

DRAFT – ICES 2012 Abstract REV B

**MANAGEMENT OF THE POST-SHUTTLE
EXTRAVEHICULAR MOBILITY UNIT (EMU)
WATER CIRCUITS**

John W. Steele, David Etter and Tony Rector
Hamilton Sundstrand Space Systems International, Inc., Windsor Locks, CT 06095

Terry Hill and Kevin Wells
NASA Johnson Space Center, Houston, TX 77058

The EMU incorporates two separate water circuits for the rejection of metabolic heat from the astronaut and the cooling of electrical components. The first (the Transport Water Loop) circulates in a semi-closed-loop manner and absorbs heat into a Liquid Coolant and Ventilation Garment (LCVG) worn by the astronaut. The second (the Feed Water Loop) provides water to a cooling device (Sublimator) with a porous plate, and that water subsequently sublimates to space vacuum. The cooling effect from the sublimation of this water translates to a cooling of the LCVG water that circulates through the Sublimator. Efforts are underway to streamline the use of a water processing kit (ALCLR) that is being used to periodically clean and disinfect the Transport Loop Water. Those efforts include a fine tuning of the duty cycle based on a review of prior performance data as well as an assessment of a fixed installation of this kit into the EMU backpack or within on-orbit EMU interface hardware. Furthermore, testing is being conducted to ensure compatibility between the International Space Station (ISS) Water Processor Assembly (WPA) effluent and the EMU Sublimator as a prelude to using the WPA effluent as influent to the EMU Feed Water loop. This work is undertaken to reduce the crew-time and logistics burdens for the EMU, while ensuring the long-term health of the EMU water circuits for a post-Shuttle 6-year service life.