

ISS LEO COMMERCIALIZATION

SUMMARY OF WORKSHOP (DEC 10-11, 2014)

NASA HQ
WASHINGTON, DC

General Session

12/10/2014

- Welcome & remarks by William Gerstenmaier, Associate Administrator, Human Exploration & Operations Mission Directorate, NASA
- Introduction & purpose by Sam Scimemi, Director, ISS Division, NASA
- NASA perspectives by Dr. Ellen Stofan, Chief Scientist, NASA & Phil McAlister, Director, Commercial Spaceflight Development Division, NASA
- FAA perspective by Dr. George Nield, Associate Administrator, Commercial Space Transportation, FAA
- CASIS perspective by Greg Johnson, President & Executive Director, CASIS
- Presentation by astronaut Dr. Cady Coleman
- Industry perspectives by Carlos Grodsinsky, ZIN Technologies and James Muncy, PoliSpace

General Session

12/11/2014

➤ **Break out Sessions:**

- Session A – Potential Commercial Space Markets, Alex MacDonald & Warren Bates, facilitators
- Session B – Regulation/Policy/Incentives, Sam Scimemi & Gale Allen, facilitators
- Session C – Evolving ISS toward LEO Commercialization, Mike Read & Robyn Gatens, facilitators

Session A: Potential Commercial Space Markets

Questions Addressed

- 1. For previously-identified markets (biotech, remote sensing/imaging, materials manufacturing), what are the next steps that NASA can help enable?**
- 2. What are other potential emerging markets?**
- 3. How could NASA investment stimulate demand for commercial LEO capability?**
- 4. What can NASA/CASIS do to more effectively communicate value of space research and effectively engage industries?**
- 5. Does a commercial habitat and/or free flyer make sense and when? What attributes would a successful commercial habitat need to have to garner business?**

Session A: Potential Commercial Space Markets

Key Actionable Takeaways:

- There is a need for increased demand-side stimulation. Funded SAA's are a potentially appropriate mechanism.
- ISS needs to continue to act as a supplier in the short term (supply services to industry), and transition to being a demand-side supporter of LEO commercial activities in the long run.
- Industry needs repeated, regular access to ISS.
- Industry needs better clarity in terms of delineation of responsibilities/ POC's for NASA/CASIS (i.e. who to approach depending on project).
- There is a need for increased transparency as to what's available on ISS and how projects are prioritized.
- A majority of participants believe a 'major pull of a lever' (intentional, large changes to emerge from NASA LEO commercialization plan) is needed to move to new state, vs 'adjusting the dial' (small incremental changes) on existing state

Session B: Regulation/Policy/Incentives

Questions Addressed

- 1. How limiting is the current Intellectual Property language?**
- 2. What kinds of economic incentives should be explored?**
- 3. How limiting are the current export control/ITAR restrictions?**
- 4. How can the government address liability issues? Should international cross-waiver agreements be extended?**
- 5. What other policy initiatives/regulations would enable space investment or reduce barriers?**

Session B: Regulation/Policy/Incentives

Key Actionable Takeaways:

- Policies that should be studied by a task group (to be established) include:
 - LEO (and ISS) as an economic development zone (free trade zones) incentives
 - Indemnification, liability in space - will need legislative help
 - Extension of current IGAs to allow activities beyond ISS
 - Spaceflight participant policy for non-NASA crew
 - Policy for commercial habitat/module on ISS
 - LEO regulatory authority
- NASA should look into other agencies to see how they have transitioned to a commercial focus – ex NIH, Sandia.
- The magnitude of the Intellectual Property issue varies depending on company; however, there is still a need for revised language. Currently on NASA's proposed legislation list.

Session C: Evolving ISS toward LEO Commercialization

Questions Addressed

- 1. What kinds of contracting mechanisms and NASA oversight models would more effectively transition to a commercial ISS?**
- 2. What kinds of on orbit facilities and equipment would better equip ISS and attract commercial research? What new capabilities might provide the highest return on investment?**
- 3. Are there elements of existing NASA contractual agreements or FAR requirements that are a hindrance to non-standard commercial participation in LEO?**
- 4. Are there infrastructure limitations that are preventing ISS from being more broadly utilized?**
- 5. We know our safety and integration processes need streamlining, but are there other elements of the current system that need reimagining?**
- 6. What kinds of improved access to data would be helpful?**
- 7. How do we determine when to transition from a government-provided capability to a commercially-procured service?**
- 8. What does industry need from NASA to enable investment of private capital in LEO?**
- 9. Are there existing ISS systems that might make sense to spin off to be commercially operated?**

Session C: Evolving ISS toward LEO Commercialization

Key actionable takeaways:

- NASA should expand upon other types of contractual arrangements - cooperative agreements, IDIQ contracts with service providers, Space Act Agreements, “Sabatier model”.
- NASA/ISS needs to adapt to a more institutionalized commercial mindset (vs one driven mostly by individuals and specific relationships).
- Not all types of customers should be treated the same or have to follow same rigor imposed upon NASA systems and projects.
- NASA should explore better ways to advertise ISS as ‘open for business’, and ability of companies to use the NASA brand.
- ISS should look at what systems & capabilities it could upgrade with commercial opportunities (e.g. communication system into IP-based).
- ISS processes need to be streamlined and improved to reduce time and overhead for users (e.g. RISE initiative underway).
- NASA needs to develop its strategic plan, forecast its own needs for LEO beyond ISS, and be intentional about transitioning from supplier to customer.
- NASA needs to let commercial firms take on projects and not compete with industry.
- NASA needs to clarify its process for new projects – whether CASIS or NASA – and unify messaging to the outside world.

Overarching Themes across Breakout Sessions

- **Overarching Need for a Roadmap** – how do we get from here to there – and what does there look like?
 - Need for clarity in roles and responsibilities and policies (all sessions)
- **Stimulation Mechanisms** – how can NASA help to jumpstart ISS commercial utilization and stimulate demand?
 - Mechanisms include funded SAA's, Challenges and Prizes, increased engagement with international partners, exploration of economic incentives used elsewhere in USG, policy changes (session A and B)
- **Transparency** – how can we make it easier to get more projects up to the ISS?
 - More accessible and clear 'how to' users guides and descriptions of opportunities, use of databases to make transparent what equipment has been approved for ISS use, what hardware resources are available and when, and how projects and resources are prioritized (session A and B)
- **ISS Operations** – what model will we evolve to in terms of outsourcing responsibilities?
 - NASA outsourcing services related to operations and enabling more commercial services with government as customer ("Sabatier" model and COTS) (session B and C)
- **Marketing** – how can NASA better promote ISS, and let others promote it also?
 - Follow through with funded research projects to provide additional help with marketing and rethinking current policy towards marketing ISS / licensing ISS brand in general (session B and C)
- **Timely Access** – how can we reduce time to orbit?
 - Current time to get a project on ISS is one of the biggest challenges and that repeated and regular access can be as much of a deal-maker as initial time to orbit. Review ISS policies and procedures. (session A and C)
- **Realizing Commercial Potential** – is incremental change enough?
 - Transition to a commercial LEO ecosystem will require a 'leap of faith' in terms of NASA as a customer of a LEO platform and a 'major pull of a lever' to move us to a new state (sessions A and C)

Next Steps – Near Term

- NASA complete strategic planning process and roadmap
- Share strategic plan with industry at ISS R&D conference (TBD)
- Plans for interagency working group

Vision

Sustained economic activity in LEO enabled by human spaceflight, driven by private and public investments creating value and benefitting Earth through commercial supply and public and private demand

Goals

Today...

Leverage ISS to enable LEO commercialization, freeing up resources for Exploration

Policy and regulatory environment promotes commercialization of LEO

Available U.S. commercial platforms that accommodate public and private demands

Robust, self-sustaining, and cost effective supply of US commercial services to/in/from LEO

Broad sectors of the economy using LEO for commercial purposes

Sustained economic activity in LEO