

CRITICAL ITEMS LIST (CIL)

SYSTEM:	Venting	FUNCTIONAL CRIT:	1
SUBSYSTEM:	Intertank	PHASE(S):	8
REV & DATE:	J, 12-19-97	HAZARD REF:	9.01, 9.05
DCN & DATE:	002, 2-28-99		
ANALYSTS:	P. Ghanchi/E. Howell		

FAILURE MODE: Blockage

FAILURE EFFECT: a) Loss of mission and vehicle/crew due to excessive delta pressure across LK2 tank forward dome resulting in fire/explosion.

TIME TO EFFECT: Seconds

FAILURE CAUSE(S):
 A: Foreign Obstruction
 B: Out of Tolerance Dimensional Clearance of Frame and/or Angle

RELIABILITY SCREENS: Not Applicable

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

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
7.2.4.1	80911001319-019 -500	Fairing Installation - GH2 Pressline (GH2 Pressline Forward Fairing Leak Area)	1 1	LW7-54 thru 88, 600 & Up LW7-89 thru 599

REMARKS:

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM: Venting
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FMEA ITEM CODE(S): 7.2.4.1

REV & DATE: J, 12-19-97
DCM & 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 GH2 pressline fairing are documented in MMC-ET-SE05-95 and MMC-ET-SE05-579. The GH2 pressline leak area is defined by the gap formed between the GH2 pressline and the fairing.

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: Intertank cleanliness is verified by MPP 80913001005. The annular shape of the GH2 pressline forward fairing leak area would be difficult to block. Heated GH2 purge precludes ice build-up around the leak area.
- B: Engineering 80911001317 specifies fabrication requirements for the frame, and engineering drawing 80911001316 specifies fabrication requirements for the angle. Engineering drawing 80911001319 specifies installation requirements for the GH2 pressline forward fairing.

TEST:

The Fairing Installation - GH2 Pressline (GH2 Pressline Forward Fairing Leak Area) is certified. Reference RCS MMC-ET-TM08-L-5149 (LWT-54 thru 88) and RCS MMC-ET-TM08-L-5512 (LWT-89 & Up).

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

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

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

- B: Inspect dimensions of Frame (drawing 80911001317) and Angle (drawing 80911001316).

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INSPECTION: (cont)

MAF Quality Inspections:

- A: Inspect (visually) fairing mount for freedom of debris (PPD4502) prior to GH2 pressline forward fairing installation (MPP 80911001319).
- A: Inspect (visually) intertank internal cleanliness during post installation shakedown (MPP 80913001005).
- A: Inspect (visually) leak area for freedom of obstruction (MMC-ET-TM04k and drawing 80900000008).
- B: Verify installation and witness torque (drawing 80911001319).

Launch Site:

- A: Inspect (visually) Intertank internal cleanliness (OMRSD File IV).
- A: Inspect (visually) leak 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.