



Exploration Technology Demonstration on the International Space Station



David Hornyak, ISS Technology Demonstration



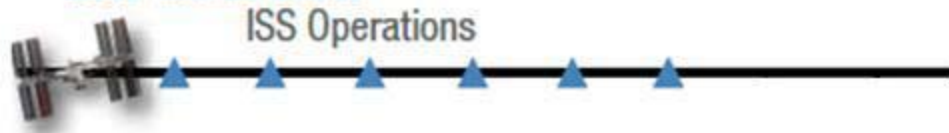
Use of ISS to Demonstrate Exploration Capabilities



ISS Utilization and Capability Demonstration

Mission and Destinations

Low-Earth Orbit



From: ISECG Global Exploration Roadmap



Incremental growth of ISS Technology Demonstrations



- Develop and demonstrate key exploration mission-enabling technologies.
 - Experience has shown in-space operational time, testing and adjustments are often required to optimize system performance.
 - Systems can be operated in an in-space environment to gain system maturity and prove the system performance before required for exploration missions.

- Demonstrate exploration capabilities or risk reductions
 - As technologies are proven, combinations of these systems can incrementally build to more complex demonstrations.
 - Example, water recovery and CO2 removal system integration demonstrations.



ISS Support of Exploration & Technology Demonstration



- Use of and building on existing space Infrastructure
 - launch vehicles,
 - in-space resources, power, data, etc.
 - distributed operations and support centers and,
 - on-orbit crew
- Long duration space environment
 - Internal and External ISS payload locations
- Technologies, systems and operational processes can be tested, evaluated, adjusted and proven utilizing ISS without risk to crew or mission success on an exploration mission.



ISS International Partnership



- The NASA ISS Payloads office and ISS program partners CSA, ESA, JAXA and ROSCOSMOS are in cooperation on developing exploration capabilities from the ISS infrastructure.
 - All ISS Program partners have agreed to participate and support the use of ISS in developing exploration technologies, systems and operational processes.
 - ISS Program International agreements may facilitate these efforts



International Cooperation in ISS Technology Demonstration



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- ISS Payloads office and ISS International Partners have discussed the exploration technologies and operational areas which ISS resources could support.
 - The OCT Technology Roadmap were used to guide the discussions and identify the most suitable technologies for demonstration on ISS
 - Advanced power production and distribution
 - Electric Propulsion
 - Robotic tools, systems and operations
 - Crewed spacecraft operation support tools
 - Advanced communication/navigation systems
 - Close proximity autonomous spacecraft systems
 - Advanced life support systems
 - Human health and protection
 - Enabling space suit technologies
 - Advanced habitats
 - Cryogenic operations
 - Thermal management



More Information

ISS Reference Guide

<http://spaceflight.nasa.gov/station/reference/>

Cumulative Results Reports:

NASA/TP-2009-213146-REVISION A

Education on ISS 2000-2006:

NASA/TP-2006-213721

World Wide Web

<http://www.nasa.gov/iss-science/>

Facilities Catalog

click on “Facilities” at web link above

ISS Research Blog “A Lab Aloft”

<http://go.usa.gov/atl>



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International Space Station Science Research Accomplishments Assembly Years: An Analysis of Res 2000-2008

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Customer Service Helpline :The International Space Station Payloads Office has both a phone and an email customer service helpline that Payload Developers and others interested in doing research can contact to get assistance. The phone is staffed during regular business hours, or messages may be issued after hours, and a representative will return the call on the next business day. Phone: 281-244-6187, email: jsc-iss-payloads-helpline@mail.nasa.gov.”

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