Title

Three years of on orbit ISS Oxygen Generation System operation 2007-2010.

Authors

Greg S. Diderich / Jacobs Engineering / Johnson Space Center
Pete Polis / Hamilton Sundstrand Corporation
Steven P. VanKeuren / Anadarko Industries
Bob Erickson / NASA / Marshall Space Flight Center

Abstract

The International Space Station (ISS) United States Orbital Segment (USOS) Oxygen Generation System (OGS) has accumulated 240 days of continuous operation at varied oxygen production rates within the US Laboratory Module (LAB) since it was first activated in July 2007. OGS relocated from the ISS LAB to Node 3 during 20A Flight (February 2010). The OGS rack delivery was accelerated for on-orbit checkout in the LAB, and it was launched to ISS in July of 2006. During the on-orbit checkout interval within the LAB from July 2007 to October 2008, OGS operational times were limited by the quantity of feedwater in a Payload Water Reservoir (PWR) bag. Longer runtimes are now achievable due to the continuous feedwater availability after ULF2 delivery and activation of the USOS Water Recovery System (WRS) racks. OGS is considered a critical function to maintaining six crew capability. There have been a number of failures which interrupted or threatened to interrupt oxygen production. Filters in the recirculation loop have clogged and have been replaced, Hydrogen sensors have fallen out of specifications, a pump delta pressure sensor failed, a pump failed to start, and the voltage on the cell stack increased out of tolerance. This paper will discuss the operating experience and characteristics of the OGS, as well as operational issues and their resolution.