AIAA Webinar with NASA's Doug Loverro

Audience Questions and Answers

20 April 2020

Q: Can you provide details of the Action Plan for Barriers to Entry?

A: In response to NextSTEP Appendix J, NASA selected Bryce Space and Technology to develop an action plan to address real and perceive barriers to growth of the low-Earth orbit economy. You can read about the selection at https://www.nasa.gov/leo-economy/nasa-selects-for-projects-optical-fibers-stem-cells-enable-low-earth-orbit-economy and the solicitation at https://www.nasa.gov/nextstep/leo_demand

Q: Any plans for partial gravity research in LEO?

A: NASA and its international partners have hardware on the space station now for use in partial-g research on small organisms (mice and smaller). For an example, please see: https://www.nasa.gov/mission_pages/station/research/experiments/explorer/Investigation.html?#id=8150

Q: If NASA purchases all on-orbit services commercially in the future, don't you think highest priority users will be those that pay the most? Won't that cause future cost increases or will NASA resolve to being lower priority?

A: NASA's acquisition strategy for LEO services will be developed as details of future service offerings become available. You can find details about NASA's expected future needs at https://www.nasa.gov/leo-economy/long-term-needs

Q: What is NASA's positioning in terms of global space economy, i.e., private operators and other agencies such as ESA, JAXA, Roscosmos, etc. Will there be continuing interest to cooperate with global partners?

A: NASA will continue to lead the world in space exploration and human spaceflight in partnership with commercial companies and international partners, as it does today.

Q: Apart from funding, what do you see as the major risks to achieving full commercialization in space as described in the presentation?

A: Full commercialization of human spaceflight will require very significant increases in non-governmental human spaceflight revenues.

Q: Do you have a notion of what fraction of current LEO revenues are non-US?

A: NASA currently covers ~77% of total ISS expenses, with the majority of the remaining covered by international partners. NASA is also currently paying for the development of Commercial Crew spacecraft systems. Less than 1% of human spaceflight related revenues in LEO currently comes from commercial or non-governmental sources.

Q: You mentioned that enabling policies were part of the LEO commercialization. Would you expand on what these policies may look like?

A: There are various policies that could enable LEO commercialization. For example, NASA recently established two new policies for this purpose. One was a policy defining and expanding the range of commercial activities that could be performed on the International Space Station: https://www.nasa.gov/leo-economy/commercial-use/introduction-to-policy. Another was to establish a pricing policy for ISS resources when commercial companies require ISS support: https://www.nasa.gov/leo-economy/commercial-use/pricing-policy. NASA is also pursuing clarifications to our Intellectual Property policies to enable better Intellectual Property protections for ISS users.

Q: What are your thoughts on how to make NASA's commercialization strategy robust to the vagaries of private companies? Such companies, particularly small ones, come and go as their start-up capital plays out, external shocks (e.g., coronavirus) occur, etc. I would think the strategy needs to be pretty dynamic and not tied to any presumed winners or losers in business development. Thoughts?

A: NASA's primary strategy to mitigate potential business disruptions with our commercial partners has been through competition. Competition incentivizes performance and cost effectiveness, but also does not leave NASA reliant on any individual provider of services or capabilities. Both commercial cargo and crew have benefited greatly from competition. The recently announced Human Landing System awards also demonstrate the use of competition as a management strategy.

Q: When will you announce the winners of the Human Landing System contracts for Artemis?

A: Please see NASA's announcement at https://www.nasa.gov/press-release/nasa-names-companies-to-develop-human-landers-for-artemis-moon-missions

Q: Mr. Loverro, can you describe any plans on privatizing the ISS?

A: Please see the information about our vision and our ISS transition plan available at https://www.nasa.gov/leo-economy/vision-for-low-earth-orbit-economy

Q: Do all ISS commercial platform users get free transport and free use of ISS capabilities? When do reimbursements start?

A: Please see details of the pricing policy for commercial activities on the space station at https://www.nasa.gov/leo-economy/commercial-use/pricing-policy
If a commercial user meets the criteria for use of ISS NL resources (upmass, use of crew time, etc.) then they are provided those resources as part of the ISS NL capability. If a commercial user does not meet the ISS NL use criteria (research and technology development) then they must follow the pricing policy detailed at the link.

Q: Will ISS extend beyond 2030?

A: NASA and its international partners have all committed to funding the space station through at least 2024. Congress appropriates NASA's funding on an annual basis, and NASA's current FY 2020 budget request and its five-year runout through 2024 includes funding for the International Space Station.

Q: What are some success stories you would like to highlight for services already taking advantage of the new pricing model?

A: NASA has received five proposals so far, resulting in two signed Reimbursable Space Act Agreements (RSAA), two new RSAA's are in the process, and we are evaluating one more. The first of these agreements to fly was launched on the SpaceX CRS-20 mission earlier this year. The companies have not yet disclosed their commercial uses publicly.

Q: Good morning. Thank you for your time. What is the status of negotiations for an additional Soyuz seat and what is the plan for staffing ISS after Chris Cassidy returns in October?

A: NASA is in negotiations with the State Space Corporation Roscosmos to purchase one additional Soyuz seat for a launch this fall. We have confidence in the availability of U.S. commercial spacecraft, which are currently projected to be available in 2020/2021.

Q: Have you seen interest in commercial garbage collection?

A: Not at this time.

Q: Are LEO Commercial Development Studies open to non-U.S. entities?

A: No. NASA's low-Earth orbit economy plan and NASA interim directive to enable commercial and marketing activities specifies that NASA is working with U.S. entities. You can learn more at: https://www.nasa.gov/leo-economy/commercial-use/introduction-to-policy

Q: Will NASA directly invest in startups that seem promising like an angel investor?

A: At the present time, NASA does not invest in companies like an angel investor. However, NASA has studied how the agency could implement such an activity as it looks to the future. To stimulate demand in low-Earth orbit, NASA is providing seed money for seven proposals to enable enterprising companies to mature their concepts and stimulate demand to develop their future markets. Learn more at: https://www.nasa.gov/leo-economy/nasa-selects-for-projects-optical-fibers-stem-cells-enable-low-earth-orbit-economy

Q: Do you see any role for the Starship launch vehicle that SpaceX is developing both in NASA's LEO commercialization strategy and for the Artemis program?

A: Please see NASA's announcement at https://www.nasa.gov/press-release/nasa-names-companies-to-develop-human-landers-for-artemis-moon-missions

Q: Any chance a more detailed explanation of any sort of commercial astronaut program could be discussed? It seems right now that NASA is the only "provider" of astronauts. Is this going to continue? How would "commercial astronauts" be regulated?

A: As part of NASA's mission to stimulate a low-Earth orbit (LEO) economy, NASA is enabling up to two short-duration private astronaut missions per year to the International Space Station beginning as early as 2020. Private astronaut missions will be privately funded, dedicated commercial spaceflights on a commercial launch vehicle dedicated to the mission to enable private astronauts to conduct approved commercial and marketing activities on the space station (or in a commercial segment attached to the station). Learn more about how NASA is enabling private astronaut missions at https://www.nasa.gov/leo-economy/private-astronaut-missions

Q: How will the transition to commercial service providers affect NASA centers (Johnson/Marshall)?

A: The transition to commercial providers has been happening for many years now, which has allowed changes to the centers to occur gradually. At the macro-level, the transition has allowed NASA personnel to be redeployed to our deep space missions. Part of NASA's strategy of moving toward commercial services is to transition more routine parts of NASA's portfolio, or parts where a profit motive can be identified, to the private sector. This enables NASA to focus on pushing the state-of-the-art and the boundaries of our space exploration efforts.

Q: Will NASA’s plans related to the commercialization of LEO extend beyond the current presidential administration?

A: NASA's low-Earth orbit commercialization activities started in 2005 and already have spanned multiple Presidential administration changes.

Q: Given the interest in the LEO economy why was there only one award for Appendix K for a study versus what was believed to be multiple awards? When will Appendix J be sent out?

A: The selection for Appendix J was announced here: https://www.nasa.gov/leo-economy/nasa-selects-for-projects-optical-fibers-stem-cells-enable-low-earth-orbit-economy

Q: How do you keep the regulatory environment for space from getting too complicated to be attractive for the most innovative companies in the U.S.?

A: NASA is not a regulatory agency, and we try to respect that boundary. That said, we are engaged with the various spaced-related regulatory agencies, and we generally promote a fair and not overly constraining regulatory framework.

Q: Launch costs are still high, even for LEO. What programs are in work to encourage development of more low-cost space access solutions?

A: While not devoted to lowering the cost of space access, a number of NASA programs encourage cost effective launch capabilities. Specifically, NASA's Launch Services Program which launches NASA satellites into space is designed to encourage low-cost and highly reliable launch services. There are also various activities within the Space Technology Mission Directorate that are designed to lower the cost of parts and/or subsystems of launch capabilities.

Q: It looks like many organizations will be working to bring business to the ISS besides NASA and CASIS, but still limitations to the resource right now – such as transportation, upmass, etc. How will NASA prioritize the resources amongst users and those sourcing customers?

A: NASA has reserved a set amount of resources for commercial and marketing activities separate from the allocation for the ISS National Lab. NASA's commercial pricing policy limits the amount of resources per company per year as outlined in the chart at https://www.nasa.gov/leo-economy/commercial-use/pricing-policy
MbE - The commercial companies with their own hardware on ISS that Doug mentioned fly research for either ISS NL users or NASA users and so their resource use is prioritized either by NASA or ISS NL.

Q: How long is ISS expected to function. Any plans to build a new station in the next decade?

A: NASA and its international partners have all committed to funding the space station through at least 2024. Congress appropriates NASA's funding on an annual basis, and NASA's current FY 2020 budget request and its five-year runout through 2024 includes funding for the International Space Station. Please see the information about our vision and our ISS transition plan available at https://www.nasa.gov/leo-economy/vision-for-low-earth-orbit-economy