

Direct Water Reuse on the International Space Station

Abstract: Water reuse is a key to sustainability of crews on the International Space Station (ISS). Since 2009, crews have utilized a U.S. system (U.S. Water Recovery System) that recovers humidity condensate and urine distillate, and reclaims it as essentially 100% of the water needed by the crew and systems. This high-profile direct potable reuse scenario was enabled by many years of careful research, design, and planning. NASA experts will describe that history, and will discuss the outcome/lessons learned from implementation of this system in an extreme environment. Moreover, experts will highlight pertinent issues such as the challenge of pharmaceutical and personal care products. The audience will come away with a firmer understanding of how water reuse is an enabling technology for human spaceflight, and will gain an appreciation for why spaceflight water reuse represents our current earth-based water resource challenges in microcosm.

Presenter: Layne Carter

Mr. Carter has received a B.S. degree in Chemical Engineering from Oklahoma State University, and a M.S. in Environmental Engineering from the University of Alabama in Huntsville. He has worked at NASA for 25 years in the development of technologies for water recycling, including the design, delivery, and operation of the Water Recovery System on ISS.

Presenter: Daniel B. Gazda, Ph.D.

Dr. Gazda works for the Wyle Science, Technology, and Engineering Group in the Water and Food Analytical Laboratory at Johnson Space Center (JSC). His primary job duties include supporting operation of the Environmental Health Systems (EHS) and Environmental Control and Life Support Systems (ECLSS) on the International Space Station (ISS). He has experience developing hardware for in-flight water quality monitoring on the ISS, evaluating and interpreting spacecraft environmental data, establishing environmental monitoring requirements for manned spaceflight, and assessing human and system risks associated with environmental contaminants.

Presenter: Torin McCoy

Mr. McCoy received his Bachelors degree from Texas A&M University and a Masters in Environmental Toxicology from Clemson University. He serves as the chief of the Environmental Sciences Branch for NASA at Johnson Space Center where he manages a group of diverse scientists involved in monitoring and protecting the spaceflight environment and astronaut health. Prior to coming to NASA, Mr. McCoy worked for 10 years as a toxicologist and manager for the state environmental regulatory agency in Texas.