

# The Ultra Low Cost Access to Space (ULCATS) Act



The March Storm 2016

The Alliance for Space Development

Comments/Feedback: [cmiller@allianceforspacedevelopment.org](mailto:cmiller@allianceforspacedevelopment.org)

A BILL TO AUTHORIZE THE OFFICE OF SPACE COMMERCIALIZATION OF THE U.S. DEPARTMENT OF COMMERCE TO AWARD PRIZES TO APPLICANTS WHO ACHIEVE CHEAP ACCESS TO SPACE IN THE UNITED STATES

**Section 1. Short Title.**

This Act may be cited as “The Ultra Low Cost Access to Space (ULCATS) Act.”

**Sec. 2. Findings.**

Congress makes the following findings:

1. A fully-reusable launch vehicle (RLV) with high flight rates, would provide cheap and reliable access to space, and has been a goal of the United States since the development of the Space Transportation System (a.k.a. “Space Shuttle) was approved for development in 1972.
2. Commercial RLVs with high-flight rates, rapid-turnaround, and surge capability will have significant dual-use applications, and will provide significant benefits to U.S. national security.
3. Commercial RLVs, with high reliability, will significantly reduce the cost and increase the reliability of space transportation for the U.S. government.
4. Significantly reducing the cost of space access will increase flight rates, create new markets and accelerate technological innovation in the United States.
5. Commercial RLVs will accelerate the growth of the American aerospace industry, create thousands of high-wage American jobs, contribute to a positive U.S. balance of trade, and are in the economic interest of the United States.
6. Commercial RLVs will establish the United States as the undisputed world-leader in space transportation, and enable America to leverage this leadership into dominant positions in other areas of space technology.
7. Commercial RLVs will enable affordable human trips to Mars by NASA by refueling large Earth departure stages that can be launched to low Earth orbit, such as by the Space Launch System.

8. Commercial RLVs will help America realize the full-promise of the International Space Station (ISS) by significantly increasing the research, experimentation and commercial utilization within the existing ISS budget.
9. Rapid, inexpensive transportation of humans and cargo to low Earth orbit will open new markets for commercial passenger travel while also creating opportunities for commercial stations in low Earth orbit.
10. America has attempted to develop RLVs several times, including the STS, the National Aerospace Plane, and the X-33/Venturestar, but none of these attempts succeeded
11. U.S. private industry has begun to develop partially-reusable launch vehicles capable of carrying human beings and cargo into space at much lower costs.
12. The basic underlying technology required for fully-reusable launch vehicles exists today, as demonstrated by flight-proven systems like the operational Boeing X-37 reusable spaceplane, which flies to Mach 25, returns to Earth, and is able to fly again.
13. U.S. industry is capable of developing an RLV, if the business case justified the very-large high-risk investment required.
14. While the basic technology exists for developing an RLV, closing the business case for RLVs is not achievable with existing demand for launch services, as current space launch markets are inelastic.
15. Previous efforts to spur competition and expedite and accelerate technological development, specifically in the private sector, have been successful in furthering the space capabilities of the United States and facilitating new, emerging markets.
16. Competition is critical to driving innovation and accelerating the development of RLVs.
17. Because of the decades of history of failed attempts to produce RLVs, and the complexity of the RLVs, it is in the interest of the United States to stimulate private development of RLVs, in a manner that pays for success, not for effort.

### **Section 3. Definitions.**

(1) Applicant shall mean any citizen of the United States or a United States Commercial Provider as defined in the Commercial Space Act of 1998 (51 U.S.C. § 50101) that registers with and provides a valid and complete written application to the U.S. Department of Commerce, Office of Space Commercialization.

(2) Reusable Launch Vehicle (RLV) shall be any system which is used to propel a crew and/or cargo from the Earth's surface into a low Earth orbit, the primary components of which, including but not limited to, rocket engines or other propulsion systems, propellant tanks, and primary structure, and similar systems, shall be re-used for each flight.

(3) Line Replaceable Units (LRU) shall carry the meaning and intent as expressed in the Defense Acquisition University Glossary (2015), defined as "An essential support item removed and replaced at field level to restore an end item to an operationally ready condition", shall be similar in operational concept to the term Line Replaceable Unit as utilized by the United States Air Force in operational high-performance aircraft, and shall be further defined by the Secretary when promulgating rules.

(4) Minimum Required Orbit (MRO) shall be at least 400 kilometers altitude, circular, at 51.6 degrees inclination.

#### **Sec. 4. Award Program General Requirements.**

(1) To the extent provided in this Act, the Secretary of the Department of Commerce, through the Office of Space Commercialization, shall determine whether the criteria have been met for the award of a prize to up to four separate applicants per the structure outlined in 4(2) and 4(3):

(2) A Phase 1 prize shall be awarded upon the successful completion of the following:

(a) Transportation of a payload of at least 1 metric ton to the Minimum Required Orbit, using an RLV, where all or part of the RLV will complete at least one complete orbit of the Earth, and then return safely to the surface of the Earth; or

(b) Transportation of a payload that contains all systems necessary to achieve a-c to the Minimum Required Orbit, using an RLV, where all or part of the RLV will complete at least one complete orbit of the Earth, and then return safely to the surface of the Earth:

- a. Safely transport at least 2 people from Earth to the Minimum Required Orbit,
  - b. Dock with a space station at the Minimum Required Orbit and transfer those people to and from the station, and
  - c. Detach from the station, and return at least two people safely to the surface of the Earth; and
- (c) Within 1 week of returning from the Minimum Required Orbit in (2)(a) or (2)(b), repeat the requirements specified in subsection in (2)(a) or (2)(b) of this section, using 100% the same RLV, equipment, and systems, as measured by dry mass; or
- (3) Applicants who have met the criteria for a Phase 1 prize may then attempt Phase 2.
  - (a) A Phase 2 prize shall be awarded upon successful completion of a mission that is composed of launch to the Minimum Required Orbit and return to Earth, and then successfully repeating that mission 9 additional times within a total 10 week period, using 100% the same RLV, equipment, and systems, as measured by dry mass.
- (4) Payment will be awarded under this section only to the extent that the participating applicant;
  - (a) Is a “United States Commercial Provider”, as defined in the Commercial Space Act of 1998 (51 U.S.C. § 50101), or a U.S. citizen;
  - (b) Meets all other laws and explicit regulatory requirements of the United States government imposed on launch and re-entry activities by U.S. citizens;
  - (c) Has used launch vehicle system technologies that are distinct from competing applicants. If competing for a secondary prize, the winning applicant must use different launch vehicle systems than the winner of a primary prize, as determined by the Secretary; and
  - (d) Complies with all rules and regulations promulgated by the Department of Commerce pursuant to this Act.
- (5) The Secretary may withhold a determination that the criteria for an award of a prize have been met if evidence is found of willful misconduct by a successful applicant, or there is a substantial overlap of launch vehicle systems between or among competing applicants.
- (6) The ability to exchange Line Replaceable Units between flights shall be allowed if it is included in the original flight system’s design under the rules promulgated by the Secretary. The ability to exchange Thermal Protection Systems between flights shall be allowed, and the ability to exchange

propulsion systems, propellant tanks, or primary structure, between flights shall not be allowed. The mass of Line Replaceable Units shall not be counted against the 100% identical dry mass requirement, as required in subsections 2(c) and 3(a) of this Section.

#### **Sec. 5. Registration, Application, Participation, and Approval.**

Before an Applicant may compete for an award payment under this Act, and before any payment is made—

- (1) the Applicant must register with the Office of Space Commercialization and provide a valid and complete written application to that Office.
- (2) The Office of Space Commercialization, must be given an opportunity to observe and evaluate the Applicant's activities, accomplishments and compliance with the criteria for an award to enable DOC certification that the Applicant has met all criteria and conditions.
- (3) Upon a determination by the Secretary that an Applicant has successfully met the criteria and conditions set forth in this Act, pursuant to the rules and regulations promulgated thereunder, and approves Applicant's eligibility for an award of payment, the Secretary shall forward said determination and a request to Congress for payment from appropriations of the United States Government.

#### **Sec. 6. Payment Structure.**

The following payments, with a maximum of one payment per applicant from among subsections (1) and (2), and a maximum of one payment per applicant from among subsections (3) and (4), for the duration of this act may be awarded:

- (1) An award of \$1 Billion, tax exempt, to be paid to the United States Commercial Provider or U.S. citizen that is the first team to achieve the Phase 1 award requirements as stated in section 4(2)(c) of this Act.
- (2) An award of \$750 Million, tax exempt, to be paid to the United States Commercial Provider or U.S. citizen that is the second team to achieve the Phase 1 award requirements as stated in section 4(2)(c) of this Act.

- (3) An award of \$1 Billion, tax exempt, to be paid to the United States Commercial Provider or U.S. citizen that is the first team to achieve the Phase 2 award requirements stated in section 4(3)(a) of this Act.
- (4) An award of \$750 Million, tax exempt, to be paid to the United States Commercial Provider or U.S. citizen that is the second team to achieve the Phase 2 award requirements stated in section 4(3)(a) of this Act.

**Sec. 7. Payment Management.**

- (1) The Department of Commerce shall be the managing agency charged with carrying out the provisions of this Act, including promulgating and administering rules and regulations in accordance with and pursuant to this Act.
- (2) The Secretary is directed to acquire all technical expertise necessary to faithfully and fully execute the responsibility of carrying out the provisions of this Act, and is authorized to obtain such expertise from other federal agencies or federally-funded research and development centers as may be required.
- (3) To the extent provided in advance in an appropriation law or to the extent additional legislative authority is enacted providing for paying one or more of the prizes as described herein, the Secretary shall provide for the payment by the United States Government of a successful prize claim.

**Sec. 8. Legislative Payment Structure of Prize**

- (1) When an organization wins a prize according to the requirements in this legislation and to the satisfaction of the Secretary of Commerce, an automatic rescission of the discretionary budget equivalent to the amount of the prize shall occur in the fiscal year following the fiscal year in which the prize is won. The rescinded funds shall be used to pay the prize amount to the organization that won the prize.

**Sec. 9. Regulations**

- (1) IN GENERAL – Not later than one year after the date of the enactment of this Act, the Secretary, or his delegate, shall issue regulations to carry out this Act that:
  - (a) Conform with the intent of congress as expressed in this Act;

- (b) Provide procedures for registration and application to the Department of Commerce in order to compete for a prize.
- (c) Provide criteria by which differentiation of Reusable Launch Vehicle systems is determined under section 3 of this Act;
- (d) Provide criteria to ensure that the Reusable Launch Vehicles of an Applicant conforms with the performance requirements as listed in Section 3 of this Act;
- (e) Provide guidance regarding definitions of Line Replaceable Units, Thermal Protection Systems, Reusable Launch Vehicles, Minimal Required Orbit, and other technical matters as needed to fulfill the requirements under this Act;
- (f) Establish the requirements for submission of documentation that the conditions for the award of a prize have been fulfilled.

**Sec. 10. Effective Date.**

This Act shall take effect on the date of enactment.