



Position Statement:

The American Space Renaissance Act

Comments relating to Title II Civil Space Section 204: Human Presence in Low-Earth Orbit

May 2016

The National Space Society (NSS) applauds Representative Jim Bridenstine's bold effort to advance all U.S. efforts in space by creating the draft American Space Renaissance Act (ASRA). **In particular, NSS strongly supports the goal expressed in ASRA Section 204 that the U.S. should "maintain a continuous human presence in low-Earth orbit" [Sec. 204 (a) (1)].** A detailed review of NSS views on this subject can be found in the NSS position paper on [Next Generation Space Stations](#).¹

NSS also strongly supports ASRA Sec. 204 (a) (1) which calls for both transport of cargo/crew and on-orbit habitation to be provided by the commercial sector. NSS has a long history of supporting both the Commercial Crew and COTS/CRS programs, and is gratified to see increasing acceptance of the usage of multiply-sourced fixed price commercial services in space.

As a member of the [Alliance for Space Development](#) (ASD),² NSS has worked with other ASD member organizations to create draft legislation titled "International Space Station and Near-Earth Space Commercialization Act of 2016" which is similar in intent but different in detail to Section 204 of the ASRA. **NSS recommends that this draft, which can be found in an Annex to this paper, be merged with that of the ASRA Section 204 and introduced as a stand-alone Bill.**

In addition, NSS has the following detailed comments on Section 204 of the ASRA.

In ASRA Section 204 (b) (1) NASA is required to develop a plan for managing the remaining life of the ISS. In Section 204 (b) (1) (A&B) NASA is directed to develop a plan to maximize the scientific output of the ISS. **NSS believes that maximizing the commercial and technological value of the ISS should be treated co-equally with scientific value, and the text updated to reflect this.** One reason for this change is to grow the commercial markets necessary to support a transition to

commercial station operation post ISS. Additionally, no text in the ASRA calls for NASA to provide assurances to current ISS users that on-going commercial, technological and scientific efforts can be continued on future commercial LEO stations. **The ASRA should be modified so that such “no gap” assurances are part of the ISS transition planning process.**

Section 204 (b)(1)(C&F) asks NASA to study the possibility of turning the ISS over to commercial operators. The international agreement governing ISS may make turning the ISS over to commercial operators challenging, and it is also possible that the aging ISS could not be operated at a profit by a commercial entity.

However, a key requirement for commercial development in space is that commercial entities using either the ISS or commercial LEO stations be able to retain ownership of their intellectual property without requiring the permission of NASA or other steps that would not exist for Earth-based activities. **Thus, NSS strongly believes that all intellectual property issues related to activities on the ISS, and especially work done in any of (1) a commercially operated ISS, (2) commercial modules that might be attached to the ISS, and (3) free-flying commercially operated modules, must be resolved so that commercial entities own the results of their investments without having to obtain permission to do so from NASA.**

Section 204 (c) (2) proposes a pilot program where a commercial entity constructs a habitat and NASA undertakes to both launch the habitat and to act as a 50% anchor tenant for three years. **NSS believes that this general structure is viable and useful (except for the “free” launch, which is discussed further below), but that the details of the NASA contribution as an anchor tenant should be subject to negotiation.** However, the ASRA only requires one such contract to be signed. **NSS believes that just as competition led to the success of COTS/CRS, it is essential to support “not less than two competitively bid agreements” rather than only one.**

Although government provision of “free” launches is superficially attractive, there are issues with this approach. A temptation will exist to use a government-owned rocket for this purpose, which in turn may lead to the design of modules without consideration of launch costs. Such an approach is unlikely to lead to a cost effective and sustainable commercial LEO space station industry.

NSS believes that alternative approaches such as Space Act Agreements (SAAs) and progress payments based on milestones achieved during the development and launch of commercial LEO station modules, an approach that worked well in COTS/CRS, should be considered to facilitate the emergence of LEO station providers. Such milestones would be developed by NASA working with industrial partners, but might include design reviews, successful testing of life support systems, selection of a launch vehicle, and the actual launch to LEO. Generally, milestone payments would cover part but not all of the development and launch

costs of the LEO station modules, thus requiring those owning and operating the modules to have significant “skin in the game.” Those developing commercial LEO stations should be free to select the optimal launch vehicle for their design approach.

In conclusion, NSS strongly supports Representative Bridenstine’s efforts to maximize the value of the ISS, while supporting a gapless transition to a future of multiple commercially owned LEO space stations.

¹ www.nss.org/legislative/positions/NSS_Position_Paper_Next_Generation_Space_Stations_2015.pdf

² www.allianceforspacedevelopment.org

ANNEX : Draft Legislation – “International Space Station and Near-Earth Space Commercialization Act of 2016

SECTION 1. SHORT TITLE; TABLE OF CONTENTS

- (a) **SHORT TITLE** – This Act may be cited as the “International Space Station and Near-Earth Space Commercialization Act of 2016”
- (b) **TABLE OF CONTENTS** – The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents

Sec. 2. Findings

Sec. 3. Definitions

TITLE I - COMMERCIALIZING SPACE STATIONS IN NEAR-EARTH SPACE AND THE ISS

Sec 101 – Future NASA and US Government needs for Near-Earth Space stations

SECTION 2. FINDINGS.

Congress makes the following findings:

- (1) Congress reaffirms that the general welfare of the United States requires that the Administration seek and encourage, to the maximum extent possible, the fullest commercial use of space.
- (2) The international partnerships of the ISS are of intrinsic value and should be preserved where there are shared interests.
- (3) The United States should not cede human presence in Near-Earth space to potentially hostile powers.
- (4) The commercialization of space is an ongoing process that started with early communication satellites, and has progressed from there, and is now beginning to include human spaceflight.
- (5) That commercialization of Near-Earth Space, and maintaining a sustained, long-term human presence in space, including multiple space stations that are available for use by NASA, NIH, NSF, the Department of Commerce, other government agencies, academic institutions, and the private sector is vital to the strategic interests of the United States.
- (6) The US government should not lose this long term presence in near-Earth space, even when it is transitioning between space stations.
- (7) Commercializing Near-Earth Space can enable exploration beyond earth orbit sooner, cheaper, and allow a greater number of activities.
- (8) The ISS is currently helping to commercialize human spaceflight in Near-Earth space, although there remain challenges and barriers to fully utilizing ISS for commercializing Near-Earth Space.
- (9) For commercialization to fully succeed, the United States must act as a customer, instead of competing with private industry.
- (10) In addition to acting as a customer, the United States shall support commercial space station development with expertise, access to facilities and other resources.
- (11) To this end, the United States should transition ISS research and development activities into a distributed laboratory using commercially owned and operated space stations services

SECTION 3. DEFINITIONS

In this Act:

- (1) ADMINISTRATOR.—The term “Administrator” means the Administrator of the National Aeronautics and Space Administration.
- (2) APPROPRIATE COMMITTEES OF CONGRESS.—The term “appropriate committees of Congress” means—
 - A. the Committee on Commerce, Science, and Transportation of the Senate; and
 - B. the Committee on Science of the House of Representatives.
- (3) ISS.—The term “ISS” means the International Space Station.
- (4) NASA.—The term “NASA” means the National Aeronautics and Space Administration.
- (5) OSTP.—The term “OSTP” means the Office of Science and Technology Policy.
- (6) GAO. — The term "GAO" means the Government Accountability Office.
- (7) FAR.— The term “FAR” means the Federal Acquisition Regulations.
- (8) NIH. – The term “NIH” means the National Institute of Health.
- (9) NSF. – The term “NSF” means the National Science Foundation.
- (10) SPACE STATION. – The term “space station” refers to an orbital structure that operates with a human crew or in a crew-tended fashion. Such stations will typically provide power, cooling, re-boost, communications, and life-support to their users.

TITLE I COMMERCIALIZING SPACE STATIONS IN NEAR-EARTH SPACE AND THE ISS

SEC 101 – FUTURE NASA AND US GOVERNMENT NEEDS FOR SPACE STATIONS

- (1) IN GENERAL. – It shall be the policy of the United States that future needs for space stations by NASA and other government agencies shall utilize commercial space stations to the greatest extent practicable. As part of its requirement to ensure the fullest use possible use of commercial space, NASA shall:
 - a. Transition ISS research and development into a distributed laboratory using commercial space station services that will continue after the ISS is decommissioned with capabilities matching on-going needs.
 - b. Enable and encourage other agencies to utilize commercial space stations whenever possible.
 - c. Enable and encourage international partnerships.
 - d. Encourage private investment into commercial space stations and commercial additions to the ISS.
 - e. Extend access to government expertise, facilities and other resources to commercial space station developers.
 - f. Buy commercial FAR part 12 services and use funded Space Act Agreements to the maximum extent practicable when it has space station needs in Near-Earth Space.
 - g. Ensure that any funds spent on BEO habitation also assist the development of commercial space stations in Near-Earth Space

- (2) Report. – Not later than one year after the date of enactment, the Administrator shall submit to the appropriate committees an assessment of NASA and the nation’s need for basic and applied research from human space stations in Near-Earth Space. This assessment must include NASA and the nation’s long term need for:
- a. Space station laboratory facilities providing research opportunities in
 - i. Nanotechnology
 - ii. Materials Science
 - iii. Molecular biology
 - iv. Basic gravitational biology
 - v. Basic radiation biology
 - vi. Other disciplines which can benefit from the space environment
 - b. Human adaptation to the microgravity space environment
 - c. Human adaptation to partial-gravity environments, such as on the Moon and Mars.
 - d. Countermeasures to human physiological problems in a microgravity and partial-g environment.
 - e. Technologies required for a long-term (including permanent) human settlements.
- (3) Report. – as part of its 2018 budget submission NASA will provide a plan detailing how it will ensure the United States will maintain and expand its current Near-Earth Space capabilities, even after the retirement of ISS, while enabling BEO missions. This plan will need to explicitly include the following items:
- a. How NASA will transition the ISS research and development activities into a distributed laboratory using commercial space station services that will continue indefinitely with capabilities matching on-going needs.
 - b. How NASA will stimulate development of a commercially available capabilities, including propulsion modules, to eliminate US dependency of foreign nations by 2020 for ISS reboost and other needs.
 - c. How NASA will minimize ISS costs using commercial-led public/private partnerships and commercial service purchase, including the use Space Act Agreements.
 - d. What NASA has learned from operating and maintaining the ISS, including technologies that could be developed, that would enable better space stations in the future, stations that would be more capable, less expensive, and require less maintenance.
 - e. What functions and resources that are limited or missing from ISS would best enable and attract expanded commercial activities in future space stations if they were expanded or provided. Possible examples include crew time, communications capacity, and frequent transportation of parcels to and from Earth.
 - f. How NASA can support commercial space station developers with expertise, facilities, and other resources.
 - g. How, when NASA has space station needs in Near-Earth Space, NASA shall buy commercial FAR part 12 services, use Space Act Agreements, and other commerce public/private partnerships.
 - h. Identification of legal and policy barriers that exist which would prevent or inhibit transiting government owned property (including modules, software, internal

hardware, subsystems and ground systems) to private ownership to support privately owned and operated space stations.

- i. How modules or other assets, and especially research assets, at ISS, whether privately owned or government owned, would transition to a new commercial stations after the retirement of the International Space Station.
How privately owned and operated space stations, space station modules, and other infrastructure planned by private industry could also be utilized for a BEO exploration program.
- j. How much help private industry will need to successfully develop facilities that NASA can rent or lease to transition to a distributed National Space Laboratory augmenting and eventually replacing the ISS.
- k. International partnership issues.
- l. What assumptions, descriptions, data, and analysis of the system trades and resolution process, and justification of trade decisions that went into this plan.