NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		107FM06		
RESTRAINT ASSEMBLY, ITEM 107 --- 0107-82968-15 (1)	2/1R	External H2O leakage. Defective Material: Tubing bond tee. Broken/cracked/ punctured water manifold or tubing. Separation of tubing from manifold or tee.	END ITEM: Water leakage from tubing into suit vent loop. GFE INTERFACE: Loss of cooling capability. Loss of water, possible fogging of helmet. MISSION: Terminate EVA. Loss of use of one EMU. CREW/VEHICLE: None with single failure. Loss of crewman with loss of SOP. TIME TO EFFECT /ACTIONS: Minutes. Activate the Purge Valve and return to airlock. TIME AVAILABLE: Minutes. TIME REQUIRED: Seconds. REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - LCVG restraint tubing, "tees" and manifold fittings are extruded/injection molded from ethylene vinyl acetate (EVA) which is irradiated to improve its physical properties. This material was selected to provide compatibility with the PLSS water loop operating system. It has good crack and puncture resistance with fair compression and cold flow resistance. EVA has excellent reforming characteristics. It can be reworked repeatedly with no reduction in physical properties. Production of these components is controlled by tight tolerancing to ensure correct interface dimensions. Tubing to fitting interfaces are secured by thermal bonding. This thermal process, as well as the solvent cleaning prior to bonding, identifies defective material through deformation or unacceptable melt characteristics. As a result of proper tolerancing and fabrication, defective tubing and fittings are precluded. The thermal bonds produced exceed the strength of the tubing. As a result of correct fabrication and adequate easement, defective bonds are precluded. Additionally, the entire system (tubing, fittings, bonds) is designed to meet a 1.5 factor of safety over the 16.7 +/- 1.0 psi maximum operating pressure. B. Test - Acceptance: See Inspection. PDA: The following tests are conducted at the LCVG Assembly level in accordance with ILC Document 0111-70028J: Initial leakage test to verify no visible leakage at 240 pph minimum flow at 17.7 psig maintained for at least 30 minutes. 1. Proof pressure test to verify no structural damage with cooling tubes charged at 33 psig for not less than 10 minutes. 2. Post proof leakage test to verify no visible leakage at 240 pph minimum flow at 17.7 psig maintained for at least 30 minutes. 3. Water lines pressure drop test at 240 pph. minimum flow at 17.7 psig maintained for at least 5 minutes. The differential pressure is not to exceed 2.4 psi at 60 degree F. 4. Dye flow test to identify any static water condition or loops failing to exhibit a minimum flow rate of 3.0 inch/sec. Certification: The LCVG softgoods were successfully tested (manned) during SSA certification to duplicate operational life (Ref. ILC-EM-98-0008). The following usage reflecting requirements of significance to the LCVG, was documented during certification: Requirement — S/AD — Actual Don/Doff — 98 — 400 Pressurized Hours — 458 — 916 The LCVG successfully completed the proof load pressure testing to 33 psig for the tubing.

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EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-107 LIQUID COOLING & VENTILATION GARMENT (LCVG)

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____
HS - Project Engineering

_____
HS - Reliability

_____ 4/24/02
HS - Engineering Manager

Approved by: _____
NASA – SSA/SSM

_____
NASA – EMU/SSM

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NASA – S&MA

_____
NASA – MOD

_____
NASA – Crew

_____ 7/4/02
NASA – Program Manager