

(3) The ability to support human missions in regions beyond low-Earth orbit and on the surface of the Moon can also drive developments in emerging areas of space infrastructure and technology.

(4) Developments in space infrastructure and technology can stimulate and enable increased space applications, such as in-space servicing, propellant resupply and transfer, and in situ resource utilization, and open opportunities for additional users of space, whether national, commercial, or international.

(5) A long term objective for human exploration of space should be the eventual international exploration of Mars.

(6) Future international missions beyond low-Earth orbit should be designed to incorporate capability development and availability, affordability, and international contributions.

(7) Human space flight and future exploration beyond low-Earth orbit should be based around a pay-as-you-go approach. Requirements in new launch and crew systems authorized in this chapter should be scaled to the minimum necessary to meet the core national mission capability needed to conduct cis-lunar missions. These initial missions, along with the development of new technologies and in-space capabilities can form the foundation for missions to other destinations. These initial missions also should provide operational experience prior to the further human expansion into space.

(b) Report on international collaboration

(1) Report required

Not later than 120 days after October 11, 2010, the Administrator shall submit to the appropriate committees of Congress a report on the following assets and capabilities:

(A) Any effort by NASA to expand and ensure effective international collaboration on the ISS.

(B) The efforts of NASA, including its approach and progress, in defining near-term, cis-lunar space human missions.

(2) NASA contributions

In preparing the report required by paragraph (1), the Administrator shall assume that NASA will contribute to the efforts described in that paragraph the following:

(A) A Space Launch System.

(B) A multi-purpose crew vehicle.

(C) Such other technology elements the Administrator may consider appropriate, and which the Administrator shall specifically identify in the report.

(Pub. L. 111-267, title III, §301, Oct. 11, 2010, 124 Stat. 2813.)

§ 18322. Space Launch System as follow-on launch vehicle to the Space Shuttle

(a) United States policy

It is the policy of the United States that NASA develop a Space Launch System as a follow-on to the Space Shuttle that can access cis-lunar space and the regions of space beyond low-Earth orbit in order to enable the United States

to participate in global efforts to access and develop this increasingly strategic region.

(b) Initiation of development

(1) In general

The Administrator shall, as soon as practicable after October 11, 2010, initiate development of a Space Launch System meeting the minimum capabilities requirements specified in subsection (c).

(2) Modification of current contracts

In order to limit NASA's termination liability costs and support critical capabilities, the Administrator shall, to the extent practicable, extend or modify existing vehicle development and associated contracts necessary to meet the requirements in paragraph (1), including contracts for ground testing of solid rocket motors, if necessary, to ensure their availability for development of the Space Launch System.

(c) Minimum capability requirements

(1) IN GENERAL.—The Space Launch System developed pursuant to subsection (b) shall be designed to have, at a minimum, the following:

(A) The initial capability of the core elements, without an upper stage, of lifting payloads weighing between 70 tons and 100 tons into low-Earth orbit in preparation for transit for missions beyond low-Earth orbit.

(B) The capability to carry an integrated upper Earth departure stage bringing the total lift capability of the Space Launch System to 130 tons or more.

(C) The capability to lift the multipurpose crew vehicle.

(D) The capability to serve as a backup system for supplying and supporting ISS cargo requirements or crew delivery requirements not otherwise met by available commercial or partner-supplied vehicles.

(2) FLEXIBILITY.—The Space Launch System shall be designed from inception as a fully-integrated vehicle capable of carrying a total payload of 130 tons or more into low-Earth orbit in preparation for transit for missions beyond low-Earth orbit. The Space Launch System shall, to the extent practicable, incorporate capabilities for evolutionary growth to carry heavier payloads. Developmental work and testing of the core elements and the upper stage should proceed in parallel subject to appropriations. Priority should be placed on the core elements with the goal for operational capability for the core elements not later than December 31, 2016.

(3) TRANSITION NEEDS.—The Administrator shall ensure critical skills and capabilities are retained, modified, and developed, as appropriate, in areas related to solid and liquid engines, large diameter fuel tanks, rocket propulsion, and other ground test capabilities for an effective transition to the follow-on Space Launch System.

(4) The capacity for efficient and timely evolution, including the incorporation of new technologies, competition of sub-elements, and commercial operations.

(Pub. L. 111-267, title III, §302, Oct. 11, 2010, 124 Stat. 2814.)

§ 18323. Multi-purpose crew vehicle

(a) Initiation of development

(1) In general

The Administrator shall continue the development of a multi-purpose crew vehicle to be available as soon as practicable, and no later than for use with the Space Launch System. The vehicle shall continue to advance development of the human safety features, designs, and systems in the Orion project.

(2) Goal for operational capability

It shall be the goal to achieve full operational capability for the transportation vehicle developed pursuant to this subsection by not later than December 31, 2016. For purposes of meeting such goal, the Administrator may undertake a test of the transportation vehicle at the ISS before that date.

(b) Minimum capability requirements

The multi-purpose crew vehicle developed pursuant to subsection (a) shall be designed to have, at a minimum, the following:

(1) The capability to serve as the primary crew vehicle for missions beyond low-Earth orbit.

(2) The capability to conduct regular in-space operations, such as rendezvous, docking, and extra-vehicular activities, in conjunction with payloads delivered by the Space Launch System developed pursuant to section 18322 of this title, or other vehicles, in preparation for missions beyond low-Earth orbit or servicing of assets described in section 18383 of this title, or other assets in cis-lunar space.

(3) The capability to provide an alternative means of delivery of crew and cargo to the ISS, in the event other vehicles, whether commercial vehicles or partner-supplied vehicles, are unable to perform that function.

(4) The capacity for efficient and timely evolution, including the incorporation of new technologies, competition of sub-elements, and commercial operations.

(Pub. L. 111-267, title III, §303, Oct. 11, 2010, 124 Stat. 2815.)

§ 18324. Utilization of existing workforce and assets in development of Space Launch System and multi-purpose crew vehicle

(a) In general

In developing the Space Launch System pursuant to section 18322 of this title and the multi-purpose crew vehicle pursuant to section 18323 of this title, the Administrator shall, to the extent practicable utilize—

(1) existing contracts, investments, workforce, industrial base, and capabilities from the Space Shuttle and Orion and Ares 1 projects, including—

(A) space-suit development activities for application to, and coordinated development of, a multi-purpose crew vehicle suit and associated life-support requirements with potential development of standard NASA-certified suit and life support systems for use in

alternative commercially-developed crew transportation systems; and

(B) Space Shuttle-derived components and Ares 1 components that use existing United States propulsion systems, including liquid fuel engines, external tank or tank-related capability, and solid rocket motor engines; and

(2) associated testing facilities, either in being or under construction as of October 11, 2010.

(b) Discharge of requirements

In meeting the requirements of subsection (a), the Administrator—

(1) shall, to the extent practicable, utilize ground-based manufacturing capability, ground testing activities, launch and operations infrastructure, and workforce expertise;

(2) shall, to the extent practicable, minimize the modification and development of ground infrastructure and maximize the utilization of existing software, vehicle, and mission operations processes;

(3) shall complete construction and activation of the A-3 test stand with a completion goal of September 30, 2013;

(4) may procure, develop, and flight test applicable components; and

(5) shall take appropriate actions to ensure timely and cost-effective development of the Space Launch System and the multi-purpose crew vehicle, including the use of a procurement approach that incorporates adequate and effective oversight, the facilitation of contractor efficiencies, and the stream-lining of contract and procurement requirements.

(Pub. L. 111-267, title III, §304, Oct. 11, 2010, 124 Stat. 2816.)

§ 18325. NASA launch support and infrastructure modernization program

(a) In general

The Administrator shall carry out a program the primary purpose of which is to prepare infrastructure at the Kennedy Space Center that is needed to enable processing and launch of the Space Launch System. Vehicle interfaces and other ground processing and payload integration areas should be simplified to minimize overall costs, enhance safety, and complement the purpose of this section.

(b) Elements

The program required by this section shall include—

(1) investments to improve civil and national security operations at the Kennedy Space Center, to enhance the overall capabilities of the Center, and to reduce the long term cost of operations and maintenance;

(2) measures to provide multi-vehicle support, improvements in payload processing, and partnering at the Kennedy Space Center; and

(3) such other measures, including investments to improve launch infrastructure at NASA flight facilities scheduled to launch cargo to the ISS under the commercial orbital transportation services program as the Administrator may consider appropriate.