

low-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 as-

sociated 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.

**(c) Report on NASA launch support and infrastructure modernization program**

**(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 plan for the implementation of the NASA launch support and infrastructure modernization program.

**(2) Elements**

The report required by this subsection shall include—

(A) a description of the ground infrastructure plan tied to the Space Launch System and potential ground investment activities at other NASA centers related to supporting the development of the Space Launch System;

(B) a description of proposed initiatives intended to be conducted jointly or in cooperation with Cape Canaveral Air Force Station, Florida, or other installations or components of the United States Government; and

(C) a description of plans to use funds authorized to be appropriated by this chapter to improve non-NASA facilities, which plans shall include a business plan outlining the nature and scope of investments planned by other parties.

(Pub. L. 111-267, title III, §305, Oct. 11, 2010, 124 Stat. 2817.)

**§ 18326. Development of technologies and in-space capabilities for beyond near-Earth space missions**

**(a) Development authorized**

The Administrator may initiate activities to develop the following:

(1) Technologies identified as necessary elements of missions beyond low-Earth orbit.

(2) In-space capabilities such as refueling and storage technology, orbital transfer stages, innovative in-space propulsion technology, communications, and data management that facilitate a broad range of users (including military and commercial) and applications defining the architecture and design of such missions.

(3) Spacesuit development and associated life support technology.

(4) Flagship missions.

**(b) Investments**

In developing technologies and capabilities under subsection (a), the Administrator may make investments—

(1) in space technologies such as advanced propulsion, propellant depots, in situ resource utilization, and robotic payloads or capabilities that enable human missions beyond low-Earth orbit ultimately leading to Mars;

(2) in a space-based transfer vehicle including these technologies with an ability to conduct space-based operations that provide capabilities—

(A) to integrate with the Space Launch System and other space-based systems;