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114TH CONGRESS
2D SESSION

S. 3346

[Report No. 114–390]

To authorize the programs of the National Aeronautics and Space Administration, and for other purposes.

IN THE SENATE OF THE UNITED STATES

SEPTEMBER 15, 2016

Mr. CRUZ (for himself, Mr. NELSON, Mr. RUBIO, Mr. PETERS, Mr. WICKER, Mr. UDALL, Ms. CANTWELL, Mr. THUNE, and Mrs. MURRAY) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

DECEMBER 5, 2016

Reported by Mr. THUNE, with an amendment

[Strike out all after the enacting clause and insert the part printed in italic]

A BILL

To authorize the programs of the National Aeronautics and Space Administration, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the ''National Aeronautics and Space Administration Transition Authorization Act of 2016''.

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATION.—The term ''Administration'' means the National Aeronautics and Space Administration.

(2) ADMINISTRATOR.—The term ''Administrator'' means the Administrator of the National Aeronautics and Space Administration.

(3) APPROPRIATE COMMITTEES OF CONGRESS.—The term ''appropriate committees of Congress'' means—

(A) the Committee on Commerce, Science, and Transportation of the Senate; and

(B) the Committee on Science, Space, and Technology of the House of Representatives.

(4) CIS-LUNAR SPACE.—The term ''cis-lunar space'' means the region of space from the Earth out to and including the region around the surface of the Moon.

(5) DEEP SPACE.—The term ''deep space'' means the region of space beyond low-Earth orbit, to include cis-lunar space.

(6) GOVERNMENT ASTRONAUT.—The term ''government astronaut'' has the meaning given the term in section 50902 of title 51, United States Code.

(7) ISS.—The term ''ISS'' means the International Space Station.

(8) ISS MANAGEMENT ENTITY.—The term ''ISS management entity'' means the organization with which the Administrator has a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

(9) NASA.—The term ''NASA'' means the National Aeronautics and Space Administration.

(10) 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).

(11) SPACE LAUNCH SYSTEM.—The term ''Space Launch System'' has the meaning given the term in section 3 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18302).

TITLE I—AUTHORIZATION OF APPROPRIATIONS

SEC. 101. FISCAL YEAR 2017.

There are authorized to be appropriated to NASA for fiscal year 2017, $19,508,000,000, as follows:

(1) For Exploration, $4,532,000,000.

(2) For Space Operations, $4,950,700,000.

(3) For Science, $5,395,000,000.

(4) For Aeronautics, $601,000,000.

(5) For Space Technology, $686,500,000.

(6) For Education, $108,000,000.

(7) For Safety, Security, and Mission Services, $2,796,700,000.

(8) For Construction and Environmental Compliance and Restoration, $400,000,000.

(9) For Inspector General, $38,100,000.

TITLE II—SUSTAINING NATIONAL SPACE COMMITMENTS

SEC. 201. SENSE OF CONGRESS ON SUSTAINING NATIONAL SPACE COMMITMENTS.

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

(1) the United States, in collaboration with its international, academic, and industry partners, should sustain and build upon our national space commitments and investments across Administrations with a continuity of purpose to advance recent achievements of space exploration and space science to extend humanity's reach into deep space, including cis-lunar space, the Moon, the surface and moons of Mars, and beyond;

(2) NASA leaders can best leverage investments in the United States space program by continuing to develop a balanced portfolio for space exploration and space science, including continued development of the Space Launch System, Orion, Commercial Crew and Commercial Resupply Services, the James Webb Space Telescope, and the ongoing operations of the International Space Station;

(3) a national, government-led space program that builds on current science and exploration programs and advances human knowledge and capabilities and opens the frontier beyond Earth for ourselves, our international partners, commercial enterprise, and science is of critical importance to our national destiny and to a future guided by United States values and freedoms;

(4) continuity of purpose and effective execution of core NASA programs are essential for efficient use of resources in pursuit of timely and tangible accomplishments;

(5) NASA could improve its efficiency and effectiveness by working with industry to streamline existing programs and requirements, procurement practices, institutional footprint, and bureaucracy while preserving effective program oversight, accountability, and safety;

(6) United States Government astronauts changed the trajectory of human history toward the promise of the stars, and it is imperative that the United States maintain and enhance its leadership in space exploration and continue to expand freedom and opportunities in space for all Americans that are

consistent with the Constitution of the United States; and

(7) NASA is and should remain a multimission agency with a balanced and robust set of core missions in science, space technology, aeronautics, human space flight and exploration, and education.

SEC. 202. FINDINGS.

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

(1) Challenges of the past, such as the cancellation of major programs, have disrupted completion of major space systems thereby—

(A) impeding planning and pursuit of national objectives in human space exploration;

(B) placing the Nation's investment in space exploration at risk; and

(C) degrading the aerospace industrial base.

(2) The National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18301 et seq.) reflects a broad, bipartisan agreement on the path forward for NASA's core missions in science, space technology, aeronautics, human space flight and exploration, and education, which

serves as the foundation for the policy updates by this Act.

(3) Sustaining the investment and maximizing utilization of the ISS and ISS National Laboratory with our international and industry partners is—

(A) consistent with the goals and objectives of the United States space program; and

(B) imperative to continuing United States global leadership in human space exploration, science, research, technology development, and education opportunities that contribute to development of the next generation of American scientists, engineers, and leaders, and to creating the opportunity for economic development of low-Earth orbit.

(4) NASA has made measurable progress in development and testing of the Space Launch System and Orion exploration systems with the near-term objectives of the initial integrated test flight and launch in 2018, a human mission in 2021, and continued missions in cis-lunar space and eventually to the surface of Mars.

(5) The Commercial Crew Program is on schedule to reestablish the capability to launch United

States government astronauts from United States soil into orbit by the end of 2018.

(6) The Aerospace Safety Advisory Panel, in its 2015 Annual Report, urged continuity of purpose noting concerns over the potential for cost overruns and schedule slips that could accompany significant changes to core NASA programs.

TITLE III—MAXIMIZING UTILIZATION OF THE ISS AND LOW-EARTH ORBIT

SEC. 301. OPERATION OF THE ISS.

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

(1) after 15 years of continuous human presence in low-Earth orbit, the ISS continues to overcome challenges and operate safely;

(2) expansion of partnerships, scientific research, commercial applications, and exploration testbed capabilities of the ISS is essential to ensuring the greatest return on investments made by the United States and its international space partners in the development, assembly, and operations of that unique facility;

(3) stable and successful Commercial Cargo and Commercial Crew programs are critical to ensuring

timely provisioning of the ISS and to reestablishing the capability to launch United States government astronauts from United States soil into orbit;

(4) sustaining United States leadership and progress in human space exploration is enabled by continuing utilization of the ISS—

(A) to facilitate the commercialization and economic development of low-Earth orbit;

(B) to serve as a testbed for technologies, and to conduct scientific research and development; and

(C) as an orbital facility enabling research upon—

(i) the health, well-being, and performance of humans in space; and

(ii) the development of in-space systems enabling human space exploration beyond low-Earth orbit;

(5) the Administrator should continue to support the development of the Commercial Crew Program as planned to end reliance upon Russian transport of United States government astronauts to the ISS which has not been possible since the retirement of the Space Shuttle program in 2011; and

(6) the ISS should continue to provide a platform for fundamental, microgravity, discovery-based space life and physical sciences research that is critical for enabling space exploration, protecting humans in space, increasing pathways for commercial space development that depend on advances in basic research, and contribute to advancing science, technology, engineering, and mathematics research.

(b) CONTINUATION OF THE ISS.—Congress reaffirms the policy set forth in section 501 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18351) that it shall be the policy of the United States, in consultation with its international partners in the ISS program, to support full and complete utilization of the ISS through at least 2024.

SEC. 302. TRANSPORTATION TO ISS.

(a) SENSE OF CONGRESS ON COMMERCIAL CREW AND COMMERCIAL CARGO PROGRAMS.—It is the sense of Congress that—

(1) NASA should build upon the success of the Commercial Orbital Transportation Services and Commercial Resupply Services programs that have allowed private sector companies to partner with NASA to deliver cargo and scientific experiments to the ISS since 2012;

(2) once certified to meet NASA's safety and reliability requirements and fully operational to meet ISS crew transfer needs, the Commercial Crew Program transportation systems should serve as the primary means of transporting United States government astronauts and international partner astronauts from United States soil to and from the ISS;

(3) Commercial Crew Program transportation systems should have the capability of serving as ISS emergency crew rescue vehicles;

(4) the 21st Century Launch Complex Program has enabled significant modernization and infrastructure improvements as launch sites across the United States to support NASA's Commercial Resupply Services and other civil and commercial space flight missions; and

(5) the 21st Century Launch Complex Program should be continued in a manner that leverages State and private investments to achieve the goals of the program.

(b) UNITED STATES POLICY.—It is the policy of the United States that, to foster the competitive development, operation, improvement and commercial availability of space transportation services, services for Federal Government access to and return from the ISS, whenever prac-

ticable, shall be procured via fair and open competition for well-defined, milestone-based, Federal Acquisition Regulation-based contracts under section 201(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18311(a)).

(c) COMMERCIAL CARGO PROGRAM.—Section 401 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18341) is amended by striking ''Commercial Orbital Transportation Services'' and inserting ''Commercial Resupply Services''.

(d) CREW SAFETY.—The Administrator shall protect the safety of United States crews by ensuring commercial crew systems meet all applicable human rating requirements in accordance with section 403(b)(1) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18342(b)(1)).

SEC. 303. ISS TRANSITION PLAN.

(a) FINDINGS.—Congress finds that NASA has been both the primary supplier and consumer of human space flight capabilities and services of the ISS and in low-Earth orbit.

(b) SENSE OF CONGRESS.—It is the sense of Congress that an orderly transition is needed for United States human space flight activities in low-Earth orbit from the current regime, that relies heavily on NASA

sponsorship, to a regime where NASA is one of many customers of a low-Earth orbit commercial human space flight enterprise.

(c) REPORTS.—Section 50111 of title 51, United States Code, is amended by adding at the end the following:

"(c) ISS TRANSITION PLAN.—

"(1) IN GENERAL.—The Administrator, in coordination with the ISS management entity, ISS partners, the scientific user community, and the commercial space sector shall develop a plan to transition in a step-wise approach from the current regime that relies heavily on NASA sponsorship to a regime where NASA is one of many customers of a low-Earth orbit commercial human space flight enterprise.

"(2) REPORTS.—Not later than 180 days after the date of enactment of the National Aeronautics and Space Administration Transition Authorization Act of 2016, and triennially thereafter until 2023, the Administrator shall submit to the appropriate committees of Congress a report that includes—

"(A) an identification of low-Earth orbit capabilities necessary to meet the Administration's deep space human space flight explo-

ration objectives and mission requirements beyond the period of operation and utilization of the ISS described in section 503 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18353), if any;

"(B) steps NASA is taking and will take, including demonstrations that could be conducted on the ISS, to stimulate and facilitate commercial demand and supply of products and services in low-Earth orbit;

"(C) an assessment of current and projected commercial activities in low-Earth orbit, including on the ISS, and their potential for meeting the capabilities identified in subparagraph (A);

"(D) an identification of barriers preventing the commercialization of low-Earth orbit, including issues relating to policy, regulations, commercial intellectual property, data, and confidentiality that could inhibit the use of the ISS as a commercial incubator;

"(E) an evaluation of the feasible and preferred service life of the ISS beyond the period described in section 503 of the National Aero-

nautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18353), through at least 2028, as a unique scientific, commercial, and exploration-related facility, including—

"(i) a general discussion of international partner capabilities and prospects for extending the partnership, to include the potential for participation by additional countries, for the purposes of the human development and exploration of deep space;

"(ii) a review of essential systems, equipment upgrades, or potential maintenance that would be necessary to extend ISS operations and utilization;

"(iii) an evaluation of the cost and schedule requirements associated with the development and delivery of essential systems, equipment upgrades, or potential maintenance identified under clause (ii);

"(iv) an identification of possible international, academic, or industry partner contributions, cost-share, and program transitions to provide the upgrades identified under clause (ii);

"(v) impacts on the goals and objectives of the ISS National Laboratory and the management entity responsible for operation of the ISS National Laboratory;

"(vi) impacts on services provided by the Commercial Resupply Services and Commercial Crew Program to the ISS;

"(vii) impacts on the use of the ISS as a testbed to transition functions of the ISS to the commercial space sector and enhance economic development of low-Earth orbit, including the evolution of self-sustaining commercial activities;

"(viii) an assessment on the technical limiting factor of the ISS lifetime, including a list of critical components and their expected lifetime and availability;

"(ix) an evaluation of the potential for expanding the use of ISS facilities to accommodate the needs of researchers and other users, including changes to policies, regulations, and laws that would stimulate greater private and public involvement on the ISS; and

"(x) such other information as may be necessary to fully describe the justification for and feasibility of extending the service life of the ISS, including the potential scientific or technological benefits to the Federal Government or public, or to academic or commercial entities;

"(F) an evaluation of the functions, roles, and responsibilities for management and operation of the ISS and a determination of—

"(i) those functions, roles, and responsibilities the Federal Government should retain during the lifecycle of the ISS;

"(ii) those functions, roles, and responsibilities that could be transferred to the commercial space sector;

"(iii) the metries that would indicate the commercial space sector's readiness and ability to assume the functions, roles, and responsibilities described in clause (ii); and

"(iv) any necessary changes to any agreements or other documents and the

law to enable the activities described in subparagraphs (B) and (C); and

''(G) progress on meeting human exploration research objectives on ISS and prospects for accomplishing future exploration and other research objectives on future commercially supplied low-Earth orbit platforms or migration of those objectives to cis-lunar space.

''(3) DEMONSTRATIONS.—Demonstrations identified under paragraph (2) may—

''(A) test the capabilities described in paragraph (2)(A); and

''(B) demonstrate or test capabilities, including commercial modules or deep space habitats, Environmental Control and Life Support Systems, orbital satellite assembly, exploration space suits, a node that enables a wide variety of activity, including multiple commercial modules and airlocks, additional docking or berthing ports for commercial crew and cargo, opportunities for the commercial space sector to cost share for transportation and other services on the ISS, and other commercial activities.''.

TITLE IV—ADVANCING HUMAN DEEP SPACE EXPLORATION

Subtitle A—Human Exploration Goals and Objectives

SEC. 411. HUMAN EXPLORATION LONG-TERM GOALS.

Section 202(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(a)) is amended to read as follows:

''(a) LONG-TERM GOALS.—The long-term goals of the human space flight and exploration efforts of NASA shall be—

''(1) to expand permanent human presence beyond low-Earth orbit and to do so, where practical, in a manner involving international, academic, and industry partners; and

''(2) the peaceful settlement of a location in space or on another celestial body and a thriving space economy in the 21st century.''.

SEC. 412. GOALS AND OBJECTIVES.

Section 202(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(b)) is amended—

(1) in paragraph (3), by striking ''; and'' and inserting a semicolon;

(2) in paragraph (4), by striking the period at the end and inserting ''; and''; and

(3) by adding at the end the following:

''(5) to achieve human exploration of Mars, including the establishment of a capability to extend human presence, including potential human habitation, on the surface of Mars.''.

SEC. 413. VISION FOR SPACE EXPLORATION.

Section 20302 of title 51, United States Code, is amended—

(1) in subsection (a), by inserting ''in cis-lunar space or'' after ''sustained human presence''; and

(2) by amending subsection (b) to read as follows:

''(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.''.

SEC. 414. EXPLORATION PLAN AND PROGRAMS.

Section 70502(2) of title 51, United States Code, is amended to read as follows:

''(2) implement an exploration research and technology development program to enable human and robotic operations consistent with section 20302(b) of this title;''.

SEC. 415. STEPPING STONE APPROACH TO EXPLORATION.

Section 70504 of title 51, United States Code, is amended to read as follows:

''§ 70504. Stepping stone approach to exploration

''(a) IN GENERAL.—In order to maximize the cost-effectiveness of the long-term exploration and utilization activities of the United States, the Administrator shall take all necessary steps, including engaging international, academic, and industry partners to ensure that activities in the Administration's human exploration program balance how those activities might also help meet the requirements of future exploration and utilization activities leading to human habitation on the surface of Mars.

''(b) COMPLETION.—Within budgetary considerations, once an exploration-related project enters its development phase, the Administrator shall seek, to the maximum extent practicable, to complete that project without undue delays.''.

Subtitle B—Assuring Core Capabilities for Exploration

SEC. 421. SPACE LAUNCH SYSTEM AND ORION.

(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 (referred to in this section as "EGS") 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) SENSE OF CONGRESS ON SPACE LAUNCH SYSTEM, ORION, AND EGS.—It is the sense of Congress that—

(1) as the United States works to send humans on a series of missions on or near 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; and

(3) continuity of purpose within the Space Launch System and Orion programs are imperative as NASA prepares for the uncrewed mission, EM–1, planned for 2018 followed by the crewed mission, EM–2, in cis-lunar space planned for 2021, and for subsequent missions beginning with EM–3 extending into cis-lunar space and eventually to Mars.

(c) IN GENERAL.—

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

(A) an uncrewed exploration mission to demonstrate the capability of both the Space

Launch System and Orion as an integrated system by 2018;

(B) a crewed exploration mission to demonstrate the Space Launch System, including the Core Stage and Exploration Upper Stages, and the crewed Orion by 2021;

(C) subsequent missions beginning with EM–3 using the Space Launch System and Orion to extend into cis-lunar space and eventually to Mars; and

(D) development of a deep space habitat as the next element in a deep space exploration architecture along with the Space Launch System and Orion.

(2) 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.

Subtitle C—Journey to Mars

SEC. 431. SPACE TECHNOLOGY INFUSION.

(a) SENSE OF CONGRESS.—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 and reduce astronaut health risks, reduce radiation exposure, consumables, and mass of materials required for the journey.

(b) POLICY.—It is the policy of the United States that the Administrator 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 and fundamental research, and technologies to expand the boundaries of the national aerospace enterprise.

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

SEC. 432. 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. 433. STRATEGIC FRAMEWORK FOR HUMAN SPACEFLIGHT AND EXPLORATION.

(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 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 strategic framework, 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 developments and implementation would influence future development and implementation; and~~

~~(4) a strategic framework should begin with low-Earth orbit, then address progress beyond low-Earth orbit to cis-lunar space in greater detail than future missions ultimately aimed at human arrival and activities on or near Mars.~~

~~(b) STRATEGIC FRAMEWORK.—~~

~~(1) IN GENERAL.—The Administrator shall develop a strategic framework, including, a critical decision plan, to expand human presence beyond low-Earth orbit, including to cis-lunar space, the moons of Mars, the surface of Mars, and beyond.~~

(2) SCOPE.—The strategic framework shall include—

(A) an integrated set of exploration, science, and other goals and objectives of a United States human space exploration program with the long-term goal of human missions near to 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 exploration objectives developed under subparagraph (A);

(C) precursor missions in cis-lunar space and other missions or activities necessary to meet the exploration objectives developed under subparagraph (A);

(D) capabilities and technologies, including the Space Launch System, Orion, a deep space habitat, and other capabilities, that enable the exploration 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; and

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

(3) CONSIDERATIONS.—In developing the strategic framework, 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) an organizational approach to ensure collaboration and coordination among NASA's Mission Directorates under section 621, when appropriate;

(D) building upon the initial uncrewed mission, EM–1, and first crewed mission, EM–2, of the Space Launch System and Orion to establish a sustainable cadence of missions ex-

tending human exploration missions into cis-lunar space;

(E) developing the 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 one 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) risks to human health and sensitive onboard technologies, including radiation exposure;

(J) evaluating the 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 432(8).

(4) CRITICAL DECISION PLAN ON HUMAN SPACE EXPLORATION.—As part of the strategic framework, 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; and

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

(5) REPORTS.—The Administrator shall submit an initial strategic framework, including a critical decision plan, to the appropriate committee of Congress before December 31, 2017, and an updated strategic framework biennially thereafter.

SEC. 434. ADVANCED SPACE SUIT CAPABILITY.

(a) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a detailed plan for achieving an advanced space suit capability that aligns with the crew needs for exploration enabled by the space launch system and Orion, including an evaluation of the merit of delivering the planned suit system for use on the ISS.

(b) CONSIDERATIONS.—In developing the detailed plan under subsection (a), the Administrator shall consider leveraging NASA's existing investments and technologies.

SEC. 435. ASTEROID ROBOTIC REDIRECT MISSION.

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

(1) NASA initially estimated that the Asteroid Robotic Redirect Mission would launch in December 2020 and cost no more than $1.25 billion, excluding launch and operations.

(2) On July 15, 2016, NASA conducted its Key Decision Point–B review of the Asteroid Robotic Redirect Mission or approval for Phase B in mission formulation.

(3) During the Key Decision Point–B review, NASA estimated that costs have grown to $1.4 billion excluding launch and operations for a launch in December 2021 and the agency must evaluate whether to accept the increase or reduce the Asteroid Robotic Redirect Mission's scope to stay within the cost cap set by the Administrator.

(4) In April 2015, the NASA Advisory Council—

(A) issued a finding that—

(i) high-performance solar electric propulsion will likely be an important part of an architecture to send humans to Mars; and

(ii) maneuvering a large test mass is not necessary to provide a valid in-space test of a new solar electric propulsion stage;

(B) determined that a solar electric propulsion mission will contribute more directly to the goal of sending humans to Mars if the mission

is focused entirely on development and validation of the solar electric propulsion stage; and

(C) determined that other possible motivations for acquiring and maneuvering a boulder, such as asteroid science and planetary defense, do not have value commensurate with their probable cost.

(5) The Asteroid Robotic Redirect Mission is competing for resources with other critical exploration development programs, including the Space Launch System, Orion, commercial crew, and a habitation module.

(6) In 2014, the NASA Advisory Council recommended that NASA conduct an independent cost and technical assessment of the Asteroid Robotic Redirect Mission.

(7) NASA completed the assessment under paragraph (6) and reviewed it as part of the agency's Key Decision Point–B review.

(8) In 2015, the NASA Advisory Council recommended that NASA preserve the following key objectives if the program needed to be descoped:

(A) Development of high power solar electric propulsion.

(B) Ability to maneuver in a low gravity environment in deep space.

(9) In January 2015 and July 2015, the NASA Advisory Council expressed its concern to NASA about the potential for growing costs for the program and highlighted that choices would need to be made about the program's content.

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

(1) the technological and scientific goals of the Asteroid Robotic Redirect Mission may not be commensurate with the cost; and

(2) alternative missions may provide a more cost effective and scientifically beneficial means to demonstrate the technologies needed for a human mission to Mars that would otherwise be demonstrated by the Asteroid Robotic Redirect Mission.

(c) EVALUATION AND REPORT.—Not later than 180 days after the date of enactment of this Act, the Administrator shall—

(1) conduct an evaluation of—

(A) alternative approaches to the Asteroid Robotic Redirect Mission for demonstrating the technologies and capabilities needed for a human mission to Mars that would otherwise be

demonstrated by the Asteroid Robotic Redirect Mission;

(B) the scientific and technical benefits of the alternatives approaches identified in subparagraph (A) compared to the Asteroid Redirect Robotic Mission to future human exploration;

(C) the commercial benefits of the alternative approaches identified in subparagraph (A), including the impact on the development of domestic solar electric propulsion technology to bolster United States competitiveness in the global marketplace; and

(D) a comparison of the estimated costs of the alternative approaches identified in subparagraph (A); and

(2) submit to the appropriate Committees of Congress a report on the evaluation under paragraph (1), including any recommendations.

Subtitle D—Scott Kelly Human Spaceflight and Exploration Act

SEC. 441. SHORT TITLE.

This subtitle may be cited as the ''Scott Kelly Human Spaceflight and Exploration Act''.

SEC. 442. FINDINGS; SENSE OF CONGRESS.

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

(1) Human space exploration can pose significant challenges and is full of substantial risk, which has ultimately claimed the lives of 24 National Aeronautics and Space Administration astronauts serving in the line of duty.

(2) As United States government astronauts participate in long-duration and exploration spaceflight missions they may experience increased health risks, such as vision impairment, bone demineralization, and behavioral health and performance risks, and may be exposed to galactic cosmic radiation. Exposure to high levels of radiation and microgravity can result in acute and long-term health consequences that can increase the risk of cancer and tissue degeneration and have potential effects on the musculoskeletal system, central nervous system, cardiovascular system, immune function, and vision.

(3) To advance the goal of long-duration and exploration spaceflight missions, United States government astronaut Scott Kelly participated in a 1-year twins study in space while his identical twin brother, former United States government astronaut

Mark Kelly, acted as a human control specimen on Earth, providing an understanding of the physical, behavioral, microbiological, and molecular reaction of the human body to an extended period of time in space.

(4) Since the Administration currently provides medical monitoring, diagnosis, and treatment for United States government astronauts during their active employment, given the unknown long-term health consequences of long-duration space exploration, the Administration has requested statutory authority from Congress to provide medical monitoring, diagnosis, and treatment to former crewmembers of human space flights for psychological and medical conditions associated with human space flight.

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

(1) the United States should continue to seek the unknown and lead the world in space exploration and scientific discovery as the Administration prepares for long-duration and exploration spaceflight in deep space and an eventual mission to Mars;

(2) data relating to the health of astronauts will become increasingly valuable to improving our understanding of many diseases humans face on Earth;

(3) the Administration should provide the type of monitoring, diagnosis, and treatment described in subsection (a) only for conditions the Administration considers unique to the training or exposure to the spaceflight environment of crewmembers of human space flights and should not require any former crewmembers to participate in the Administration's monitoring;

(4) such monitoring, diagnosis, and treatment should not replace a former crewmember's private health insurance;

(5) expanded data acquired from such monitoring, diagnosis, and treatment should be used to tailor treatment, inform the requirements for new spaceflight medical hardware, and develop controls in order to prevent disease occurrence in the astronaut corps;

(6) the Administration's existing radiation exposure standards, which have been used for missions pertaining to the Space Shuttle and the ISS, would limit missions to durations of 150 to 250 days and would pose significant challenges to long-duration or

exploration spaceflight or a multiyear mission to Mars; and

(7) the 340-day space mission of Scott Kelly aboard the ISS—

(A) was pivotal for the goal of the United States for humans to explore deep space and Mars as the mission generated new insight into how the human body adjusts to weightlessness, isolation, radiation, and the stress of long-duration space flight; and

(B) will help support the physical and mental well-being of astronauts during longer space exploration missions in the future.

SEC. 443. MEDICAL MONITORING AND RESEARCH RELATING TO HUMAN SPACE FLIGHT.

(a) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, is amended by adding at the end the following:

"§ 20148. Medical monitoring and research relating to human space flight

"(a) IN GENERAL.—Notwithstanding any other provision of law, the Administrator may provide for the medical monitoring, diagnosis, and treatment of a United States government astronaut, or a former United States government astronaut or payload specialist for conditions

that the Administrator considers associated with human space flight, including scientific and medical tests for psychological and medical conditions.

''(b) EXCLUSIONS.—The Administrator may not—

''(1) provide for medical monitoring, diagnosis, or treatment of a United States government astronaut, or a former United States government astronaut or payload specialist under subsection (a) for any psychological or medical condition that is not associated with human space flight; or

''(2) require a former United States government astronaut or payload specialist to participate in the monitoring authorized under subsection (a).

''(c) PRIVACY.—Consistent with applicable provisions of law relating to privacy, the Administrator shall protect the privacy of all medical records generated under subsection (a) and accessible to the Administration.

''(d) REGULATIONS.—The Administrator shall promulgate such regulations as are necessary to carry out this section.''.

(b) TABLE OF CONTENTS.—The table of contents for chapter 201 of title 51, United States Code, is amended by inserting after the item relating to section 20147 the following:

''20148. Medical monitoring and research relating to human space flight.''.

TITLE V—ADVANCING SPACE SCIENCE

SEC. 501. MAINTAINING A BALANCED SPACE SCIENCE PORTFOLIO.

(a) SCIENCE PORTFOLIO.—Section 803 of the National Aeronautics and Space Administration Authorization Act of 2010 (Public Law 111–267; 124 Stat. 2832) is amended to read as follows:

"SEC. 803. OVERALL SCIENCE PORTFOLIO.

''Congress restates its sense that—

''(1) a balanced and adequately funded set of activities, consisting of research and analysis grants 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 should set science priorities by following the guidance provided by the scientific community through the National Academy of Sciences' decadal surveys.''.

(b) CONFORMING AMENDMENT.—The item relating to section 803 in the table of contents in section 1(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (Public Law 111–267; 124 Stat.

2806) is amended by striking ''Overall science portfolio-sense of the Congress'' and inserting ''Overall science portfolio''.

SEC. 502. PLANETARY SCIENCE.

(a) FINDINGS.—Congress finds that—

(1) 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 decadal survey for planetary science, the Administrator shall ensure, to the greatest extent practicable, the completion of a balanced set of Discovery, New Frontiers, and flagship missions.

(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.

SEC. 503. JAMES WEBB SPACE TELESCOPE.

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

(1) the James Webb Space Telescope should significantly advance our understanding of star and planet formation, improve our knowledge of the early universe, and support United States leadership in astrophysics; and

(2) consistent with annual Government Accountability Office reviews of the James Webb Space Telescope program, the Administrator should continue robust surveillance of the performance of the James Webb Space Telescope project and continue to improve the reliability of cost estimates and contractor performance data and other major spaceflight projects in order to enhance NASA's

ability to successfully deliver the James Webb Space Telescope on-time and within budget.

SEC. 504. SENSE OF CONGRESS ON WIDE-FIELD INFRARED SURVEY TELESCOPE.

It is the sense of Congress that—

(1) the Wide-Field Infrared Survey Telescope (commonly known as ''WFIRST'') mission has the potential to enable scientific discoveries that will transform our understanding of the universe; and

(2) the Administrator, to the extent practicable, should make progress on the technologies and capabilities needed to position the Administration to meet the objectives, as outlined in the 2010 National Academies' Astronomy and Astrophysics Decadal Survey, in a way that maximizes the scientific productivity of meeting those objectives for the resources invested.

SEC. 505. SENSE OF CONGRESS ON MARS 2020 ROVER.

It is the sense of Congress that—

(1) the Mars 2020 mission, to develop a Mars rover and to enable the return of samples to Earth, should remain a priority for NASA; and

(2) the Mars 2020 mission—

(A) should significantly increase our understanding of Mars;

(B) should help determine whether life previously existed on that planet; and

(C) should provide opportunities to gather knowledge and demonstrate technologies that address the challenges of future human expeditions to Mars.

SEC. 506. EUROPA.

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

(1) Studies of Europa, Jupiter's moon, indicate that Europa may provide a habitable environment, as it contains key ingredients known to support life on Earth, including liquid water, heat, chemistry, and time.

(2) In 2012, using the Hubble Space Telescope, NASA scientists observed water vapor around the south polar region of Europa, which provides potential evidence of water plumes in that region.

(3) For decades, the Europa mission has consistently ranked as a high priority mission for the scientific community.

(4) The Europa mission was ranked as the top priority mission in the previous Planetary Science Decadal Survey and ranked as the second-highest

priority in the current Planetary Science Decadal Survey.

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

(1) the Europa mission could provide another avenue in which to capitalize on our Nation's current investment in the Space Launch System that would significantly reduce the transit time for such a deep space mission; and

(2) a scientific, robotic exploration mission to Europa, as prioritized in both Planetary Science Decadal Surveys, should be supported.

TITLE VI—MAXIMIZING EFFICIENCY

Subtitle A—Agency Information Technology and Cybersecurity

SEC. 611. INFORMATION TECHNOLOGY GOVERNANCE.

(a) IN GENERAL.—The Administrator, in consultation with the chief information officer of NASA, shall—

(1) ensure the NASA Chief Information Officer has a significant role in the management, governance, and oversight processes related to information technology operations and investments and information security programs for the protection of NASA systems;

~~(2) establish the NASA Chief Information Officer as a direct report to the Administrator;~~

~~(3) ensure the NASA Chief Information Officer has the appropriate resources and insight to oversee NASA information technology and information security operations and investments;~~

~~(4) provide an information technology program management framework to increase the efficiency and effectiveness of information technology investments, including relying on metrics for identifying and reducing potential duplication, waste, and cost;~~

~~(5) establish a monetary threshold for all agency information technology investments and related contracts, including non-highly and highly specialized and specialized information technology, regardless of the procurement instrument, over which the NASA Chief Information Officer shall have final approval;~~

~~(6) improve the operational linkage between the NASA Chief Information Officer and each NASA mission directorate, center, and mission support office to ensure both agency and mission needs are considered in agency-wide information technology and information security management and oversight;~~

(7) review the portfolio of information technology investments and spending, including information technology-related investments included as part of activities within NASA mission directorates that may not be considered information technology, to ensure investments are recognized and reported appropriately based on guidance from the Office of Management and Budget;

(8) consider appropriate revisions to the charters of information technology boards and councils that inform information technology investment and operation decisions; and

(9) consider whether the Chief Information Officer should have a seat on any boards or councils described in paragraph (8).

SEC. 612. INFORMATION TECHNOLOGY STRATEGIC PLAN.

(a) IN GENERAL.—Subject to subsection (b), the NASA Chief Information Officer, in consultation with the chief information officer of each Administration center, shall develop an information technology strategic plan to guide NASA information technology management and strategic objectives.

(b) REQUIREMENTS.—In developing the strategic plan, the NASA Chief Information Officer shall ensure that the strategic plan is consistent with—

(1) the deadline under section 306(a) of title 5, United States Code, and

(2) the requirements under section 3506 of title 44, United States Code.

(c) CONTENTS.—The strategic plan shall include—

(1) near and long-term goals and objectives for leveraging information technology;

(2) a plan for how the NASA Chief Information Officer will submit to Congress of a list of information technology projects, including completion dates and risk level in accordance with guidance from the Office of Management and Budget;

(3) an implementation overview for an agency-wide centralized approach to information technology investments and operations, including reducing barriers to cross-center collaboration;

(4) coordination by the NASA Chief Information Officer with centers and mission directorates to ensure that information technology policies are effectively and efficiently implemented across the agency;

(5) a plan to increase the efficiency and effectiveness of information technology investments, including a description of how unnecessarily duplicative, wasteful, legacy, or outdated information technology across NASA will be identified and elimi-

nated, and a schedule for the identification and elimination of such information technology;

(6) a plan for improving the information security of agency information and agency information systems, including improving security control assessments and role-based security training of employees; and

(7) submission by the NASA Chief Information Officer to Congress of information regarding high risk projects and cybersecurity risks.

(d) CONGRESSIONAL OVERSIGHT.—The NASA Chief Information Officer shall submit to the appropriate committees of Congress the strategic plan under subsection (a) and any updates thereto.

SEC. 613. CYBERSECURITY.

(a) FINDING.—The security of NASA information and information systems is vital to the success of the mission of the agency.

(b) INFORMATION SECURITY PLAN.—Section 1207 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18445) is amended—

(1) by redesignating subsections (a) through (c) as subsections (b) through (d), respectively;

(2) by inserting before subsection (b), as redesignated, the following:

"(a) AGENCY-WIDE INFORMATION SECURITY PLAN.—

"(1) IN GENERAL.—Not later than 1 year after the date of enactment of the National Aeronautics and Space Administration Transition Authorization Act of 2016, the Administrator shall implement the information security plan developed under paragraph (2) and take such further actions as the Administrator considers necessary to improve the information security system in accordance with this section.

"(2) INFORMATION SECURITY PLAN.—Subject to paragraphs (3), (4), and (5), the chief information officer of NASA, shall develop an agency-wide information security plan to enhance information security for NASA information and information infrastructure.

"(3) REQUIREMENTS.—In developing the plan under paragraph (2), the chief information officer shall ensure that the plan—

"(A) is consistent with policies, standards, guidelines, and directives on information security under subchapter II of chapter 35 of title 44, United States Code;

~~"(B) is consistent with the standards and guidelines under section 11331 of title 40, United States Code; and~~

~~"(C) meets applicable National Institute of Standards and Technology information security standards and guidelines.~~

~~"(4) APPROVAL.—The chief information officer shall submit the plan to the Administrator for approval prior to its implementation.~~

~~"(5) CONTENTS.—The plan shall include—~~

~~"(A) an overview of the requirements of the information security system;~~

~~"(B) an agency-wide risk management framework for information security;~~

~~"(C) a description of the information security system management controls and common controls that are necessary to ensure compliance with information security-related requirements;~~

~~"(D) an identification and assignment of roles, responsibilities, and management commitment for information security at the agency;~~

~~"(E) coordination among organizational entities, including between each center, facility, mission directorate, and mission support office,~~

and among agency entities responsible for different aspects of information security;

''(F) heightened consideration of the need to protect the information security of mission-critical systems and activities and high-impact and moderate-impact information systems; and

''(G) a schedule of frequent reviews and updates, as necessary, of the plan.''; and

(3) in subsection (b), as redesignated—

(A) in paragraph (1)—

(i) in subparagraph (B), by striking ''; and'' and inserting a semicolon;

(ii) in subparagraph (C), by striking the period at the end and inserting ''; and''; and

(iii) by adding at the end the following:

''(D) an update on the agency's efforts to apply additional information security protections to secure high-impact and moderate-impact information systems and mission-critical systems and activities, including those systems that control spacecraft and maintain critical data sources.''; and

(B) in paragraph (2), by striking ''section 3545'' and inserting ''section 3555''.

SEC. 614. OVERSIGHT IMPLEMENTATION PROGRESS.

Not later than 90 days after the date of enactment of this Act, and periodically thereafter until the information security plan under section 1207 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18445), as amended, is developed and implemented agency-wide, the Administrator shall provide to the appropriate committees of Congress an update on the progress made toward implementation of or response to—

(1) the information security plan under that section; and

(2) the information security-related recommendations made by the NASA Inspector General and the Comptroller General in the 5 years preceding the date of enactment of this Act.

SEC. 615. SOFTWARE OVERSIGHT.

The Administrator shall—

(1) develop a strategic plan to transition NASA from legacy software by adopting a service-based acquisition model in line with industry best practices;

(2) develop and implement an agency-wide software license management policy to improve cen-

tralization, lifecycle management, and procurement education, including education on contract negotiations, relevant laws and regulations, and agency-wide contract terms and conditions; and

(3) direct an agency-wide inventory of NASA's total software licenses and spending, including costs, benefits, usage, and trending data.

SEC. 616. SECURITY MANAGEMENT OF FOREIGN NATIONAL ACCESS.

The Administrator shall notify the appropriate committees of Congress when the agency has implemented the information technology security recommendations from the National Academy of Public Administration on foreign national access management, based on reports from January 2014 and March 2016.

SEC. 617. CYBERSECURITY OF WEB APPLICATIONS.

Not later than 180 days after the date of enactment of this Act, the NASA Chief Information Officer shall—

(1) develop a plan, including such actions and milestones as are necessary, to fully remediate security vulnerabilities of NASA web applications within a timely fashion after discovery; and

(2) implement the recommendation from the NASA Inspector General in the audit report dated July 10, 2014, (IG–14–023) to remove from the

~~Internet or secure with a web application firewall all NASA web applications in development or testing mode.~~

~~Subtitle B—Collaboration Among Mission Directorates and Other Matters~~

~~SEC. 621. COLLABORATION AMONG MISSION DIRECTORATES.~~

~~The Administrator shall encourage an interdisciplinary approach among all NASA mission directorates and divisions, whenever appropriate, for projects or missions—~~

~~(1) to improve coordination, and encourage collaboration and early planning on scope;~~

~~(2) to determine areas of overlap or alignment;~~

~~(3) to find ways to leverage across divisional perspectives to maximize the outcomes; and~~

~~(4) to be more efficient with resources and funds.~~

~~SEC. 622. NASA LAUNCH CAPABILITIES COLLABORATION.~~

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

~~(1) The Launch Services Program is responsible for the acquisition, management, and technical oversight of commercial launch services for NASA's science and robotic missions.~~

~~(2) The Commercial Crew Program is responsible for the acquisition, management, and technical oversight of commercial crew transportation systems.~~

~~(3) The Launch Services Program and Commercial Crew Program have worked together to gain exceptional technical insight into the contracted launch service providers that are common to both programs.~~

~~(4) The Launch Services Program has a long history of oversight of 12 different launch vehicles and over 80 launches.~~

~~(5) Co-location of the Launch Services Program and Commercial Crew Program has enabled the Commercial Crew Program to efficiently obtain the launch vehicle technical expertise of and provide engineering and analytical support to the Commercial Crew Program.~~

~~(b) SENSE OF CONGRESS.—It is the sense of Congress that—~~

~~(1) the Launch Services Program and Commercial Crew Program each benefit from communication and coordination of launch manifests, technical information, and common launch vehicle insight between the programs; and~~

(2) such communication and coordination is enabled by the co-location of the programs.

(c) IN GENERAL.—The Administrator shall pursue a strategy for acquisition of crewed transportation services and non-crewed launch services that continues to enhance communication, collaboration, and coordination between the Launch Services Program and the Commercial Crew Program.

SEC. 623. COMMERCIAL SPACE LAUNCH COOPERATION.

(a) FINDING.—Congress recognized the benefit of commercial space launch cooperation between the Federal Government and the private sector when it granted the Secretary of Defense authority to foster cooperation between the Department of Defense and certain covered entities relating to space transportation infrastructure under section 2276 of title 10, United States Code.

(b) IN GENERAL.—Chapter 505 of title 51, United States Code, is amended by adding at the end the following:

"§ 50507. Commercial launch cooperation

"(a) AUTHORITY FOR AGREEMENTS RELATING TO SPACE TRANSPORTATION INFRASTRUCTURE.—Notwithstanding section 50504, the Administrator—

"(1) may enter into an agreement with a covered entity to provide the covered entity with sup-

port and services related to the space transportation infrastructure of the Administration—

"(A) to maximize the use of the space transportation infrastructure of the Administration by the private sector in the United States; and

"(B) to encourage commercial space activities by enabling investment by covered entities in the space transportation infrastructure of the Administration; and

"(2) at the request of the covered entity, may include that support and services in the contracted space launch and reentry range support requirements of the Administration if—

"(A) the Administrator determines that including that support and services in the requirements—

"(i) is in the best interest of the Federal Government;

"(ii) does not interfere with the requirements of the Administration; and

"(iii) does not compete with the commercial space activities of other covered entities; and

‘‘(B) any commercial requirement included in the agreement has full non-Federal funding before the execution of the agreement.

‘‘(b) CONTRIBUTIONS.—

‘‘(1) IN GENERAL.—The Administrator may enter into an agreement with a covered entity on a cooperative and voluntary basis to accept funds, services, and equipment to carry out the purposes in subsection (a)(1).

‘‘(2) USE OF CONTRIBUTIONS.—Any funds, services, or equipment accepted by the Administrator under this subsection—

‘‘(A) may be used only for the objectives specified in this section in accordance with terms of use set forth in the agreement entered into under this subsection; and

‘‘(B) shall be managed by the Administrator in accordance with regulations promulgated under subsection (d).

‘‘(3) REQUIREMENTS WITH RESPECT TO AGREEMENTS.—An agreement entered into with a covered entity under this subsection shall—

‘‘(A) address the terms of use, ownership, and disposition of the funds, services, or equipment contributed under the agreement; and

"(B) include a provision that the covered entity will not recover the costs of its contribution through any other agreement with the United States.

"(c) ANNUAL REPORT.—Not later than January 31 of each year, the Administrator shall submit to the appropriate committees of Congress a report on the process used to establish agreements under subsections (a) and (b), including noticing announcements of opportunities and criteria for selecting a covered entity, and the funds, services, and equipment accepted and used by the Administrator under this section during the preceding fiscal year.

"(d) REGULATIONS.—The Administrator shall promulgate regulations to carry out this section.

"(e) DEFINITIONS.—In this section:

"(1) COVERED ENTITY.—In this section, the term 'covered entity' means—

"(A) a non-Federal entity that—

"(i) is organized under the laws of the United States or of any jurisdiction within the United States; and

"(ii) is engaged in commercial space activities; or

"(B) an entity that controls, is controlled by, or is under common control with, a non-Federal entity described in subparagraph (A).

"(2) LAUNCH SUPPORT FACILITIES.—The term 'launch support facilities' has the meaning given the term in section 50501.

"(3) SPACE RECOVERY SUPPORT FACILITIES.—The term 'space recovery support facilities' has the meaning given the term in section 50501.

"(4) SPACE TRANSPORTATION INFRASTRUCTURE.—The term 'space transportation infrastructure' has the meaning given that term in section 50501.".

(c) TABLE OF CONTENTS.—The table of contents for chapter 505 of title 51, United States Code, is amended by adding after the item relating to section 50506 the following:

"50507. Commercial space launch cooperation.".

SEC. 624. DETECTION AND AVOIDANCE OF COUNTERFEIT PARTS.

(a) FINDINGS.—Congress finds the following:

(1) A 2012 investigation by the Committee on Armed Services of the Senate of counterfeit electronic parts in the Department of Defense supply chain from 2009 through 2010 uncovered 1,800 cases and over one million counterfeit parts and ex-

posed the threat such counterfeit parts pose to service members and national security.

(2) Since 2010, the Comptroller General of the United States has identified in 3 separate reports the risks and challenges associated with counterfeit parts and counterfeit prevention at both the Department of Defense and NASA, including inconsistent definitions of counterfeit parts, poorly targeted quality control practices, and potential barriers to improvements to these practices.

(b) SENSE OF CONGRESS.—It is the sense of Congress that the presence of counterfeit electronic parts in the NASA supply chain poses a danger to United States government astronauts, crew, and other personnel and a risk to the agency overall.

(c) REGULATIONS.—

(1) IN GENERAL.—Not later than 270 days after the date of enactment of this Act, the Administrator shall revise the NASA Supplement to the Federal Acquisition Regulation to improve the detection and avoidance of counterfeit electronic parts in the supply chain.

(2) CONTRACTOR RESPONSIBILITIES.—In revising the regulations under paragraph (1), the Administrator shall—

(A) require each covered contractor—

(i) to detect and avoid the use or inclusion of any counterfeit parts in electronic parts or products that contain electronic parts; and

(ii) to take such corrective actions as the Administrator considers necessary to remedy the use or inclusion described in clause (i);

(iii) including a subcontractor, to notify the applicable NASA contracting officer not later than 30 calendar days after the date the covered contractor becomes aware, or has reason to suspect, that any end item, component, part or material contained in supplies purchased by NASA, or purchased by a covered contractor or subcontractor for delivery to, or on behalf of, NASA, contains a counterfeit electronic part or suspect counterfeit electronic part;

(B) prohibit the cost of counterfeit electronic parts, suspect counterfeit electronic parts, and any corrective action described under subparagraph (A)(ii) from being included as allowable costs under agency contracts, unless—

(i) the covered contractor has an operational system to detect and avoid counterfeit electronic parts and suspect counterfeit electronic parts that has been reviewed and approved by NASA or the Department of Defense; and

(ii) the covered contractor has provided the notice under subparagraph (A)(iii); or

(iii) the counterfeit electronic parts or suspect counterfeit electronic parts were provided to the covered contractor as Government property in accordance with part 45 of the Federal Acquisition Regulation.

(3) SUPPLIERS OF ELECTRONIC PARTS.—In revising the regulations under paragraph (1), the Administrator shall—

(A) require NASA and covered contractors, including subcontractors, at all tiers—

(i) to obtain electronic parts that are in production or currently available in stock from—

(I) the original manufacturers of the parts or their authorized dealers; or

(II) suppliers who obtain such parts exclusively from the original manufacturers of the parts or their authorized dealers; and

(ii) to obtain electronic parts that are not in production or currently available in stock from suppliers that meet qualification requirements established under subparagraph (C);

(B) establish documented requirements consistent with published industry standards or Government contract requirements for—

(i) notification of the agency; and

(ii) inspection, testing, and authentication of electronic parts that NASA or a covered contractor, including a subcontractor, obtains from any source other than a source described in subparagraph (A);

(C) establish qualification requirements, consistent with the requirements of section 2319 of title 10, United States Code, pursuant to which NASA may identify suppliers that have appropriate policies and procedures in place to detect and avoid counterfeit electronic

parts and suspect counterfeit electronic parts; and

(D) authorize a covered contractor, including a subcontractor, to identify and use additional suppliers beyond those identified under subparagraph (C) if—

(i) the standards and processes for identifying such suppliers comply with established industry standards;

(ii) the covered contractor assumes responsibility for the authenticity of parts provided by such suppliers under paragraph (2); and

(iii) the selection of such suppliers is subject to review and audit by NASA.

(d) DEFINITIONS.—In this section:

(1) COVERED CONTRACTOR.—The term ''covered contractor'' means a contractor that supplies an electronic part, or a product that contains an electronic part, to NASA.

(2) ELECTRONIC PART.—The term ''electronic part'' means a discrete electronic component, including a microcircuit, transistor, capacitor, resistor, or diode, that is intended for use in a safety or mission critical application.

SEC. 625. EDUCATION AND OUTREACH.

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

(1) United States competitiveness in the 21st century requires engaging the science, technology, engineering, and mathematics (referred to in this section as ''STEM'') talent in all States;

(2) the Administration is uniquely positioned to educate and inspire students and the broader public on STEM subjects and careers;

(3) the Administration's Education Mission Directorates, along with the other mission directorates, have been effective in delivering educational content because of the strong engagement of Administration scientists and engineers in the Administration's education and outreach activities; and

(4) the Administration's education and outreach programs, including the Experimental Program to Stimulate Competitive Research (EPSCoR) and the Space Grant College and Fellowship Program, reflect the Administration's successful commitment to growing and diversifying the national science and engineering workforce.

(b) CONTINUATION OF EDUCATION AND OUTREACH ACTIVITIES AND PROGRAMS.—

~~(1) IN GENERAL.—The Administrator shall continue engagement with the public and education opportunities for students via all the Administration's mission directorates to the maximum extent practicable.~~

~~(2) REPORT.—Not later than 60 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the Administration's near-term outreach plans for advancing space law education.~~

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "National Aeronautics and Space Administration Transition Authorization Act of 2016".

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

SEC. 2. DEFINITIONS.

In this Act:

(1) ADMINISTRATION.—The term "Administration" means the National Aeronautics and Space Administration.

(2) ADMINISTRATOR.—The term "Administrator" means the Administrator of the National Aeronautics and Space Administration.

(3) APPROPRIATE COMMITTEES OF CONGRESS.—The term "appropriate committees of Congress" means—

(A) the Committee on Commerce, Science, and Transportation of the Senate; and

(B) the Committee on Science, Space, and Technology of the House of Representatives.

(4) CIS-LUNAR SPACE.—The term "cis-lunar space" means the region of space from the Earth out to and including the region around the surface of the Moon.

(5) DEEP SPACE.—The term "deep space" means the region of space beyond low-Earth orbit, to include cis-lunar space.

(6) GOVERNMENT ASTRONAUT.—The term "government astronaut" has the meaning given the term in section 50902 of title 51, United States Code.

(7) ISS.—The term "ISS" means the International Space Station.

(8) ISS MANAGEMENT ENTITY.—The term "ISS management entity" means the organization with which the Administrator has a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

(9) NASA.—The term "NASA" means the National Aeronautics and Space Administration.

(10) 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).

(11) SPACE LAUNCH SYSTEM.—The term "Space Launch System" has the meaning given the term in section 3 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18302).

TITLE I—AUTHORIZATION OF APPROPRIATIONS

SEC. 101. FISCAL YEAR 2017.

There are authorized to be appropriated to NASA for fiscal year 2017, $19,508,000,000, as follows:

(1) For Exploration, $4,532,000,000.

(2) For Space Operations, $4,950,700,000.

(3) For Science, $5,395,000,000.

(4) For Aeronautics, $601,000,000.

(5) For Space Technology, $686,500,000.

(6) For Education, $108,000,000.

(7) For Safety, Security, and Mission Services, $2,796,700,000.

(8) For Construction and Environmental Compliance and Restoration, $400,000,000.

(9) For Inspector General, $38,100,000.

TITLE II—SUSTAINING NATIONAL SPACE COMMITMENTS

SEC. 201. SENSE OF CONGRESS ON SUSTAINING NATIONAL SPACE COMMITMENTS.

It is the sense of Congress that—

(1) the United States, in collaboration with its international, academic, and industry partners, should sustain and build upon our national space

commitments and investments across Administrations with a continuity of purpose to advance recent achievements of space exploration and space science to extend humanity's reach into deep space, including cis-lunar space, the Moon, the surface and moons of Mars, and beyond;

(2) NASA leaders can best leverage investments in the United States space program by continuing to develop a balanced portfolio for space exploration and space science, including continued development of the Space Launch System, Orion, Commercial Crew Program, Commercial Resupply Services Program, the James Webb Space Telescope, and the ongoing operations of the ISS;

(3) a national, government-led space program that builds on current science and exploration programs, advances human knowledge and capabilities, and opens the frontier beyond Earth for ourselves, our international partners, commercial enterprise, and science is of critical importance to our national destiny and to a future guided by United States values and freedoms;

(4) continuity of purpose and effective execution of core NASA programs are essential for efficient use

of resources in pursuit of timely and tangible accomplishments;

(5) NASA could improve its efficiency and effectiveness by working with industry to streamline existing programs and requirements, procurement practices, institutional footprint, and bureaucracy while preserving effective program oversight, accountability, and safety;

(6) United States government astronauts changed the trajectory of human history toward the promise of the stars, and it is imperative that the United States maintain and enhance its leadership in space exploration and continue to expand freedom and opportunities in space for all Americans that are consistent with the Constitution of the United States; and

(7) NASA is and should remain a multimission agency with a balanced and robust set of core missions in science, space technology, aeronautics, human space flight and exploration, and education.

SEC. 202. FINDINGS.

Congress makes the following findings:

(1) Challenges of the past, such as the cancellation of major programs, have disrupted completion of major space systems thereby—

(A) impeding planning and pursuit of national objectives in human space exploration;

(B) placing the Nation's investment in space exploration at risk; and

(C) degrading the aerospace industrial base.

(2) The National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18301 et seq.) reflects a broad, bipartisan agreement on the path forward for NASA's core missions in science, space technology, aeronautics, human space flight and exploration, and education, which serves as the foundation for the policy updates by this Act.

(3) Sustaining the investment and maximizing utilization of the ISS and ISS National Laboratory with our international and industry partners is—

(A) consistent with the goals and objectives of the United States space program; and

(B) imperative to continuing United States global leadership in human space exploration, science, research, technology development, and education opportunities that contribute to development of the next generation of American scientists, engineers, and leaders, and to creating the opportunity for economic development of low-Earth orbit.

(4) NASA has made measurable progress in development and testing of the Space Launch System and Orion exploration systems with the near-term objectives of the initial integrated test flight and launch in 2018, a human mission in 2021, and continued missions with an annual cadence in cis-lunar space and eventually to the surface of Mars.

(5) The Commercial Crew Program is on schedule to reestablish the capability to launch United States government astronauts from United States soil into low-Earth orbit by the end of 2018.

(6) The Aerospace Safety Advisory Panel, in its 2015 Annual Report, urged continuity of purpose noting concerns over the potential for cost overruns and schedule slips that could accompany significant changes to core NASA programs.

TITLE III—MAXIMIZING UTILIZATION OF THE ISS AND LOW-EARTH ORBIT

SEC. 301. OPERATION OF THE ISS.

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

(1) after 15 years of continuous human presence in low-Earth orbit, the ISS continues to overcome challenges and operate safely;

(2) expansion of partnerships, scientific research, commercial applications, and exploration testbed capabilities of the ISS is essential to ensuring the greatest return on investments made by the United States and its international space partners in the development, assembly, and operations of that unique facility;

(3) a stable and successful Commercial Resupply Services Program and Commercial Crew Program are critical to ensuring timely provisioning of the ISS and to reestablishing the capability to launch United States government astronauts from United States soil into low-Earth orbit;

(4) sustaining United States leadership and progress in human space exploration is enabled in part by continuing utilization of the ISS—

(A) to facilitate the commercialization and economic development of low-Earth orbit;

(B) to serve as a testbed for technologies, and to conduct scientific research and development; and

(C) as an orbital facility enabling research upon—

(i) the health, well-being, and performance of humans in space; and

(ii) the development of in-space systems enabling human space exploration beyond low-Earth orbit;

(5) the Administrator should continue to support the development of the Commercial Crew Program as planned to end reliance upon Russian transport of United States government astronauts to the ISS which has not been possible since the retirement of the Space Shuttle program in 2011; and

(6) the ISS should continue to provide a platform for fundamental, microgravity, discovery-based space life and physical sciences research that is critical for enabling space exploration, protecting humans in space, increasing pathways for commercial space development that depend on advances in basic research, and contribute to advancing science, technology, engineering, and mathematics research.

(b) CONTINUATION OF THE ISS.—Congress reaffirms the policy set forth in section 501 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18351) that it shall be the policy of the United States, in consultation with its international partners in the ISS program, to support full and complete utilization of the ISS through at least 2024.

SEC. 302. TRANSPORTATION TO ISS.

(a) SENSE OF CONGRESS ON COMMERCIAL CREW PROGRAM AND COMMERCIAL RESUPPLY SERVICES PROGRAM.—It is the sense of Congress that—

(1) NASA should build upon the success of the Commercial Orbital Transportation Services and Commercial Resupply Services programs that have allowed private sector companies to partner with NASA to deliver cargo and scientific experiments to the ISS since 2012;

(2) once certified to meet NASA's safety and reliability requirements and fully operational to meet ISS crew transfer needs, the Commercial Crew Program transportation systems should serve as the primary means of transporting United States government astronauts and international partner astronauts from United States soil to and from the ISS;

(3) Commercial Crew Program transportation systems should have the capability of serving as ISS emergency crew rescue vehicles;

(4) the 21st Century Launch Complex Program has enabled significant modernization and infrastructure improvements at launch sites across the United States to support NASA's Commercial Resupply Services Program and other civil and commercial space flight missions; and

(5) the 21st Century Launch Complex Program should be continued in a manner that leverages State and private investments to achieve the goals of the program.

(b) UNITED STATES POLICY.—It is the policy of the United States that, to foster the competitive development, operation, improvement and commercial availability of space transportation services, services for Federal Government access to and return from the ISS, whenever practicable, shall be procured via fair and open competition for well-defined, milestone-based, Federal Acquisition Regulation-based contracts under section 201(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18311(a)).

(c) COMMERCIAL CARGO PROGRAM.—Section 401 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18341) is amended by striking "Commercial Orbital Transportation Services" and inserting "Commercial Resupply Services".

(d) CREW SAFETY.—The Administrator shall protect the safety of United States crews by ensuring commercial crew systems meet all applicable human rating requirements in accordance with section 403(b)(1) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18342(b)(1)).

SEC. 303. ISS TRANSITION PLAN.

(a) FINDINGS.—Congress finds that NASA has been both the primary supplier and consumer of human space flight capabilities and services of the ISS and in low-Earth orbit.

(b) SENSE OF CONGRESS.—It is the sense of Congress that an orderly transition is needed for United States human space flight activities in low-Earth orbit from the current regime, that relies heavily on NASA sponsorship, to a regime where NASA is one of many customers of a low-Earth orbit commercial human space flight enterprise.

(c) REPORTS.—Section 50111 of title 51, United States Code, is amended by adding at the end the following:

"(c) ISS TRANSITION PLAN.—

"(1) IN GENERAL.—The Administrator, in coordination with the ISS management entity, ISS partners, the scientific user community, and the commercial space sector, shall develop a plan to transition in a step-wise approach from the current regime that relies heavily on NASA sponsorship to a regime where NASA is one of many customers of a low-Earth orbit commercial human space flight enterprise.

"(2) REPORTS.—Not later than December 1, 2017, and triennially thereafter until 2023, the Administrator shall submit to the appropriate committees of Congress a report that includes—

"(A) an identification of low-Earth orbit capabilities necessary to meet the Administration's deep space human space flight exploration objectives and mission requirements beyond the period of operation and utilization of the ISS described in section 503 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18353), if any;

"(B) steps NASA is taking and will take, including demonstrations that could be conducted on the ISS, to stimulate and facilitate commercial demand and supply of products and services in low-Earth orbit;

"(C) an assessment of current and projected commercial activities in low-Earth orbit, including on the ISS, and their potential for meeting the capabilities identified in subparagraph (A);

"(D) an identification of barriers preventing the commercialization of low-Earth orbit, including issues relating to policy, regulations, commercial intellectual property, data, and confidentiality, that could inhibit the use of the ISS as a commercial incubator;

"(E) an evaluation of the feasible and preferred service life of the ISS beyond the period

described in section 503 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18353), through at least 2028, as a unique scientific, commercial, and exploration-related facility, including—

"(i) a general discussion of international partner capabilities and prospects for extending the partnership, to include the potential for participation by additional countries, for the purposes of the human development and exploration of deep space;

"(ii) a review of essential systems, equipment upgrades, or potential maintenance that would be necessary to extend ISS operations and utilization;

"(iii) an evaluation of the cost and schedule requirements associated with the development and delivery of essential systems, equipment upgrades, or potential maintenance identified under clause (ii);

"(iv) an identification of possible international, academic, or industry partner contributions, cost-share, and program transitions to provide the upgrades identified under clause (ii);

"(v) impacts on the goals and objectives of the ISS National Laboratory and the management entity responsible for operation of the ISS National Laboratory;

"(vi) impacts on services provided by the Commercial Resupply Services Program and Commercial Crew Program to the ISS;

"(vii) impacts on the use of the ISS as a testbed to transition functions of the ISS to the commercial space sector and enhance economic development of low-Earth orbit, including the evolution of self-sustaining commercial activities;

"(viii) an assessment on the technical limiting factors of the ISS lifetime, including a list of critical components and their expected lifetime and availability;

"(ix) an evaluation of the potential for expanding the use of ISS facilities to accommodate the needs of researchers and other users, including changes to policies, regulations, and laws that would stimulate greater private and public involvement on the ISS; and

"(x) such other information as may be necessary to fully describe the justification for and feasibility of extending the service life of the ISS, including the potential scientific or technological benefits to the Federal Government, public, or to academic or commercial entities;

"(F) an evaluation of the functions, roles, and responsibilities for management and operation of the ISS and a determination of—

"(i) those functions, roles, and responsibilities the Federal Government should retain during the lifecycle of the ISS;

"(ii) those functions, roles, and responsibilities that could be transferred to the commercial space sector;

"(iii) the metrics that would indicate the commercial space sector's readiness and ability to assume the functions, roles, and responsibilities described in clause (ii); and

"(iv) any necessary changes to any agreements or other documents and the law to enable the activities described in subparagraphs (B) and (C); and

"(G) a description of the progress on meeting human exploration research objectives on ISS and prospects for accomplishing future exploration and other research objectives on future commercially supplied low-Earth orbit platforms or migration of those objectives to cis-lunar space.

"(3) DEMONSTRATIONS.—Demonstrations identified under paragraph (2) may—

"(A) test the capabilities described in paragraph (2)(A); and

"(B) demonstrate or test capabilities, including commercial modules or deep space habitats, Environmental Control and Life Support Systems, orbital satellite assembly, exploration space suits, a node that enables a wide variety of activity, including multiple commercial modules and airlocks, additional docking or berthing ports for commercial crew and cargo, opportunities for the commercial space sector to cost share for transportation and other services on the ISS, and other commercial activities.".

SEC. 304. INDEMNIFICATION; NASA LAUNCH SERVICES AND REENTRY SERVICES.

(a) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, is amended by adding at the end the following:

"§ 20148. Indemnification; NASA launch services and reentry services

"(a) IN GENERAL.—Under such regulations in conformity with this section as the Administrator shall prescribe taking into account the availability, cost, and terms of liability insurance, any contract between the Administration and a provider may provide that the United States will indemnify the provider against successful claims (including reasonable expenses of litigation or settlement) by third parties for death, bodily injury, or loss of or damage to property resulting from launch services and reentry services carried out under the contract that the contract defines as unusually hazardous or nuclear in nature, but only to the extent the total amount of successful claims related to the activities under the contract—

"(1) is more than the amount of insurance or demonstration of financial responsibility described in subsection (c)(3); and

"(2) is not more than the amount specified in section 50915(a)(1)(B).

"(b) TERMS OF INDEMNIFICATION.—A contract made under subsection (a) that provides indemnification shall provide for—

"(1) notice to the United States of any claim or suit against the provider for death, bodily injury, or loss of or damage to property; and

"(2) control of or assistance in the defense by the United States, at its election, of that claim or suit and approval of any settlement.

"(c) LIABILITY INSURANCE OF THE PROVIDER.—

"(1) IN GENERAL.—The provider under subsection (a) shall obtain liability insurance or demonstrate financial responsibility in amounts to compensate for the maximum probable loss from claims by—

"(A) a third party for death, bodily injury, or property damage or loss resulting from a launch service or reentry service carried out under the contract; and

"(B) the United States Government for damage or loss to Government property resulting from a launch service or reentry service carried out under the contract.

"(2) MAXIMUM PROBABLE LOSSES.—

"(A) IN GENERAL.—The Administrator shall determine the maximum probable losses under subparagraphs (A) and (B) of paragraph (1) not later than 90 days after the date that the provider requests such a determination and submits all information the Administrator requires.

"(B) REVISIONS.—The Administrator may revise a determination under subparagraph (A) of this paragraph if the Administrator determines the revision is warranted based on new information.

"(3) AMOUNT OF INSURANCE.—For the total claims related to one launch or reentry, a provider shall not be required to obtain insurance or demonstrate financial responsibility of more than—

"(A)(i) $500,000,000 under paragraph (1)(A); or

"(ii) $100,000,000 under paragraph (1)(B); or

"(B) the maximum liability insurance available on the world market at reasonable cost.

"(4) COVERAGE.—An insurance policy or demonstration of financial responsibility under this subsection shall protect the following, to the extent of

their potential liability for involvement in launch services or reentry services:

"(A) The Government.

"(B) Personnel of the Government.

"(C) Related entities of the Government.

"(D) Related entities of the provider.

"(E) Government astronauts.

"(d) NO INDEMNIFICATION WITHOUT CROSS-WAIVER.—Notwithstanding subsection (a), the Administrator may not indemnify a provider under this section unless there is a cross-waiver between the Administration and the provider as described in subsection (e).

"(e) CROSS-WAIVERS.—

"(1) IN GENERAL.—The Administrator, on behalf of the United States and its departments, agencies, and instrumentalities, shall reciprocally waive claims with a provider under which each party to the waiver agrees to be responsible, and agrees to ensure that its related entities are responsible, for damage or loss to its property, or for losses resulting from any injury or death sustained by its employees or agents, as a result of activities arising out of the performance of the contract.

"(2) LIMITATION.—The waiver made by the Government under paragraph (1) shall apply only to the

extent that the claims are more than the amount of insurance or demonstration of financial responsibility required under subsection (c)(1)(B).

"(f) WILLFUL MISCONDUCT.—Indemnification under subsection (a) may exclude claims resulting from the willful misconduct of the provider or its related entities.

"(g) CERTIFICATION OF JUST AND REASONABLE AMOUNT.—No payment may be made under subsection (a) unless the Administrator or the Administrator's designee certifies that the amount is just and reasonable.

"(h) PAYMENTS.—

"(1) IN GENERAL.—Upon the approval by the Administrator, payments under subsection (a) may be made from funds appropriated for such payments.

"(2) LIMITATION.—The Administrator shall not approve payments under paragraph (1), except to the extent provided in an appropriation law or to the extent additional legislative authority is enacted providing for such payments.

"(3) ADDITIONAL APPROPRIATIONS.—If the Administrator requests additional appropriations to make payments under this subsection, then the request for those appropriations shall be made in accordance with the procedures established under section 50915.

"(i) RULES OF CONSTRUCTION.—

"(1) IN GENERAL.—The authority to indemnify under this section shall not create any rights in third persons that would not otherwise exist by law.

"(2) OTHER AUTHORITY.—Nothing in this section may be construed as prohibiting the Administrator from indemnifying a provider or any other NASA contractor under other law, including under Public Law 85–804 (50 U.S.C. 1431 et seq.).

"(3) ANTI-DEFICIENCY ACT.—Notwithstanding any other provision of this section—

"(A) all obligations under this section are subject to the availability of funds; and

"(B) nothing in this section may be construed to require obligation or payment of funds in violation of sections 1341, 1342, 1349 through 1351, and 1511 through 1519 of title 31, United States Code (commonly referred to as the 'Anti-Deficiency Act').

"(j) RELATIONSHIP TO OTHER LAWS.—The Administrator may not provide indemnification under this section for an activity that requires a license or permit under chapter 509.

"(k) DEFINITIONS.—In this section:

"(1) GOVERNMENT ASTRONAUT.—The term 'government astronaut' has the meaning given the term in section 50902.

"(2) LAUNCH SERVICES.—The term 'launch services' has the meaning given the term in section 50902.

"(3) PROVIDER.—The term 'provider' means a person that provides domestic launch services or domestic reentry services to the Government.

"(4) REENTRY SERVICES.—The term 'reentry services' has the meaning given the term in section 50902.

"(5) RELATED ENTITY.—The term 'related entity' means a contractor or subcontractor.

"(6) THIRD PARTY.—The term 'third party' means a person except—

"(A) the United States Government;

"(B) related entities of the Government involved in launch services or reentry services;

"(C) a provider;

"(D) related entities of the provider involved in launch services or reentry services; or

"(E) a government astronaut.".

(b) CONFORMING AMENDMENT.—The table of contents for subchapter III of chapter 201 of title 51, United States

Code, is amended by inserting after the item relating to section 20147 the following:

"20148. Indemnification; NASA launch services and reentry services.".

TITLE IV—ADVANCING HUMAN DEEP SPACE EXPLORATION

Subtitle A—Human Exploration Goals and Objectives

SEC. 411. HUMAN EXPLORATION LONG-TERM GOALS.

Section 202(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(a)) is amended to read as follows:

"(a) LONG-TERM GOALS.—The long-term goals of the human space flight and exploration efforts of NASA shall be—

"(1) to expand permanent human presence beyond low-Earth orbit and to do so, where practical, in a manner involving international, academic, and industry partners; and

"(2) the peaceful settlement of a location in space or on another celestial body and a thriving space economy in the 21st century.".

SEC. 412. GOALS AND OBJECTIVES.

Section 202(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(b)) is amended—

(1) in paragraph (3), by striking "; and" and inserting a semicolon;

(2) in paragraph (4), by striking the period at the end and inserting "; and"; and

(3) by adding at the end the following:

"(5) to achieve human exploration of Mars, including the establishment of a capability to extend human presence, including potential human habitation, on the surface of Mars.".

SEC. 413. VISION FOR SPACE EXPLORATION.

Section 20302 of title 51, United States Code, is amended—

(1) in subsection (a), by inserting "in cis-lunar space or" after "sustained human presence"; and

(2) by amending subsection (b) to read as follows:

"(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.".

SEC. 414. EXPLORATION PLAN AND PROGRAMS.

Section 70502(2) of title 51, United States Code, is amended to read as follows:

"(2) implement an exploration research and technology development program to enable human and robotic operations consistent with section 20302(b) of this title;".

SEC. 415. STEPPING STONE APPROACH TO EXPLORATION.

Section 70504 of title 51, United States Code, is amended to read as follows:

"§ 70504. Stepping stone approach to exploration

"(a) IN GENERAL.—In order to maximize the cost-effectiveness of the long-term exploration and utilization activities of the United States, the Administrator shall take all necessary steps, including engaging international, academic, and industry partners, to ensure that activities in the Administration's human exploration program balance how those activities might also help meet the requirements of future exploration and utilization activities leading to human habitation on the surface of Mars.

"(b) COMPLETION.—Within budgetary considerations, once an exploration-related project enters its development phase, the Administrator shall seek, to the maximum extent practicable, to complete that project without undue delays.".

Subtitle B—Assuring Core Capabilities for Exploration

SEC. 421. SPACE LAUNCH SYSTEM AND ORION.

(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) 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 on or near 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; and

(3) the United States should have continuity of purpose for Space Launch System and Orion in deep space exploration missions, using them beginning with the uncrewed mission, EM–1, planned for 2018, followed by the crewed mission, EM–2, in cis-lunar space planned for 2021, and for subsequent missions beginning with EM–3 extending into cis-lunar space and eventually to Mars.

(c) IN GENERAL.—

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

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

(B) a crewed exploration mission to demonstrate the Space Launch System, including the

Core Stage and Exploration Upper Stages, and the crewed Orion mission by 2021;

(C) subsequent missions beginning with EM–3 using the Space Launch System and Orion to extend into cis-lunar space and eventually to Mars; and

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

(2) 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.

Subtitle C—Journey to Mars

SEC. 431. SPACE TECHNOLOGY INFUSION.

(a) SENSE OF CONGRESS.—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.

(b) POLICY.—It is the policy of the United States that the Administrator 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.

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

SEC. 432. 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. 433. STRATEGIC FRAMEWORK FOR HUMAN SPACEFLIGHT AND EXPLORATION.

(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 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 strategic framework, 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 developments and implementation would influence future development and implementation; and

(4) a strategic framework should begin with low-Earth orbit, then address progress beyond low-Earth orbit to cis-lunar space in greater detail, and then address future missions ultimately aimed at human arrival and activities on or near Mars.

(b) STRATEGIC FRAMEWORK.—

(1) IN GENERAL.—The Administrator shall develop a strategic framework, including a critical decision plan, to expand human presence beyond low-Earth orbit, including to cis-lunar space, the moons of Mars, the surface of Mars, and beyond.

(2) SCOPE.—The strategic framework shall include—

(A) an integrated set of exploration, science, and other goals and objectives of a United States human space exploration program with the long-

term goal of human missions near to 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 exploration objectives developed under subparagraph (A);

(C) precursor missions in cis-lunar space and other missions or activities necessary to meet the exploration objectives developed under subparagraph (A), including anticipated timelines and missions for the Space Launch System and Orion;

(D) capabilities and technologies, including the Space Launch System, Orion, a deep space habitat, and other capabilities, that enable the exploration 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; and

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

(3) CONSIDERATIONS.—In developing the strategic framework, 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) an organizational approach to ensure collaboration and coordination among NASA's Mission Directorates under section 621, when appropriate, including to collect and return to Earth a sample from the Martian surface;

(D) building upon the initial uncrewed mission, EM–1, and first crewed mission, EM–2, 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 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) risks to human health and sensitive onboard technologies, including radiation exposure;

(J) evaluating the 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 432(8).

(4) CRITICAL DECISION PLAN ON HUMAN SPACE EXPLORATION.—As part of the strategic framework, 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 EM–3 for the Space Launch System and Orion to extend human exploration from cis-lunar space to the surface of Mars.

(5) REPORTS.—The Administrator shall submit an initial strategic framework, including a critical

decision plan, to the appropriate committees of Congress before December 1, 2017, and an updated strategic framework biennially thereafter.

SEC. 434. ADVANCED SPACE SUIT CAPABILITY.

Not later than 90 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a detailed plan for achieving an advanced space suit capability that aligns with the crew needs for exploration enabled by the Space Launch System and Orion, including an evaluation of the merit of delivering the planned suit system for use on the ISS.

SEC. 435. ASTEROID ROBOTIC REDIRECT MISSION.

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

(1) NASA initially estimated that the Asteroid Robotic Redirect Mission would launch in December 2020 and cost no more than $1,250,000,000, excluding launch and operations.

(2) On July 15, 2016, NASA conducted its Key Decision Point–B review of the Asteroid Robotic Redirect Mission or approval for Phase B in mission formulation.

(3) During the Key Decision Point–B review, NASA estimated that costs have grown to $1,400,000,000 excluding launch and operations for a launch in December 2021 and the agency must evalu-

ate whether to accept the increase or reduce the Asteroid Robotic Redirect Mission's scope to stay within the cost cap set by the Administrator.

(4) In April 2015, the NASA Advisory Council—

(A) issued a finding that—

(i) high-performance solar electric propulsion will likely be an important part of an architecture to send humans to Mars; and

(ii) maneuvering a large test mass is not necessary to provide a valid in-space test of a new solar electric propulsion stage;

(B) determined that a solar electric propulsion mission will contribute more directly to the goal of sending humans to Mars if the mission is focused entirely on development and validation of the solar electric propulsion stage; and

(C) determined that other possible motivations for acquiring and maneuvering a boulder, such as asteroid science and planetary defense, do not have value commensurate with their probable cost.

(5) The Asteroid Robotic Redirect Mission is competing for resources with other critical exploration

development programs, including the Space Launch System, Orion, commercial crew, and a habitation module.

(6) In 2014, the NASA Advisory Council recommended that NASA conduct an independent cost and technical assessment of the Asteroid Robotic Redirect Mission.

(7) NASA completed the assessment under paragraph (6) and reviewed it as part of the agency's Key Decision Point–B review.

(8) In 2015, the NASA Advisory Council recommended that NASA preserve the following key objectives if the program needed to be descoped:

(A) Development of high power solar electric propulsion.

(B) Ability to maneuver in a low gravity environment in deep space.

(9) In January 2015 and July 2015, the NASA Advisory Council expressed its concern to NASA about the potential for growing costs for the program and highlighted that choices would need to be made about the program's content.

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

(1) the technological and scientific goals of the Asteroid Robotic Redirect Mission may not be commensurate with the cost; and

(2) alternative missions may provide a more cost effective and scientifically beneficial means to demonstrate the technologies needed for a human mission to Mars that would otherwise be demonstrated by the Asteroid Robotic Redirect Mission.

(c) EVALUATION AND REPORT.—Not later than 180 days after the date of enactment of this Act, the Administrator shall—

(1) conduct an evaluation of—

(A) alternative approaches to the Asteroid Robotic Redirect Mission for demonstrating the technologies and capabilities needed for a human mission to Mars that would otherwise be demonstrated by the Asteroid Robotic Redirect Mission;

(B) the scientific and technical benefits of the alternatives approaches identified in subparagraph (A) compared to the Asteroid Redirect Robotic Mission to future human exploration;

(C) the commercial benefits of the alternative approaches identified in subparagraph (A), including the impact on the development of

domestic solar electric propulsion technology to bolster United States competitiveness in the global marketplace; and

(D) a comparison of the estimated costs of the alternative approaches identified in subparagraph (A); and

(2) submit to the appropriate committees of Congress a report on the evaluation under paragraph (1), including any recommendations.

Subtitle D—Scott Kelly Human Spaceflight and Exploration Act

SEC. 441. SHORT TITLE.

This subtitle may be cited as the "Scott Kelly Human Spaceflight and Exploration Act".

SEC. 442. FINDINGS; SENSE OF CONGRESS.

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

(1) Human space exploration can pose significant challenges and is full of substantial risk, which has ultimately claimed the lives of 24 National Aeronautics and Space Administration astronauts serving in the line of duty.

(2) As United States government astronauts participate in long-duration and exploration spaceflight missions they may experience increased health risks, such as vision impairment, bone demineralization,

and behavioral health and performance risks, and may be exposed to galactic cosmic radiation. Exposure to high levels of radiation and microgravity can result in acute and long-term health consequences that can increase the risk of cancer and tissue degeneration and have potential effects on the musculoskeletal system, central nervous system, cardiovascular system, immune function, and vision.

(3) To advance the goal of long-duration and exploration spaceflight missions, United States government astronaut Scott Kelly participated in a 1-year twins study in space while his identical twin brother, former United States government astronaut Mark Kelly, acted as a human control specimen on Earth, providing an understanding of the physical, behavioral, microbiological, and molecular reaction of the human body to an extended period of time in space.

(4) Since the Administration currently provides medical monitoring, diagnosis, and treatment for United States government astronauts during their active employment, given the unknown long-term health consequences of long-duration space exploration, the Administration has requested statutory authority from Congress to provide medical monitoring, diagnosis, and treatment to former United States govern-

ment astronauts for psychological and medical conditions associated with human space flight.

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

(1) the United States should continue to seek the unknown and lead the world in space exploration and scientific discovery as the Administration prepares for long-duration and exploration spaceflight in deep space and an eventual mission to Mars;

(2) data relating to the health of astronauts will become increasingly valuable to improving our understanding of many diseases humans face on Earth;

(3) the Administration should provide the type of monitoring, diagnosis, and treatment described in subsection (a) only for conditions the Administration considers unique to the training or exposure to the spaceflight environment of United States government astronauts and should not require any former United States Government astronauts to participate in the Administration's monitoring;

(4) such monitoring, diagnosis, and treatment should not replace a former United States government astronaut's private health insurance;

(5) expanded data acquired from such monitoring, diagnosis, and treatment should be used to tai-

lor treatment, inform the requirements for new spaceflight medical hardware, and develop controls in order to prevent disease occurrence in the astronaut corps;

(6) the Administration's existing radiation exposure standards, which have been used for missions pertaining to the Space Shuttle and the ISS, would limit missions to durations of 150 to 250 days and would pose significant challenges to long-duration or exploration spaceflight or a multiyear mission to Mars; and

(7) the 340-day space mission of Scott Kelly aboard the ISS—

(A) was pivotal for the goal of the United States for humans to explore deep space and Mars as the mission generated new insight into how the human body adjusts to weightlessness, isolation, radiation, and the stress of long-duration space flight; and

(B) will help support the physical and mental well-being of astronauts during longer space exploration missions in the future.

SEC. 443. MEDICAL MONITORING AND RESEARCH RELATING TO HUMAN SPACE FLIGHT.

(a) IN GENERAL.—Subchapter III of chapter 201 of title 51, United States Code, as amended by section 304 of this Act, is further amended by adding at the end the following:

"§ 20149. Medical monitoring and research relating to human space flight

"(a) IN GENERAL.—Notwithstanding any other provision of law, the Administrator may provide for the medical monitoring, diagnosis, and treatment of a United States government astronaut, or a former United States government astronaut or payload specialist, for conditions that the Administrator considers associated with human space flight, including scientific and medical tests for psychological and medical conditions.

"(b) EXCLUSIONS.—The Administrator may not—

"(1) provide for medical monitoring, diagnosis, or treatment of a United States government astronaut, or a former United States government astronaut or payload specialist, under subsection (a) for any psychological or medical condition that is not associated with human space flight; or

"(2) require a former United States government astronaut or payload specialist to participate in the monitoring authorized under subsection (a).

"(c) PRIVACY.—Consistent with applicable provisions of law relating to privacy, the Administrator shall protect the privacy of all medical records generated under subsection (a) and accessible to the Administration.

"(d) REGULATIONS.—The Administrator shall promulgate such regulations as are necessary to carry out this section.".

(b) TABLE OF CONTENTS.—The table of contents for chapter 201 of title 51, United States Code, as amended by section 304 of this Act, is further amended by inserting after the item relating to section 20148 the following:

"20149. Medical monitoring and research relating to human space flight.".

TITLE V—ADVANCING SPACE SCIENCE

SEC. 501. MAINTAINING A BALANCED SPACE SCIENCE PORTFOLIO.

(a) SCIENCE PORTFOLIO.—Section 803 of the National Aeronautics and Space Administration Authorization Act of 2010 (Public Law 111–267; 124 Stat. 2832) is amended to read as follows:

"SEC. 803. OVERALL SCIENCE PORTFOLIO.

"Congress restates its sense 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 mis-

sions, contributes to a robust and productive science program and serves as a catalyst for innovation and discovery; and

"(2) the Administrator 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) CONFORMING AMENDMENT.—The item relating to section 803 in the table of contents in section 1(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (Public Law 111–267; 124 Stat. 2806) is amended by striking "Overall science portfolio-sense of the Congress" and inserting "Overall science portfolio".

SEC. 502. PLANETARY SCIENCE.

(a) FINDINGS.—Congress finds that—

(1) 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 decadal survey for planetary science, the Administrator shall ensure, to the greatest extent practicable, the completion of a balanced set of Discovery, New Frontiers, and flagship missions.

(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.

SEC. 503. JAMES WEBB SPACE TELESCOPE.

It is the sense of Congress that—

(1) the James Webb Space Telescope should significantly advance our understanding of star and planet formation, improve our knowledge of the early

universe, and support United States leadership in astrophysics; and

(2) consistent with annual Government Accountability Office reviews of the James Webb Space Telescope program, the Administrator should continue robust surveillance of the performance of the James Webb Space Telescope project and continue to improve the reliability of cost estimates and contractor performance data and other major spaceflight projects in order to enhance NASA's ability to successfully deliver the James Webb Space Telescope on-time and within budget.

SEC. 504. SENSE OF CONGRESS ON WIDE-FIELD INFRARED SURVEY TELESCOPE.

It is the sense of Congress that—

(1) the Wide-Field Infrared Survey Telescope (commonly known as "WFIRST") mission has the potential to enable scientific discoveries that will transform our understanding of the universe; and

(2) the Administrator, to the extent practicable, should make progress on the technologies and capabilities needed to position the Administration to meet the objectives, as outlined in the 2010 National Academies' Astronomy and Astrophysics Decadal Survey,

in a way that maximizes the scientific productivity of meeting those objectives for the resources invested.

SEC. 505. SENSE OF CONGRESS ON MARS 2020 ROVER.

It is the sense of Congress that—

(1) the Mars 2020 mission, to develop a Mars rover and to enable the return of samples to Earth, should remain a priority for NASA; and

(2) the Mars 2020 mission—

(A) should significantly increase our understanding of Mars;

(B) should help determine whether life previously existed on that planet; and

(C) should provide opportunities to gather knowledge and demonstrate technologies that address the challenges of future human expeditions to Mars.

SEC. 506. EUROPA.

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

(1) Studies of Europa, Jupiter's moon, indicate that Europa may provide a habitable environment, as it contains key ingredients known to support life on Earth, including liquid water, heat, chemistry, and time.

(2) In 2012, using the Hubble Space Telescope, NASA scientists observed water vapor around the

south polar region of Europa, which provides potential evidence of water plumes in that region.

(3) For decades, the Europa mission has consistently ranked as a high priority mission for the scientific community.

(4) The Europa mission was ranked as the top priority mission in the previous Planetary Science Decadal Survey and ranked as the second-highest priority in the current Planetary Science Decadal Survey.

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

(1) the Europa mission could provide another avenue in which to capitalize on our Nation's current investment in the Space Launch System that would significantly reduce the transit time for such a deep space mission; and

(2) a scientific, robotic exploration mission to Europa, as prioritized in both Planetary Science Decadal Surveys, should be supported.

TITLE VI—MAXIMIZING EFFICIENCY

Subtitle A—Agency Information Technology and Cybersecurity

SEC. 611. INFORMATION TECHNOLOGY GOVERNANCE.

The Administrator, in consultation with the chief information officer of NASA, shall—

(1) ensure the NASA Chief Information Officer has a significant role in the management, governance, and oversight processes related to information technology operations and investments and information security programs for the protection of NASA systems;

(2) establish the NASA Chief Information Officer as a direct report to the Administrator;

(3) ensure the NASA Chief Information Officer has the appropriate resources and insight to oversee NASA information technology and information security operations and investments;

(4) provide an information technology program management framework to increase the efficiency and effectiveness of information technology investments, including relying on metrics for identifying and reducing potential duplication, waste, and cost;

(5) establish a monetary threshold for all agency information technology investments and related contracts, including non-highly and highly specialized and specialized information technology, regardless of the procurement instrument, over which the NASA Chief Information Officer shall have final approval;

(6) improve the operational linkage between the NASA Chief Information Officer and each NASA mission directorate, center, and mission support office to ensure both agency and mission needs are considered in agency-wide information technology and information security management and oversight;

(7) review the portfolio of information technology investments and spending, including information technology-related investments included as part of activities within NASA mission directorates that may not be considered information technology, to ensure investments are recognized and reported appropriately based on guidance from the Office of Management and Budget;

(8) consider appropriate revisions to the charters of information technology boards and councils that inform information technology investment and operation decisions; and

(9) consider whether the NASA Chief Information Officer should have a seat on any boards or councils described in paragraph (8).

SEC. 612. INFORMATION TECHNOLOGY STRATEGIC PLAN.

(a) IN GENERAL.—Subject to subsection (b), the NASA Chief Information Officer, in consultation with the chief information officer of each Administration center, shall develop an information technology strategic plan to guide NASA information technology management and strategic objectives.

(b) REQUIREMENTS.—In developing the strategic plan, the NASA Chief Information Officer shall ensure that the strategic plan is consistent with—

(1) the deadline under section 306(a) of title 5, United States Code; and

(2) the requirements under section 3506 of title 44, United States Code.

(c) CONTENTS.—The strategic plan shall include—

(1) near and long-term goals and objectives for leveraging information technology;

(2) a plan for how the NASA Chief Information Officer will submit to Congress of a list of information technology projects, including completion dates and risk level in accordance with guidance from the Office of Management and Budget;

(3) an implementation overview for an agency-wide centralized approach to information technology investments and operations, including reducing barriers to cross-center collaboration;

(4) coordination by the NASA Chief Information Officer with centers and mission directorates to ensure that information technology policies are effectively and efficiently implemented across the agency;

(5) a plan to increase the efficiency and effectiveness of information technology investments, including a description of how unnecessarily duplicative, wasteful, legacy, or outdated information technology across NASA will be identified and eliminated, and a schedule for the identification and elimination of such information technology;

(6) a plan for improving the information security of agency information and agency information systems, including improving security control assessments and role-based security training of employees; and

(7) submission by the NASA Chief Information Officer to Congress of information regarding high risk projects and cybersecurity risks.

(d) CONGRESSIONAL OVERSIGHT.—The NASA Chief Information Officer shall submit to the appropriate com-

mittees of Congress the strategic plan under subsection (a) and any updates thereto.

SEC. 613. CYBERSECURITY.

(a) FINDING.—The security of NASA information and information systems is vital to the success of the mission of the agency.

(b) INFORMATION SECURITY PLAN.—Section 1207 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18445) is amended—

(1) by redesignating subsections (a) through (c) as subsections (b) through (d), respectively;

(2) by inserting before subsection (b), as redesignated, the following:

"(a) AGENCY-WIDE INFORMATION SECURITY PLAN.—

"(1) IN GENERAL.—Not later than 1 year after the date of enactment of the National Aeronautics and Space Administration Transition Authorization Act of 2016, the Administrator shall implement the information security plan developed under paragraph (2) and take such further actions as the Administrator considers necessary to improve the information security system in accordance with this section.

"(2) INFORMATION SECURITY PLAN.—Subject to paragraphs (3), (4), and (5), the chief information officer of NASA, shall develop an agency-wide informa-

tion security plan to enhance information security for NASA information and information infrastructure.

"(3) REQUIREMENTS.—In developing the plan under paragraph (2), the chief information officer shall ensure that the plan—

"(A) is consistent with policies, standards, guidelines, and directives on information security under subchapter II of chapter 35 of title 44, United States Code;

"(B) is consistent with the standards and guidelines under section 11331 of title 40, United States Code; and

"(C) meets applicable National Institute of Standards and Technology information security standards and guidelines.

"(4) APPROVAL.—The chief information officer shall submit the plan to the Administrator for approval prior to its implementation.

"(5) CONTENTS.—The plan shall include—

"(A) an overview of the requirements of the information security system;

"(B) an agency-wide risk management framework for information security;

"(C) a description of the information security system management controls and common

controls that are necessary to ensure compliance with information security-related requirements;

"(D) an identification and assignment of roles, responsibilities, and management commitment for information security at the agency;

"(E) coordination among organizational entities, including between each center, facility, mission directorate, and mission support office, and among agency entities responsible for different aspects of information security;

"(F) heightened consideration of the need to protect the information security of mission-critical systems and activities and high-impact and moderate-impact information systems; and

"(G) a schedule of frequent reviews and updates, as necessary, of the plan."; and

(3) in subsection (b), as redesignated—

(A) in paragraph (1)—

(i) in subparagraph (B), by striking "; and" and inserting a semicolon;

(ii) in subparagraph (C), by striking the period at the end and inserting "; and"; and

(iii) by adding at the end the following:

"(D) an update on the agency's efforts to apply additional information security protections to secure high-impact and moderate-impact information systems and mission-critical systems and activities, including those systems that control spacecraft and maintain critical data sources."; and

(B) in paragraph (2), by striking "section 3545" and inserting "section 3555".

SEC. 614. OVERSIGHT IMPLEMENTATION PROGRESS.

Not later than 90 days after the date of enactment of this Act, and periodically thereafter until the information security plan under section 1207 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18445), as amended, is developed and implemented agency-wide, the Administrator shall provide to the appropriate committees of Congress an update on the progress made toward implementation of or response to—

(1) the information security plan under that section; and

(2) the information security-related recommendations made by the NASA Inspector General and the Comptroller General in the 5 years preceding the date of enactment of this Act.

SEC. 615. SOFTWARE OVERSIGHT.

The Administrator shall—

(1) develop a strategic plan to transition NASA from legacy software by adopting a service-based acquisition model in line with industry best practices;

(2) develop and implement an agency-wide software license management policy to improve centralization, lifecycle management, and procurement education, including education on contract negotiations, relevant laws and regulations, and agency-wide contract terms and conditions; and

(3) direct an agency-wide inventory of NASA's total software licenses and spending, including costs, benefits, usage, and trending data.

SEC. 616. SECURITY MANAGEMENT OF FOREIGN NATIONAL ACCESS.

The Administrator shall notify the appropriate committees of Congress when the agency has implemented the information technology security recommendations from the National Academy of Public Administration on foreign national access management, based on reports from January 2014 and March 2016.

SEC. 617. CYBERSECURITY OF WEB APPLICATIONS.

Not later than 180 days after the date of enactment of this Act, the NASA Chief Information Officer shall—

(1) develop a plan, including such actions and milestones as are necessary, to fully remediate security vulnerabilities of NASA web applications within a timely fashion after discovery; and

(2) implement the recommendation from the NASA Inspector General in the audit report dated July 10, 2014, (IG–14–023) to remove from the Internet or secure with a web application firewall all NASA web applications in development or testing mode.

Subtitle B—Collaboration Among Mission Directorates and Other Matters

SEC. 621. COLLABORATION AMONG MISSION DIRECTORATES.

The Administrator shall encourage an interdisciplinary approach among all NASA mission directorates and divisions, whenever appropriate, for projects or missions—

(1) to improve coordination, and encourage collaboration and early planning on scope;

(2) to determine areas of overlap or alignment;

(3) to find ways to leverage across divisional perspectives to maximize outcomes; and

(4) to be more efficient with resources and funds.

SEC. 622. NASA LAUNCH CAPABILITIES COLLABORATION.

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

(1) The Launch Services Program is responsible for the acquisition, management, and technical oversight of commercial launch services for NASA's science and robotic missions.

(2) The Commercial Crew Program is responsible for the acquisition, management, and technical oversight of commercial crew transportation systems.

(3) The Launch Services Program and Commercial Crew Program have worked together to gain exceptional technical insight into the contracted launch service providers that are common to both programs.

(4) The Launch Services Program has a long history of oversight of 12 different launch vehicles and over 80 launches.

(5) Co-location of the Launch Services Program and Commercial Crew Program has enabled the Commercial Crew Program to efficiently obtain the launch vehicle technical expertise of and provide engineering and analytical support to the Commercial Crew Program.

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

(1) the Launch Services Program and Commercial Crew Program each benefit from communication

and coordination of launch manifests, technical information, and common launch vehicle insight between the programs; and

(2) such communication and coordination is enabled by the co-location of the programs.

(c) IN GENERAL.—The Administrator shall pursue a strategy for acquisition of crewed transportation services and non-crewed launch services that continues to enhance communication, collaboration, and coordination between the Launch Services Program and the Commercial Crew Program.

SEC. 623. COMMERCIAL SPACE LAUNCH COOPERATION.

(a) FINDING.—Congress recognized the benefit of commercial space launch cooperation between the Federal Government and the private sector when it granted the Secretary of Defense authority to foster cooperation between the Department of Defense and certain covered entities relating to space transportation infrastructure under section 2276 of title 10, United States Code.

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

(1) the Administrator should take into account the unique needs and obligations that multi-user, public State spaceports may have with the State government as well as current and prospective contrac-

tual arrangements with commercial and government customers when developing and carrying out agreements under section 50507 of title 51, United States Code, with State spaceports operating on NASA facilities; and

(2) the authority granted under section 50507 of title 51, United States Code, is not intended to supersede or conflict with the congressional intent and purposes codified in chapter 509 of that title, the responsibilities of the Secretary of Transportation under section 50913 of that title, or with the intent of section 50504 of that title.

(c) IN GENERAL.—Chapter 505 of title 51, United States Code, is amended by adding at the end the following:

"§ 50507. Commercial launch cooperation

"(a) AUTHORITY FOR AGREEMENTS RELATING TO SPACE TRANSPORTATION INFRASTRUCTURE.—The Administrator—

"(1) may enter into an agreement with a covered entity to provide the covered entity with support and services related to the space transportation infrastructure of the Administration—

"(A) to maximize the use of the space transportation infrastructure of the Administration by the private sector in the United States;

"(B) to maximize the effectiveness and efficiency of the space transportation infrastructure of the Administration;

"(C) to reduce the cost of services provided by the Administration related to space transportation infrastructure at launch support facilities and space recovery support facilities; and

"(D) to encourage commercial space activities by enabling investment by covered entities in the space transportation infrastructure of the Administration; and

"(2) at the request of the covered entity, may include that support and services in the contracted space launch and reentry range support requirements of the Administration if—

"(A) the Administrator determines that including that support and services in the requirements—

"(i) is in the best interest of the Federal Government;

"(ii) does not interfere with the requirements of the Administration;

"(iii) does not compete with the commercial space activities of other covered entities; and

"(iv) does not result in the Administration retaining ownership of assets which are no longer needed to meet a programmatic mission of the Administration; and

"(B) any commercial requirement included in the agreement has full non-Federal funding before the execution of the agreement.

"(b) CONTRIBUTIONS.—

"(1) IN GENERAL.—The Administrator may enter into an agreement with a covered entity on a cooperative and voluntary basis to accept funds, services, and equipment to carry out the purposes in subsection (a)(1).

"(2) USE OF CONTRIBUTIONS.—Any funds, services, or equipment accepted by the Administrator under this subsection—

"(A) may be used only for the objectives specified in this section in accordance with terms of use set forth in the agreement entered into under this subsection; and

"(B) shall be managed by the Administrator in accordance with procedures prescribed under subsection (d).

"(3) REQUIREMENTS WITH RESPECT TO AGREEMENTS.—An agreement entered into with a covered entity under this subsection shall—

"(A) address the terms of use, ownership, and disposition of the funds, services, or equipment contributed under the agreement;

"(B) include a provision that the covered entity will not recover the costs of its contribution through any other agreement with the United States; and

"(C) include a provision that the contribution of a covered entity will not preclude access to or use by another covered entity.

"(c) ANNUAL REPORT.—Not later than January 31 of each year, the Administrator shall submit to the appropriate committees of Congress a report on the process used to establish agreements under subsections (a) and (b), including noticing announcements of opportunities and criteria for selecting a covered entity, and the funds, services, and equipment accepted and used by the Administrator under this section during the preceding fiscal year.

"(d) PROCEDURES.—The Administrator shall prescribe procedures to carry out this section consistent with sections 50504 and 50913.

"(e) DEFINITIONS.—In this section:

"(1) COVERED ENTITY.—In this section, the term 'covered entity' means—

"(A) a non-Federal entity that—

"(i) is organized under the laws of the United States or of any jurisdiction within the United States; and

"(ii) is engaged in commercial space activities; or

"(B) an entity that controls, is controlled by, or is under common control with, a non-Federal entity described in subparagraph (A).

"(2) LAUNCH SUPPORT FACILITIES.—The term 'launch support facilities' has the meaning given the term in section 50501.

"(3) SPACE RECOVERY SUPPORT FACILITIES.—The term 'space recovery support facilities' has the meaning given the term in section 50501.

"(4) SPACE TRANSPORTATION INFRASTRUCTURE.—The term 'space transportation infrastructure' has the meaning given that term in section 50501.".

(d) TABLE OF CONTENTS.—The table of contents for chapter 505 of title 51, United States Code, is amended by adding after the item relating to section 50506 the following:

"50507. Commercial space launch cooperation.".

SEC. 624. DETECTION AND AVOIDANCE OF COUNTERFEIT PARTS.

(a) FINDINGS.—Congress finds the following:

(1) A 2012 investigation by the Committee on Armed Services of the Senate of counterfeit electronic parts in the Department of Defense supply chain from 2009 through 2010 uncovered 1,800 cases and over 1,000,000 counterfeit parts and exposed the threat such counterfeit parts pose to service members and national security.

(2) Since 2010, the Comptroller General of the United States has identified in 3 separate reports the risks and challenges associated with counterfeit parts and counterfeit prevention at both the Department of Defense and NASA, including inconsistent definitions of counterfeit parts, poorly targeted quality control practices, and potential barriers to improvements to these practices.

(b) SENSE OF CONGRESS.—It is the sense of Congress that the presence of counterfeit electronic parts in the NASA supply chain poses a danger to United States government astronauts, crew, and other personnel and a risk to the agency overall.

(c) REGULATIONS.—

(1) IN GENERAL.—Not later than 270 days after the date of enactment of this Act, the Administrator

shall revise the NASA Supplement to the Federal Acquisition Regulation to improve the detection and avoidance of counterfeit electronic parts in the supply chain.

(2) CONTRACTOR RESPONSIBILITIES.—In revising the regulations under paragraph (1), the Administrator shall—

(A) require each covered contractor—

(i) to detect and avoid the use or inclusion of any counterfeit parts in electronic parts or products that contain electronic parts;

(ii) to take such corrective actions as the Administrator considers necessary to remedy the use or inclusion described in clause (i); and

(iii) including a subcontractor, to notify the applicable NASA contracting officer not later than 30 calendar days after the date the covered contractor becomes aware, or has reason to suspect, that any end item, component, part or material contained in supplies purchased by NASA, or purchased by a covered contractor or subcontractor for delivery to, or on behalf of, NASA, contains

a counterfeit electronic part or suspect counterfeit electronic part; and

(B) prohibit the cost of counterfeit electronic parts, suspect counterfeit electronic parts, and any corrective action described under subparagraph (A)(ii) from being included as allowable costs under agency contracts, unless—

(i)(I) the covered contractor has an operational system to detect and avoid counterfeit electronic parts and suspect counterfeit electronic parts that has been reviewed and approved by NASA or the Department of Defense; and

(II) the covered contractor has provided the notice under subparagraph (A)(iii); or

(ii) the counterfeit electronic parts or suspect counterfeit electronic parts were provided to the covered contractor as Government property in accordance with part 45 of the Federal Acquisition Regulation.

(3) SUPPLIERS OF ELECTRONIC PARTS.—In revising the regulations under paragraph (1), the Administrator shall—

(A) require NASA and covered contractors, including subcontractors, at all tiers—

(i) to obtain electronic parts that are in production or currently available in stock from—

(I) the original manufacturers of the parts or their authorized dealers; or

(II) suppliers who obtain such parts exclusively from the original manufacturers of the parts or their authorized dealers; and

(ii) to obtain electronic parts that are not in production or currently available in stock from suppliers that meet qualification requirements established under subparagraph (C);

(B) establish documented requirements consistent with published industry standards or Government contract requirements for—

(i) notification of the agency; and

(ii) inspection, testing, and authentication of electronic parts that NASA or a covered contractor, including a subcontractor, obtains from any source other than a source described in subparagraph (A);

(C) establish qualification requirements, consistent with the requirements of section 2319 of title 10, United States Code, pursuant to which NASA may identify suppliers that have appropriate policies and procedures in place to detect and avoid counterfeit electronic parts and suspect counterfeit electronic parts; and

(D) authorize a covered contractor, including a subcontractor, to identify and use additional suppliers beyond those identified under subparagraph (C) if—

(i) the standards and processes for identifying such suppliers comply with established industry standards;

(ii) the covered contractor assumes responsibility for the authenticity of parts provided by such suppliers under paragraph (2); and

(iii) the selection of such suppliers is subject to review and audit by NASA.

(d) DEFINITIONS.—In this section:

(1) COVERED CONTRACTOR.—The term "covered contractor" means a contractor that supplies an electronic part, or a product that contains an electronic part, to NASA.

(2) ELECTRONIC PART.—The term "electronic part" means a discrete electronic component, including a microcircuit, transistor, capacitor, resistor, or diode, that is intended for use in a safety or mission critical application.

SEC. 625. EDUCATION AND OUTREACH.

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

(1) United States competitiveness in the 21st century requires engaging the science, technology, engineering, and mathematics (referred to in this section as "STEM") talent in all States;

(2) the Administration is uniquely positioned to educate and inspire students and the broader public on STEM subjects and careers;

(3) the Administration's Education and Communication Offices, Mission Directorates, and Centers have been effective in delivering educational content because of the strong engagement of Administration scientists and engineers in the Administration's education and outreach activities; and

(4) the Administration's education and outreach programs, including the Experimental Program to Stimulate Competitive Research (EPSCoR) and the Space Grant College and Fellowship Program, reflect

the Administration's successful commitment to growing and diversifying the national science and engineering workforce.

(b) CONTINUATION OF EDUCATION AND OUTREACH ACTIVITIES AND PROGRAMS.—

(1) IN GENERAL.—The Administrator shall continue engagement with the public and education opportunities for students via all the Administration's mission directorates to the maximum extent practicable.

(2) REPORT.—Not later than 60 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the Administration's near-term outreach plans for advancing space law education.

SEC. 626. LEVERAGING COMMERCIAL SATELLITE SERVICING CAPABILITIES ACROSS MISSION DIRECTORATES.

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

(1) Refueling and relocating aging satellites to extend their operational lifetimes is a capacity that NASA will substantially benefit from and is important for lowering the costs of ongoing scientific, national security, and commercial satellite operations.

(2) The technologies involved in satellite servicing, such as dexterous robotic arms, propellant transfer systems, and solar electric propulsion, are all critical capabilities to support a human exploration mission to Mars.

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

(1) satellite servicing is a vital capability that will bolster the capacity and affordability of NASA's ongoing scientific and human exploration operations while simultaneously enhancing the ability of domestic companies to compete in the global marketplace; and

(2) future NASA satellites and spacecraft across mission directorates should be constructed in a manner that allows for servicing in order to maximize operational longevity and affordability.

(c) LEVERAGING OF CAPABILITIES.—The Administrator shall identify orbital assets in both the Science Mission Directorate and the Human Exploration and Operations Mission Directorate that could benefit from satellite servicing-related technologies, and shall work across all NASA mission directorates to evaluate opportunities for the private sector to perform such services or advance technical

capabilities by leveraging the technologies and techniques developed by NASA programs and other industry programs.

SEC. 627. FLIGHT OPPORTUNITIES.

(a) DEVELOPMENT OF PAYLOADS.—

(1) IN GENERAL.—In order to conduct necessary research, the Administrator shall continue and, as the Administrator considers appropriate, expand the development of technology payloads for—

(A) scientific research; and

(B) investigating new or improved capabilities.

(2) FUNDS.—For the purpose of carrying out paragraph (1), the Administrator shall make funds available for—

(A) flight testing;

(B) payload development; and

(C) hardware related to subparagraphs (A) and (B).

(b) REAFFIRMATION OF POLICY.—Congress reaffirms that the Administrator should provide flight opportunities for payloads to microgravity environments and suborbital altitudes as authorized by section 907 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18405).

SEC. 628. SENSE OF CONGRESS ON SMALL CLASS LAUNCH MISSIONS.

It is the sense of Congress that—

(1) Venture Class Launch Services contracts awarded under the Launch Services Program will expand opportunities for future dedicated launches of CubeSats and other small satellites and small orbital science missions; and

(2) principal investigator-led small orbital science missions, including CubeSat class, Small Explorer (SMEX) class, and Venture class, offer valuable opportunities to advance science at low cost, train the next generation of scientists and engineers, and enable participants to acquire skills in systems engineering and systems integration that are critical to maintaining the Nation's leadership in space and to enhancing United States innovation and competitiveness abroad.

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A BILL

To authorize the programs of the National Aeronautics and Space Administration, and for other purposes.

DECEMBER 5, 2016

Reported with an amendment