

engineering community in the program authorized by this subchapter; and

(3) make all results of the program authorized by this subchapter available to the appropriate regulatory agencies and provide for the widest practicable dissemination of such results.

(Pub. L. 111-314, § 3, Dec. 18, 2010, 124 Stat. 3354.)

HISTORICAL AND REVISION NOTES

<i>Revised Section</i>	<i>Source (U.S. Code)</i>	<i>Source (Statutes at Large)</i>
20163	42 U.S.C. 2483.	Pub. L. 85-568, title IV, § 403, as added Pub. L. 94-39, § 8, June 19, 1975, 89 Stat. 222.

§ 20164. International cooperation

In carrying out the provisions of this subchapter, the Administration, subject to the direction of the President and after consultation with the Secretary of State, shall make every effort to enlist the support and cooperation of appropriate scientists and engineers of other countries and international organizations.

(Pub. L. 111-314, § 3, Dec. 18, 2010, 124 Stat. 3355.)

HISTORICAL AND REVISION NOTES

<i>Revised Section</i>	<i>Source (U.S. Code)</i>	<i>Source (Statutes at Large)</i>
20164	42 U.S.C. 2484.	Pub. L. 85-568, title IV, § 404, as added Pub. L. 94-39, § 8, June 19, 1975, 89 Stat. 223.

CHAPTER 203—RESPONSIBILITIES AND VISION

Sec.	
20301.	General responsibilities.
20302.	Vision for space exploration.
20303.	Contribution to innovation.
20304.	Basic research enhancement.
20305.	National Academies decadal surveys.

§ 20301. General responsibilities

(a) PROGRAMS.—The Administrator shall ensure that the Administration carries out a balanced set of programs that shall include, at a minimum, programs in—

(1) human space flight, in accordance with section 20302 of this title;

(2) aeronautics research and development; and

(3) scientific research, which shall include, at a minimum—

(A) robotic missions to study the Moon and other planets and their moons, and to deepen understanding of astronomy, astrophysics, and other areas of science that can be productively studied from space;

(B) Earth science research and research on the Sun-Earth connection through the development and operation of research satellites and other means;

(C) support of university research in space science, Earth science, and microgravity science; and

(D) research on microgravity, including research that is not directly related to human exploration.

(b) CONSULTATION AND COORDINATION.—In carrying out the programs of the Administration, the Administrator shall—

(1) consult and coordinate to the extent appropriate with other relevant Federal agencies, including through the National Science and Technology Council;

(2) work closely with the private sector, including by—

(A) encouraging the work of entrepreneurs who are seeking to develop new means to launch satellites, crew, or cargo;

(B) contracting with the private sector for crew and cargo services, including to the International Space Station, to the extent practicable;

(C) using commercially available products (including software) and services to the extent practicable to support all Administration activities; and

(D) encouraging commercial use and development of space to the greatest extent practicable; and

(3) involve other nations to the extent appropriate.

(Pub. L. 111-314, § 3, Dec. 18, 2010, 124 Stat. 3355.)

HISTORICAL AND REVISION NOTES

<i>Revised Section</i>	<i>Source (U.S. Code)</i>	<i>Source (Statutes at Large)</i>
20301	42 U.S.C. 16611(a).	Pub. L. 109-155, title I, § 101(a), Dec. 30, 2005, 119 Stat. 2897.

Statutory Notes and Related Subsidiaries

IMPROVED PROCESS FOR YIELD DETERMINATION; REPORT; DEFINITIONS

Pub. L. 118-31, div. A, title XVI, § 1601(b)–(d), Dec. 22, 2023, 137 Stat. 583, provided that:

“(b) IMPROVED PROCESS FOR YIELD DETERMINATION.—Not later than one year after the date of the enactment of this Act [Dec. 22, 2023], the Secretary of Defense, the Secretary of Transportation, and the Administrator of the National Aeronautics and Space Administration shall jointly establish a process through which scientifically-valid yield determinations can be assessed for space launch vehicles while in flight.

“(c) REPORT.—Not later than 90 days after the completion of the LOX-Methane Assessment working group process, the Secretary of Defense, the Secretary of Transportation, and the Administrator of the National Aeronautics and Space Administration shall submit to the appropriate congressional committees a report that includes a description of the effects of the LOX-Methane Assessment on existing and future maximum credible event analyses and any resulting effects on commercial space launch, civil space activities, and national security.

“(d) DEFINITIONS.—In this section:

“(1) The term ‘appropriate congressional committees’ means the following:

“(A) The congressional defense committees [Committees on Armed Services and Appropriations of the Senate and the House of Representatives].

“(B) The Committee on Commerce, Science, and Transportation of the Senate.

“(C) The Committee on Science, Space, and Technology of the House of Representatives.

“(D) The Committee on Transportation and Infrastructure of the House of Representatives.

“(2) The term ‘LOX-Methane Assessment working group’ means the ongoing interagency working group studying the explosive characteristics of liquid oxygen and methane and comprised of representatives from the Department of Defense, the Department of Transportation, and the National Aeronautics and Space Administration.

“(3) The term ‘launch vehicle’ has the meaning given such term in section 50902(11) of title 51, United States Code.”

SPACE LAUNCH SYSTEM CONFIGURATIONS

Pub. L. 117–167, div. B, title VII, §10812, Aug. 9, 2022, 136 Stat. 1735, provided that:

“(a) EXPLORATION GROUND SYSTEMS INFRASTRUCTURE.—The Administrator shall ensure that—

“(1) the necessary elements of a ground system infrastructure are in place to enable the preparation and use of the Space Launch System, specifically the Block 1 (at least 70 mt), Block 1B (at least 105 mt), and Block 2 (at least 130 mt) variants of the Space Launch System; and

“(2) not fewer than 2 bays of the vehicle assembly building of such ground system infrastructure are outfitted and dedicated to support Space Launch System stacking and preparations.

“(b) FLIGHT RATE AND SAFETY.—After the first crewed lunar landing of the Administration’s Moon to Mars activities, the Administrator shall, to the extent practicable, seek to carry out a flight rate of 2 integrated Space Launch System and Orion crew vehicle missions annually until the lunar activities needed to enable a human mission to Mars are completed so as to maintain the critical human spaceflight production and operations skills necessary for the safety of human spaceflight activities in deep space.

“(c) MOBILE LAUNCH PLATFORM.—

“(1) IN GENERAL.—The Administrator is authorized to maintain 2 operational mobile launch platforms to enable the launch of multiple configurations of the Space Launch System.

“(2) SECOND MOBILE LAUNCH PLATFORM.—

“(A) IN GENERAL.—In implementing paragraph (1), the Administrator shall take all necessary steps to develop and complete a second mobile launch platform, to be in place by 2026, to support the first launch of the Block 1B variant of the Space Launch System.

“(B) REQUIREMENT.—Such second mobile launch platform shall be sized and constructed to accommodate the Block 2 variant of the Space Launch System.

“(d) REPORTS.—The Administrator shall submit to Congress—

“(1) not later than 45 days after the date of the enactment of this Act [Aug. 9, 2022], a report on the steps the Administrator and industry partners are taking—

“(A) to address the cost, schedule, and performance challenges in the development of the Mobile Launch–2 platform; and

“(B) to ensure that such platform is ready for operational use on a schedule that aligns with the current plans for an Artemis IV launch, which is currently anticipated in 2027; and

“(2) not later than 90 days after such date of enactment, a report that contains a list of the key milestones required for completing each of the Space Launch System variants, and an estimated date on which such milestones will be completed.

“(e) EXPLORATION UPPER STAGE.—

“(1) IN GENERAL.—To meet the capability requirements under section 302(c)(2) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322(c)(2)), the Administrator shall continue development of the Exploration Upper Stage for the Space Launch System on a schedule consistent with the Artemis IV lunar mission.

“(2) BRIEFING.—Not later than 90 days after the date of the enactment of this Act, the Administrator shall brief the appropriate committees of Congress on the development and scheduled availability of the Exploration Upper Stage for the Artemis IV lunar mission.

“(f) MAIN PROPULSION TEST ARTICLE.—To meet the requirements under section 302(c)(3) of the National Aeronautics and Space Administration Authorization Act of

2010 (42 U.S.C. 18322(c)(3)), the Administrator may initiate development of a main propulsion test article for the integrated Exploration Upper Stage element of the Space Launch System, consistent with cost and schedule constraints, particularly for long-lead propulsion hardware needed for flight.”

[For definitions of terms used in section 10812 of Pub. L. 116–167, set out above, see section 10802 of Pub. L. 117–167, set out as a Definitions note under section 10101 of this title.]

ROCKET ENGINE TEST INFRASTRUCTURE

Pub. L. 117–167, div. B, title VII, §10813, Aug. 9, 2022, 136 Stat. 1736, provided that:

“(a) IN GENERAL.—The Administrator shall, to the extent practicable, continue to carry out a program to modernize rocket propulsion test infrastructure at NASA facilities—

“(1) to increase capabilities;

“(2) to enhance safety;

“(3) to support propulsion development and testing; and

“(4) to foster the improvement of Government and commercial space transportation and exploration.

“(b) PROJECTS.—Projects funded under the program described in subsection (a) may include—

“(1) infrastructure and other facilities and systems relating to rocket propulsion test stands and rocket propulsion testing;

“(2) enhancements to test facility capacity and flexibility; and

“(3) such other projects as the Administrator considers appropriate to meet the goals described in that subsection.

“(c) REQUIREMENTS.—In carrying out the program under subsection (a), the Administrator shall—

“(1) to the extent practicable and appropriate, prioritize investments in projects that enhance test and flight certification capabilities, including for large thrust-level atmospheric and altitude engines and engine systems, and multi-engine integrated test capabilities;

“(2) continue to make underutilized test facilities available for commercial use on a reimbursable basis; and

“(3) ensure that no project carried out under this program adversely impacts, delays, or defers testing or other activities associated with facilities used for Government programs, including—

“(A) the Space Launch System and the Exploration Upper Stage of the Space Launch System;

“(B) in-space propulsion to support exploration missions; or

“(C) nuclear propulsion testing.

“(d) RULE OF CONSTRUCTION.—Nothing in this section shall preclude a NASA program, including the Space Launch System and the Exploration Upper Stage of the Space Launch System, from using the modernized test infrastructure developed under this section.

“(e) WORKING CAPITAL FUND STUDY.—

“(1) IN GENERAL.—Not later than 1 year after the date of the enactment of this division [Aug. 9, 2022], the Administrator shall submit to the appropriate committees of Congress a report on the use of the authority under section 30102 of title 51, United States Code, to promote increased use of NASA rocket propulsion test infrastructure for research, development, testing, and evaluation activities by other Federal agencies, firms, associations, corporations, and educational institutions.

“(2) MATTERS TO BE INCLUDED.—The report required by paragraph (1) shall include the following:

“(A) An assessment of prior use, if any, of the authority under section 30102 of title 51, United States Code, to improve testing infrastructure.

“(B) An analysis of any barrier to implementation of such authority for the purpose of promoting increased use of NASA rocket propulsion test infrastructure.”

[For definitions of terms used in section 10813 of Pub. L. 116–167, set out above, see section 10802 of Pub. L.

117-167, set out as a Definitions note under section 10101 of this title.]

SEARCH FOR LIFE

Pub. L. 117-167, div. B, title VII, §10822, Aug. 9, 2022, 136 Stat. 1740, provided that:

“(a) SENSE OF CONGRESS.—It is the sense of Congress that—

“(1) the report entitled ‘An Astrobiology Strategy for the Search for Life in the Universe’ published by the National Academies of Sciences, Engineering, and Medicine outlines key scientific questions and methods on the search for the origin, evolution, distribution, and future of life in the universe; and

“(2) the interaction of lifeforms with their environment, a central focus of astrobiology research, is a topic of broad significance to life sciences research in space and on Earth.

“(b) PROGRAM CONTINUATION.—

“(1) IN GENERAL.—The Administrator [of the National Aeronautics and Space Administration] shall continue to implement a collaborative, multidisciplinary science and technology development program to search for evidence of the existence or historical existence of life beyond Earth in support of—

“(A) the scientific priorities of the most recent decadal surveys on planetary science and astrobiology and astronomy and astrophysics of the National Academies of Sciences, Engineering, and Medicine; and

“(B) the objective described in section 20102(d)(10) of title 51, United States Code.

“(2) ELEMENT.—The program under paragraph (1) shall include activities relating to astronomy, biology, geology, and planetary science.

“(3) COORDINATION WITH LIFE SCIENCES PROGRAM.—In carrying out the program under paragraph (1), the Administrator shall coordinate efforts with the life sciences program of the [National Aeronautics and Space] Administration.

“(4) INSTRUMENTATION AND SENSOR TECHNOLOGY.—In carrying out the program under paragraph (1), the Administrator may invest in the development of new instrumentation and sensor technology.

“(5) TECHNOSIGNATURES.—In carrying out the program under paragraph (1), the Administrator may support, as appropriate, merit-reviewed, competitively selected research on technosignatures.”

SPACE NUCLEAR CAPABILITIES

Pub. L. 117-167, div. B, title VII, §10841, Aug. 9, 2022, 136 Stat. 1751, provided that:

“(a) NUCLEAR PROPULSION.—

“(1) USE IN ROBOTIC AND HUMAN EXPLORATION ACTIVITIES.—The Administrator, in collaboration with other relevant Federal agencies and with industry, shall take all necessary steps to carry out research and development, ground-based testing and in-space testing, and other associated activities to enable the use of space nuclear propulsion in Administration robotic and human exploration activities, including in cargo missions to Mars in the late 2020’s and crewed missions to Mars in the 2030’s.

“(2) SPACE NUCLEAR PROPULSION PROGRAM.—

“(A) IN GENERAL.—The Administrator shall establish a space nuclear propulsion program to carry out the activities described in paragraph (1).

“(B) ELEMENTS.—The program established under subparagraph (A) shall include the following:

“(i) Research and development in both nuclear electric and nuclear thermal propulsion technology maturation efforts, to the extent practicable, and the development of consistent figures of merit across both nuclear electric and nuclear thermal systems, as recommended by the National Academies of Sciences, Engineering, and Medicine in the report entitled ‘Space Nuclear Propulsion for Human Mars Exploration’, so as to inform a down-selection of a nuclear electric or

nuclear thermal propulsion system by 2026, or as early as practicable.

“(ii) Ground-based testing, to the extent practicable, including not less than 1 ground-based test of a full-scale, integrated nuclear propulsion system before any in-space test or demonstration of such system.

“(iii) In-space demonstration of a nuclear propulsion system in the late 2020’s, which may be carried out as a cargo mission to Mars.

“(3) PLAN.—

“(A) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act [Aug. 9, 2022], the Administrator shall submit to the appropriate committees of Congress a plan to achieve an in-space flight test of a nuclear propulsion system that could support the first crewed mission to Mars in the 2030’s.

“(B) ELEMENTS.—The plan required by subparagraph (A) shall include the following:

“(i) A timeline to mature enabling technologies and an outline of major milestones for integration of such technologies into the larger nuclear propulsion system.

“(ii) A cost estimate for maturing such technologies.

“(iii) A description of facility requirements for the program under paragraph (2) associated with such technologies.

“(iv) A description of the manner in which the Administrator will use the efforts described in paragraph (2)(B) to determine whether the in-space flight test should demonstrate a nuclear electric propulsion system or a nuclear thermal propulsion system.

“(C) An identification of any policy or regulatory challenges or barriers to conducting such in-space test or any precursor ground-based testing, and a description of options for addressing such challenges or barriers.

“(b) NUCLEAR SURFACE POWER PROGRAM.—

“(1) ESTABLISHMENT.—The Administrator shall establish a program for research, testing, and development of a space nuclear surface power reactor design.

“(2) PLAN.—

“(A) IN GENERAL.—The Administrator shall—

“(i) develop a plan and timeline for the program established under paragraph (1), taking into consideration mission needs; and

“(ii) include in such plan opportunities for participation by United States commercial entities.

“(B) SUBMISSION.—Not later than 1 year after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress the plan developed under subparagraph (A).

“(c) ASSESSMENT OF IN-SPACE PROPULSION TESTING FACILITIES.—

“(1) IN GENERAL.—The Administrator shall carry out a needs assessment for facilities and technical capabilities required to support ground-based testing of a full-scale, full-power integrated nuclear propulsion system.

“(2) ELEMENT.—The assessment required by paragraph (1) shall consider the potential development of facilities that will support long-term research and development of space nuclear propulsion systems.

“(3) REPORT.—Not later than 270 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the results of the assessment carried out under paragraph (1).”

[For definitions of terms used in section 10841 of Pub. L. 116-167, set out above, see section 10802 of Pub. L. 117-167, set out as a Definitions note under section 10101 of this title.]

PRIORITIZATION OF LOW-ENRICHED URANIUM TECHNOLOGY

Pub. L. 117-167, div. B, title VII, §10842, Aug. 9, 2022, 136 Stat. 1753, provided that:

“(a) IN GENERAL.—The Administrator shall prioritize the use of low-enriched uranium, including high-assay low-enriched uranium, for space nuclear research and development, including ground and in-space testing and other related demonstration activities carried out under this title [see Short Title of 2022 Amendment note set out under section 10101 of this title].

“(b) INTERAGENCY COLLABORATION.—The Administrator shall, to the extent practicable, collaborate and coordinate with the Secretary of Defense, the Secretary of Energy, and the heads of other relevant Federal agencies on technology development, knowledge exchange, lessons learned regarding nuclear power and propulsion technologies, common fuels, flight demonstrations, and operational systems production for space applications.

“(c) REPORT ON NUCLEAR TECHNOLOGY PRIORITIZATION.—Not later than 120 days after the date of the enactment of this Act [Aug. 9, 2022], the Administrator shall submit to the appropriate committees of Congress a report that details the actions taken and planned, including a timeline for such actions, to implement subsection (a).”

[For definitions of terms used in section 10842 of Pub. L. 116–167, set out above, see section 10802 of Pub. L. 117–167, set out as a Definitions note under section 10101 of this title.]

FUNDING FOR CERTAIN LUNAR TRANSPORTATION AND HABITATION CAPABILITIES, LUNAR TERRAIN MOBILITY CAPABILITIES, EXPLORATION MISSION RATED SUITS, LUNAR COMMUNICATIONS AND NAVIGATION CAPABILITIES

Pub. L. 117–103, div. B, title III, Mar. 15, 2022, 136 Stat. 136, provided in part: “That acquisition of human-rated deep space exploration lunar and cislunar transportation and habitation capabilities, human-rated lunar terrain mobility capabilities, exploration mission rated suits, lunar communications and navigation capabilities, and their associated components, may be funded incrementally in fiscal year 2022 and thereafter.”

FUNDING FOR ORION, SPACE LAUNCH SYSTEM, EXPLORATION GROUND SYSTEMS, AND MOBILE LAUNCH PLATFORMS

Pub. L. 115–141, div. B, title III, Mar. 23, 2018, 132 Stat. 430, provided in part: “That acquisition of Orion crew vehicles, SLS launch vehicles, Exploration Ground Systems, mobile launch platforms, and their associated components may be funded incrementally in fiscal year 2018 and thereafter”.

SPACE LAUNCH SYSTEM, ORION, AND EXPLORATION GROUND SYSTEMS

Pub. L. 115–10, title IV, §421, Mar. 21, 2017, 131 Stat. 35, as amended by Pub. L. 117–167, div. B, title VII, §10817(a), Aug. 9, 2022, 136 Stat. 1740, provided that:

“(a) FINDINGS.—Congress makes the following findings:

“(1) NASA has made steady progress in developing and testing the Space Launch System and Orion exploration systems with the successful Exploration Flight Test of Orion in December of 2014, the final qualification test firing of the 5-segment Space Launch System boosters in June 2016, and a full thrust, full duration test firing of the RS–25 Space Launch System core stage engine in August 2016.

“(2) Through the 21st Century Launch Complex program and Exploration Ground Systems programs, NASA has made significant progress in transforming exploration ground systems infrastructure to meet NASA’s mission requirements for the Space Launch System and Orion and to modernize NASA’s launch complexes to the benefit of the civil, defense, and commercial space sectors.

“(b) SPACE LAUNCH SYSTEM.—

“(1) SENSE OF CONGRESS.—It is the sense of Congress that use of the Space Launch System and Orion, with contributions from partnerships with the private sec-

tor, academia, and the international community, is the most practical approach to reaching the Moon, Mars, and beyond.

“(2) REAFFIRMATION.—Congress reaffirms the policy and minimum capability requirements for the Space Launch System under section 302 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322).

“(c) SENSE OF CONGRESS ON SPACE LAUNCH SYSTEM, ORION, AND EXPLORATION GROUND SYSTEMS.—It is the sense of Congress that—

“(1) as the United States works to send humans on a series of missions to Mars in the 2030s, the United States national space program should continue to make progress on its commitment by fully developing the Space Launch System, Orion, and related Exploration Ground Systems;

“(2) using the Space Launch System and Orion for a wide range of contemplated missions will facilitate the national defense, science, and exploration objectives of the United States;

“(3) the United States should have continuity of purpose for the Space Launch System and Orion in deep space exploration missions, using them beginning with the uncrewed mission, Artemis I, planned for 2018, followed by the crewed mission, Artemis II, in cis-lunar space planned for 2021, and for subsequent missions beginning with Artemis III extending into cis-lunar space and eventually to Mars;

“(4) the President’s annual budget requests for the Space Launch System and Orion development, test, and operational phases should strive to accurately reflect the resource requirements of each of those phases;

“(5) the fully integrated Space Launch System, including an upper stage needed to go beyond low-Earth orbit, will safely enable human space exploration of the Moon, Mars, and beyond; and

“(6) the Administrator should budget for and undertake a robust ground test and uncrewed and crewed flight test and demonstration program for the Space Launch System and Orion in order to promote safety and reduce programmatic risk.

“(d) IN GENERAL.—The Administrator shall continue the development of the fully integrated Space Launch System, including an upper stage needed to go beyond low-Earth orbit, in order to safely enable human space exploration of the Moon, Mars, and beyond over the course of the next century as required in section 302(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322(c)).

“(e) REPORT.—

“(1) IN GENERAL.—Not later than 60 days after the date of enactment of this Act [Mar. 21, 2017], the Administrator shall submit to the appropriate committees of Congress a report addressing the ability of Orion to meet the needs and the minimum capability requirements described in section 303(b)(3) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18323(b)(3)).

“(2) CONTENTS.—The report shall detail—

“(A) those components and systems of Orion that ensure it is in compliance with section 303(b)(3) of that Act (42 U.S.C. 18323(b)(3));

“(B) the expected date that Orion, integrated with a vehicle other than the Space Launch System, could be available to transport crew and cargo to the ISS;

“(C) any impacts to the deep space exploration missions under subsection (f) of this section due to enabling Orion to meet the minimum capability requirements described in section 303(b)(3) of that Act (42 U.S.C. 18323(b)(3)) and conducting the mission described in subparagraph (B) of this paragraph; and

“(D) the overall cost and schedule impacts associated with enabling Orion to meet the minimum capability requirements described in section 303(b)(3) of that Act (42 U.S.C. 18323(b)(3)) and conducting the mission described in subparagraph (B) of this paragraph.

“(f) EXPLORATION MISSIONS.—The Administrator shall continue development of—

“(1) an uncrewed exploration mission to demonstrate the capability of both the Space Launch System and Orion as an integrated system by 2018;

“(2) subject to applicable human rating processes and requirements, a crewed exploration mission to demonstrate the Space Launch System, including the Core Stage and Exploration Upper Stages, by 2021;

“(3) subsequent missions beginning with Artemis III at operational flight rate sufficient to maintain safety and operational readiness using the Space Launch System and Orion to extend into cis-lunar space and eventually to Mars; and

“(4) a deep space habitat as a key element in a deep space exploration architecture along with the Space Launch System and Orion.

“(g) OTHER USES.—The Administrator shall assess the utility of the Space Launch System for use by the science community and for other Federal Government launch needs, including consideration of overall cost and schedule savings from reduced transit times and increased science returns enabled by the unique capabilities of the Space Launch System.

“(h) UTILIZATION REPORT.—

“(1) IN GENERAL.—The Administrator, in consultation with the Secretary of Defense and the Director of National Intelligence, shall prepare a report that addresses the effort and budget required to enable and utilize a cargo variant of the 130-ton Space Launch System configuration described in section 302(c) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18322(c)).

“(2) CONTENTS.—In preparing the report, the Administrator shall—

“(A) consider the technical requirements of the scientific and national security communities related to a cargo variant of the Space Launch System; and

“(B) directly assess the utility and estimated cost savings obtained by using a cargo variant of the Space Launch System for national security and space science missions.

“(3) SUBMISSION TO CONGRESS.—Not later than 180 days after the date of enactment of this Act [Mar. 21, 2017], the Administrator shall submit the report to the appropriate committees of Congress.”
[Pub. L. 117-167, div. B, title VII, §10817(a), Aug. 9, 2022, 136 Stat. 1740, which directed amendment of section 421 of the National Aeronautics and Space Administration Authorization Act of 2017, was executed by amending section 421 of Pub. L. 115-10, set out above, which is section 421 of the National Aeronautics and Space Administration Transition Authorization Act of 2017, to reflect the probable intent of Congress.]

[For definitions of terms used in section 421 of Pub. L. 115-10, set out above, see section 2 of Pub. L. 115-10, set out as a note under section 10101 of this title.]

MAINTAINING A BALANCED SPACE SCIENCE PORTFOLIO

Pub. L. 115-10, title V, §501, Mar. 21, 2017, 131 Stat. 48, provided that:

“(a) SENSE OF CONGRESS ON SCIENCE PORTFOLIO.—Congress reaffirms the sense of Congress that—

“(1) a balanced and adequately funded set of activities, consisting of research and analysis grant programs, technology development, suborbital research activities, and small, medium, and large space missions, contributes to a robust and productive science program and serves as a catalyst for innovation and discovery; and

“(2) the Administrator [of the National Aeronautics and Space Administration] should set science priorities by following the guidance provided by the scientific community through the National Academies of Sciences, Engineering, and Medicine’s decadal surveys.

“(b) POLICY.—It is the policy of the United States to ensure, to the extent practicable, a steady cadence of large, medium, and small science missions.”

PLANETARY SCIENCE

Pub. L. 115-10, title V, §502, Mar. 21, 2017, 131 Stat. 48, provided that:

“(a) FINDINGS.—Congress finds that—

“(1) Administration [National Aeronautics and Space Administration] support for planetary science is critical to enabling greater understanding of the solar system and the origin of the Earth;

“(2) the United States leads the world in planetary science and can augment its success in that area with appropriate international, academic, and industry partnerships;

“(3) a mix of small, medium, and large planetary science missions is required to sustain a steady cadence of planetary exploration; and

“(4) robotic planetary exploration is a key component of preparing for future human exploration.

“(b) MISSION PRIORITIES.—

“(1) IN GENERAL.—In accordance with the priorities established in the most recent Planetary Science Decadal Survey, the Administrator [of the National Aeronautics and Space Administration] shall ensure, to the greatest extent practicable, the completion of a balanced set of Discovery, New Frontiers, and Flagship missions at the cadence recommended by the most recent Planetary Science Decadal Survey.

“(2) MISSION PRIORITY ADJUSTMENTS.—Consistent with the set of missions described in paragraph (1), and while maintaining the continuity of scientific data and steady development of capabilities and technologies, the Administrator may seek, if necessary, adjustments to mission priorities, schedule, and scope in light of changing budget projections.”

EXTRASOLAR PLANET EXPLORATION STRATEGY

Pub. L. 115-10, title V, §508, Mar. 21, 2017, 131 Stat. 50, provided that:

“(a) STRATEGY.—

“(1) IN GENERAL.—The Administrator [of the National Aeronautics and Space Administration] shall enter into an arrangement with the National Academies to develop a science strategy for the study and exploration of extrasolar planets, including the use of the Transiting Exoplanet Survey Satellite, the James Webb Space Telescope, a potential Wide-Field Infrared Survey Telescope mission, or any other telescope, spacecraft, or instrument, as appropriate.

“(2) REQUIREMENTS.—The strategy shall—

“(A) outline key scientific questions;

“(B) identify the most promising research in the field;

“(C) indicate the extent to which the mission priorities in existing decadal surveys address the key extrasolar planet research and exploration goals;

“(D) identify opportunities for coordination with international partners, commercial partners, and not-for-profit partners; and

“(E) make recommendations regarding the activities under subparagraphs (A) through (D), as appropriate.

“(b) USE OF STRATEGY.—The Administrator shall use the strategy—

“(1) to inform roadmaps, strategic plans, and other activities of the Administration [National Aeronautics and Space Administration] as they relate to extrasolar planet research and exploration; and

“(2) to provide a foundation for future activities and initiatives related to extrasolar planet research and exploration.

“(c) REPORT TO CONGRESS.—Not later than 18 months after the date of enactment of this Act [Mar. 21, 2017], the National Academies shall submit to the Administrator and to the appropriate committees of Congress [Committee on Science, Space, and Technology of the House of Representatives and Committee on Commerce, Science, and Transportation of the Senate] a report containing the strategy developed under subsection (a).”

ASTROBIOLOGY STRATEGY

Pub. L. 115-10, title V, §509, Mar. 21, 2017, 131 Stat. 50, provided that:

“(a) STRATEGY.—

“(1) IN GENERAL.—The Administrator [of the National Aeronautics and Space Administration] shall enter into an arrangement with the National Academies to develop a science strategy for astrobiology that would outline key scientific questions, identify the most promising research in the field, and indicate the extent to which the mission priorities in existing decadal surveys address the search for life’s origin, evolution, distribution, and future in the Universe.

“(2) RECOMMENDATIONS.—The strategy shall include recommendations for coordination with international partners.

“(b) USE OF STRATEGY.—The Administrator shall use the strategy developed under subsection (a) in planning and funding research and other activities and initiatives in the field of astrobiology.

“(c) REPORT TO CONGRESS.—Not later than 18 months after the date of enactment of this Act [Mar. 21, 2017], the National Academies shall submit to the Administrator and to the appropriate committees of Congress [Committee on Science, Space, and Technology of the House of Representatives and Committee on Commerce, Science, and Transportation of the Senate] a report containing the strategy developed under subsection (a).”

SPACE TECHNOLOGY RESEARCH AND DEVELOPMENT

Pub. L. 115-10, title VII, §§701, 702, Mar. 21, 2017, 131 Stat. 56, 57 provided that:

“SEC. 701. SPACE TECHNOLOGY INFUSION.

“(a) SENSE OF CONGRESS ON SPACE TECHNOLOGY.—It is the sense of Congress that space technology is critical—

“(1) to developing technologies and capabilities that will make the Administration [National Aeronautics and Space Administration]’s core missions more affordable and more reliable;

“(2) to enabling a new class of Administration missions beyond low-Earth orbit; and

“(3) to improving technological capabilities and promote innovation for the Administration and the Nation.

“(b) SENSE OF CONGRESS ON PROPULSION TECHNOLOGY.—It is the sense of Congress that advancing propulsion technology would improve the efficiency of trips to Mars and could shorten travel time to Mars, reduce astronaut health risks, and reduce radiation exposure, consumables, and mass of materials required for the journey.

“(c) POLICY.—It is the policy of the United States that the Administrator [of the National Aeronautics and Space Administration] shall develop technologies to support the Administration’s core missions, as described in section 2(3) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18301(3)), and support sustained investments in early stage innovation, fundamental research, and technologies to expand the boundaries of the national aerospace enterprise.

“(d) PROPULSION TECHNOLOGIES.—A goal of propulsion technologies developed under subsection (c) shall be to significantly reduce human travel time to Mars.

“SEC. 702. SPACE TECHNOLOGY PROGRAM.

“(a) SPACE TECHNOLOGY PROGRAM AUTHORIZED.—The Administrator [of the National Aeronautics and Space Administration] shall conduct a space technology program (referred to in this section as the ‘Program’) to research and develop advanced space technologies that could deliver innovative solutions across the Administration [National Aeronautics and Space Administration]’s space exploration and science missions.

“(b) CONSIDERATIONS.—In conducting the Program, the Administrator shall consider—

“(1) the recommendations of the National Academies’ review of the Administration’s Space Technology roadmaps and priorities; and

“(2) the applicable enabling aspects of the stepping stone approach to exploration under section 70504 of title 51, United States Code.

“(c) REQUIREMENTS.—In conducting the Program, the Administrator shall—

“(1) to the extent practicable, use a competitive process to select research and development projects;

“(2) to the extent practicable and appropriate, use small satellites and the Administration’s suborbital and ground-based platforms to demonstrate space technology concepts and developments; and

“(3) as appropriate, partner with other Federal agencies, universities, private industry, and foreign countries.

“(d) SMALL BUSINESS PROGRAMS.—The Administrator shall organize and manage the Administration’s Small Business Innovation Research Program and Small Business Technology Transfer Program within the Program.

“(e) NONDUPLICATION CERTIFICATION.—The Administrator shall submit a budget for each fiscal year, as transmitted to Congress under section 1105(a) of title 31, United States Code, that avoids duplication of projects, programs, or missions conducted by [the] Program with other projects, programs, or missions conducted by another office or directorate of the Administration.

“(f) COLLABORATION, COORDINATION, AND ALIGNMENT.—

“(1) IN GENERAL.—The Administrator shall—

“(A) ensure that the Administration’s projects, programs, and activities in support of technology research and development of advanced space technologies are fully coordinated and aligned;

“(B) ensure that the results [of] the projects, programs, and activities under subparagraph (A) are shared and leveraged within the Administration; and

“(C) ensure that the organizational responsibility for research and development activities in support of human space exploration not initiated as of the date of enactment of this Act [Mar. 21, 2017] is established on the basis of a sound rationale.

“(2) SENSE OF CONGRESS.—It is the sense of Congress that projects, programs, and missions being conducted by the Human Exploration and Operations Mission Directorate in support of research and development of advanced space technologies and systems focusing on human space exploration should continue in that Directorate.

“(g) REPORT.—Not later than 180 days after the date of enactment of this Act, the Administrator shall provide to the appropriate committees of Congress a report—

“(1) comparing the Administration’s space technology investments with the high-priority technology areas identified by the National Academies in the National Research Council’s report on the Administration’s Space Technology Roadmaps; and

“(2) including—

“(A) identification of how the Administration will address any gaps between the agency’s investments and the recommended technology areas, including a projection of funding requirements; and

“(B) identification of the rationale described in subsection (f)(1)(C).

“(h) ANNUAL REPORT.—The Administrator shall include in the Administration’s annual budget request for each fiscal year the rationale for assigning organizational responsibility for, in the year prior to the budget fiscal year, each initiated project, program, and mission focused on research and development of advanced technologies for human space exploration.”

Executive Documents

SPACE POLICY DIRECTIVE-6. NATIONAL STRATEGY FOR SPACE NUCLEAR POWER AND PROPULSION

Space Policy Directive-6, Dec. 16, 2020, 85 F.R. 82873, provided:

Memorandum for the Vice President[,] the Secretary of State[,] the Secretary of Defense[,] the Secretary of Commerce[,] the Secretary of Transportation[,] the

Secretary of Energy[,] the Director of the Office of Management and Budget[,] the Assistant to the President for National Security Affairs[,] the Administrator of the National Aeronautics and Space Administration[,] the Chairman of the Nuclear Regulatory Commission[,] and] the Director of the Office of Science and Technology Policy

SECTION 1. *Policy.* The ability to use space nuclear power and propulsion (SNPP) systems safely, securely, and sustainably is vital to maintaining and advancing United States dominance and strategic leadership in space. SNPP systems include radioisotope power systems (RPSs) and fission reactors used for power or propulsion in spacecraft, rovers, and other surface elements. SNPP systems can allow operation of such elements in environments in which solar and chemical power are inadequate. They can produce more power at lower mass and volume compared to other energy sources, thereby enabling persistent presence and operations. SNPP systems also can shorten transit times for crewed and robotic spacecraft, thereby reducing radiation exposure in harsh space environments.

National Security Presidential Memorandum–20 (NSPM–20) of August 20, 2019 (Launch of Spacecraft Containing Space Nuclear Systems), updated the process for launches of spacecraft containing space nuclear systems. It established it as the policy of the United States to “develop and use space nuclear systems when such systems safely enable or enhance space exploration or operational capabilities.”

Cooperation with commercial and international partners is critical to achieving America’s objectives for space exploration. Presidential Policy Directive 4 of June 28, 2010 (National Space Policy), as amended by the Presidential Memorandum of December 11, 2017 (Reinvigorating America’s Human Space Exploration Program) [82 F.R. 58501], established it as the policy of the United States to “[l]ead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and to bring back to Earth new knowledge and opportunities.”

This memorandum establishes a national strategy to ensure the development and use of SNPP systems when appropriate to enable and achieve the scientific, exploration, national security, and commercial objectives of the United States. In the context of this strategy only, the term “development” includes the full development process from design through testing and production, and the term “use” includes launch, operation, and disposition. This memorandum outlines high-level policy goals and a supporting roadmap that will advance the ability of the United States to use SNPP systems safely, securely, and sustainably. The execution of this strategy will be subject to relevant budgetary and regulatory processes and to the availability of appropriations.

SEC. 2. *Goals.* The United States will pursue goals for SNPP development and use that are both mission-enabling and ambitious in their substance and their timeline. These goals will enable a range of existing and future space missions, with the aim of accelerating achievement of key milestones, including in-space demonstration and use of new SNPP capabilities. This memorandum establishes the following such goals for the Nation:

(a) Develop uranium fuel processing capabilities that enable production of fuel that is suitable to lunar and planetary surface and in-space power, nuclear electric propulsion (NEP), and nuclear thermal propulsion (NTP) applications, as needed. These capabilities should support the ability to produce different uranium fuel forms to meet the nearest-term mission needs and, to the extent feasible, should maximize commonality—meaning use of the same or similar materials, processes, designs, or infrastructure—across these fuel forms. To maximize private-sector engagement and cost savings, these capabilities should be developed to enable a range of terrestrial as well as space applications, including future commercial applications;

(b) Demonstrate a fission power system on the surface of the Moon that is scalable to a power range of 40 kilowatt-electric (kWe) and higher to support a sustained lunar presence and exploration of Mars. To the extent feasible, this power system should align with mission needs for, and potential future government and commercial applications of, in-space power, NEP, and terrestrial nuclear power;

(c) Establish the technical foundations and capabilities—including through identification and resolution of the key technical challenges—that will enable options for NTP to meet future Department of Defense (DoD) and National Aeronautics and Space Administration (NASA) mission requirements; and

(d) Develop advanced RPS capabilities that provide higher fuel efficiency, higher specific energy, and longer operational lifetime than existing RPS capabilities, thus enabling survivable surface elements to support robotic and human exploration of the Moon and Mars and extending robotic exploration of the solar system.

SEC. 3. *Principles.* The United States will adhere to principles of safety, security, and sustainability in its development and use of SNPP systems, in accordance with all applicable Federal laws and consistent with international obligations and commitments.

(a) *Safety.* All executive departments and agencies (agencies) involved in the development and use of SNPP systems shall take appropriate measures to ensure, within their respective roles and responsibilities, the safe development, testing, launch, operation, and disposition of SNPP systems. For United States Government SNPP programs, the sponsoring agency holds primary responsibility for safety. For programs involving multiple agencies, the terms of cooperation shall designate a lead agency with primary responsibility for safety in each stage of development and use.

(i) Ground development. Activities associated with ground development, including ground testing, of SNPP systems shall be conducted in accordance with applicable Federal, State, and local laws and existing authorities of regulatory agencies.

(ii) Launch. NSPM–20 established safety guidelines and safety analysis and review processes for Federal Government launches of spacecraft containing space nuclear systems, including SNPP systems, and for launches for which the Department of Transportation has statutory authority to license as commercial space launch activities (commercial launches). These guidelines and processes address launch and any subsequent stages during which accidents may result in radiological effects on the public or the environment—for instance, in an unplanned reentry from Earth orbit or during an Earth flyby. Launch activities shall be conducted in accordance with these guidelines and processes.

(iii) Operation and disposition. The operation and disposition of SNPP systems shall be planned and conducted in a manner that protect human and environmental safety and national security assets. Fission reactor SNPP systems may be operated on interplanetary missions, in sufficiently high orbits, and in low-Earth orbits if they are stored in sufficiently high orbits after the operational part of their mission. In this context, a sufficiently high orbit is one in which the orbital lifetime of the spacecraft is long enough for the fission products to decay to a level of radioactivity comparable to that of uranium–235 by the time it reenters the Earth’s atmosphere, and the risks to existing and future space missions and of collision with objects in space are minimized. Spacecraft operating fission reactors in low-Earth orbits shall incorporate a highly reliable operational system to ensure effective and controlled disposition of the reactor.

(b) *Security.* All agencies involved in the development and use of SNPP systems shall take appropriate measures to protect nuclear and radiological materials and sensitive information, consistent with sound nuclear nonproliferation principles. For United States Government SNPP programs, the sponsoring agency holds pri-

primary responsibility for security. For programs involving multiple agencies, the terms of cooperation shall designate a lead agency with primary responsibility for security in each stage of development and use. The use of highly enriched uranium (HEU) in SNPP systems should be limited to applications for which the mission would not be viable with other nuclear fuels or non-nuclear power sources. Before selecting HEU or, for fission reactor systems, any nuclear fuel other than low-enriched uranium (LEU), for any given SNPP design or mission, the sponsoring agency shall conduct a thorough technical review to assess the viability of alternative nuclear fuels. The sponsoring agency shall provide to the respective staffs of the National Security Council, the National Space Council, the Office of Science and Technology Policy, and the Office of Management and Budget a briefing that provides justification for why the use of HEU or other non-LEU fuel is required, and any steps the agency has taken to address nuclear safety, security, and proliferation-related risks. The Director of the Office of Science and Technology Policy shall ensure, through the National Science and Technology Council, that other relevant agencies are invited to participate in these briefings.

(c) *Sustainability.* All agencies involved in the development and use of SNPP systems shall take appropriate measures to conduct these activities in a manner that is suitable for the long-term sustenance of United States space capabilities and leadership in SNPP.

(i) *Coordination and Collaboration.* To maximize efficiency and return on taxpayer investment, the heads of relevant agencies shall seek and pursue opportunities to coordinate among existing and future SNPP development and use programs. Connecting current efforts with likely future applications will help ensure that such programs can contribute to long-term United States SNPP capabilities and leadership. Agencies also shall seek opportunities to partner with the private sector, including academic institutions, in order to facilitate contributions to United States SNPP capabilities and leadership. To help identify opportunities for collaboration, the heads of relevant agencies should conduct regular technical exchanges among SNPP programs, to the extent that such exchanges are consistent with the principle of security and comply with applicable Federal, State, and local laws. Agencies shall coordinate with the Department of State when seeking opportunities for international partnerships.

(ii) *Commonality.* The heads of relevant agencies shall seek to identify and use opportunities for commonality among SNPP systems, and between SNPP and terrestrial nuclear systems, whenever doing so could advance program and policy objectives without unduly inhibiting innovation or market development, or hampering system suitability to specific mission applications. For example, opportunities for commonality may exist in goals (e.g., demonstration timeline), reactor design, nuclear fuels (e.g., fuel type and form, and enrichment level), supplementary systems (e.g., power conversion, moderator, reflector, shielding, and system vessel), methods (e.g., additive manufacturing of fuel or reactor elements), and infrastructure (e.g., fuel supply, testing facilities, launch facilities, and workforce).

(iii) *Cost-effectiveness.* The heads of relevant agencies should pursue SNPP development and use solutions that are cost-effective while also consistent with the principles of safety and security. For any program or system, the heads of such agencies should seek to identify the combination of in-space and ground-based testing and certification that will best qualify the system for a given mission while ensuring public safety.

SEC. 4. *Roles and Responsibilities.* (a) The Vice President, on behalf of the President and acting through the National Space Council, shall coordinate United States policy related to use of SNPP systems.

(b) The Secretary of State shall, under the direction of the President, coordinate United States activities related to international obligations and commitments and international cooperation involving SNPP.

(c) The Secretary of Defense shall conduct and support activities associated with development and use of SNPP systems to enable and achieve United States national security objectives. When appropriate, the Secretary of Defense shall facilitate private-sector engagement in DoD SNPP activities.

(d) The Secretary of Commerce shall promote responsible United States commercial SNPP investment, innovation, and use, and shall, when consistent with the authorities of the Secretary, ensure the publication of clear, flexible, performance-based rules that are applicable to use of SNPP and are easily navigated. Under the direction of the Secretary of Commerce, the Department of Commerce (DOC) shall ascertain and communicate the views of private-sector partners and potential private-sector partners to relevant agency partners in order to facilitate public-private collaboration in SNPP development and use.

(e) The Secretary of Transportation's statutory authority includes licensing commercial launches and reentries, including vehicles containing SNPP systems. Within this capacity, the Secretary of Transportation shall, when appropriate, facilitate private-sector engagement in the launch or reentry aspect of SNPP development and use activities, in support of United States science, exploration, national security, and commercial objectives. To help ensure the launch safety of an SNPP payload, and consistent with 51 U.S.C. 50904, a payload review may be conducted as part of a license application review or may be requested by a payload owner or operator in advance of or apart from a license application.

(f) The Secretary of Energy shall, in coordination with sponsoring agencies and other agencies, as appropriate, support development and use of SNPP systems to enable and achieve United States scientific, exploration, and national security objectives. When appropriate, the Secretary of Energy shall work with sponsoring agencies and DOC to facilitate United States private-sector engagement in Department of Energy (DOE) SNPP activities. Under the direction of the Secretary of Energy and consistent with the authorities granted to DOE, including authorities under the Atomic Energy Act of 1954 (AEA), as amended, 42 U.S.C. 2011, *et seq.*, DOE may authorize ground-based SNPP development activities, including DOE activities conducted in coordination with sponsoring agencies and private-sector entities. As directed in NSPM-20, the Secretary of Energy shall maintain, on a full-cost recovery basis, the capability and infrastructure to develop, furnish, and conduct safety analyses for space nuclear systems for use in United States Government space systems.

(g) The Administrator of NASA shall conduct and support activities associated with development and use of SNPP systems to enable and achieve United States space science and exploration objectives. The Administrator of NASA shall establish the performance requirements for SNPP capabilities necessary to achieve those objectives. When appropriate, the Administrator of NASA shall facilitate private-sector engagement in NASA SNPP activities, and shall coordinate with the Secretary of Commerce and, as appropriate, the Secretary of State and the Secretary of Energy, to help facilitate private-sector SNPP activities.

(h) The Nuclear Regulatory Commission (NRC) has statutory authority under the AEA for licensing and regulatory safety and security oversight of commercial nuclear activities taking place within the United States. The NRC should, as appropriate and particularly in circumstances within NRC authority where DOE regulatory authorities cannot be applied, enable private-sector engagement in SNPP development and use activities in support of United States science, exploration, national security, and commercial objectives.

(i) The Director of the Office of Science and Technology Policy shall coordinate United States policy related to research and development of SNPP systems.

SEC. 5. *Roadmap.* The United States will pursue a coordinated roadmap for federally-supported SNPP ac-

tivities to achieve the goals and uphold the principles established in this memorandum. This roadmap comprises the following elements, which the relevant agencies should pursue consistent with the following objective timeline, subject to relevant budgetary and regulatory processes and to the availability of appropriations:

(a) By the mid-2020s, develop uranium fuel processing capabilities that enable production of fuel that is suitable for lunar and planetary surface and in-space power, NEP, and NTP applications, as needed.

(i) Identify relevant mission needs. DoD and NASA should provide to DOE any mission needs (e.g., power density, environment, and timelines) relevant to the identification of fuels suitable for planetary surface and in-space power, NEP, and NTP applications.

(ii) Identify candidate fuel or fuels. DoD and NASA, in cooperation with DOE and private-sector partners, as appropriate, should identify candidate fuel or fuels to meet the identified mission requirements. This review and assessment should account for current and expected United States capabilities to produce and qualify for use candidate fuels, and for potential commonality of fuels or fuel variants across multiple planetary surface and in-space power, in-space propulsion, and terrestrial applications.

(iii) Qualify at least one candidate fuel. DoD and NASA, in cooperation with DOE and private-sector partners, as appropriate, should qualify a fuel or fuels for demonstrations of a planetary surface power reactor and an in-space propulsion system. While seeking opportunities to use private-sector-partner capabilities, agencies should ensure that the Federal Government retains an ability for screening and qualification of candidate fuels.

(iv) Supply fuel for demonstrations. DOE, in cooperation with NASA and DoD, and with private-sector partners, as appropriate, should identify feedstock and uranium that can be made available for planetary surface power and in-space propulsion demonstrations. DOE shall ensure that any provision of nuclear material for SNPP will not disrupt enriched uranium supplies for the United States nuclear weapons program and the naval propulsion program, and that SNPP needs are included among broader considerations of nuclear fuel supply provisioning and management.

(b) By the mid- to late-2020s, demonstrate a fission power system on the surface of the Moon that is scalable to a power range of 40 kWe and higher to support sustained lunar presence and exploration of Mars.

(i) Initiate a surface power project. NASA should initiate a fission surface power project for lunar surface demonstration by 2027, with scalability to Mars exploration. NASA should consult with DoD and other agencies, and with the private sector, as appropriate, when developing project requirements.

(ii) Conduct technology and requirements assessment. NASA, in coordination with DoD and other agencies, and with private-sector partners, as appropriate, should evaluate technology options for a surface power system including reactor designs, power conversion, shielding, and thermal management. NASA should work with other agencies, and private-sector partners, as appropriate, to evaluate opportunities for commonality among other SNPP needs, including in-space power and terrestrial power needs, possible NEP technology needs, and reactor demonstrations planned by NASA, other agencies, or the private sector.

(iii) Engage the private sector. DOE and NASA should determine a mechanism or mechanisms for engaging with the private sector to meet NASA's SNPP surface power needs in an effective manner consistent with the guiding principles set forth in this memorandum. In evaluating mechanisms, DOE and NASA should consider the possibility of NASA issuing a request for proposal for the development and construction of the surface power reactor system or demonstration.

(iv) System development. NASA should work with DOE, and with other agencies and private-sector partners, as appropriate, to develop the lunar surface power demonstration project.

(v) Conduct demonstration mission. NASA, in coordination with other agencies and with private-sector partners, as appropriate, should launch and conduct the lunar surface power demonstration project.

(c) By the late-2020s, establish the technical foundations and capabilities—including through identification and resolution of the key technical challenges—that will enable NTP options to meet future DoD and NASA mission needs.

(i) Conduct requirements assessment. DoD and NASA, in cooperation with DOE, and with other agencies and private-sector partners, as appropriate, should assess the ability of NTP capabilities to enable and advance existing and potential future DoD and NASA mission requirements.

(ii) Conduct technology assessment. DoD and NASA, in cooperation with DOE, and with other agencies and private-sector partners, as appropriate, should evaluate technology options and associated key technical challenges for an NTP system, including reactor designs, power conversion, and thermal management. DoD and NASA should work with their partners to evaluate and use opportunities for commonality with other SNPP needs, terrestrial power needs, and reactor demonstration projects planned by agencies and the private sector.

(iii) Technology development. DoD, in coordination with DOE and other agencies, and with private-sector partners, as appropriate, should develop reactor and propulsion system technologies that will resolve the key technical challenges in areas such as reactor design and production, propulsion system and spacecraft design, and SNPP system integration.

(d) By 2030, develop advanced RPS capabilities that provide higher fuel efficiency, higher specific energy, and longer operational lifetime than existing RPS capabilities, thus enabling survivable surface elements to support robotic and human exploration of the Moon and Mars and extending robotic exploration of the solar system.

(i) Maintain RPS capability. Mission sponsoring agencies should assess their needs for radioisotope heat source material to meet emerging mission requirements, and should work with DOE to jointly identify the means to produce or acquire the necessary material on a timeline that meets mission requirements.

(ii) Engage the private sector. NASA, in coordination with DOE and DOC, should conduct an assessment of opportunities for engaging the private sector to meet RPS needs in an effective manner consistent with the guiding principles established in this memorandum.

(iii) Conduct technology and requirements assessment. NASA, in coordination with DOE and DoD, and with other agencies and private-sector partners, as appropriate, should assess requirements for next-generation RPS systems and evaluate technology options for meeting those requirements.

(iv) System development. DOE, in coordination with NASA and DoD, and with other agencies and private-sector partners, as appropriate, should develop one or more next-generation RPS system or systems to meet the goals of higher fuel efficiency, higher specific energy, and longer operational lifetime for the required range of power.

SEC. 6. *Implementation.* The Vice President, through the National Space Council, shall coordinate implementation of this memorandum.

SEC. 7. *General Provisions.* (a) Nothing in this memorandum shall be construed to impair or otherwise affect:

(i) the authority granted by law to an executive department or agency, or the head thereof; or

(ii) the functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(b) This memorandum shall be implemented consistent with applicable law and subject to the availability of appropriations.

(c) This memorandum is not intended to, and does not, create any right or benefit, substantive or proce-

dural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

(d) The Secretary of Energy is authorized and directed to publish this memorandum in the Federal Register.

DONALD J. TRUMP.

§ 20302. Vision for space exploration

(a) IN GENERAL.—The Administrator shall establish a program to develop a sustained human presence in cis-lunar space or on the Moon, including a robust precursor program, to promote exploration, science, commerce, and United States preeminence in space, and as a stepping-stone to future exploration of Mars and other destinations. The Administrator is further authorized to develop and conduct appropriate international collaborations in pursuit of these goals.

(b) FUTURE EXPLORATION OF MARS.—The Administrator shall manage human space flight programs, including the Space Launch System and Orion, to enable humans to explore Mars and other destinations by defining a series of sustainable steps and conducting mission planning, research, and technology development on a timetable that is technically and fiscally possible, consistent with section 70504.

(c) DEFINITIONS.—In this section:

(1) ORION.—The term “Orion” means the multipurpose crew vehicle described under section 303 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18323).

(2) SPACE LAUNCH SYSTEM.—The term “Space Launch System” means has the meaning¹ given the term in section 3 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18302).

(Pub. L. 111–314, § 3, Dec. 18, 2010, 124 Stat. 3356; Pub. L. 115–10, title IV, § 413, Mar. 21, 2017, 131 Stat. 33.)

HISTORICAL AND REVISION NOTES

Table with 3 columns: Revised Section, Source (U.S. Code), Source (Statutes at Large). Row 1: 20302, 42 U.S.C. 16611(b), Pub. L. 109–155, title I, § 101(b), Dec. 30, 2005, 119 Stat. 2898.

Editorial Notes

AMENDMENTS

2017—Subsec. (a). Pub. L. 115–10, § 413(1), inserted “in cis-lunar space or” after “sustained human presence”.

Subsec. (b). Pub. L. 115–10, § 413(2), amended subsec. (b) generally. Prior to amendment, text read as follows: “The Administrator shall manage human space flight programs to strive to achieve the following milestones (in conformity with section 70502 of this title):

“(1) Returning Americans to the Moon no later than 2020.

“(2) Launching the Crew Exploration Vehicle as close to 2010 as possible.

“(3) Increasing knowledge of the impacts of long duration stays in space on the human body using the most appropriate facilities available, including the International Space Station.

“(4) Enabling humans to land on and return from Mars and other destinations on a timetable that is technically and fiscally possible.”

¹ So in original.

Subsec. (c). Pub. L. 115–10, § 413(3), added subsec. (c).

Statutory Notes and Related Subsidiaries

MOON TO MARS

Pub. L. 117–167, div. B, title VII, § 10811, Aug. 9, 2022, 136 Stat. 1731, provided that:

“(a) SENSE OF CONGRESS.—It is the sense of Congress that—

“(1) advances in space technology and space exploration capabilities—

“(A) ensure the long-term technological preeminence, economic competitiveness, STEM workforce development, and national security of the United States; and

“(B) offer profound inspirational value for future generations;

“(2) the Artemis missions—

“(A) will make further progress on advancing the human exploration roadmap to achieve human presence beyond low-Earth orbit to the surface of Mars, as required under section 432 of the National Aeronautics and Space Administration Transition Authorization Act of 2017 (Public Law 115–10; 51 U.S.C. 20302 note);

“(B) should fulfill the goal of landing United States astronauts, including the first woman and the next man, on the Moon; and

“(C) should seek collaboration with commercial and international partners to establish sustainable lunar exploration, and should fund any sustainable lunar activities not directly required for the advancement of a human mission to Mars separately;

“(3) in carrying out the Artemis missions, the Administrator [of the National Aeronautics and Space Administration] should ensure that the entire Artemis program is inclusive and representative of all people of the United States, including women and minorities;

“(4) safe and successful execution of the roadmap to achieve human presence on Mars, including the Artemis missions, requires—

“(A) a clear strategic vision for achieving lunar and Mars exploration that is shared by NASA [National Aeronautics and Space Administration], international partners, nongovernmental partners, Congress, and the people of the United States;

“(B) a well-developed and executable timeline, budget, and mission architecture, to inform decisions, including decisions relating to workforce and infrastructure needs and the development of technical and nontechnical skills;

“(C) consistent NASA oversight of all relevant exploration activities, enabled by NASA leadership with authority, responsibility, and accountability for decisions and well-developed capabilities for systems engineering and integration;

“(D) clearly defined roles for NASA, international partners, and nongovernmental partners, including criteria for determining whether NASA should make, manage, or buy key capabilities; and

“(E) mechanisms to ensure NASA insight into the activities of its international and nongovernmental partners, as required to identify and mitigate risks to mission safety and success.

“(b) MOON TO MARS OFFICE AND PROGRAM.—

“(1) MOON TO MARS OFFICE.—Not later than 120 days after the date of the enactment of this Act [Aug. 9, 2022], the Administrator shall establish within the Exploration Systems Development Mission Directorate a Moon to Mars Program Office (referred to in this section as the ‘Office’) to lead and manage the Moon to Mars program established under paragraph (2), including Artemis missions and activities.

“(2) MOON TO MARS PROGRAM.—

“(A) ESTABLISHMENT.—Not later than 120 days after the date of the enactment of this Act, the Administrator shall establish a Moon to Mars Program (referred to in this section as the ‘Program’)