# Calendar No. 628

113TH CONGRESS
2D SESSION

# S. 1317

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2014 through 2016 and for other purposes.

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IN THE SENATE OF THE UNITED STATES

JULY 17, 2013

Mr. NELSON (for himself and Mr. ROCKEFELLER) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

DECEMBER 10, 2014

Reported by Mr. ROCKEFELLER, with an amendment

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

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# A BILL

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2014 through 2016 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 Authorization Act of 2013".~~

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

**SEC. 2. FINDINGS.**

Congress makes the following findings:

(1) A robust and balanced space program enhances the United States long-term national and economic security by—

(A) stimulating development of advanced technologies with widespread applications;

(B) increasing the United States technological competitiveness;

(C) enhancing global prosperity and security through cooperation in shared interests, such as advancement of science, understanding of Earth and the universe, and protection from space borne threats, such as asteroids;

(D) opening the solar system to the full range of peaceful human activity; and

(E) inspiring students to pursue disciplines in science, technology, engineering, and mathematics.

(2) The Nation's space program should include—

(A) national security and civil space activities;

(B) robotic and human exploration;

(C) advancement of scientific knowledge and engagement of the general public;

(D) U.S. Government led launch capability development, including the Space Launch System and the Orion multi-purpose crew vehicle, and partnerships with commercial and international entities;

(E) advancement of the space frontier and stimulation of commerce; and

(F) searching outward to further our understanding of the universe and observing Earth to expand knowledge of our home planet.

**SEC. 3. 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) ISS.—The term ''ISS'' means the International Space Station.

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

(6) ORION.—The term ''Orion'' means the multi-purpose crew vehicle described under section 303 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18323).

(7) SPACE LAUNCH SYSTEM.—The term ''Space Launch System'' has the meaning given the term under 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 2014.**

There are authorized to be appropriated to NASA for fiscal year 2014, $18,100,000,000, as follows:

(1) For Exploration, $4,275,000,000, of which—

(A) $1,600,000,000 shall be for Space Launch System;

(B) $1,200,000,000 shall be for the Orion multi-purpose crew vehicle;

(C) $350,000,000 shall be for Exploration Ground Systems;

(D) $325,000,000 shall be for Exploration Research and Development; and

(E) $800,000,000 shall be for Commercial Space Flight.

(2) For Space Operations, $3,832,000,000, of which—

(A) $3,000,000,000 shall be for the ISS program; and

(B) $832,000,000 for Space and Flight Support.

(3) For Science, $5,154,000,000, of which—

(A) $1,800,000,000 shall be for Earth Sciences;

(B) $1,400,000,000 shall be for Planetary Science;

(C) $642,000,000 shall be for Astrophysics;

(D) $658,000,000 shall be for the James Webb Space Telescope; and

(E) $654,000,000 shall be for Heliophysics.

(4) For Aeronautics, $570,000,000.

(5) For Space Technology, $635,000,000.

(6) For Education, $136,000,000.

(7) For Cross-Agency Support Programs, $2,850,000,000.

(8) For Construction and Environmental Compliance and Restoration, $610,000,000.

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

**SEC. 102. FISCAL YEAR 2015.**

There are authorized to be appropriated to NASA for fiscal year 2015, $18,462,000,000, as follows

(1) For Exploration, $4,522,000,000, of which—

(A) $1,725,000,000 shall be for Space Launch System;

(B) $1,225,000,000 shall be for the Orion multi-purpose crew vehicle;

(C) $425,000,000 shall be for Exploration Ground Systems;

(D) $332,000,000 shall be for Exploration Research and Development; and

(E) $815,000,000 shall be for Commercial Space Flight.

(2) For Space Operations, $3,948,000,000, of which—

(A) $3,103,000,000 shall be for the ISS program; and

(B) $845,000,000 for Space and Flight Support.

(3) For Science, $5,234,400,000, of which—

(A) $1,836,000,000 shall be for Earth Sciences;

(B) $1,450,000,000 shall be for Planetary Science;

(C) $670,000,000 shall be for Astrophysics;

(D) $645,400,000 shall be for the James Webb Space Telescope; and

(E) $633,000,000 shall be for Heliophysics.

(4) For Aeronautics, $581,000,000.

(5) For Space Technology, $650,000,000.

(6) For Education, $139,800,000.

(7) For Cross-Agency Support Programs, $2,907,000,000.

(8) For Construction and Environmental Compliance and Restoration, $441,000,000.

(9) For Inspector General, $38,800,000.

**SEC. 103. FISCAL YEAR 2016.**

There are authorized to be appropriated to NASA for fiscal year 2016, $18,831,000,000, as follows:

(1) For Exploration, $4,660,000,000, of which—

(A) $1,800,000,000 shall be for Space Launch System;

(B) $1,250,000,000 shall be for the Orion multi-purpose crew vehicle;

(C) $435,000,000 shall be for Exploration Ground Systems;

(D) $350,000,000 shall be for Exploration Research and Development; and

(E) $825,000,000 shall be for Commercial Space Flight.

(2) For Space Operations, $4,010,000,000, of which—

(A) $3,196,000,000 shall be for the ISS program; and

(B) $814,000,000 for Space and Flight Support.

(3) For Science, $5,315,800,000, of which—

(A) $1,872,000,000 shall be for Earth Sciences;

(B) $1,500,000,000 shall be for Planetary Science;

(C) $686,800,000 shall be for Astrophysics;

(D) $620,000,000 shall be for the James Webb Space Telescope; and

(E) $637,000,000 shall be for Heliophysics.

(4) For Aeronautics, $593,000,000.

(5) For Space Technology, $665,000,000.

(6) For Education, $142,000,000.

(7) For Cross-Agency Support Programs, $2,965,000,000.

(8) For Construction and Environmental Compliance and Restoration, $441,000,000.

(9) For Inspector General, $39,200,000.

# TITLE II—HUMAN SPACE FLIGHT EXPLORATION AND OPERATIONS

## Subtitle A—Exploration

**SEC. 201. MISSIONS AND DESTINATIONS.**

(a) IN GENERAL.—Congress reaffirms that the long-term goal of the human space flight and exploration efforts of NASA shall be to expand permanent human presence beyond low-Earth orbit and to do so, where practical, in a manner involving international partners, as stated in section 202(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(a)).

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

(1) by striking ''and'' at the end of paragraph (3);

(2) by striking the period at the end of paragraph (4) 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 for human habitation on the surface of Mars.''.

(c) DEVELOPMENT OF EXPLORATION STRATEGY.—

(1) IN GENERAL.—Not later than 270 days after the date of enactment of this Act, and biennially thereafter, the Administrator shall submit to the appropriate committees of Congress a strategy to achieve the objective under section 202(b)(5) of the National Aeronautics and Space Administration Authorization Act of 2010, as amended (42 U.S.C. 18312(b)(5)) through a series of successive, free-standing, but complementary missions making robust utilization of cis-lunar space and employing the Space Launch System, Orion, and other capabilities provided under titles III, IV, V, and IX of that Act (42 U.S.C. 18301 et seq.).

(2) STRATEGY REQUIREMENTS.—In developing the strategy under paragraph (1), the Administrator shall include—

(A) the utility of an expanded human presence in cis-lunar space toward enabling missions to various lunar orbits, the lunar surface, asteroids, the Mars system, and other destinations of interest for future human exploration and development;

(B) the utility of an expanded human presence in cis-lunar space for economic, scientific, and technological advances;

(C) the opportunities for collaboration with—

(i) international partners;

(ii) private industry; and

(iii) other Federal agencies, including missions relevant to national security or scientific needs;

(D) the opportunities specifically afforded by the ISS to support high priority scientific and technological developments useful in expanding and sustaining a human presence in cis-lunar space and beyond;

(E) a range of exploration mission architectures and approaches for the missions identified under paragraph (1); and

(F) standards for ensuring crew health and safety, including limits regarding radiation exposure and countermeasures necessary to meet those limits, means and methods for addressing urgent medical conditions or injuries, and other such safety, health, and medical

issues that can be anticipated in the conduct of the missions identified under paragraph (1).

(3) COMPARISON OF MISSION ARCHITECTURES AND APPROACHES.—

(A) IN GENERAL.—The strategy shall include a comparison of mission architectures and approaches identified under paragraph (2)(E) with a primary objective of identifying the architectures and approaches that—

(i) best support the long-term goal under section 202(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(a)); and

(ii) are enabled by the Space Launch System, Orion, and other transportation capabilities and technologies provided under titles III, IV, V, and IX of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18301 et seq.) and by other capabilities that may be available commercially or internationally.

(B) FACTORS.—The comparison of mission architectures and approaches under subpara-

graph (A) shall include options that assess cost, schedule, safety, sustainability, opportunities for international collaboration, the enabling of new markets and opportunities for U.S. private industry, compelling scientific opportunities or national security considerations and requirements, the flexibility of the architecture to adjust to evolving technologies, leadership, and priorities, and contributions made to U.S. technological excellence, competitiveness, and leadership.

(C) NATIONAL SECURITY COLLABORATION.—In identifying opportunities for collaboration under paragraph (2)(C)(iii), the Administrator, in collaboration with the Secretary of Defense and Director of National Intelligence, shall include a discussion of the work, cost, and schedule required to enable and utilize a cargo variant of the Space Launch System, including the 70-, 105-, and 130-metric ton configurations, with both a 5-meter or 8-meter faring.

(4) ADDITIONAL REQUIREMENTS.—The strategy shall include—

(A) technical information as needed to identify interest from the scientific and national security communities; and

(B) an assessment of the Space Launch System to enable and sustain near-Earth object surveillance of potentially Earth-threatening objects for the purpose of planetary protection.

**SEC. 202. NASA PROCESSING AND LAUNCH INFRASTRUCTURE.**

(a) POLICY.—It is the policy of the United States that the Exploration Ground Systems to process and launch the Space Launch System, Orion, and related exploration elements, and the 21st Century Space Launch Complex to enable and facilitate civil, defense, and private launches are complementary efforts to modernize infrastructure, reduce costs, and maintain capabilities for current and future missions.

(b) DEVELOPMENT OF THE PROCESSING AND LAUNCH SUPPORT INFRASTRUCTURE.—In executing the programs described under subsection (a), the Administrator, to the extent practicable—

(1) may not exclude the ability of Exploration Ground Systems to support efforts under section 305(b) of the National Aeronautics and Space Ad-

ministration Authorization Act of 2010 (42 U.S.C. 18325(b));

(2) shall allow for cost-sharing opportunities by providing multi-use systems and capabilities to current and future users of the 21st Century Space Launch Complex through modernization, refurbishment, or development of infrastructure; and

(3) shall pursue, in collaboration with local, State, or Federal agencies, or private industry, capabilities and investments that support multiple entities to advance NASA's current and future missions and benefit NASA by creating new partnerships.

**SEC. 203. NAMING OF THE SPACE LAUNCH SYSTEM.**

(a) FINDINGS.—Congress finds that education and outreach to encourage the next generation of scientists and engineers to become involved in science and space exploration is one of the Administration's most important missions.

(b) REPORT.—Not later than 30 days after the date of enactment of this Act, the Administration shall submit to the appropriate committees of Congress a plan to engage the public, including science students in elementary and secondary education programs, throughout the United States in naming the Space Launch System.

**SEC. 204. REPORT; SPACE SUIT SYSTEM.**

Not later than 90 days after the date of enactment of this Act, the Administration shall submit to the appropriate committees of Congress a report updating Congress on the Constellation Space Suit System. The report shall include justification as to whether another competition to award contracts for the design, development, certification, production, and sustaining engineering of this space suit system is required to meet the needs of NASA's human exploration program.

# Subtitle B—Maximizing ISS Utilization

**SEC. 221. OPERATION AND UTILIZATION OF THE ISS.**

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

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

(2) every effort should be made to ensure that decisions regarding the service life of the ISS are made on the basis of its projected capability to con-

tinue providing effective and productive research and exploration test bed capabilities.

(b) CONTINUATION OF THE INTERNATIONAL SPACE STATION.—Congress reaffirms the policy stated in section 501(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18351(a)) 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 2020.

(c) NASA ACTIONS.—In furtherance of the policy under subsection (b), the Administrator shall ensure, to the extent practicable, that the ISS, as a designated national laboratory—

(1) remains viable as an element of overall exploration and partnership strategies and approaches; and

(2) remains an effective, functional vehicle providing research and test bed capabilities for the United States through 2020, up to 2028, and possibly beyond.

(d) REPORT.—The Administrator, in consultation with the Office of Science and Technology Policy, shall determine, through analyses and discussions with ISS partners, the feasible and preferred service life of the ISS

as a unique scientific, commercial, and exploration-related facility. Not later than 120 days after the date of enactment of this Act, and triennially thereafter, the Administrator shall submit to the appropriate committees of Congress a report that, at a minimum, includes—

(1) an assessment of whether ISS operations can be extended to at least 2028, including—

(A) a description of any activities that would be required of the international partnership to ensure that safety requirements are met;

(B) a general discussion of international partner capabilities and interest in extension, to include the potential for participation by additional countries;

(C) a review of essential systems or equipment upgrades that would be necessary for ISS extension and utilization to at least 2028;

(D) an evaluation of the cost and schedule requirements associated with the development and delivery of essential systems or equipment upgrades identified under subparagraph (C); and

(E) an identification of possible partner contributions and program transitions to pro-

~~vide the upgrades identified under subparagraph (C);~~

~~(2) 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~~

~~(3) 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 that, within the United States-owned modules of the ISS or in partner-owned facilities of the ISS allocated for United States utilization by international agreement, are or may become engaged in research and testing activities sponsored, conducted, and managed by the Administration or by the ISS management entity.~~

~~(c) DEFINITION OF ISS MANAGEMENT ENTITY.—In this section, the term "ISS management entity" means the organization with which the Administrator enters into a cooperative agreement under section 504(a) of the Na-~~

tional Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

**SEC. 222. RESEARCH ROLES AND RESPONSIBILITIES.**

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

(1) expansion of the non-NASA utilization of the ISS is critical to maximizing the research potential of the ISS national laboratory and to facilitating expanded commercial activity in low-Earth orbit; and

(2) in order to expand the non-NASA scientific utilization of ISS research capabilities and facilities, it is essential to clarify the roles and responsibilities of the entities managing research within the U.S. Segment of the ISS.

(b) MANAGEMENT OF THE ISS NATIONAL LABORATORY.—Section 504 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354) is amended—

(1) in subsection (b), by adding at the end the following:

"(3) CONFLICTS OF INTEREST.—The Administrator shall ensure that the liaison function under this subsection is implemented in a manner that precludes any conflict of interest between the objectives

and activities of the entities identified under subsection (c).'';

(2) in subsection (d)(2)—

(A) by inserting ''(A) IN GENERAL.—'' before ''If any NASA research plan'' and adjusting the text accordingly;

(B) by inserting ''and subject to subparagraph (B)'' after ''Until September 30, 2020'' in subparagraph (A), as redesignated; and

(C) by adding at the end the following:

''(B) MUTUAL AGREEMENT.—An exception under subparagraph (A) may only be granted if there is mutual agreement between the entities identified under subsection (c).''; and

(3) by adding at the end the following:

''(e) CLARIFICATION OF ROLES.—The organization with which the Administrator enters into a cooperative agreement under subsection (a) for management of the ISS national laboratory shall be considered a separate and equal partner of any NASA organizational entity responsible for management of the NASA research plan onboard the ISS.''.

(c) REPORT.—

(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Adminis-

trator shall submit to the appropriate committees of Congress a report on the following:

(A) Options for expanding the Administration's collaboration with its ISS partners, including—

(i) providing U.S. personnel expanded access to international partner research facilities; and

(ii) coordinating research efforts to minimize the duplication of effort, unless duplication is a justified element of the scientific process or essential for backup or redundant capability.

(B) The potential for increasing ISS crew size to maximize utilization and applications.

(C) Efforts undertaken by the Administration and the ISS management entity—

(i) to enhance collaborative research between the Administration and other Federal science agencies, such as the National Institutes of Health and the National Science Foundation; and

(ii) to expand the use of the ISS national laboratory capabilities by Federal science agencies.

(2) DEFINITION OF ISS MANAGEMENT ENTITY.—In this subsection, the term ''ISS management entity'' means the organization with which the Administrator enters into a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).

**SEC. 223. ISS NATIONAL LABORATORY; PROPERTY RIGHTS IN INVENTIONS.**

Section 20135 of title 51, United States Code, is amended—

(1) in subsection (g), by striking ''Each such waiver'' and inserting ''Except as provided under subsection (l), each such waiver''; and

(2) by adding at the end the following:

''(l) WAIVER OF RIGHTS TO INVENTIONS; COMMERCIAL MICROGRAVITY RESEARCH.—

''(1) IN GENERAL.—With respect to any invention or class of inventions made or which may be made by any person or class of persons in the performance of any non-NASA scientific utilization of the ISS national laboratory, the Administrator may waive the license reserved by the Administrator under subsection (g), in whole or in part and according to negotiated terms and conditions, including the

terms and conditions under paragraphs (1), (2), (3), and (5) of section 202(c) of title 35, if the Administrator finds that the reservation of the license by the Administrator would substantially inhibit the commercialization of an invention.

''(2) CONSTRUCTION.—Nothing in this subsection shall be construed to affect the rights of the Federal Government under any other procurement contract, grant, understanding, arrangement, agreement, or transaction.''.

**SEC. 224. COMMERCIAL CARGO AND CREW CAPABILITIES.**

(a) FINDINGS.—Congress finds that—

(1) NASA's Commercial Orbital Transportation Services, Cargo Resupply Services, and Commercial Crew Program demonstrate the potential for procuring routine, commercially provided access to the ISS and to low-Earth orbit using innovative and cost-effective development and procurement strategies;

(2) Federal investments in the U.S. private space industry have the ability to provide for lower cost access to space for researchers and for commercial ventures;

(3) commercially provided space transportation is critical to maximizing utilization of the ISS;

(4) encouraging competition among launch service providers and maintaining multiple space transportation options helps to reduce long-term costs to the Federal Government and to induce continual improvement in available private-sector services; and

(5) consistent with section 201(b) of the National Aeronauties and Space Administration Authorization Act of 2010 (42 U.S.C. 18311(b)), maintaining multiple launch service providers helps ensure uninterrupted access to the space environment should a particular provider's services become unavailable.

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

(1) should continue to support the development of safe, reliable, and cost effective commercial launch capabilities for the primary purpose of securing domestic access to the ISS as quickly and safely as possible; and

(2) should encourage a viable commercial market for the capabilities under paragraph (1).

(c) UNITED STATES POLICY.—It is the policy of the United States that, to foster the competitive development, operation, and improvement of private space transportation services, services for Federal Government access to

and return from the ISS, whenever feasible, 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)).

(d) SELECTION OF COMMERCIAL PROVIDERS.—In evaluating commercial space transportation service providers, the Administrator—

(1) shall aim to minimize the life-cycle costs of obtaining transportation services;

(2) shall assure compliance with all safety and mission assurance requirements;

(3) shall consider contractor financial investment into the development of transportation capabilities; and

(4) for commercial crew transport services—

(A) shall consider flexibility in design, including sample return capabilities; and

(B) shall provide a written notification and justification to the appropriate committees of Congress if the price per seat exceeds the cost negotiated by NASA for crew transport in April 2013.

(5) STRATEGY FOR PROCURING COMMERCIAL SERVICES.—In implementing the policy under subsection (c), the Administrator shall submit to the appropriate committees of Congress, not later than 120 days after the date of enactment of this Act, a strategy for transitioning from Space Act Agreements to Federal Acquisition Regulation-based contracts for the procurement of crew transportation services to and from the ISS. The strategy shall include—

(A) a comparison of potential procurement strategies based on—

(i) maximizing safety and mission assurance;

(ii) the total projected costs to the Federal Government through 2020, given multiple projections of Government demand for launch services;

(iii) the feasibility of the procurement strategy and timeline, given projected funding availabilities;

(iv) the potential for supporting the research and exploration test bed needs of the Federal Government and of the independent entity responsible for ISS national

laboratory activities for the purposes described under section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)); and

(v) the projected impacts on developing a viable market for commercial launch services;

(B) an evaluation of the costs and benefits of ensuring the availability of at least 2 U.S.-based launch service providers, considering—

(i) the potential need for diversified cargo and sample return capabilities, including a soft-landing capability as described under section 404 of the National Aeronautics and Space Administration Authorization Act of 2010 (124 Stat. 2822); and

(ii) the ability of multiple cargo or crew launch service providers to meet private or non-NASA Government mission requirements and the subsequent benefit to the United States of such ability;

(C) justification for the procurement strategy selected from among those considered; and

(D) for the selected procurement strategy, identification of additional or modified authorities, regulations, or guidelines that are necessary for successful implementation.

# Subtitle C—Other Matters

**SEC. 231. SAFETY AND MISSION ASSURANCE IN HUMAN SPACE FLIGHT.**

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

(1) In the early part of the space race, the United States took over 3 years from the launch of the first American satellite, Explorer I, to the launch of the first American to space, Alan B. Shepard, Jr.

(2) It was known then, as it is now, that the exploration of space by humans is an inherently dangerous endeavor.

(3) Access to space requires complex propulsion systems, such as the now retired Space Shuttle, which generated over 7,000,000 pounds of thrust.

(4) Adding humans to the complex systems required to reach space requires additional safeguards, life support systems, and other measures to protect from the harsh environment of space in order to minimize risk to human life.

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

(1) meticulousness and attention to detail helps ensure that all humans are safe and protected to the best of the abilities of all those involved in helping achieve the reaches of space;

(2) those who strive to send humans into space should make every effort to ensure the success of missions and programs through independent safety and mission assurance analyses;

(3) diligent oversight efforts ensure adherence to safety, reliability, and quality assurance policies and procedures for missions and programs; and

(4) lessons learned from mishaps and near misses should be implemented into designs, decisions, policy, and procedures to reduce the risk of future incidents that could jeopardize crew safety or mission success.

**SEC. 232. LAUNCH LIABILITY PROVISIONS.**

(a) LIABILITY EXTENSION.—Section 50915(f) of title 51, United States Code, is amended by striking ''December 31, 2013'' and inserting ''December 31, 2016''.

(b) PROTECTION FOR LAUNCH ACTIVITIES.—Subchapter III of chapter 201 of title 51, United States Code is amended by inserting after section 20147 the following:

**"§ 20148. Indemnification; NASA launch 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 a provider against claims (including reasonable expenses of litigation or settlement) by third parties for death, bodily injury, or loss of or damage to property resulting from activities that the contract defines as unusually hazardous or nuclear in nature, but—

"(1) only to the extent that such claims are not compensated by liability insurance of the provider; and

"(2) only to the extent that such claims arise out of the direct performance of the contract.

"(b) LIMITATION.—Indemnification under subsection (a) may be limited to claims resulting from other than the actual negligence or willful misconduct of the provider.

"(c) TERMS OF INDEMNIFICATION.—A contract made under subsection (a) that provides indemnification shall also 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 suit or claim.

"(d) LIABILITY INSURANCE OF THE PROVIDER.—Each provider that is a party to a contract made under subsection (a) shall have and maintain liability insurance in such amounts as the Administrator shall require to cover liability to third parties and loss of or damage to property.

"(e) 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 (f).

"(f) CROSS-WAIVERS.—The Administrator, on behalf of the United States, and its departments, agencies, and instrumentalities, may reciprocally waive claims with a provider under which each party to the waiver agrees to be responsible, and agrees to ensure that its own related entities are responsible, for damage or loss to its property for which it is responsible, or for losses resulting from any injury or death sustained by its own employees or agents, as a result of activities connected to the contract.

"(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.—Upon the approval by the Administrator, payments under subsection (a) may be made, at the Administrator's election, either from—

''(1) funds obligated for the performance of the agreement concerned;

''(2) funds available for research and development not otherwise obligated; or

''(3) funds appropriated for such payments.

''(i) 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.

''(j) CONSTRUCTION.—The authority to indemnify under this section shall not create any rights in third persons that would not otherwise exist by law.

''(k) DEFINITIONS.—In this section:

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

''(2) PROVIDER.—The term 'provider' means a person that provides domestic launch services in support of any space activity the Government carries out for the Government.''.

(c) 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.".

# TITLE III—SCIENCE

## Subtitle A—Earth Science

**SEC. 301. EARTH SCIENCE.**

(a) FINDINGS.—Congress finds that—

(1) continuous, long-term Earth observation data supports the preparation for and management of natural and human-induced disasters, benefits resource management and agricultural forecasting, improves our understanding of climate, and encourages environmental and economic sustainability;

(2) due to the scope of activities required, Earth science research and Earth observation are multi-agency endeavors requiring significant cooperation and information sharing among government, international, and scientific community partners;

(3) in developing Earth observation technologies, conducting Earth science satellite missions, and providing research products to the scientific community, NASA plays a crucial role in advancing Earth science; and

~~(4) the loss of observational capabilities in Earth science, as predicted by the National Research Council's midterm update to its Earth Science Decadal Survey, risks reversing gains in weather forecast accuracy, reducing disaster response capabilities, and creating an irreversible gap in Earth science data.~~

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

~~(1) given the importance of Earth science and Earth observation data, NASA Earth science efforts—~~

~~(A) should be conducted in coordination with other Federal agencies; and~~

~~(B) should be cognizant of international efforts and the needs of the scientific and businesses communities; and~~

~~(2) whenever feasible, NASA and other Federal agencies should consider the potential for reducing costs by purchasing commercially available Earth science data and services.~~

~~(c) MISSION PRIORITIZATION.—~~

~~(1) NATIONAL STRATEGY FOR EARTH OBSERVATION.—The Office of Science and Technology Policy, in implementing its National Strategy for Earth Ob-~~

servation and in developing a National Plan for Civil Earth Observations, shall prioritize Federal Earth science and observation investments based on—

(A) its assessment of Earth science and observation data requirements;

(B) the capability requirements as identified by the National Academies decadal surveys;

(C) the projected costs of Earth science missions and data gathering activities; and

(D) the projected and available budgets.

(2) NATIONAL PLAN FOR CIVIL EARTH OBSERVATIONS.—The Administration, in prioritizing future Earth science and Earth observation missions and technology development under the National Plan for Civil Earth Observations and chapter 201 of title 51, United States Code, shall consider potential cost-reduction opportunities, including—

(A) if feasible, co-locating Earth science sensors on other satellites; and

(B) purchasing commercially available Earth science data and services, including launch access to orbital and sub-orbital space.

# Subtitle B—Space Science

**SEC. 321. HUMAN EXPLORATION AND SCIENCE COLLABORATION.**

The Administrator shall ensure that the Science Mission Directorate and the Human Exploration and Operations Mission Directorate coordinate in researching and reducing the risks that space exploration beyond low-Earth orbit pose to astronaut health. Not later than 90 days after the date of enactment of this Act, the Administrator shall provide to the appropriate committees of Congress a report detailing the results of previous research in this area and identifying opportunities for future science missions to contribute to the understanding of these risks.

**SEC. 322. MAINTAINING A BALANCED SPACE SCIENCE PORTFOLIO.**

(a) IN GENERAL.—Section 803 of the National Aeronautics and Space Administration Authorization Act of 2010 (124 Stat. 2832) is amended to read as follows:

**"SEC. 803. OVERALL SCIENCE PORTFOLIO; SENSE OF CONGRESS.**

"Congress reaffirms its sense that a balanced and adequately funded set of activities, consisting of research and analysis grants programs, technology development, small, medium, and large space missions, and suborbital

research activities, contributes to a robust and productive science program and serves as a catalysis for innovation and discovery. The Administrator should set science priorities by following the guidance provided by the scientific community through the National Academies' 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 (124 Stat. 2806) is amended by striking ''Overall science portfolio-sense of the Congress'' and inserting ''Overall science portfolio; sense of Congress''.

**SEC. 323. SCIENCE MISSION EXTENSIONS.**

Section 30504 of title 51, United States Code is amended to read as follows:

**''§ 30504. Assessment of science mission extensions**

''(a) ASSESSMENT.—The Administrator shall carry out biennial reviews within each of the Science divisions to assess the cost and benefits of extending the date of the termination of data collection for those missions that have exceeded their planned mission lifetime. In conducting these assessments, the Administrator shall consider—

''(1) the potential continued benefit of instruments on missions that are beyond their planned mission lifetime; and

''(2) the cost and schedule impacts, if any, of mission extension on other NASA activities and science missions.

''(b) CONSULTATION REQUIREMENT.—When deciding whether to extend science missions with an operational component, the Administrator shall consult with the National Oceanic and Atmospheric Administration and any other affected Federal agency.''.

**SEC. 324. PLANETARY SCIENCE.**

(a) FINDINGS.—Congress finds that—

(1) Administration support for planetary science is critical to enabling greater understanding of the solar system and its origin;

(2) the United States leads the world in planetary science and can augment its success with appropriate international 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.—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. The Administrator may seek, if necessary, adjustments to mission priorities, schedule, and scope in light of changing budget projections.

(c) INSTRUMENTATION.—To support its science mission priorities, the Administration shall invest in a sustained program to develop or mature scientific instrument capabilities, as delineated in the NASA Science Instruments, Observatories, and Sensor Systems Roadmap.

**SEC. 325. SPACE WEATHER.**

(a) OSTP ROADMAP.—In coordination with NASA, the National Oceanic and Atmospheric Administration, and other relevant Federal agencies, the Director of the Office of Science and Technology Policy, not later than 24 months after the date of enactment of this Act, shall deliver to the appropriate committees of Congress a roadmap for developing and deploying space weather forecasting technologies. The roadmap shall, at a minimum—

(1) aim to relieve capability gaps identified by the National Space Weather Program Council review of space weather observing systems, as requested by

the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18301 et seq.); and

(2) consider ongoing and future requirements for space weather modeling, monitoring, and prediction.

(b) NASA TECHNOLOGY ROADMAPS.—The Administration shall update and further develop its technology roadmaps as required to address mitigating a wide range of space weather effects on both satellites and spacecraft.

(c) ALERT PROTOCOL.—The Director of the Office of Science and Technology Policy shall coordinate relevant Federal agencies to propose protocols for communicating and responding to space weather forecasts. Protocol assessment shall consider the needs of both government and private sector entities. The Director of the Office of Science and Technology Policy shall deliver a report on proposed protocols to Congress not later than 24 months after the date of enactment of this Act.

**SEC. 326. JAMES WEBB SPACE TELESCOPE.**

It is the sense of Congress that—

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

universe, and support U.S. leadership in astrophysics;

(2) significant progress has been made with regard to overcoming the James Webb Space Telescope's technical challenges and in improving NASA management oversight;

(3) the on-time and on-budget completion of the James Webb Space Telescope should remain a top NASA priority; and

(4) consistent with annual Government Accountability Office reviews of the James Webb Space Telescope program, the Administrator should continue to improve the James Webb Space Telescope's cost and schedule estimates and oversight procedures in order to enhance NASA's ability to successfully deliver the James Webb Space Telescope on time and on budget.

**SEC. 327. UNIVERSITY CLASS SCIENCE MISSIONS.**

(a) SENSE OF CONGRESS.—It is the sense of Congress that principal investigator-led small orbital science missions, including CubeSat, University Explorer (UNEX), Small Explorer (SMEX), and Venture class missions, offer valuable, lower-cost opportunities to advance science, train the next generation of scientists and engineers, and provide opportunities for program participants

to acquire skills in systems engineering and systems integration that are critical to maintaining the Nation's leadership in space.

(b) REVIEW OF PRINCIPAL INVESTIGATOR LED SMALL ORBITAL SCIENCE MISSIONS.—

(1) IN GENERAL.—Not later than 120 days after the date of enactment of this Act, the Administrator shall enter into an arrangement with the National Academy of Sciences to conduct a review of the small orbital science missions described under subsection (a).

(2) REQUIREMENTS.—The review under paragraph (1) shall include the following:

(A) The status, capability, and availability of existing small orbital science mission programs in which the missions are led by principal investigators and enable significant participation by university scientists and students.

(B) The opportunities that the small orbital science missions described under subsection (a) provide for scientific research, training, and education, including scientific and engineering workforce development.

(C) The use of commercial applications, such as hosted payloads, free flyers, and data

buys, as vehicles to further the goals of small orbital science missions, while preserving the principle of independent peer review as the basis for mission selection.

(c) REPORT.—

(1) IN GENERAL.—Not later than 15 months after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the review required by this section.

(2) CONTENTS.—The report shall include—

(A) a summary of the review under subsection (b);

(B) the findings of the Administrator with respect to that review; and

(C) recommendations regarding principal investigator led small orbital science missions conducted by the Administration.

# TITLE IV—AERONAUTICS

**SEC. 401. SENSE OF CONGRESS ON NASA AERONAUTICS.**

(a) FINDINGS.—Congress finds that—

(1) aviation is vital to the United States economy, with the industry supporting nearly 1,000,000 jobs, conducting nearly 10,000,000 commercial flights per year within the United States alone, and

contributing to the aerospace industry's positive trade balance in 2012;

(2) in helping test and mature new technologies for quiet and efficient air transportation, NASA's Aeronautics Research Mission Directorate addresses major aviation trends, such as the rapid growth in passengers, increasing fuel costs, and the demand for faster vehicles;

(3) the Directorate works closely with industry and academia to address long-term challenges to the air transportation system that require improving aviation safety, increasing the capacity of the increasingly crowded national airspace system, and reducing environmental impacts;

(4) through its Aeronautics Test Program, the Directorate manages the flight operations and test infrastructure at 4 NASA centers, providing both NASA and its industry partners with access to critical facilities;

(5) NASA's contribution to aeronautics is evidenced in the use of its technologies in almost every modern aircraft; and

(6) the Directorate has identified otherwise unknown safety issues and helped optimize aircraft

routes, yielding millions of dollars in potential savings to airlines and benefitting passengers.

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

(1) the Aeronautics Research Mission Directorate builds on the successful legacy of NASA's predecessor, the National Advisory Committee for Aeronautics, which worked closely with industry partners to advance both military and civil aviation until its dissolution in 1958;

(2) NASA aeronautics research, development, and test activities, including investments into composite structures, new fuels, and innovative aircraft concepts, must continue in order to support U.S. leadership in aviation;

(3) the Directorate's efforts to collaborate with the aviation industry to gather and analyze data and to prototype and test algorithms that optimize flight routes, manage air traffic, and account for weather impacts are critical to supporting the safe use of the national airspace; and

(4) continued cooperation between NASA's Aeronautics Research Mission Directorate and the Federal Aviation Administration is vital to providing the data and tools necessary to best regulate the na-

tional airspace and to ensure that new technologies are effectively tested and acquire timely regulatory approval.

# TITLE V—SPACE TECHNOLOGY

**SEC. 501. SPACE TECHNOLOGY.**

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

(1) previous investments in space technologies have not only enabled space exploration and research missions, but also have improved the quality of life on Earth;

(2) by improving affordability, reliability, and operational capability, continued space technology developments will enable NASA missions that otherwise would be unachievable;

(3) investments in space technology engage the talent of the Administration and of the Nation's academic and business enterprises; and

(4) space technology roadmaps serve as a useful framework for NASA, academic, and industry development efforts.

(b) SPACE TECHNOLOGY DIRECTIVE.—To advance NASA's space exploration and space research goals, the Administrator shall continue a program with responsibility for NASA investments in space technologies and capabili-

ties. To the greatest extent possible, the Administrator shall synergize all NASA space technology investments, encourage collaboration in space technology development with academia and industry, and minimize duplication of space technology development efforts across the Administration and the private sector unless duplication is required to maintain mission safety, security, or backup capability.

(c) SPACE TECHNOLOGY ROADMAP REPORT.—In carrying out the policy under subsection (b), the Administrator shall submit to the appropriate committees of Congress, not later than 24 months after the date of enactment of this Act, a progress report on the development, testing, and demonstration of the 14 technological areas of the Space Technology Roadmaps.

# TITLE VI—EDUCATION

**SEC. 601. EDUCATION AND OUTREACH ACTIVITIES.**

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

(1) the Administration is uniquely recognized in the educational and global communities for its aerospace knowledge, passionate workforce, and unique capabilities and facilities;

(2) U.S. competitiveness in aerospace requires engaging the science, technology, engineering, and

mathematics (STEM) talent in all States and jurisdictions;

(3) 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;

(4) the Administration's outreach efforts to underrepresented and underserved communities, by helping minorities to pursue higher education in STEM fields and to attain STEM careers, benefit the overall national workforce; and

(5) the Administration's efforts to improve the management and execution of its education portfolio and to evaluate program success using evidence-based approaches should continue.

(b) IN GENERAL.—The Administration shall—

(1) continue to execute its educational and outreach programs, including providing a wide range of academic research opportunities and engaging the public interest in science, technology, engineering and mathematics;

(2) continue to collaborate with minority institutions to increase student participation in science, technology, engineering, and mathematics; and

(3) seek partnerships with industry, academia, and with other communities to best respond to the Nation's aerospace-related educational and workforce needs.

(c) SPACE GRANT.—To enhance the United States STEM education and workforce, the Administrator shall continue to operate the National Space Grant College and Fellowship program through a national network of regional consortia. The program shall provide hands-on research, training, and education programs, use measurable outcomes to gauge success, and allow States flexibility in its execution.

# TITLE VII—OTHER MATTERS

## SEC. 701. SENSE OF CONGRESS ON NASA'S CROSS AGENCY SUPPORT.

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

(1) Cross Agency Support operates and maintains the Administration's centers and facilities, including headquarters, enabling the accomplishment of the Administration's missions while protecting human health and the environment.

~~(2) Cross Agency Support provides for the unique facilities, skilled personnel, and administrative support that NASA programs, research, and development activities require at the centers.~~

~~(3) Cross Agency Support provides the Administration with the capability to improve mission success by supplying safety and mission assurance, engineering technical authority, and health and medical oversight across all of NASA's programs, research, and operations.~~

~~(4) The Orbital Debris Program Office is located in Cross Agency Support and leads the Administration's effort in addressing the orbital debris issue, which is an issue resulting from over 50 years of spaceflight.~~

~~(5) Cross Agency Support delivers the information technology services used throughout the Administration that allow its workforce to work and communicate efficiently and effectively, not only internal to the Administration, but with the citizens of the world which provides them the opportunity to be included and participate in the Administration's accomplishments.~~

~~(6) The Administration's public affairs, located in Cross Agency Support, provided worldwide live~~

coverage of the Curiosity Rover's landing on Mars, the largest rover ever sent to Mars, in August of 2012.

(7) The authority and execution of the Administration's offices responsible for finance, budget, acquisition, external relations, legislative affairs, training, security, and human capital management are performed under Cross Agency Support.

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

(1) Cross Agency Support represents a variety of functions vital to the strength and success of the Administration and is essential to the Administration's vision;

(2) the centers and facilities in the Administration are a vital part of the many advances in science and technology the Administration has provided and continues to provide to this Nation and the world since the Administration was created in 1958;

(3) at the Administration's core is safety and mission success that, through Cross Agency Support, is carried out by the highly talented and dedicated workforce at the Administration's centers and facilities;

(4) as the Administration looks to continue international, interagency, and industry cooperation and partnerships, Cross Agency Support will continue to provide the overseeing and execution of these efforts; and

(5) Cross Agency Support be given the necessary resources to keep the Administration capable of meeting the goals set forth by Congress and continue to be a global leader in space and aeronautics.

**SEC. 702. SPACE COMMUNICATIONS NETWORK.**

(a) PLAN.—The Administrator shall prepare an updated plan for NASA's near-Earth, space, and deep space communications network and infrastructure. The plan shall—

(1) identify steps to sustain the existing network and infrastructure;

(2) assess the capabilities, including any upgrades, needed to support NASA's programs;

(3) identify priorities for how resources should be used to implement the plan; and

(4) assess the impact on missions if resources are not secured at the level needed.

(b) TRANSMITTAL.—Not later than 270 days after the date of enactment of this Act, the Administrator shall

transmit the plan to the appropriate committees of Congress.

**SEC. 703. ASTRONAUT OCCUPATIONAL HEALTHCARE.**

(a) IN GENERAL.—Chapter 313 of title 51, United States Code, is amended by adding at the end the following:

**"§ 31303. Astronaut occupational healthcare**

"(a) IN GENERAL.—Notwithstanding any other provision of law, the Administrator, as the Administrator considers necessary, may provide for the medical monitoring, diagnosis, and treatment of a crewmember for conditions that the Administrator considers associated with human space flight, including scientific and medical tests for psychological and medical conditions.

"(b) RECORDS.—Consistent with applicable Federal privacy laws, the Administration shall retain access to all medical records and other health data from the provision of healthcare under subsection (a).

"(c) DEFINITION OF CREWMEMBER.—In this section, the term 'crewmember' means—

"(1) a former NASA astronaut/payload specialist who has flown on at least 1 space mission;

"(2) a management NASA astronaut who has flown at least 1 space mission and is currently employed by the U.S. Government; or

"(3) an active NASA astronaut/payload specialist assigned, waiting assignment, or training for an assignment to a NASA human space flight.".

(b) CONFORMING AMENDMENT.—The table of contents for chapter 313 of title 51, United States Code, is amended by adding after the item relating to section 31302 the following:

"31303. Astronaut occupational healthcare.".

**SEC. 704. HELIUM CAPTURE AND RECOVERY.**

(a) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress an agency-wide plan to recover and recycle helium, whenever possible, that the Administration uses or will use in current, planned, and future experimentation, tests, launches, and operations.

(b) CONSIDERATIONS.—In developing the plan under subsection (a), the Administrator shall consider how modifications, updates, or new lifecycle designs for engines, balloons, airships, or other future programs can be designed or operated to recover and recycle helium.

**SEC. 705. INFORMATION TECHNOLOGY GOVERNANCE.**

(a) SENSE OF CONGRESS.—It is the sense of Congress that effective information technology governance is critical to ensuring information security, decreased costs, and overall mission assurance. The June 5, 2013, NASA

~~Office of Inspector General audit, "NASA's Information Technology Governance," found that the NASA Chief Information Officer has limited oversight and control over a majority of the Administration's information technology assets and cannot enforce security measures across the agency's computer networks. For nearly 2 decades, the Administration has operated under a decentralized information technology governance structure that has resulted in increased costs and inadequate security. At the same time, centralization of information technology governance has resulted in increased security and lower operating costs at other agencies.~~

~~(b) INFORMATION TECHNOLOGY GOVERNANCE.—The Administrator shall, in consultation with Mission Directorate and NASA Center Chief Information Officers—~~

~~(1) ensure the Agency Chief Information Officer has the appropriate resources and visibility to oversee agency-wide information technology operations and investments;~~

~~(2) establish a direct line of report between the Agency Chief Information Officer and the Administrator;~~

~~(3) establish a minimum monetary threshold for all agency information technology investments over~~

which the Agency Chief Information Officer shall have final approval; and

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

**SEC. 706. IMPROVEMENTS TO BASELINES AND COST CONTROLS BREACH REPORTING PROCESS.**

Section 30104 of title 51, United States Code is amended—

(1) in subsection (d)(3)—

(A) by striking ''the notification''; and

(B) by inserting ''the notification and a timeline by which the Administrator intends to make the determination, report, and analysis under subsection (e)'' before the period at the end;

(2) in subsection (e)(1), by striking ''Not later than 30 days after receiving a written notification under subsection (d)(2)'' and inserting ''In accordance with the timeline under subsection (d)(3)'';

(3) in subsection (e)(1)(A), by striking ''not later than 15 days after making the determination'' and inserting ''in accordance with the timeline under subsection (d)(3)'';

(4) in subsection (e)(2), by striking ''not later than 6 months after the Administrator makes a determination under this subsection'' and inserting ''in accordance with the timeline under subsection (d)(3)''; and

(5) in subsection (f), by inserting ''or an annual budget request that reflects this growth'' after ''a report under subsection (e)(1)(A)''.

**SEC. 707. INFRASTRUCTURE.**

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

(1) the Administration has a role in providing access to unique or specialized laboratory capabilities that are not economically viable for purchase by commercial entities and therefore are not available outside of NASA;

(2) the deteriorating condition of the Administration's facilities and other infrastructure is hampering the research effectiveness and efficiency performed at those facilities by both the Administration and industry participants;

(3) the Administration must improve the condition of its facilities and infrastructure to maintain the competitiveness of the U.S. aerospace industry;

(4) to ensure continued researcher access to reliable and efficient world-class facilities, the Administration should seek to establish strategic partnerships with other Federal agencies, academic institutions, and industry, as appropriate; and

(5) decisions regarding whether to dispose of, maintain, or modernize existing facilities and other infrastructure must be made in the context of meeting the future laboratory needs of the Administration and other Federal agencies.

(b) PLAN.—Not later than 1 year after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a plan for retaining or acquiring the facilities, laboratories, equipment, test capabilities, and other infrastructure necessary to meet the Administration's mandates and its current and future missions. The plan shall—

(1) identify the Administration's future infrastructure needs, including facilities, laboratories, equipment, and test capabilities;

(2) include a strategy for identifying and removing unnecessary or duplicative infrastructure consistent with the national strategic direction under the National Space Policy, the National Aeronautics Research, Development, Test and Evaluation Infra-

structure Plan, the National Aeronautics and Space Administration Authorization Act of 2010, title 51 of the United States Code, and other Administration-related law;

(3) include a strategy for the maintenance, repair, upgrading, and modernization of the Administration's facilities, laboratories, equipment, and other infrastructure;

(4) recommend criteria for prioritizing deferred maintenance tasks and for upgrading or modernizing facilities, laboratories, equipment, and other infrastructure;

(5) include an assessment of modifications needed to maximize the use of facilities, laboratories, equipment, and other infrastructure that offer unique and highly specialized benefits to the aerospace industry and the public; and

(6) include recommendations for implementation, including a timeline, milestones, and an estimate of the resources required for carrying out the plan.

(c) ESTABLISHMENT OF CAPITAL FUNDS.—The Administrator shall establish a capital fund at each of NASA's field centers for the modernization of facilities, laboratories, equipment, and other infrastructure in ac-

cordance with the plan under subsection (b). The Administrator shall ensure, to the greatest extent practicable, that any financial savings achieved by closing an outdated or surplus facility at a NASA field center is made available to that field center's capital fund for the purpose of modernizing that field center's facilities, laboratories, equipment, and other infrastructure in accordance with the plan under subsection (b).

**SEC. 708. KNOWLEDGE MANAGEMENT.**

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

(1) the Administration's success relies heavily on the accumulated technical knowledge of its skilled civil servant and contractor workforce;

(2) in light of an aging workforce, it is imperative that the Administration preserve, to the maximum extent possible, both critical technical skills and all knowledge valuable to future mission planning and operation; and

(3) exercising best practice knowledge management systems within the Administration will benefit the future NASA workforce and help ensure future mission successes.

(b) KNOWLEDGE MANAGEMENT SYSTEM.—The Administrator shall establish an Administration-wide knowl-

edge management system and implement industry-standard best practices for capturing, archiving, and retrieving heritage and future information. The information under this subsection shall be accessible to all Administration employees unless otherwise prohibited because of the classified or sensitive nature of the information.

(c) REPORT.—Not later than 12 months after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report that, at a minimum, includes—

(1) a description of any actions necessary to create or modify an Administration-wide knowledge management system;

(2) a plan for implementing the knowledge management system, including employee training and the provision of secure access to information, as required for all personnel working on Administration programs, projects, and research;

(3) a summary of implementation costs for the knowledge management system; and

(4) a timeline and progress report for implementation.

(d) WORKFORCE STABILIZATION AND CRITICAL SKILLS PRESERVATION.—Section 1105 of the National Aeronautics and Space Administration Authorization Act

~~of 2010 (42 U.S.C. 18431) is amended by striking "2013" and inserting "2016".~~

***SECTION 1. SHORT TITLE; TABLE OF CONTENTS.***

*(a) SHORT TITLE.—This Act may be cited as the "National Aeronautics and Space Administration Authorization Act of 2013".*

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

***SEC. 2. FINDINGS.***

*Congress makes the following findings:*

*(1) A robust and balanced space program enhances the United States long-term national and economic security by—*

*(A) stimulating development of advanced technologies with widespread applications;*

*(B) increasing the United States technological competitiveness;*

*(C) enhancing global prosperity and security through cooperation in shared interests, such as advancement of science, understanding of*

*Earth and the universe, and protection from space borne threats, such as asteroids;*

*(D) opening the solar system to the full range of peaceful human activity; and*

*(E) inspiring students to pursue disciplines in science, technology, engineering, and mathematics.*

*(2) The Nation's space program should include—*

*(A) national security and civil space activities;*

*(B) robotic and human exploration;*

*(C) advancement of scientific knowledge and engagement of the general public;*

*(D) U.S. Government led launch capability development, including the Space Launch System and the Orion multi-purpose crew vehicle, and partnerships with commercial and international entities;*

*(E) advancement of the space frontier and stimulation of commerce; and*

*(F) searching outward to further our understanding of the universe and observing Earth to expand knowledge of our home planet.*

***SEC. 3. 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) ISS.—The term "ISS" means the International Space Station.*

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

*(6) 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).*

*(7) SPACE LAUNCH SYSTEM.—The term "Space Launch System" has the meaning given the term under 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 2014.***

*There are authorized to be appropriated to NASA for fiscal year 2014, $18,100,000,000, as follows:*

*(1) For Exploration, $4,275,000,000, of which—*

*(A) $1,600,000,000 shall be for Space Launch System;*

*(B) $1,200,000,000 shall be for the Orion multi-purpose crew vehicle;*

*(C) $350,000,000 shall be for Exploration Ground Systems;*

*(D) $325,000,000 shall be for Exploration Research and Development; and*

*(E) $800,000,000 shall be for Commercial Space Flight.*

*(2) For Space Operations, $3,832,000,000, of which—*

*(A) $3,000,000,000 shall be for the ISS program; and*

*(B) $832,000,000 for Space and Flight Support.*

*(3) For Science, $5,154,000,000, of which—*

*(A) $1,800,000,000 shall be for Earth Sciences;*

*(B) $1,400,000,000 shall be for Planetary Science;*

*(C) $642,000,000 shall be for Astrophysics;*

*(D) $658,000,000 shall be for the James Webb Space Telescope; and*

*(E) $654,000,000 shall be for Heliophysics.*

*(4) For Aeronautics, $570,000,000.*

*(5) For Space Technology, $635,000,000.*

*(6) For Education, $136,000,000.*

*(7) For Cross-Agency Support Programs, $2,850,000,000.*

*(8) For Construction and Environmental Compliance and Restoration, $610,000,000.*

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

***SEC. 102. FISCAL YEAR 2015.***

*There are authorized to be appropriated to NASA for fiscal year 2015, $18,462,000,000, as follows*

*(1) For Exploration, $4,522,000,000, of which—*

*(A) $1,725,000,000 shall be for Space Launch System;*

*(B) $1,225,000,000 shall be for the Orion multi-purpose crew vehicle;*

*(C) $425,000,000 shall be for Exploration Ground Systems;*

*(D) $332,000,000 shall be for Exploration Research and Development; and*

*(E) $815,000,000 shall be for Commercial Space Flight.*

*(2) For Space Operations, $3,948,000,000, of which—*

*(A) $3,103,000,000 shall be for the ISS program; and*

*(B) $845,000,000 for Space and Flight Support.*

*(3) For Science, $5,234,400,000, of which—*

*(A) $1,836,000,000 shall be for Earth Sciences;*

*(B) $1,450,000,000 shall be for Planetary Science;*

*(C) $670,000,000 shall be for Astrophysics;*

*(D) $645,400,000 shall be for the James Webb Space Telescope; and*

*(E) $633,000,000 shall be for Heliophysics.*

*(4) For Aeronautics, $581,000,000.*

*(5) For Space Technology, $650,000,000.*

*(6) For Education, $139,800,000.*

*(7) For Cross-Agency Support Programs, $2,907,000,000.*

*(8) For Construction and Environmental Compliance and Restoration, $441,000,000.*

*(9) For Inspector General, $38,800,000.*

***SEC. 103. FISCAL YEAR 2016.***

*There are authorized to be appropriated to NASA for fiscal year 2016, $18,831,000,000, as follows:*

*(1) For Exploration, $4,660,000,000, of which—*

*(A) $1,800,000,000 shall be for Space Launch System;*

*(B) $1,250,000,000 shall be for the Orion multi-purpose crew vehicle;*

*(C) $435,000,000 shall be for Exploration Ground Systems;*

*(D) $350,000,000 shall be for Exploration Research and Development; and*

*(E) $825,000,000 shall be for Commercial Space Flight.*

*(2) For Space Operations, $4,010,000,000, of which—*

*(A) $3,196,000,000 shall be for the ISS program; and*

*(B) $814,000,000 for Space and Flight Support.*

*(3) For Science, $5,315,800,000, of which—*

*(A) $1,872,000,000 shall be for Earth Sciences;*

*(B) $1,500,000,000 shall be for Planetary Science;*

*(C) $686,800,000 shall be for Astrophysics;*

*(D) $620,000,000 shall be for the James Webb Space Telescope; and*

*(E) $637,000,000 shall be for Heliophysics.*

*(4) For Aeronautics, $593,000,000.*

*(5) For Space Technology, $665,000,000.*

*(6) For Education, $142,000,000.*

*(7) For Cross-Agency Support Programs, $2,965,000,000.*

*(8) For Construction and Environmental Compliance and Restoration, $441,000,000.*

*(9) For Inspector General, $39,200,000.*

# *TITLE II—HUMAN SPACE FLIGHT EXPLORATION AND OPERATIONS*

## *Subtitle A—Exploration*

***SEC. 201. MISSIONS AND DESTINATIONS.***

*(a) IN GENERAL.—Congress reaffirms that the long-term goal of the human space flight and exploration efforts of NASA shall be to expand permanent human presence beyond low-Earth orbit and to do so, where practical, in a*

*manner involving international partners, as stated in section 202(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(a)).*

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

*(1) by striking "and" at the end of paragraph (3);*

*(2) by striking the period at the end of paragraph (4) 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 for human habitation on the surface of Mars.".*

*(c) DEVELOPMENT OF EXPLORATION STRATEGY.—*

*(1) IN GENERAL.—Not later than 90 days after the date of enactment of this Act, and biennially thereafter, the Administrator shall submit to the appropriate committees of Congress a strategy to achieve the objective under section 202(b)(5) of the National Aeronautics and Space Administration Authorization Act of 2010, as amended (42 U.S.C. 18312(b)(5)) through a series of successive, free-standing, but complementary missions making robust utilization of cislunar space and employing the Space Launch Sys-*

*tem, Orion, and other capabilities provided under titles III, IV, V, and IX of that Act (42 U.S.C. 18301 et seq.).*

*(2) STRATEGY REQUIREMENTS.—In developing the strategy under paragraph (1), the Administrator shall include—*

*(A) the utility of an expanded human presence in cis-lunar space toward enabling missions to various lunar orbits, the lunar surface, asteroids, the Mars system, and other destinations of interest for future human exploration and development;*

*(B) the utility of an expanded human presence in cis-lunar space for economic, scientific, and technological advances;*

*(C) the opportunities for collaboration with—*

*(i) international partners;*

*(ii) private industry; and*

*(iii) other Federal agencies, including missions relevant to national security or scientific needs;*

*(D) the opportunities specifically afforded by the ISS to support high priority scientific and technological developments useful in expand-*

*ing and sustaining a human presence in cis-lunar space and beyond;*

*(E) a range of exploration mission architectures and approaches for the missions identified under paragraph (1); and*

*(F) standards for ensuring crew health and safety, including limits regarding radiation exposure and countermeasures necessary to meet those limits, means and methods for addressing urgent medical conditions or injuries, and other such safety, health, and medical issues that can be anticipated in the conduct of the missions identified under paragraph (1).*

*(3) COMPARISON OF MISSION ARCHITECTURES AND APPROACHES.—*

*(A) IN GENERAL.—The strategy shall include a comparison of mission architectures and approaches identified under paragraph (2)(E) with a primary objective of identifying the architectures and approaches that—*

*(i) best support the long-term goal under section 202(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18312(a)); and*

*(ii) are enabled by the Space Launch System, Orion, and other transportation capabilities and technologies provided under titles III, IV, V, and IX of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18301 et seq.) and by other capabilities that may be available commercially or internationally.*

*(B) FACTORS.—The comparison of mission architectures and approaches under subparagraph (A) shall include options that assess cost, schedule, safety, sustainability, opportunities for international collaboration, the enabling of new markets and opportunities for U.S. private industry, compelling scientific opportunities or national security considerations and requirements, the flexibility of the architecture to adjust to evolving technologies, leadership, and priorities, and contributions made to U.S. technological excellence, competitiveness, and leadership.*

*(C) NATIONAL SECURITY COLLABORATION.—In identifying opportunities for collaboration under paragraph (2)(C)(iii), the Administrator, in collaboration with the Secretary of Defense and Director of National Intelligence,*

*shall include a discussion of the work, cost, and schedule required to enable and utilize a cargo variant of the Space Launch System, including the 70-, 105-, and 130-metric ton configurations, with both a 5-meter or 8-meter faring.*

*(4) ADDITIONAL REQUIREMENTS.—The strategy shall include—*

*(A) technical information as needed to identify interest from the scientific and national security communities; and*

*(B) an assessment of the Space Launch System to enable and sustain near-Earth object surveillance of potentially Earth-threatening objects for the purpose of planetary protection.*

***SEC. 202. NASA PROCESSING AND LAUNCH INFRASTRUCTURE.***

*(a) POLICY.—It is the policy of the United States that the Exploration Ground Systems to process and launch the Space Launch System, Orion, and related exploration elements, and the 21st Century Space Launch Complex to enable and facilitate civil, defense, and private launches are complementary efforts to modernize infrastructure, reduce costs, and maintain capabilities for current and future missions.*

*(b) DEVELOPMENT OF THE PROCESSING AND LAUNCH SUPPORT INFRASTRUCTURE.—In executing the programs described under subsection (a), the Administrator, to the extent practicable—*

*(1) may not exclude the ability of Exploration Ground Systems to support efforts under section 305(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18325(b));*

*(2) shall allow for cost-sharing opportunities by providing multi-use systems and capabilities to current and future users of the 21st Century Space Launch Complex through modernization, refurbishment, or development of infrastructure; and*

*(3) shall pursue, in collaboration with local, State, or Federal agencies, or private industry, capabilities and investments that support multiple entities to advance NASA's current and future missions and benefit NASA by creating new partnerships.*

*(c) IMPROVEMENT OF LAUNCH INFRASTRUCTURE FOR ACCESS TO ISS.—*

*(1) IN GENERAL.—The Administrator shall continue to improve launch infrastructure at United States facilities launching vehicles to resupply the*

*ISS in order to ensure continuous, timely, redundant, and efficient access to the ISS.*

*(2) FUNDING.—The budget materials for the Administration in each budget of the President for a fiscal year (as submitted to Congress pursuant to section 1105(a) of title 31, United States Code) shall specify the amount required for the Administration for such fiscal year for purposes of paragraph (1).*

***SEC. 203. NAMING OF THE SPACE LAUNCH SYSTEM.***

*(a) FINDINGS.—Congress finds that education and outreach to encourage the next generation of scientists and engineers to become involved in science and space exploration is one of the Administration's most important missions.*

*(b) REPORT.—Not later than 30 days after the date of enactment of this Act, the Administration shall submit to the appropriate committees of Congress a plan to engage the public, including science students in elementary and secondary education programs, throughout the United States in naming—*

*(1) NASA's overall deep space human exploration program; and*

*(2) the Space Launch System.*

***SEC. 204. REPORT; SPACE SUIT SYSTEM.***

*Not later than 90 days after the date of enactment of this Act, the Administration shall submit to the appropriate committees of Congress a report updating Congress on the Constellation Space Suit System. The report shall include justification as to whether another competition to award contracts for the design, development, certification, production, and sustaining engineering of this space suit system is required to meet the needs of NASA's human exploration program.*

## *Subtitle B—Maximizing ISS Utilization*

***SEC. 221. OPERATION AND UTILIZATION OF THE ISS.***

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

*(1) maximum utilization of partnerships, scientific research, commercial applications, and exploration test bed capabilities of the ISS is essential to ensuring the greatest return on investments made by the United States and its international partners in the development, assembly, and operations of that unique facility; and*

*(2) every effort should be made to ensure that decisions regarding the service life of the ISS are made on the basis of its projected capability to continue*

*providing effective and productive research and exploration test bed capabilities.*

*(b) CONTINUATION OF THE INTERNATIONAL SPACE STATION.—Congress reaffirms the policy stated in section 501(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18351(a)) 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 2020.*

*(c) NASA ACTIONS.—In furtherance of the policy under subsection (b), the Administrator shall ensure, to the extent practicable, that the ISS, as a designated national laboratory—*

*(1) remains viable as an element of overall exploration and partnership strategies and approaches;*

*(2) is considered for use by all NASA mission directorates, as appropriate, for technically appropriate scientific data gathering or technology risk reduction demonstrations; and*

*(3) remains an effective, functional vehicle providing research and test bed capabilities for the United States through 2020, up to 2028, and possibly beyond.*

*(d) REPORT.—The Administrator, in consultation with the Office of Science and Technology Policy, shall determine, through analyses and discussions with ISS partners, the feasible and preferred service life of the ISS as a unique scientific, commercial, and exploration-related facility. Not later than 120 days after the date of enactment of this Act, and triennially thereafter, the Administrator shall submit to the appropriate committees of Congress a report that, at a minimum, includes—*

*(1) an assessment of whether ISS operations can be extended to at least 2028, including—*

*(A) a description of any activities that would be required of the international partnership to ensure that safety requirements are met;*

*(B) a general discussion of international partner capabilities and interest in extension, to include the potential for participation by additional countries;*

*(C) a review of essential systems or equipment upgrades that would be necessary for ISS extension and utilization to at least 2028;*

*(D) an evaluation of the cost and schedule requirements associated with the development and delivery of essential systems or equipment*

*upgrades identified under subparagraph (C); and*

*(E) an identification of possible partner contributions and program transitions to provide the upgrades identified under subparagraph (C);*

*(2) 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*

*(3) 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 that, within the United States-owned modules of the ISS or in partner-owned facilities of the ISS allocated for United States utilization by international agreement, are or may become engaged in research and testing activities sponsored, conducted, and managed by the Administration or by the ISS management entity.*

*(e) DEFINITION OF ISS MANAGEMENT ENTITY.—In this section, the term "ISS management entity" means the organization with which the Administrator enters into a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).*

***SEC. 222. RESEARCH ROLES AND RESPONSIBILITIES.***

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

*(1) expansion of the non-NASA utilization of the ISS is critical to maximizing the research potential of the ISS national laboratory and to facilitating expanded commercial activity in low-Earth orbit; and*

*(2) in order to expand the non-NASA scientific utilization of ISS research capabilities and facilities, it is essential to clarify the roles and responsibilities of the entities managing research within the U.S. Segment of the ISS.*

*(b) MANAGEMENT OF THE ISS NATIONAL LABORATORY.—Section 504 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354) is amended—*

*(1) in subsection (b), by adding at the end the following:*

*"(3) CONFLICTS OF INTEREST.—The Administrator shall ensure that the liaison function under this subsection is implemented in a manner that precludes any conflict of interest between the objectives and activities of the entities identified under subsection (e).";*

*(2) in subsection (d)(2)—*

*(A) by inserting "(A) IN GENERAL.—" before "If any NASA research plan" and adjusting the text accordingly;*

*(B) by inserting "and subject to subparagraph (B)" after "Until September 30, 2020" in subparagraph (A), as redesignated; and*

*(C) by adding at the end the following:*

*"(B) MUTUAL AGREEMENT.—An exception under subparagraph (A) may only be granted if there is mutual agreement between the entities identified under subsection (e).";* and

*(3) by adding at the end the following:*

*"(e) CLARIFICATION OF ROLES.—The organization with which the Administrator enters into a cooperative agreement under subsection (a) for management of the ISS national laboratory shall be considered a separate and equal partner of any NASA organizational entity respon-*

*sible for management of the NASA research plan onboard the ISS.".*

*(c) REPORT.—*

*(1) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report on the following:*

*(A) Options for expanding the Administration's collaboration with its ISS partners, including—*

*(i) providing U.S. personnel expanded access to international partner research facilities; and*

*(ii) coordinating research efforts to minimize the duplication of effort, unless duplication is a justified element of the scientific process or essential for backup or redundant capability.*

*(B) The potential for increasing ISS crew size to maximize utilization and applications.*

*(C) Efforts undertaken by the Administration and the ISS management entity—*

*(i) to enhance collaborative research between the Administration and other Federal science agencies, such as the National Insti-*

*tutes of Health and the National Science Foundation; and*

*(ii) to expand the use of the ISS national laboratory capabilities by Federal science agencies.*

*(2) DEFINITION OF ISS MANAGEMENT ENTITY.—In this subsection, the term "ISS management entity" means the organization with which the Administrator enters into a cooperative agreement under section 504(a) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(a)).*

***SEC. 223. ISS NATIONAL LABORATORY; PROPERTY RIGHTS IN INVENTIONS.***

*Section 20135 of title 51, United States Code, is amended—*

*(1) in subsection (g), by striking "Each such waiver" and inserting "Except as provided under subsection (l), each such waiver"; and*

*(2) by adding at the end the following:*

*"(l) WAIVER OF RIGHTS TO INVENTIONS; COMMERCIAL MICROGRAVITY RESEARCH.—*

*"(1) IN GENERAL.—With respect to any invention or class of inventions made or which may be made by any person or class of persons in the per-*

*formance of any non-NASA scientific utilization of the ISS national laboratory, the Administrator may waive the license reserved by the Administrator under subsection (g), in whole or in part and according to negotiated terms and conditions, including the terms and conditions under paragraphs (1), (2), (3), and (5) of section 202(c) of title 35, if the Administrator finds that the reservation of the license by the Administrator would substantially inhibit the commercialization of an invention.*

*''(2) CONSTRUCTION.—Nothing in this subsection shall be construed to affect the rights of the Federal Government under any other procurement contract, grant, understanding, arrangement, agreement, or transaction.''.*

***SEC. 224. COMMERCIAL CARGO AND CREW CAPABILITIES.***

*(a) FINDINGS.—Congress finds that—*

*(1) NASA's Commercial Orbital Transportation Services, Cargo Resupply Services, and Commercial Crew Program demonstrate the potential for procuring routine, commercially provided access to the ISS and to low-Earth orbit using innovative and cost-effective development and procurement strategies;*

*(2) Federal investments in the U.S. private space industry have the ability to provide for lower cost ac-*

*cess to space for researchers and for commercial ventures;*

*(3) commercially provided space transportation is critical to maximizing utilization of the ISS;*

*(4) encouraging competition among launch service providers and maintaining multiple space transportation options helps to reduce long-term costs to the Federal Government and to induce continual improvement in available private-sector services; and*

*(5) consistent with section 201(b) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18311(b)), maintaining multiple launch service providers helps ensure uninterrupted access to the space environment should a particular provider's services become unavailable.*

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

*(1) should continue to support the development of safe, reliable, and cost effective commercial launch capabilities for the primary purpose of securing domestic access to the ISS as quickly and safely as possible; and*

*(2) should encourage a viable commercial market for the capabilities under paragraph (1).*

*(c) UNITED STATES POLICY.—It is the policy of the United States that, to foster the competitive development, operation, and improvement of private space transportation services, services for Federal Government access to and return from the ISS, whenever feasible, 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)).*

*(d) SELECTION OF COMMERCIAL PROVIDERS.—In evaluating commercial space transportation service providers, the Administrator—*

*(1) shall aim to minimize the life-cycle costs of obtaining transportation services;*

*(2) shall assure compliance with all safety and mission assurance requirements;*

*(3) shall consider contractor financial investment into the development of transportation capabilities; and*

*(4) for commercial crew transport services—*

*(A) shall consider flexibility in design, including sample return capabilities; and*

*(B) shall provide a written notification and justification to the appropriate committees of*

*Congress if the price per seat exceeds the cost negotiated by NASA for crew transport in April 2013.*

*(5) STRATEGY FOR PROCURING COMMERCIAL SERVICES.—In implementing the policy under subsection (c), the Administrator shall submit to the appropriate committees of Congress, not later than 120 days after the date of enactment of this Act, a strategy for transitioning from Space Act Agreements to Federal Acquisition Regulation-based contracts for the procurement of crew transportation services to and from the ISS. The strategy shall include—*

*(A) a comparison of potential procurement strategies based on—*

*(i) maximizing safety and mission assurance;*

*(ii) the total projected costs to the Federal Government through 2020, given multiple projections of Government demand for launch services;*

*(iii) the feasibility of the procurement strategy and timeline, given projected funding availabilities;*

*(iv) the potential for supporting the research and exploration test bed needs of the*

*Federal Government and of the independent entity responsible for ISS national laboratory activities for the purposes described under section 504(d) of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18354(d)); and*

*(v) the projected impacts on developing a viable market for commercial launch services;*

*(B) an evaluation of the costs and benefits of ensuring the availability of at least 2 U.S.-based launch service providers, considering—*

*(i) the potential need for diversified cargo and sample return capabilities, including a soft-landing capability as described under section 404 of the National Aeronautics and Space Administration Authorization Act of 2010 (124 Stat. 2822); and*

*(ii) the ability of multiple cargo or crew launch service providers to meet private or non-NASA Government mission requirements and the subsequent benefit to the United States of such ability;*

*(C) justification for the procurement strategy selected from among those considered; and*

*(D) for the selected procurement strategy, identification of additional or modified authorities, regulations, or guidelines that are necessary for successful implementation.*

## *Subtitle C—Other Matters*

### *SEC. 231. SAFETY AND MISSION ASSURANCE IN HUMAN SPACE FLIGHT.*

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

*(1) In the early part of the space race, the United States took over 3 years from the launch of the first American satellite, Explorer I, to the launch of the first American to space, Alan B. Shepard, Jr.*

*(2) It was known then, as it is now, that the exploration of space by humans is an inherently dangerous endeavor.*

*(3) Access to space requires complex propulsion systems, such as the now retired Space Shuttle, which generated over 7,000,000 pounds of thrust.*

*(4) Adding humans to the complex systems required to reach space requires additional safeguards, life support systems, and other measures to protect from the harsh environment of space in order to minimize risk to human life.*

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

*(1) meticulousness and attention to detail helps ensure that all humans are safe and protected to the best of the abilities of all those involved in helping achieve the reaches of space;*

*(2) those who strive to send humans into space should make every effort to ensure the success of missions and programs through independent safety and mission assurance analyses;*

*(3) diligent oversight efforts ensure adherence to safety, reliability, and quality assurance policies and procedures for missions and programs; and*

*(4) lessons learned from mishaps and near misses should be implemented into designs, decisions, policy, and procedures to reduce the risk of future incidents that could jeopardize crew safety or mission success.*

***SEC. 232. LAUNCH LIABILITY PROVISIONS.***

*(a) LIABILITY EXTENSION.—Section 50915(f) of title 51, United States Code, is amended by striking "December 31, 2013" and inserting "December 31, 2016".*

*(b) PROTECTION FOR LAUNCH ACTIVITIES.—Subchapter III of chapter 201 of title 51, United States Code is amended by inserting after section 20147 the following:*

***"§ 20148. Indemnification; NASA launch 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 a provider against claims (including reasonable expenses of litigation or settlement) by third parties for death, bodily injury, or loss of or damage to property resulting from activities that the contract defines as unusually hazardous or nuclear in nature, but—*

*"(1) only to the extent that such claims are not compensated by liability insurance of the provider; and*

*"(2) only to the extent that such claims arise out of the direct performance of the contract.*

*"(b) LIMITATION.—Indemnification under subsection (a) may be limited to claims resulting from other than the actual negligence or willful misconduct of the provider.*

*"(c) TERMS OF INDEMNIFICATION.—A contract made under subsection (a) that provides indemnification shall also 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 suit or claim.*

*"(d) LIABILITY INSURANCE OF THE PROVIDER.—Each provider that is a party to a contract made under subsection (a) shall have and maintain liability insurance in such amounts as the Administrator shall require to cover liability to third parties and loss of or damage to property.*

*"(e) 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 (f).*

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

*"(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.—Upon the approval by the Administrator, payments under subsection (a) may be made, at the Administrator's election, either from—*

*"(1) funds obligated for the performance of the contract concerned;*

*"(2) funds available for research and development not otherwise obligated; or*

*"(3) funds appropriated for such payments.*

*"(i) APPLICATION OF CERTAIN PROVISIONS.—If the Administrator requests additional appropriations to make payments under this section, then the request for those appropriations shall be made in accordance with the procedures established under section 50915. The Administrator shall not authorize payments under subsection (h) of this section, except to the extent provided in an appropriation law or to the extent additional legislative authority is enacted providing for such payments. Notwithstanding any other provision of this section, all obligations under this section are subject to the availability of funds, and nothing in this section shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act (31 U.S.C. 1341).*

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

*"(l) DEFINITIONS.—In this section:*

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

*"(2) PROVIDER.—The term 'provider' means a person that provides domestic launch services in support of any space activity the Government carries out for the Government, including a subcontractor under a contract containing an indemnification provision under subsection (a).*

*"(3) RELATED ENTITY.—The term 'related entity' includes a contractor or subcontractor.".*

*(c) 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.".*

***SEC. 233. TERMINATION LIABILITY.***

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

*(1) while NASA's rate of contract termination is relatively low, the proper management of termination liability is essential to minimizing the government's cost risk and to ensuring that taxpayer funding properly supports meeting NASA contract performance goals;*

*(2) maintaining the Administration's flexibility in executing termination liability provisions helps NASA to effectively manage its cost risks, given the circumstances relevant to individual contracts;*

*(3) current statute provides the Administration with broad leeway in determining the amount of and managing its termination liability reserves; and*

*(4) the concerns noted in 2011 by the Comptroller General, who found that NASA had not successfully monitored potential termination liability costs or enforced related procedures, must be addressed in order to ensure the best use of taxpayer funds.*

*(b) REPORT.—Not later than 90 days after the date of enactment of this Act, the Administrator shall deliver to the appropriate committees of Congress a review of its current termination liability practices and the benefits of potential alternatives. The report shall include –*

*(1) an accounting of the total budget currently held in reserve, by either the Administration or a con-*

*tractor, to cover termination liability for the Space Launch System and Orion programs;*

*(2) an accounting of the current cost risk of termination liability for the Space Launch System and Orion programs;*

*(3) a description of the guidelines by which the Administration determines the appropriate level of termination liability and monitors potential termination liability costs over the lifetime of a contract;*

*(4) a descriptive list of alternative frameworks for managing termination liability, including frameworks wherein neither NASA nor the contractor holds funds in reserve to cover termination liability;*

*(5) a comparison demonstrating the benefits and drawbacks of the current and alternative termination liability frameworks; and*

*(6) a description of any statutory changes that may be required to implement alternative termination liability frameworks, which may include permitting the Administration to pool reserves across programs or to apply current year appropriations towards liability payments.*

*(c) GAO REVIEW.—Concurrent with the delivery of the report to the appropriate committees of Congress, the Administration shall submit the report for review by the*

*Comptroller General. Not later than 30 days after the date that NASA receives the report, the Comptroller General shall deliver to Congress an assessment of the potential for continued improvement relative to the previous GAO review of NASA termination liability, conducted in 2011.*

# *TITLE III—SCIENCE*

## *Subtitle A—Earth Science*

***SEC. 301. EARTH SCIENCE.***

*(a) FINDINGS.—Congress finds that—*

*(1) continuous, long-term Earth observation data supports the preparation for and management of natural and human-induced disasters, benefits resource management and agricultural forecasting, improves our understanding of climate, and encourages environmental and economic sustainability;*

*(2) due to the scope of activities required, Earth science research and Earth observation are multi-agency endeavors requiring significant cooperation and information sharing among government, international, and scientific community partners;*

*(3) in developing Earth observation technologies, conducting Earth science satellite missions, and providing research products to the scientific community, NASA plays a crucial role in advancing Earth science; and*

*(4) the loss of observational capabilities in Earth science, as predicted by the National Research Council's midterm update to its Earth Science Decadal Survey, risks reversing gains in weather forecast accuracy, reducing disaster response capabilities, and creating an irreversible gap in Earth science data.*

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

*(1) given the importance of Earth science and Earth observation data, NASA Earth science efforts—*

*(A) should be conducted in coordination with other Federal agencies; and*

*(B) should be cognizant of international efforts and the needs of the scientific and businesses communities; and*

*(2) whenever feasible, NASA and other Federal agencies should consider the potential for reducing costs by purchasing commercially available Earth science data and services while maintaining free and open data policies.*

*(c) MISSION PRIORITIZATION.—*

*(1) NATIONAL STRATEGY FOR EARTH OBSERVATION.—The Office of Science and Technology Policy, in implementing its National Strategy for Earth Observation and in developing a National Plan for Civil*

*Earth Observations, shall prioritize Federal Earth science and observation investments based on—*

*(A) its assessment of Earth science and observation data requirements;*

*(B) the capability requirements as identified by the National Academies decadal surveys;*

*(C) the projected costs of Earth science missions and data gathering activities; and*

*(D) the projected and available budgets.*

*(2) NATIONAL PLAN FOR CIVIL EARTH OBSERVATIONS.—The Administration, in prioritizing future Earth science and Earth observation missions and technology development under the National Plan for Civil Earth Observations and chapter 201 of title 51, United States Code, shall consider potential cost-reduction opportunities, including—*

*(A) if feasible, co-locating Earth science sensors on other satellites; and*

*(B) purchasing commercially available services, such as launch access to orbital and sub-orbital space, and Earth science data with free and open data policies.*

*(d) DEEP SPACE CLIMATE OBSERVATORY.—The Administrator shall continue to develop and integrate the National Institute of Standards and Technology Advanced Ra-*

*diometer, the Earth Polychromatic Imaging Camera, and related hardware and software onto the Deep Space Climate Observatory.*

***SEC. 302. LAND REMOTE SENSING.***

*(a) REAFFIRMATION OF FINDING.—Congress reaffirms the finding in section 2(1) of the Land Remote Sensing Policy Act of 1992 (Public Law 102–555; 106 Stat. 4163; 15 U.S.C. 5601), namely, that "[t]he continuous collection and utilization of land remote sensing data from space are of major benefit in studying and understanding human impacts on the global environment, in managing the Earth's natural resources, in carrying out national security functions, and in planning and conducting many other activities of scientific, economic, and social importance".*

*(b) FINDINGS.—Congress makes the following findings:*

*(1) Since 1972, the Landsat program has provided standardized scientific data, the continuity of which is essential to ensuring the value of Landsat in monitoring the environment, modeling and detecting changes in the global supply of natural resources, and updating maps relevant to national security.*

*(2) Landsat data engages and benefits a broad group of national stakeholders, from Landsat data processors in South Dakota to coastal restoration planners in Louisiana, forest managers in Colorado,*

*Texas, and West Virginia, fire risk assessors in California, and beyond.*

*(3) The May 2013 operationalization of Landsat 8 is especially notable given the dramatic increase in the usage and economic value of Landsat data which has occurred since the 2008 adoption of free and open data policies.*

*(4) Rapidly proceeding with the definition and construction of the next global land-imaging system, Landsat 9 offers the potential for cost savings by taking advantage of the standing infrastructure and flight hardware used to construct Landsat 8 to sustain the highly successful Landsat partnership between the Administration and the United States Geological Survey.*

*(5) According to the report of the National Academies of Sciences entitled "Future U.S. Workforce on Geospatial Intelligence", remote sensing is one of the 5 core areas on which the current production and analysis of geospatial intelligence relies.*

*(c) SYSTEM DEFINITION AND PROCUREMENT OF NEXT GLOBAL LAND-IMAGING SYSTEM.—The Administrator shall use existing studies and data to initiate system definition and procurement of the next global land-imaging system in*

*a manner consistent with continuing Earth remote sensing data collection over multi-decade time periods.*

*(d) SUPPORT FOR EDUCATION IN REMOTE SENSING DISCIPLINES.—The Administrator shall, to the extent practicable within funds available to the Administration, seek partnerships with institutions of higher education, and other Federal agencies, to support education of the next generation of remote sensing engineers, scientists, and analysts.*

## *Subtitle B—Space Science*

***SEC. 321. HUMAN EXPLORATION AND SCIENCE COLLABORATION.***

*The Administrator shall ensure that the Science Mission Directorate and the Human Exploration and Operations Mission Directorate coordinate in researching and reducing the risks that space exploration beyond low-Earth orbit pose to astronaut health. Not later than 90 days after the date of enactment of this Act, the Administrator shall provide to the appropriate committees of Congress a report detailing the results of previous research in this area and identifying opportunities for future science missions to contribute to the understanding of these risks.*

***SEC. 322. MAINTAINING A BALANCED SPACE SCIENCE PORTFOLIO.***

*(a) IN GENERAL.—Section 803 of the National Aeronautics and Space Administration Authorization Act of 2010 (124 Stat. 2832) is amended to read as follows:*

***"SEC. 803. OVERALL SCIENCE PORTFOLIO; SENSE OF CONGRESS.***

*"Congress reaffirms its sense that a balanced and adequately funded set of activities, consisting of research and analysis grants programs, technology development, small, medium, and large space missions, and suborbital research activities, contributes to a robust and productive science program and serves as a catalysis for innovation and discovery. The Administrator should set science priorities by following the guidance provided by the scientific community through the National Academies' 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 (124 Stat. 2806) is amended by striking "Overall science portfolio-sense of the Congress" and inserting "Overall science portfolio; sense of Congress".*

***SEC. 323. SCIENCE MISSION EXTENSIONS.***

*Section 30504 of title 51, United States Code is amended to read as follows:*

***"§ 30504. Assessment of science mission extensions***

*"(a) ASSESSMENT.—The Administrator shall carry out biennial reviews within each of the Science divisions to assess the cost and benefits of extending the date of the termination of data collection for those missions that have exceeded their planned mission lifetime. In conducting these assessments, the Administrator shall consider—*

*"(1) the potential continued benefit of instruments on missions that are beyond their planned mission lifetime; and*

*"(2) the cost and schedule impacts, if any, of mission extension on other NASA activities and science missions.*

*"(b) CONSULTATION REQUIREMENT.—When deciding whether to extend science missions with an operational component, the Administrator shall consult with the National Oceanic and Atmospheric Administration and any other affected Federal agency.".*

***SEC. 324. PLANETARY SCIENCE.***

*(a) FINDINGS.—Congress finds that—*

*(1) Administration support for planetary science is critical to enabling greater understanding of the solar system and its origin;*

*(2) the United States leads the world in planetary science and can augment its success with appropriate international 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.—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. Consistent with this balanced mix of missions and 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.*

*(c) INSTRUMENTATION.—To support its science mission priorities, the Administration shall invest in a sustained program to develop or mature scientific instrument capabilities, as delineated in the NASA Science Instruments, Observatories, and Sensor Systems Roadmap.*

***SEC. 325. SPACE WEATHER.***

*(a) OSTP ROADMAP.—In coordination with NASA, the National Oceanic and Atmospheric Administration, and other relevant Federal agencies, the Director of the Office of Science and Technology Policy, not later than 24*

*months after the date of enactment of this Act, shall deliver to the appropriate committees of Congress a roadmap for developing and deploying space weather forecasting technologies. The roadmap shall, at a minimum—*

*(1) aim to relieve capability gaps identified by the National Space Weather Program Council review of space weather observing systems, as requested by the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18301 et seq.); and*

*(2) consider ongoing and future requirements for space weather modeling, monitoring, and prediction.*

*(b) NASA TECHNOLOGY ROADMAPS.—The Administration shall update and further develop its technology roadmaps as required to address mitigating a wide range of space weather effects on both satellites and spacecraft.*

*(c) ALERT PROTOCOL.—The Director of the Office of Science and Technology Policy shall coordinate relevant Federal agencies to propose protocols for communicating and responding to space weather forecasts. Protocol assessment shall consider the needs of both government and private sector entities. The Director of the Office of Science and Technology Policy shall deliver a report on proposed protocols to Congress not later than 24 months after the date of enactment of this Act.*

***SEC. 326. JAMES WEBB SPACE TELESCOPE.***

*It is the sense of Congress that—*

*(1) the James Webb Space Telescope will significantly advance our understanding of star and planet formation, improve our knowledge of the early universe, and support U.S. leadership in astrophysics;*

*(2) significant progress has been made with regard to overcoming the James Webb Space Telescope's technical challenges and in improving NASA management oversight;*

*(3) the on-time and on-budget completion of the James Webb Space Telescope should remain a top NASA priority; and*

*(4) consistent with annual Government Accountability Office reviews of the James Webb Space Telescope program, the Administrator should continue to improve the James Webb Space Telescope's cost and schedule estimates and oversight procedures in order to enhance NASA's ability to successfully deliver the James Webb Space Telescope on time and on budget.*

***SEC. 327. UNIVERSITY CLASS SCIENCE MISSIONS.***

*(a) SENSE OF CONGRESS.—It is the sense of Congress that principal investigator-led suborbital and small orbital science missions, including CubeSat, University Explorer (UNEX), Small Explorer (SMEX), and Venture class missions, offer valuable, lower-cost opportunities to advance*

*science, train the next generation of scientists and engineers, and provide opportunities for program participants to acquire skills in systems engineering and systems integration that are critical to maintaining the Nation's leadership in space. The use of public-private partnerships and commercial contracting are important means for sustaining lower costs.*

*(b) REVIEW OF PRINCIPAL INVESTIGATOR LED SUBORBITAL AND SMALL ORBITAL SCIENCE MISSIONS.—*

*(1) IN GENERAL.—Not later than 120 days after the date of enactment of this Act, the Administrator, in collaboration with the Director of the National Science Foundation, shall enter into an arrangement with the National Academy of Sciences to conduct a review of suborbital and small orbital science missions, including those described under subsection (a).*

*(2) REQUIREMENTS.—The review under paragraph (1) shall include the following:*

*(A) The status, capability, and availability of existing suborbital and small orbital science mission programs in which the missions are led by principal investigators and enable significant participation by university scientists and students.*

*(B) The opportunities that suborbital and small orbital science missions provide for scientific research, training, and education, including scientific and engineering workforce development.*

*(C) The use of commercial applications, such as hosted payloads, free flyers, data buys, secondary payloads, and commercial launches further the goals of suborbital and small orbital science missions, while preserving the principle of independent peer review as the basis for mission selection.*

*(c) REPORT.—*

*(1) IN GENERAL.—Not later than 15 months after the date of enactment of this Act, the Administrator and the Director of the National Science Foundation shall submit to the appropriate committees of Congress a report on the review required by this section.*

*(2) CONTENTS.—The report shall include—*

*(A) a summary of the review under subsection (b);*

*(B) the findings of the Administrator and the Director of the National Science Foundation with respect to that review; and*

*(C) recommendations regarding principal investigator led suborbital and small orbital science missions conducted by the Administration and the National Science Foundation.*

# *TITLE IV—AERONAUTICS*

***SEC. 401. NASA AERONAUTICS.***

*(a) FINDINGS.—Congress finds that—*

*(1) aviation is vital to the United States economy, with the industry supporting nearly 1,000,000 jobs, conducting nearly 10,000,000 commercial flights per year within the United States alone, and contributing to the aerospace industry's positive trade balance in 2012;*

*(2) in helping test and mature new technologies for quiet and efficient air transportation, NASA's Aeronautics Research Mission Directorate addresses major aviation trends, such as the rapid growth in passengers, increasing fuel costs, and the demand for faster vehicles;*

*(3) the Directorate works closely with industry and academia to address long-term challenges to the air transportation system that require improving aviation safety, increasing the capacity of the increasingly crowded national airspace system, and reducing environmental impacts;*

*(4) through its Aeronautics Test Program, the Directorate manages the flight operations and test infrastructure at 4 NASA centers, providing both NASA and its industry partners with access to critical facilities;*

*(5) NASA's contribution to aeronautics is evidenced in the use of its technologies in almost every modern aircraft; and*

*(6) the Directorate has identified otherwise unknown safety issues and helped optimize aircraft routes, yielding millions of dollars in potential savings to airlines and benefitting passengers.*

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

*(1) the Aeronautics Research Mission Directorate builds on the successful legacy of NASA's predecessor, the National Advisory Committee for Aeronautics, which worked closely with industry partners to advance both military and civil aviation until its dissolution in 1958;*

*(2) NASA aeronautics research, development, and test activities, including investments into composite structures, new fuels, and innovative aircraft concepts, must continue in order to support U.S. leadership in aviation;*

*(3) the Directorate's efforts to collaborate with the aviation industry to gather and analyze data and to prototype and test algorithms that optimize flight routes, manage air traffic, and account for weather impacts are critical to supporting the safe use of the national airspace;*

*(4) continued cooperation between NASA's Aeronautics Research Mission Directorate and the Federal Aviation Administration is vital to providing the data and tools necessary to best regulate the national airspace and to ensure that new technologies are effectively tested and acquire timely regulatory approval; and*

*(5) continued cooperation between NASA's Aeronautics Research Mission Directorate and the Department of Defense is vital to providing technical expertise, research, and experimental and test facilities for a broad range of aeronautics research and development, including hypersonics and rotorcraft.*

*(c) ADVANCED COMPOSITES PROJECT.—*

*(1) IN GENERAL.—The Administrator shall carry out an Advanced Composites Project to accelerate the use of advanced composite materials in aircraft. To implement the project, the Administrator shall enter into a public-private partnership between the Admin-*

*istration and appropriate private sector entities. The partnership shall be called the "Advanced Composites Consortium".*

*(2) PARTICIPATION AND COORDINATION WITH OTHER FEDERAL AGENCIES.—The partnership to implement the project—*

*(A) may include other Federal agencies if the Administrator determines that the participation of such agencies in the partnership will further the purpose of the partnership; and*

*(B) shall coordinate with the Joint Advanced Materials and Structures Center of Excellence of the Federal Aviation Administration.*

*(3) PURPOSE.—The purpose of the Advanced Composites Project shall be to accelerate the development and certification of advanced composite materials and structures for use in commercial and military aircraft. The partnership shall foster collaboration with the private sector, and with other Federal agencies, in order to accomplish the purpose of the project.*

# *TITLE V—SPACE TECHNOLOGY*

***SEC. 501. SPACE TECHNOLOGY.***

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

*(1) previous investments in space technologies have not only enabled space exploration and research missions, but also have improved the quality of life on Earth;*

*(2) by improving affordability, reliability, and operational capability, continued space technology developments will enable NASA missions that otherwise would be unachievable;*

*(3) investments in space technology engage the talent of the Administration and of the Nation's academic and business enterprises; and*

*(4) space technology roadmaps serve as a useful framework for NASA, academic, and industry development efforts.*

*(b) SPACE TECHNOLOGY DIRECTIVE.—To advance NASA's space exploration and space research goals, the Administrator shall continue a program with responsibility for NASA investments in space technologies and capabilities. To the greatest extent possible, the Administrator shall synergize all NASA space technology investments, encourage collaboration in space technology development with academia and industry, and minimize duplication of space technology development efforts across the Administration and the private sector unless duplication is required to maintain mission safety, security, or backup capability.*

*(c) SPACE TECHNOLOGY ROADMAP REPORT.—In carrying out the policy under subsection (b), the Administrator shall submit to the appropriate committees of Congress, not later than 24 months after the date of enactment of this Act, a progress report on the development, testing, and demonstration of the 14 technological areas of the Space Technology Roadmaps.*

*(d) FLIGHT OPPORTUNITIES.—*

*(1) DEVELOPMENT OF PAYLOADS.—In order to do necessary research, the Administrator shall continue and, as appropriate, expand the development of technology payloads that investigate improved capabilities and scientific research.*

*(2) FLIGHT OPPORTUNITIES FOR PAYLOADS.—The Administrator shall provide flight opportunities for such 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).*

*(e) REPORT REPEAL.—Notwithstanding any other provision of law, the Administration is not required to compile or submit the annual report on the Innovative Partnerships Program under section 1107(c) of the National Aeronautics and Space Administration Authorization Act of 2008 (122 Stat. 4779).*

# *TITLE VI—EDUCATION*

***SEC. 601. EDUCATION AND OUTREACH ACTIVITIES.***

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

*(1) the Administration is uniquely recognized in the educational and global communities for its aerospace knowledge, passionate workforce, and unique capabilities and facilities;*

*(2) U.S. competitiveness in aerospace requires engaging the science, technology, engineering, and mathematics (STEM) talent in all States and jurisdictions;*

*(3) 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;*

*(4) the Administration's outreach efforts to underrepresented and underserved communities, by helping minorities to pursue higher education in STEM fields and to attain STEM careers, benefit the overall national workforce; and*

*(5) the Administration's efforts to improve the management and execution of its education portfolio and to evaluate program success using evidence-based approaches should continue.*

*(b) IN GENERAL.—The Administration shall—*

*(1) continue to execute its educational and outreach programs, including providing a wide range of academic research opportunities and engaging the public interest in science, technology, engineering and mathematics;*

*(2) continue to collaborate with minority institutions (as defined in section 365 of title III of the Higher Education Act of 1965 (20 U.S.C. 1067k) to increase student participation in science, technology, engineering, and mathematics; and*

*(3) seek partnerships with industry, academia, and with other communities to best respond to the Nation's aerospace-related educational and workforce needs.*

*(c) SPACE GRANT.—To enhance the United States STEM education and workforce, the Administrator shall continue to operate the National Space Grant College and Fellowship program through a national network consisting of a state-based consortium in each State (as defined under section 40302 of title 51, United States Code). The program*

*shall provide hands-on research, training, and education programs, use measurable outcomes to gauge success, and allow States flexibility in its execution.*

# *TITLE VII—OTHER MATTERS*

## *SEC. 701. SENSE OF CONGRESS ON NASA'S CROSS AGENCY SUPPORT.*

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

*(1) Cross Agency Support operates and maintains the Administration's centers and facilities, including headquarters, enabling the accomplishment of the Administration's missions while protecting human health and the environment.*

*(2) Cross Agency Support provides for the unique facilities, skilled personnel, and administrative support that NASA programs, research, and development activities require at the centers.*

*(3) Cross Agency Support provides the Administration with the capability to improve mission success by supplying safety and mission assurance, engineering technical authority, and health and medical oversight across all of NASA's programs, research, and operations.*

*(4) The Orbital Debris Program Office is located in Cross Agency Support and leads the Administration's effort in addressing the orbital debris issue,*

*which is an issue resulting from over 50 years of spaceflight.*

*(5) Cross Agency Support delivers the information technology services used throughout the Administration that allow its workforce to work and communicate efficiently and effectively, not only internal to the Administration, but with the citizens of the world which provides them the opportunity to be included and participate in the Administration's accomplishments.*

*(6) The Administration's public affairs, located in Cross Agency Support, provided worldwide live coverage of the Curiosity Rover's landing on Mars, the largest rover ever sent to Mars, in August of 2012.*

*(7) The authority and execution of the Administration's offices responsible for finance, budget, acquisition, external relations, legislative affairs, training, security, and human capital management are performed under Cross Agency Support.*

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

*(1) Cross Agency Support represents a variety of functions vital to the strength and success of the Administration and is essential to the Administration's vision;*

*(2) the centers and facilities in the Administration are a vital part of the many advances in science and technology the Administration has provided and continues to provide to this Nation and the world since the Administration was created in 1958;*

*(3) at the Administration's core is safety and mission success that, through Cross Agency Support, is carried out by the highly talented and dedicated workforce at the Administration's centers and facilities;*

*(4) as the Administration looks to continue international, interagency, and industry cooperation and partnerships, Cross Agency Support will continue to provide the overseeing and execution of these efforts; and*

*(5) Cross Agency Support be given the necessary resources to keep the Administration capable of meeting the goals set forth by Congress and continue to be a global leader in space and aeronautics.*

***SEC. 702. SPACE COMMUNICATIONS NETWORK.***

*(a) PLAN.—The Administrator shall prepare an updated plan for NASA's near-Earth, space, and deep space communications network and infrastructure. The plan shall—*

*(1) identify steps to sustain the existing network and infrastructure;*

*(2) assess the capabilities, including any upgrades, needed to support NASA's programs;*

*(3) identify priorities for how resources should be used to implement the plan; and*

*(4) assess the impact on missions if resources are not secured at the level needed.*

*(b) TRANSMITTAL.—Not later than 270 days after the date of enactment of this Act, the Administrator shall transmit the plan to the appropriate committees of Congress.*

***SEC. 703. ASTRONAUT OCCUPATIONAL HEALTHCARE.***

*(a) IN GENERAL.—Chapter 313 of title 51, United States Code, is amended by adding at the end the following:*

***"§ 31303. Astronaut occupational healthcare***

*"(a) IN GENERAL.—Notwithstanding any other provision of law, the Administrator, as the Administrator considers necessary, may provide for the medical monitoring, diagnosis, and treatment of a crewmember for conditions that the Administrator considers associated with human space flight, including scientific and medical tests for psychological and medical conditions.*

*"(b) RECORDS.—Consistent with applicable Federal privacy laws, the Administration shall retain access to all*

*medical records and other health data from the provision of healthcare under subsection (a).*

*"(c) DEFINITION OF CREWMEMBER.—In this section, the term 'crewmember' means—*

*"(1) a former NASA astronaut/payload specialist who has flown on at least 1 space mission;*

*"(2) a management NASA astronaut who has flown at least 1 space mission and is currently employed by the U.S. Government; or*

*"(3) an active NASA astronaut/payload specialist assigned, waiting assignment, or training for an assignment to a NASA human space flight.".*

*(b) CONFORMING AMENDMENT.—The table of contents for chapter 313 of title 51, United States Code, is amended by adding after the item relating to section 31302 the following:*

*"31303. Astronaut occupational healthcare.".*

***SEC. 704. HELIUM CAPTURE AND RECOVERY.***

*(a) IN GENERAL.—Not later than 180 days after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress an agency-wide plan to recover and recycle helium, whenever possible, that the Administration uses or will use in current, planned, and future experimentation, tests, launches, and operations.*

*(b) CONSIDERATIONS.—In developing the plan under subsection (a), the Administrator shall consider how modifications, updates, or new lifecycle designs for engines, balloons, airships, or other future programs can be designed or operated to recover and recycle helium.*

***SEC. 705. INFORMATION TECHNOLOGY GOVERNANCE.***

*(a) SENSE OF CONGRESS.—It is the sense of Congress that effective information technology governance is critical to ensuring information security, decreased costs, and overall mission assurance. The June 5, 2013, NASA Office of Inspector General audit, "NASA's Information Technology Governance," found that the NASA Chief Information Officer has limited oversight and control over a majority of the Administration's information technology assets and cannot enforce security measures across the agency's computer networks. For nearly 2 decades, the Administration has operated under a decentralized information technology governance structure that has resulted in increased costs and inadequate security. At the same time, centralization of information technology governance has resulted in increased security and lower operating costs at other agencies.*

*(b) INFORMATION TECHNOLOGY GOVERNANCE.—The Administrator shall, in consultation with Mission Directorate and NASA Center Chief Information Officers—*

*(1) ensure the Agency Chief Information Officer has the appropriate resources and visibility to oversee agency-wide information technology operations and investments;*

*(2) establish a direct line of report between the Agency Chief Information Officer and the Administrator;*

*(3) establish a minimum monetary threshold for all agency information technology investments over which the Agency Chief Information Officer shall have final approval; and*

*(4) consider appropriate revisions to the charters of information technology boards and councils that inform information technology investment and operation decisions.*

***SEC. 706. IMPROVEMENTS TO BASELINES AND COST CONTROLS BREACH REPORTING PROCESS.***

*Section 30104 of title 51, United States Code is amended—*

*(1) in subsection (d)(3)—*

*(A) by striking "the notification"; and*

*(B) by inserting "the notification and a timeline by which the Administrator intends to make the determination, report, and analysis*

*under subsection (e)" before the period at the end;*

*(2) in subsection (e)(1), by striking "Not later than 30 days after receiving a written notification under subsection (d)(2)" and inserting "In accordance with the timeline under subsection (d)(3)";*

*(3) in subsection (e)(1)(A), by striking "not later than 15 days after making the determination" and inserting "in accordance with the timeline under subsection (d)(3)";*

*(4) in subsection (e)(2), by striking "not later than 6 months after the Administrator makes a determination under this subsection" and inserting "in accordance with the timeline under subsection (d)(3)"; and*

*(5) in subsection (f), by inserting "or an annual budget request that reflects this growth" after "a report under subsection (e)(1)(A)".*

***SEC. 707. INFRASTRUCTURE.***

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

*(1) the Administration has a role in providing access to unique or specialized laboratory capabilities that are not yet economically viable for purchase by*

*commercial entities and therefore are not available outside of NASA;*

*(2) the Administration must improve the condition of its relevant facilities and infrastructure to maintain the competitiveness of the U.S. aerospace industry;*

*(3) to ensure continued researcher access to reliable and efficient world-class facilities, the Administration should continue to seek to establish strategic partnerships with other Federal agencies, academic institutions, and industry, as appropriate; and*

*(4) decisions regarding whether to dispose of, maintain, or modernize existing facilities and other infrastructure must be made in the context of meeting the future needs of the Administration.*

*(b) PLAN.—Not later than 1 year after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a plan for retaining, acquiring, or disposing of the facilities, laboratories, equipment, test capabilities, and other infrastructure necessary to meet the Administration's mandates and its current and future missions. The plan shall—*

*(1) identify the Administration's future infrastructure needs, including facilities, laboratories, equipment, and test capabilities;*

*(2) include a strategy for identifying and removing unnecessary or duplicative infrastructure consistent with the national strategic direction under the National Space Policy, the National Aeronautics Research, Development, Test and Evaluation Infrastructure Plan, the National Aeronautics and Space Administration Authorization Act of 2010, title 51 of the United States Code, and other Administration-related law;*

*(3) include a strategy for the maintenance, repair, upgrading, and modernization of the Administration's facilities, laboratories, equipment, and other infrastructure not being excessed or disposed of;*

*(4) recommend criteria for prioritizing deferred maintenance tasks and for upgrading or modernizing facilities, laboratories, equipment, and other infrastructure;*

*(5) include an assessment , including cost-effectiveness, of any modifications needed to maximize the use of facilities, laboratories, equipment, and other infrastructure that offer unique and highly specialized benefits to the aerospace industry and the public; and*

*(6) include recommendations for implementation, including a timeline, milestones, and an esti-*

*mate of the resources required for carrying out the plan.*

*(c) ESTABLISHMENT OF CAPITAL FUNDS.—The Administrator shall establish a capital fund at each of NASA's field centers for the modernization of facilities, laboratories, equipment, and other infrastructure in accordance with the plan under subsection (b). The Administrator shall ensure, to the greatest extent practicable, that any financial savings achieved by closing an outdated or surplus facility at a NASA field center is made available to that field center's capital fund for the purpose of modernizing that field center's facilities, laboratories, equipment, and other infrastructure in accordance with the plan under subsection (b).*

***SEC. 708. COMMERCIAL LAUNCH COOPERATION.***

*(a) 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 support and services related to the space transportation infrastructure of the Administration; and*

*"(2) at the request of the covered entity, may include that support and services in the 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, unless that competition is in the national security interests of the United States; 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 contributions of funds, services, and equipment to carry out this section.*

*"(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 of the Administration.*

*"(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 pursuant to 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 its congressional oversight committees a report on the funds, services, and equipment accepted and used by the Administrator under this section during the preceding fiscal year.*

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

*"(e) DEFINITION OF COVERED ENTITY.—In this section, the term 'covered entity' means a non-Federal entity that—*

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

*"(2) is engaged in commercial space activities.".*

*(b) CLERICAL AMENDMENT.—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 launch cooperation.".*

***SEC. 709. KNOWLEDGE MANAGEMENT.***

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

*(1) the Administration's success relies heavily on the accumulated technical knowledge of its skilled civil servant and contractor workforce;*

*(2) in light of an aging workforce, it is imperative that the Administration preserve, to the maximum extent possible, both critical technical skills and all knowledge valuable to future mission planning and operation; and*

*(3) exercising best practice knowledge management systems within the Administration will benefit the future NASA workforce and help ensure future mission successes.*

*(b) KNOWLEDGE MANAGEMENT SYSTEM.—The Administrator shall establish an Administration-wide knowledge management system and implement industry-standard best practices for capturing, archiving, and retrieving heritage and future information. The information under this subsection shall be accessible to all Administration employees unless otherwise prohibited because of the classified or sensitive nature of the information.*

*(c) REPORT.—Not later than 12 months after the date of enactment of this Act, the Administrator shall submit to the appropriate committees of Congress a report that, at a minimum, includes—*

*(1) a description of any actions necessary to create or modify an Administration-wide knowledge management system;*

*(2) a plan for implementing the knowledge management system, including employee training and the provision of secure access to information, as required for all personnel working on Administration programs, projects, and research;*

*(3) a summary of implementation costs for the knowledge management system; and*

*(4) a timeline and progress report for implementation.*

*(d) WORKFORCE STABILIZATION AND CRITICAL SKILLS PRESERVATION.—Section 1105 of the National Aeronautics and Space Administration Authorization Act of 2010 (42 U.S.C. 18431) is amended by striking "2013" and inserting "2016".*

***SEC. 710. AUTHORITY TO PROTECT CERTAIN TECHNICAL DATA FROM PUBLIC DISCLOSURE.***

*Section 20131 of title 51, United States Code, is amended—*

*(1) in subsection (a)(3), by striking "subsection (b)" and inserting "subsection (b) or (c)";*

*(2) by redesignating subsection (c) as subsection (d); and*

*(3) by inserting after subsection (b) the following:*

*"(c) AUTHORITY TO WITHHOLD FROM PUBLIC DISCLOSURE CERTAIN TECHNICAL DATA.—*

*"(1) IN GENERAL.—Notwithstanding any other provision of law, the Administrator may withhold from public disclosure any technical data with aeronautical or space application in the possession of, or*

*under the control of, the Administration, if the data may not be exported lawfully outside the United States without an approval, authorization, or license under the Export Administration Act of 1979 (50 U.S.C. App. 2401 et seq.) or the Arms Export Control Act (22 U.S.C. 2751 et seq.).*

*"(2) DEFINITION OF TECHNICAL DATA.—In this subsection, the term 'technical data' means any blueprints, drawings, photographs, plans, instructions, computer software, or documentation, or other technical information that can be used, or be adapted for use, to design, develop, engineer, produce, manufacture, assemble, operate, repair, test, maintain, overhaul, modify, or reproduce any aeronautical or space items, including subsystems, components, or parts therefor, or technology concerning such items.*

*"(3) FOIA EXEMPTION 3.—This subsection shall be considered a statute described in section 552(b)(3) of title 5.*

*"(4) REPORT REPEAL.—Notwithstanding any other provision of law, the Administration is not required to compile or submit the annual audit on export controls compliance under section 126 of the National Aeronautics and Space Administration Authorization Act of 2000 (114 Stat. 1585).".*

**Calendar No. 628**

113TH CONGRESS
2D SESSION

# S. 1317

# A BILL

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2014 through 2016 and for other purposes.

DECEMBER 10, 2014

Reported with an amendment