

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’)

in accordance with sections 20302(b) and 70504 of title 51, United States Code, which shall include Artemis missions and activities, to achieve the goal of human exploration of Mars.

“(B) ELEMENTS.—The Program shall include the following elements:

“(i) The Space Launch System under section 20302 of title 51, United States Code.

“(ii) The Orion crew vehicle under such section.

“(iii) Exploration Ground Systems.

“(iv) An outpost in orbit around the Moon under section 70504 of such title [probably should be “section 70505 of such title”].

“(v) Human-rated landing systems.

“(vi) Spacesuits.

“(vii) Any other element needed to meet the requirements for the Program.

“(C) DIRECTION.—The Administrator shall ensure that—

“(i) each Artemis mission demonstrates or advances a technology or operational concept that will enable human missions to Mars;

“(ii) the Program incorporates each such mission into the human exploration roadmap 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); and

“(iii) the Program includes cislunar space exploration activities that—

“(I) use a combination of launches of the Space Launch System and space transportation services from United States commercial providers, as appropriate, for each such mission;

“(II) plan for not fewer than 1 Space Launch System launch annually beginning after the first successful crewed launch of Orion on the Space Launch System, with a goal of 2 Space Launch System launches annually as soon as practicable; and

“(III) establish an outpost in orbit around the Moon that—

“(aa) demonstrates technologies, systems, and operational concepts directly applicable to the space vehicle that will be used to transport humans to Mars;

“(bb) has the capability for periodic human habitation; and

“(cc) functions as a point of departure, return, or staging for missions to multiple locations on the lunar surface or other destinations.

“(3) DIRECTOR.—

“(A) IN GENERAL.—The Administrator shall appoint a Director for the Program, who shall lead the Office and report to the Associate Administrator of the Exploration Systems Development Mission Directorate.

“(B) ACCOUNTABILITY.—The Director shall have accountability for risk management and shall have authority, as consistent with NASA Space Flight Program and Project Management requirements—

“(i) to implement—

“(I) Program-level requirements; and

“(II) an architecture and program plan developed to meet such requirements;

“(ii) to manage resources, personnel, and contracts necessary to implement the Program, as appropriate;

“(iii) to manage cost, risk, schedule, and performance factors;

“(iv) to direct and oversee a Program-wide systems engineering and integration and integrated risk management function; and

“(v) to carry out other authorities, in accordance with [National Aeronautics and Space] Administration policies and procedures.

“(C) RESPONSIBILITIES.—The Director shall be responsible for—

“(i) developing and managing—

“(I) an integrated master plan, integrated master schedule, and integrated risk management procedures for the Program;

“(II) a Program-wide systems engineering and integration function as described in subsection (c);

“(III) plans for technology and capabilities development;

“(IV) logistics support, science data management, communications, and other plans that are relevant to the functions of the Office; and

“(V) performance measures to assess the progress of the Program;

“(ii) advising the Associate Administrator of the Exploration Systems Development Mission Directorate on the development of—

“(I) Program-level requirements, including for a human Mars orbital mission and a human mission to the surface of Mars; and

“(II) an architecture based on the requirements described in subclause (I); and

“(iii) informing the Associate Administrator of the Administration on coordination among NASA centers, as required to most efficiently achieve the goals of the Program.

“(c) SYSTEMS ENGINEERING AND INTEGRATION.—The Director of the Office shall—

“(1) establish within the Office a Program-wide systems engineering and integration function; and

“(2) appoint a manager for such function to manage systems engineering and integration activities across the Program, including with respect to the Program elements described in subsection (b)(2).

“(d) IMPLEMENTATION.—In the implementation of the Program, the Administrator shall ensure that—

“(1) for the purposes of reducing risk and complexity and making the maximum use of taxpayer investments to date, in conducting Artemis activities, the Administration does not take any action in regard to the design of the Exploration Upper Stage-enhanced Space Launch System that would preclude it from carrying an integrated human-rated lunar landing system for crewed lunar landing missions;

“(2) the Program maintains a robust series of ground-based and in-flight testing activities, including, with respect to each crewed system design, not less than 1 uncrewed flight test, followed by a crewed flight test, as appropriate, prior to use of the design on a human-rated lunar landing system or Mars mission; and

“(3) human lunar landing missions under the Program, including surface and in-space activities, are carried out solely by government astronauts.

“(e) STUDY.—Not later than 180 days after the date of the enactment of this Act, the Administrator shall submit to the appropriate committees of Congress [Committee on Commerce, Science, and Transportation of the Senate and Committee on Science, Space, and Technology of the House of Representatives] a report detailing—

“(1) progress towards the establishment of—

“(A) the Office, the Program, and the Program architecture; and

“(B) the integrated master plan, integrated master schedule, and integrated risk management procedures for the Program;

“(2) performance measures and milestones for the Program and any interim assessment with respect to such performance measures, as practicable;

“(3) initial criteria for determining whether NASA should make, manage, or buy key capabilities within the Program or engage with international partners to access such capabilities;

“(4) strategies to ensure consistent insight into the activities of NASA partners, including nongovernmental partners, as required to identify and mitigate mission risks;

“(5) progress towards the establishment of a systems engineering and integration function; and

“(6) an annual budget profile for resources required to implement the Program during the 5-year period beginning on the date of the enactment of this Act.” [For definition of “STEM” as used in section 10811 of Pub. L. 117-167, set out above, see section 18901 of Title 42, The Public Health and Welfare.]

[For definitions of “Orion”, “cislunar space”, and “government astronauts” as used in section 10811 of Pub. L. 117-167, set out above, see section 10802 of Pub. L. 117-167, set out as a Definitions note under section 10101 of this title.]

HUMAN SPACE EXPLORATION

Pub. L. 115-10, title IV, §§ 431, 432, Mar. 21, 2017, 131 Stat. 38, as amended by Pub. L. 117-167, div. B, title VII, § 10817(b), Aug. 9, 2022, 136 Stat. 1740, provided that:

“SEC. 431. FINDINGS ON HUMAN SPACE EXPLORATION.

“Congress makes the following findings:

“(1) In accordance with section 204 of the National Aeronautics and Space Administration Authorization Act of 2010 (124 Stat. 2813), the National Academies of Sciences, Engineering, and Medicine, through its Committee on Human Spaceflight, conducted a review of the goals, core capabilities, and direction of human space flight, and published the findings and recommendations in a 2014 report entitled, ‘Pathways to Exploration: Rationales and Approaches for a U.S. Program of Human Space Exploration’.

“(2) The Committee on Human Spaceflight included leaders from the aerospace, scientific, security, and policy communities.

“(3) With input from the public, the Committee on Human Spaceflight concluded that many practical and aspirational rationales for human space flight together constitute a compelling case for continued national investment and pursuit of human space exploration toward the horizon goal of Mars.

“(4) According to the Committee on Human Spaceflight, the rationales include economic benefits, national security, national prestige, inspiring students and other citizens, scientific discovery, human survival, and a sense of shared destiny.

“(5) The Committee on Human Spaceflight affirmed that Mars is the appropriate long-term goal for the human space flight program.

“(6) The Committee on Human Spaceflight recommended that NASA define a series of sustainable steps and conduct mission planning and technology development as needed to achieve the long-term goal of placing humans on the surface of Mars.

“(7) Expanding human presence beyond low-Earth orbit and advancing toward human missions to Mars requires early planning and timely decisions to be made in the near-term on the necessary courses of action for commitments to achieve short-term and long-term goals and objectives.

“(8) In addition to the 2014 report described in paragraph (1), there are several independently developed reports or concepts that describe potential Mars architectures or concepts and identify Mars as the long-term goal for human space exploration, including NASA’s ‘The Global Exploration Roadmap’ of 2013, ‘NASA’s Journey to Mars—Pioneering Next Steps in Space Exploration’ of 2015, NASA Jet Propulsion Laboratory’s ‘Minimal Architecture for Human Journeys to Mars’ of 2015, and Explore Mars’ ‘The Humans to Mars Report 2016’.

“SEC. 432. HUMAN EXPLORATION ROADMAP.

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

“(1) expanding human presence beyond low-Earth orbit and advancing toward human missions to Mars in the 2030s requires early strategic planning and timely decisions to be made in the near-term on the necessary courses of action for commitments to achieve short-term and long-term goals and objectives;

“(2) for strong and sustained United States leadership, a need exists to advance a human exploration roadmap, addressing exploration objectives in collaboration with international, academic, and industry partners;

“(3) an approach that incrementally advances toward a long-term goal is one in which nearer-term de-

velopments and implementation would influence future development and implementation; and

“(4) a human exploration roadmap should begin with low-Earth orbit, then address in greater detail progress beyond low-Earth orbit to cis-lunar space, and then address future missions aimed at human arrival and activities near and then on the surface of Mars.

“(b) HUMAN EXPLORATION ROADMAP.—

“(1) IN GENERAL.—The Administrator shall develop a human exploration roadmap, including a critical decision plan, to expand human presence beyond low-Earth orbit to the surface of Mars and beyond, considering potential interim destinations such as cis-lunar space and the moons of Mars.

“(2) SCOPE.—The human exploration roadmap shall include—

“(A) an integrated set of exploration, science, and other goals and objectives of a United States human space exploration program to achieve the long-term goal of human missions near or on the surface of Mars in the 2030s;

“(B) opportunities for international, academic, and industry partnerships for exploration-related systems, services, research, and technology if those opportunities provide cost-savings, accelerate program schedules, or otherwise benefit the goals and objectives developed under subparagraph (A);

“(C) sets and sequences of precursor missions in cis-lunar space and other missions or activities necessary—

“(i) to demonstrate the proficiency of the capabilities and technologies identified under subparagraph (D); and

“(ii) to meet the goals and objectives developed under subparagraph (A), including anticipated timelines and missions for the Space Launch System and Orion;

“(D) an identification of the specific capabilities and technologies, including the Space Launch System, Orion, a deep space habitat, and other capabilities, that facilitate the goals and objectives developed under subparagraph (A);

“(E) a description of how cis-lunar elements, objectives, and activities advance the human exploration of Mars;

“(F) an assessment of potential human health and other risks, including radiation exposure;

“(G) mitigation plans, whenever possible, to address the risks identified in subparagraph (F);

“(H) a description of those technologies already under development across the Federal Government or by other entities that facilitate the goals and objectives developed under subparagraph (A);

“(I) a specific process for the evolution of the capabilities of the fully integrated Orion with the Space Launch System and a description of how these systems facilitate the goals and objectives developed under subparagraph (A) and demonstrate the capabilities and technologies described in subparagraph (D);

“(J) a description of the capabilities and technologies that need to be demonstrated or research data that could be gained through the utilization of the ISS and the status of the development of such capabilities and technologies;

“(K) a framework for international cooperation in the development of all capabilities and technologies identified under this section, including an assessment of the risks posed by relying on international partners for capabilities and technologies on the critical path of development;

“(L) a process for partnering with nongovernmental entities using Space Act Agreements or other acquisition instruments for future human space exploration; and

“(M) include [sic] information on the phasing of planned intermediate destinations, Mars mission risk areas and potential risk mitigation approaches, technology requirements and phasing of

required technology development activities, the management strategy to be followed, related ISS activities, planned international collaborative activities, potential commercial contributions, and other activities relevant to the achievement of the goal established in this section.

“(3) CONSIDERATIONS.—In developing the human exploration roadmap, the Administrator shall consider—

“(A) using key exploration capabilities, namely the Space Launch System and Orion;

“(B) using existing commercially available technologies and capabilities or those technologies and capabilities being developed by industry for commercial purposes;

“(C) establishing an organizational approach to ensure collaboration and coordination among NASA’s Mission Directorates under section 821 [set out as a note under section 20111 of this title], when appropriate, including to collect and return to Earth a sample from the Martian surface;

“(D) building upon the initial uncrewed mission, Artemis I, and first crewed mission, Artemis II, of the Space Launch System and Orion to establish a sustainable cadence of missions extending human exploration missions into cis-lunar space, including anticipated timelines and milestones;

“(E) developing the robotic and precursor missions and activities that will demonstrate, test, and develop key technologies and capabilities essential for achieving human missions to Mars, including long-duration human operations beyond low-Earth orbit, space suits, solar electric propulsion, deep space habitats, environmental control life support systems, Mars lander and ascent vehicle, entry, descent, landing, ascent, Mars surface systems, and in-situ resource utilization;

“(F) demonstrating and testing 1 or more habitat modules in cis-lunar space to prepare for Mars missions;

“(G) using public-private, firm fixed-price partnerships, where practicable;

“(H) collaborating with international, academic, and industry partners, when appropriate;

“(I) any risks to human health and sensitive on-board technologies, including radiation exposure;

“(J) any risks identified through research outcomes under the NASA Human Research Program’s Behavioral Health Element; and

“(K) the recommendations and ideas of several independently developed reports or concepts that describe potential Mars architectures or concepts and identify Mars as the long-term goal for human space exploration, including the reports described under section 431.

“(4) CRITICAL DECISION PLAN ON HUMAN SPACE EXPLORATION.—As part of the human exploration roadmap, the Administrator shall include a critical decision plan—

“(A) identifying and defining key decisions guiding human space exploration priorities and plans that need to be made before June 30, 2020, including decisions that may guide human space exploration capability development, precursor missions, long-term missions, and activities;

“(B) defining decisions needed to maximize efficiencies and resources for reaching the near, intermediate, and long-term goals and objectives of human space exploration; and

“(C) identifying and defining timelines and milestones for a sustainable cadence of missions beginning with Artemis III for the Space Launch System and Orion to extend human exploration from cis-lunar space to the surface of Mars.

“(5) REPORTS.—

“(A) INITIAL HUMAN EXPLORATION ROADMAP.—The Administrator shall submit to the appropriate committees of Congress—

“(i) an initial human exploration roadmap, including a critical decision plan, before December 1, 2017; and

“(ii) an updated human exploration roadmap periodically as the Administrator considers necessary but not less than biennially.

“(B) CONTENTS.—Each human exploration roadmap under this paragraph shall include a description of—

“(i) the achievements and goals accomplished in the process of developing such capabilities and technologies during the 2-year period prior to the submission of the human exploration roadmap; and

“(ii) the expected goals and achievements in the following 2-year period.

“(C) SUBMISSION WITH BUDGET.—Each human exploration roadmap under this section shall be included in the budget for that fiscal year transmitted to Congress under section 1105(a) of title 31, United States Code.”

[Pub. L. 117-167, div. B, title VII, §10817(b), Aug. 9, 2022, 136 Stat. 1740, which directed amendment of section 432(b) of the National Aeronautics and Space Administration Authorization Act of 2017, was executed by amending section 432(b) of Pub. L. 115-10, set out above, which is section 432(b) 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 sections 431 and 432 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.]

§ 20303. Contribution to innovation

(a) PARTICIPATION IN INTERAGENCY ACTIVITIES.—The Administration shall be a full participant in any interagency effort to promote innovation and economic competitiveness through near-term and long-term basic scientific research and development and the promotion of science, technology, engineering, and mathematics education, consistent with the Administration’s mission, including authorized activities.

(b) HISTORIC FOUNDATION.—In order to carry out the participation described in subsection (a), the Administrator shall build on the historic role of the Administration in stimulating excellence in the advancement of physical science and engineering disciplines and in providing opportunities and incentives for the pursuit of academic studies in science, technology, engineering, and mathematics.

(c) BALANCED SCIENCE PROGRAM AND ROBUST AUTHORIZATION LEVELS.—The balanced science program authorized by section 101(d) of the National Aeronautics and Space Administration Authorization Act of 2005 (42 U.S.C. 16611(d))¹ shall be an element of the contribution by the Administration to the interagency programs.

(d) ANNUAL REPORT.—

(1) REQUIREMENT.—The Administrator shall submit to Congress and the President an annual report describing the activities conducted pursuant to this section, including a description of the goals and the objective metrics upon which funding decisions were made.

(2) CONTENT.—Each report submitted pursuant to paragraph (1) shall include, with regard to science, technology, engineering, and mathematics education programs, at a minimum, the following:

(A) A description of each program.

¹ See References in Text note below.