

**NCERA-101 Station Report
Sierra Nevada Corporation/ORBITEC, Madison WI**

August 31, 2016-April 1, 2017

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1. Impact Nugget:

SNC/ORBITEC will continue to develop environmental control technologies for space based biological and physical-chemical life support systems, technologies that may have applications for terrestrial environmental control systems.

2. New Facilities and Equipment.

SNC/ORBITEC has added several new employees and will be expanding to a third building in 2018.

3. Unique Plant Responses.

Nothing to report.

4. Accomplishment Summaries.

Hybrid Life Support Systems

SNC/ORBITEC will continue work on the development of Exploration Life Support Salad Crop production as an early stage implementation of hybrid life support systems (combination of bioregenerative and physical-chemical life support technologies).

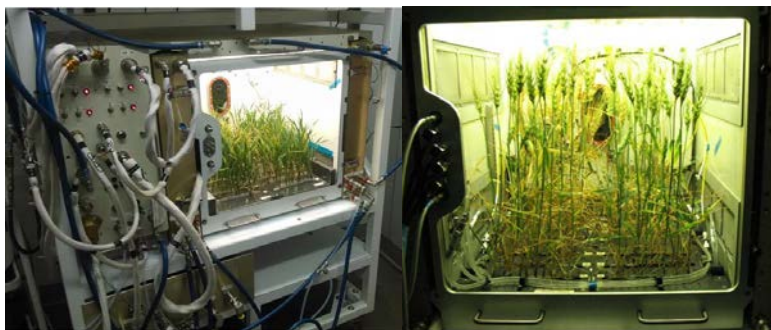


Payload Development***VEGGIE***

SNC/ORBITEC continues to work with the Kennedy Space Center (KSC) to support the Veggie plant-growth system hardware that is on-board the ISS. A second Veggie unit should be transported to the ISS later this year.

***Advanced Plant Habitat***

SNC/ORBITEC also continues to support KSC in the development of the Plant Habitat system for plant research aboard the International Space Station. When flown, this system will be the largest plant growth system put in space to date. It should fly this year (2017). Delivery of Plant Habitat flight components was made to KSC for transport to the ISS on Orbital Sciences and SpaceX spacecraft.

***Mass Measurement Device***

SNC/ORBITEC is completing development of a Zero-G Mass Measurement Device (ZGMMD) that will launch to ISS this year. The ZGMMD will provide for mass measurement of rodents on the ISS, but can also measure the mass of other specimens such as plant tissues.



Aerospace Environmental Control

SNC/ORBITEC continues to work with Commercial Crew Integration Capabilities partners for development of human Life Support and Thermal Control systems.

5. Impact Statements

- SNC/ORBITEC is advancing the technology of controlled environment systems to meet the performance and quality needs of long duration space applications. Some of this technology may be transferable and scalable to protected agriculture systems.
- SNC/ORBITEC is developing LED lighting configurations and control strategies for plant and human lighting applications to provide increased lighting system utility for aerospace and gravitational biology applications.
- SNC/ORBITEC is using its space biology controlled environment work and human life support work to spark interest in high school and college students in controlled environment technology and STEM.

6. Published Written Works.

None since the last station report.

7. Scientific and Outreach Oral Presentations.

2016 American Society for Gravitational and Space Research Annual Meeting (presentation only)

Non-Thermal Fresh Food Sanitation by Atmospheric Pressure Plasma. Ross W. Remiker, Robert J. Surdyk, and Robert C. Morrow, Orbital Technologies Corporation, and Magesh Thiyagajaran - Glasram Technologies.

Greenwall Plant Growth System for Space-Based Application. John Wetzel, Bob Morrow, RJ Surdyk, and Trey Pietras, Orbital Technologies Corporation

Evolution of plant growth systems for long duration hybrid life support system validation. Robert C. Morrow, Robert C. Richter, and Thomas M. Crabb. Orbital Technologies Corporation, Madison, WI, USA.

8. Other relevant accomplishments, news and activities.

ORBITEC has completely transitioned to Sierra Nevada Corporation as of January 2, 2017. For the time being our group in Madison, WI will be called SNC/ORBITEC.

9. Website:

Sierra Nevada Corporation <http://www.sncorp.com/>