

Calendar No. 548

111TH CONGRESS
2D SESSION**S. 3729**

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2011 through 2013, and for other purposes.

IN THE SENATE OF THE UNITED STATES

AUGUST 5, 2010

Mr. ROCKEFELLER, from the Committee on Commerce, Science, and Transportation, reported the following original bill; which was read twice and placed on the calendar

A BILL

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2011 through 2013, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SEC. 1. SHORT TITLE; TABLE OF CONTENTS.**

4 (a) SHORT TITLE.—This Act may be cited as the
5 “National Aeronautics and Space Administration Author-
6 ization Act of 2010”.

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

- Sec. 1. Short title; table of contents.
- Sec. 2. Findings.
- Sec. 3. Definitions.

TITLE I—AUTHORIZATION OF APPROPRIATIONS

- Sec. 101. Fiscal year 2011.
- Sec. 102. Fiscal year 2012.
- Sec. 103. Fiscal year 2013.

TITLE II—POLICY, GOALS, AND OBJECTIVES FOR HUMAN SPACE FLIGHT AND EXPLORATION

- Sec. 201. United States human space flight policy.
- Sec. 202. Goals and objectives.
- Sec. 203. Assurance of core capabilities.
- Sec. 204. Independent study on human exploration of space.

TITLE III—EXPANSION OF HUMAN SPACE FLIGHT BEYOND THE INTERNATIONAL SPACE STATION AND LOW-EARTH ORBIT

- Sec. 301. Human space flight beyond low-Earth orbit.
- Sec. 302. Space Launch System as follow-on launch vehicle to the Space Shuttle.
- Sec. 303. Multi-purpose crew vehicle.
- Sec. 304. Utilization of existing workforce and assets in development of Space Launch System and multi-purpose crew vehicle.
- Sec. 305. NASA launch support and infrastructure modernization program.
- Sec. 306. Report on effects of transition to Space Launch System on the solid and liquid rocket motor industrial bases.
- Sec. 307. Sense of Congress on other technology and robotic elements in human space flight and exploration.
- Sec. 308. Development of technologies and in-space capabilities for beyond near-Earth space missions.

TITLE IV— DEVELOPMENT AND USE OF COMMERCIAL CREW AND CARGO TRANSPORTATION CAPABILITIES

- Sec. 401. Commercial Cargo Development program.
- Sec. 402. Commercial Crew Development program.
- Sec. 403. Requirements applicable to development of commercial crew transportation capabilities and services.
- Sec. 404. Report on International Space Station cargo return capability.

TITLE V—CONTINUATION, SUPPORT, AND EVOLUTION OF THE INTERNATIONAL SPACE STATION

- Sec. 501. Continuation of the International Space Station through 2020.
- Sec. 502. Maximum utilization of the International Space Station.
- Sec. 503. Maintenance of the United States segment and assurance of continued operations of the International Space Station.
- Sec. 504. Management of the ISS national laboratory.

TITLE VI—SPACE SHUTTLE RETIREMENT AND TRANSITION

- Sec. 601. Sense of Congress on the Space Shuttle program.
- Sec. 602. Retirement of Space Shuttle orbiters and transition of Space Shuttle program.

Sec. 603. Disposition of orbiter vehicles.

TITLE VII—EARTH SCIENCE

- Sec. 701. Sense of Congress.
- Sec. 702. Interagency collaboration implementation approach.
- Sec. 703. Transitioning experimental research to operations.
- Sec. 704. Decadal survey missions implementation for Earth observation.
- Sec. 705. Expansion of Earth science applications.
- Sec. 706. Instrument test-beds and venture class missions.
- Sec. 707. Sense of Congress on NPOESS follow-on program.

TITLE VIII—SPACE SCIENCE

- Sec. 801. Technology development.
- Sec. 802. Suborbital research activities.
- Sec. 803. Overall science portfolio-sense of the Congress.
- Sec. 804. In-space servicing.
- Sec. 805. Decadal results.
- Sec. 806. On-going restoration of radioisotope thermoelectric generator material production.
- Sec. 807. Collaboration with ESMD and SOMD on robotic missions.
- Sec. 808. Near-Earth object survey and policy with respect to threats posed.
- Sec. 809. Space weather.

TITLE IX—AERONAUTICS AND SPACE TECHNOLOGY

- Sec. 901. Sense of Congress.
- Sec. 902. Aeronautics research goals.
- Sec. 903. Research collaboration.
- Sec. 904. Goal for agency space technology.
- Sec. 905. Implementation plan for agency space technology.
- Sec. 906. National space technology policy.
- Sec. 907. Commercial reusable suborbital research program.

TITLE X—EDUCATION

- Sec. 1001. Report on education implementation outcomes.
- Sec. 1002. Sense of Congress on the Experimental Program to Stimulate Competitive Research.
- Sec. 1003. Science, technology, engineering, and mathematics commercial orbital platform program.

TITLE XI—RESCOPING AND REVITALIZING INSTITUTIONAL CAPABILITIES

- Sec. 1101. Sense of Congress.
- Sec. 1102. Institutional requirements study.
- Sec. 1103. NASA capabilities study requirement.
- Sec. 1104. Sense of Congress on community transition support.
- Sec. 1105. Workforce stabilization and critical skills preservation.

TITLE XII—OTHER MATTERS

- Sec. 1201. Report on space traffic management.
- Sec. 1202. National and international orbital debris mitigation.
- Sec. 1203. Reports on program and cost assessment and control assessment.

- Sec. 1204. Eligibility for service of individual currently serving as Administrator of NASA.
- Sec. 1205. Sense of Congress on independent verification and validation of NASA software.
- Sec. 1206. Counterfeit parts.
- Sec. 1207. Information security.
- Sec. 1208. National Center for Human Performance.
- Sec. 1209. Enhanced-use Leasing.
- Sec. 1210. Sense of Congress concerning the Stennis Space Center.

1 **SEC. 2. FINDINGS.**

2 Congress makes the following findings:

3 (1) The United States human space flight pro-
4 gram has, since the first Mercury flight on May 5,
5 1961, been a source of pride and inspiration for the
6 Nation.

7 (2) The establishment of and commitment to
8 human exploration goals is essential for providing
9 the necessary long term focus and programmatic
10 consistency and robustness of the United States ci-
11 vilian space program.

12 (3) The National Aeronautics and Space Ad-
13 ministration is and should remain a multi-mission
14 agency with a balanced and robust set of core mis-
15 sions in science, aeronautics, and human space flight
16 and exploration.

17 (4) In the 50 years since the establishment of
18 NASA, the arena of space has evolved substantially.
19 As the uses and users of space continue to expand,
20 the issues and operations in the regions closest to
21 Earth have become increasingly complex, with a

1 growing number of overlaps between civil, commer-
2 cial and national security activities. These develop-
3 ments present opportunities and challenges to the
4 space activities of NASA and the United States.

5 (5) The extraordinary challenges of achieving
6 access to space both motivated and accelerated the
7 development of technologies and industrial capabili-
8 ties that have had widespread applications which
9 have contributed to the technological excellence of
10 the United States. It is essential to tie space activity
11 to human challenges ranging from enhancing the in-
12 fluence, relationships, security, economic develop-
13 ment, and commerce of the United States to improv-
14 ing the overall human condition.

15 (6) It is essential to the economic well-being of
16 the United States that the aerospace industrial ca-
17 pacity, highly skilled workforce, and embedded ex-
18 pertise remain engaged in demanding, challenging,
19 and exciting efforts that ensure United States lead-
20 ership in space exploration and related activities.

21 (7) Crewmembers provide the essential compo-
22 nent to ensure the return on investment from and
23 the growth and safe operation of the ISS. The Rus-
24 sian Soyuz vehicle has allowed continued human
25 presence on the ISS for United States crewmembers

1 with its ability to serve as both a routine and backup
2 capability for crew delivery, rescue, and return. With
3 the impending retirement of the Space Shuttle, the
4 United States will find itself with no national crew
5 delivery and return system. Without any other sys-
6 tem, the United States and all the ISS partners will
7 have no redundant system for human access to and
8 from the ISS. It is therefore essential that a United
9 States capability be developed as soon as possible.

10 (8) Existing and emerging United States com-
11 mercial launch capabilities and emerging launch ca-
12 pabilities offer the potential for providing crew sup-
13 port assets. New capabilities for human crew access
14 to the ISS should be developed in a manner that en-
15 sures ISS mission assurance and safety. Commercial
16 services offer the potential to broaden the avail-
17 ability and access to space at lower costs.

18 (9) While commercial transportation systems
19 have the promise to contribute valuable services, it
20 is in the United States national interest to maintain
21 a government operated space transportation system
22 for crew and cargo delivery to space.

23 (10) Congress restates its commitment, ex-
24 pressed in the National Aeronautics and Space Ad-
25 ministration Authorization Act of 2005 (Public Law

1 109–155) and the National Aeronautics and Space
2 Administration Authorization Act of 2008 (Public
3 Law 110–422), to the development of commercially
4 developed launch and delivery systems to the ISS for
5 crew and cargo missions. Congress reaffirms that
6 NASA shall make use of United States commercially
7 provided ISS crew transfer and crew rescue services
8 to the maximum extent practicable.

9 (11) It is critical to identify an appropriate
10 combination of NASA and related United States
11 Government programs, while providing a framework
12 that allows partnering, leveraging and stimulation of
13 the existing and emerging commercial and inter-
14 national efforts in both near Earth space and the re-
15 gions beyond.

16 (12) The designation of the United States seg-
17 ment of the ISS as a National Laboratory, as pro-
18 vided by the National Aeronautics and Space Ad-
19 ministration Authorization Act of 2005 and the Na-
20 tional Aeronautics and Space Administration Au-
21 thorization Act of 2008, provides an opportunity for
22 multiple United States Government agencies, univer-
23 sity-based researchers, research organizations, and
24 others to utilize the unique environment of micro-

1 gravity for fundamental scientific research and po-
2 tential economic development.

3 (13) For some potential replacement elements
4 necessary for ISS sustainability, the Space Shuttle
5 may represent the only vehicle, existing or planned,
6 capable of carrying those elements to the ISS in the
7 near term. Additional or alternative transportation
8 capabilities must be identified as contingency deliv-
9 ery options, and accompanied by an independent
10 analysis of projected availability of such capabilities.

11 (14) The United States must develop, as rap-
12 idly as possible, replacement vehicles capable of pro-
13 viding both human and cargo launch capability to
14 low-Earth orbit and to destinations beyond low-
15 Earth orbit.

16 (15) There is a need for national space and ex-
17 port control policies that protect the national secu-
18 rity of the United States while also enabling the
19 United States and its aerospace industry to under-
20 take cooperative programs in science and human
21 space flight in an effective and efficient manner and
22 to compete effectively in the global market place.

23 **SEC. 3. DEFINITIONS.**

24 In this Act:

1 (1) ADMINISTRATOR.—The term “Adminis-
2 trator” means the Administrator of the National
3 Aeronautics and Space Administration.

4 (2) APPROPRIATE COMMITTEES OF CON-
5 GRESS.—The term “appropriate committees of Con-
6 gress” means—

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

9 (B) the Committee on Science of the
10 House of Representatives.

11 (3) CIS-LUNAR SPACE.—The term “cis-lunar
12 space” means the region of space from the Earth
13 out to and including the region around the surface
14 of the Moon.

15 (4) DEEP SPACE.—The term “deep space”
16 means the region of space beyond cis-lunar space.

17 (5) ISS.—The term “ISS” means the Inter-
18 national Space Station.

19 (6) NASA.—The term “NASA” means the Na-
20 tional Aeronautics and Space Administration.

21 (7) NEAR-EARTH SPACE.—The term “near-
22 Earth space” means the region of space that in-
23 cludes low-Earth orbit and extends out to and in-
24 cludes geo-synchronous orbit.

1 (8) NOAA.—The term “NOAA” means the Na-
2 tional Oceanic and Atmospheric Administration.

3 (9) OSTP.—The term “OSTP” means the Of-
4 fice of Science and Technology Policy.

5 (10) SPACE LAUNCH SYSTEM.—The term
6 “Space Launch System” means the follow-on gov-
7 ernment-owned civil launch system developed, man-
8 aged, and operated by NASA to serve as a key com-
9 ponent to expand human presence beyond low-Earth
10 orbit.

11 **TITLE I—AUTHORIZATION OF** 12 **APPROPRIATIONS**

13 **SEC. 101. FISCAL YEAR 2011.**

14 There are authorized to be appropriated to NASA for
15 fiscal year 2011, \$19,000,000,000, as follows:

16 (1) For Exploration, \$3,868,000,000, of
17 which—

18 (A) \$1,120,000,000 shall be for a multi-
19 purpose crew vehicle, and associated program
20 and other necessary support;

21 (B) \$1,631,000,000 shall be for Space
22 Launch System and associated program and
23 other necessary support;

24 (C) \$250,000,000 shall be for Exploration
25 Technology Development;

1 (D) \$155,000,000 shall be for Human Re-
2 search;

3 (E) \$300,000,000 shall be for Commercial
4 Cargo;

5 (F) \$312,000,000 shall be for Commercial
6 Crew Development activities and studies related
7 to commercial crew services; and

8 (G) \$100,000,000 shall be for Robotic Pre-
9 cursor Studies and Instruments.

10 (2) For Space Operations, \$5,508,500,000, of
11 which—

12 (A) \$2,779,800,000 shall be for the ISS
13 program;

14 (B) \$1,609,700,000 shall be for Space
15 Shuttle, to support Space Shuttle flight oper-
16 ations and related activities; and

17 (C) \$1,119,000,000 for Space and Flight
18 Services, of which \$428,600,000 shall be di-
19 rected toward NASA launch support and infra-
20 structure modernization program.

21 (3) For Science, \$5,005,600,000, of which—

22 (A) \$1,801,800,000 shall be for Earth
23 Sciences;

24 (B) \$1,485,700,000 shall be for Planetary
25 Science;

1 (C) \$1,076,300,000 shall be for Astro-
2 physics; and

3 (D) \$641,900,000 shall be for
4 Heliophysics.

5 (4) For Aeronautics, \$929,600,000, of which—

6 (A) \$579,600,000 shall be for Aeronautics
7 Research; and

8 (B) \$350,000,000 shall be for Space Tech-
9 nology.

10 (5) For Education, \$145,800,000, of which—

11 (A) \$25,000,000 shall be for the Experi-
12 mental Program to Stimulate Competitive Re-
13 search; and

14 (B) \$45,600,000 shall be for the Space
15 Grant program.

16 (6) For Cross-Agency Support Programs,
17 \$3,111,400,000.

18 (7) For Construction and Environmental Com-
19 pliance and Restoration, \$394,300,000.

20 (8) For Inspector General, \$37,000,000.

21 **SEC. 102. FISCAL YEAR 2012.**

22 There are authorized to be appropriated to NASA for
23 fiscal year 2012, \$19,450,000,000, as follows:

24 (1) For Exploration, \$5,252,300,000, of
25 which—

1 (A) \$1,400,000,000 shall be for a multi-
2 purpose crew vehicle and associated program
3 and other necessary support;

4 (B) \$2,650,000,000 shall be for Space
5 Launch System and associated program and
6 other necessary support;

7 (C) \$437,300,000 shall be for Exploration
8 Technology Development;

9 (D) \$165,000,000 shall be for Human Re-
10 search;

11 (E) \$500,000,000 shall be for commercial
12 crew capabilities; and

13 (F) \$100,000,000 shall be for Robotic Pre-
14 cursor Instruments and Low-Cost Missions.

15 (2) For Space Operations, \$4,141,500,000, of
16 which—

17 (A) \$2,952,250,000 shall be for the ISS
18 operations and crew/cargo support; and

19 (B) \$1,189,250,000 shall be for Space and
20 Flight Services, of which \$500,000,000 shall be
21 directed toward the NASA launch support and
22 infrastructure modernization program.

23 (3) For Science, \$5,248,600,000, of which—

24 (A) \$1,944,500,000 shall be for Earth
25 Sciences;

1 (B) \$1,547,200,000 shall be for Planetary
2 Science;

3 (C) \$1,109,300,000 shall be for Astro-
4 physics; and

5 (D) \$647,600,000 shall be for
6 Heliophysics.

7 (4) For Aeronautics, \$1,070,600,000, of
8 which—

9 (A) \$584,700,000 shall be for Aeronautics
10 Research; and

11 (B) \$486,000,000 shall be for Space Tech-
12 nology.

13 (5) For Education, \$145,800,000, of which—

14 (A) \$25,000,000 shall be for the Experi-
15 mental Program to Stimulate Competitive Re-
16 search; and

17 (B) \$45,600,000 shall be for the Space
18 Grant program.

19 (6) For Cross-Agency Support Programs,
20 \$3,189,600,000.

21 (7) For Construction and Environmental Com-
22 pliance and Restoration, \$363,800,000.

23 (8) For Inspector General, \$37,800,000.

1 **SEC. 103. FISCAL YEAR 2013.**

2 There are authorized to be appropriated to NASA for
3 fiscal year 2013, \$19,960,000,000, as follows:

4 (1) For Exploration, \$5,264,000,000, of
5 which—

6 (A) \$1,400,000,000 shall be for a multi-
7 purpose crew vehicle and associated program
8 and other necessary support;

9 (B) \$2,640,000,000 shall be for Space
10 Launch System and associated program and
11 other necessary support;

12 (C) \$449,000,000 shall be for Exploration
13 Technology Development;

14 (D) \$175,000,000 shall be for Human Re-
15 search;

16 (E) \$500,000,000 shall be for commercial
17 crew capabilities; and

18 (F) \$100,000,000 shall be for Robotic Pre-
19 cursor Instruments and Low-Cost Missions.

20 (2) For Space Operations, \$4,253,300,000, of
21 which—

22 (A) \$3,129,400,000 shall be for the ISS
23 operations and crew/cargo support; and

24 (B) \$1,123,900,000 shall be for Space and
25 Flight Services, of which \$400,000,000 shall be

1 directed toward the NASA launch support and
2 infrastructure modernization program.

3 (3) For Science, \$5,509,600,000, of which—

4 (A) \$2,089,500,000 shall be for Earth
5 Sciences;

6 (B) \$1,591,200,000 shall be for Planetary
7 Science;

8 (C) \$1,149,100,000 shall be for Astro-
9 physics; and

10 (D) \$679,800,000 shall be for
11 Heliophysics.

12 (4) For Aeronautics, \$1,105,000,000, of
13 which—

14 (A) \$590,000,000 shall be for Aeronautics
15 Research; and

16 (B) \$515,000,000 shall be for Space Tech-
17 nology.

18 (5) For Education, \$145,700,000, of which—

19 (A) \$25,000,000 shall be for the Experi-
20 mental Program to Stimulate Competitive Re-
21 search; and

22 (B) \$45,600,000 shall be for the Space
23 Grant program.

24 (6) For Cross-Agency Support Programs,
25 \$3,276,800,000.

1 (7) For Construction and Environmental Com-
2 pliance and Restoration, \$366,900,000.

3 (8) For Inspector General, \$38,700,000.

4 **TITLE II—POLICY, GOALS, AND**
5 **OBJECTIVES FOR HUMAN**
6 **SPACE FLIGHT AND EXPLO-**
7 **RATION**

8 **SEC. 201. UNITED STATES HUMAN SPACE FLIGHT POLICY.**

9 (a) USE OF NON-UNITED STATES HUMAN SPACE
10 FLIGHT TRANSPORTATION CAPABILITIES.—It is the pol-
11 icy of the United States that reliance upon and use of non-
12 United States human space flight capabilities shall be un-
13 dertaken only as a contingency in circumstances where no
14 United States-owned and operated human space flight ca-
15 pability is available, operational, and certified for flight
16 by appropriate Federal agencies.

17 (b) UNITED STATES HUMAN SPACE FLIGHT CAPA-
18 BILITIES.—Congress reaffirms the policy stated in section
19 501(a) of the National Aeronautics and Space Administra-
20 tion Authorization Act of 2005 (42 U.S.C. 16761(a)), that
21 the United States shall maintain an uninterrupted capa-
22 bility for human space flight and operations in low-Earth
23 orbit, and beyond, as an essential instrument of national
24 security and of the capacity to ensure continued United

1 States participation and leadership in the exploration and
2 utilization of space.

3 **SEC. 202. GOALS AND OBJECTIVES.**

4 (a) **LONG TERM GOAL.**—The long term goal of the
5 human space flight and exploration efforts of NASA shall
6 be to expand permanent human presence beyond low-
7 Earth orbit and to do so, where practical, in a manner
8 involving international partners.

9 (b) **KEY OBJECTIVES.**—The key objectives of the
10 United States for human expansion into space shall be—

11 (1) to sustain the capability for long-duration
12 presence in low-Earth orbit, initially through con-
13 tinuation of the ISS and full utilization of the
14 United States segment of the ISS as a National
15 Laboratory, and through assisting and enabling an
16 expanded commercial presence in, and access to,
17 low-Earth orbit, as elements of a low-Earth orbit in-
18 frastructure;

19 (2) to determine if humans can live in an ex-
20 tended manner in space with decreasing reliance on
21 Earth, starting with utilization of low-Earth orbit
22 infrastructure, to identify potential roles that space
23 resources such as energy and materials may play, to
24 meet national and global needs and challenges, such
25 as potential cataclysmic threats, and to explore the

1 viability of and lay the foundation for sustainable
2 economic activities in space;

3 (3) to maximize the role that human explo-
4 ration of space can play in advancing overall knowl-
5 edge of the universe, supporting United States na-
6 tional and economic security and the United States
7 global competitive posture, and inspiring young peo-
8 ple in their educational pursuits; and

9 (4) to build upon the cooperative and mutually
10 beneficial framework established by the ISS partner-
11 ship agreements and experience in developing and
12 undertaking programs and meeting objectives de-
13 signed to realize the goal of human space flight set
14 forth in subsection (a).

15 **SEC. 203. ASSURANCE OF CORE CAPABILITIES.**

16 (a) SENSE OF CONGRESS.—It is the sense of Con-
17 gress that—

18 (1) the ISS, technology developments, the cur-
19 rent Space Shuttle program, and follow-on transpor-
20 tation systems authorized by this Act form the foun-
21 dation of initial capabilities for missions beyond low-
22 Earth orbit to a variety of lunar and Lagrangian or-
23 bital locations; and

24 (2) these initial missions and related capabili-
25 ties should be utilized to provide operational experi-

1 ence, technology development, and the placement
2 and assured use of in-space infrastructure and in-
3 space servicing of existing and future assets.

4 (b) SPACE SHUTTLE CAPABILITY ASSURANCE.—

5 (1) DEVELOPMENT OF FOLLOW-ON SPACE
6 TRANSPORTATION SYSTEMS.—The Administrator
7 shall proceed with the development of follow-on
8 space transportation systems in a manner that en-
9 sures that the national capability to restart and fly
10 Space Shuttle missions can be initiated if required
11 by the Congress, in an Act enacted after the date of
12 enactment of this Act, or by a Presidential deter-
13 mination transmitted to the Congress, before the
14 last Space Shuttle mission authorized by this Act is
15 completed.

16 (2) REQUIRED ACTIONS.—In carrying out the
17 requirement in paragraph (1), the Administrator
18 shall authorize refurbishment of the manufactured
19 external tank of the Space Shuttle, designated as
20 ET-94, and take all actions necessary to enable its
21 readiness for use in the Space Launch System devel-
22 opment as a critical skills and capability retention
23 effort or for test purposes, while preserving the abil-
24 ity to use this tank if needed for an ISS contingency
25 if deemed necessary under paragraph (1).

1 **SEC. 204. INDEPENDENT STUDY ON HUMAN EXPLORATION**
2 **OF SPACE.**

3 (a) IN GENERAL.—In fiscal year 2012 the Adminis-
4 trator shall contract with the National Academies for a
5 review of the goals, core capabilities, and direction of
6 human space flight, using the goals set forth in the Na-
7 tional Aeronautics and Space Act of 1958, the National
8 Aeronautics and Space Administration Authorization Act
9 of 2005, and the National Aeronautics and Space Admin-
10 istration Authorization Act of 2008, the goals set forth
11 in this Act, and goals set forth in any existing statement
12 of space policy issued by the President.

13 (b) ELEMENTS.—The review shall include—

14 (1) a broad spectrum of participation with rep-
15 resentatives of a range of disciplines, backgrounds,
16 and generations, including civil, commercial, inter-
17 national, scientific, and national security interests;

18 (2) input from NASA’s international partner
19 discussions and NASA’s Human Exploration Frame-
20 work Team;

21 (3) an examination of the relationship of na-
22 tional goals to foundational capabilities, robotic ac-
23 tivities, technologies, and missions authorized by this
24 Act;

25 (4) a review and prioritization of scientific, en-
26 gineering, economic, and social science questions to

1 be addressed by human space exploration to improve
2 the overall human condition; and

3 (5) findings and recommendations for fiscal
4 years 2014 through 2023.

5 **TITLE III—EXPANSION OF**
6 **HUMAN SPACE FLIGHT BE-**
7 **YOND THE INTERNATIONAL**
8 **SPACE STATION AND LOW-**
9 **EARTH ORBIT**

10 **SEC. 301. HUMAN SPACE FLIGHT BEYOND LOW-EARTH**
11 **ORBIT.**

12 (a) FINDINGS.—Congress makes the following find-
13 ings:

14 (1) The extension of the human presence from
15 low-Earth orbit to other regions of space beyond
16 low-Earth orbit will enable missions to the surface of
17 the Moon and missions to deep space destinations
18 such as near-Earth asteroids and Mars.

19 (2) The regions of cis-lunar space are accessible
20 to other national and commercial launch capabilities,
21 and such access raises a host of national security
22 concerns and economic implications that inter-
23 national human space endeavors can help to address.

24 (3) The ability to support human missions in
25 regions beyond low-Earth orbit and on the surface

1 of the Moon can also drive developments in emerging
2 areas of space infrastructure and technology.

3 (4) Developments in space infrastructure and
4 technology can stimulate and enable increased space
5 applications, such as in-space servicing, propellant
6 resupply and transfer, and in situ resource utiliza-
7 tion, and open opportunities for additional users of
8 space, whether national, commercial, or inter-
9 national.

10 (5) A long term objective for human exploration
11 of space should be the eventual international explo-
12 ration of Mars.

13 (6) Future international missions beyond low-
14 Earth orbit should be designed to incorporate capa-
15 bility development and availability, affordability, and
16 international contributions.

17 (7) Human space flight and future exploration
18 beyond low-Earth orbit should be based around a
19 pay-as-you-go approach. Requirements in new
20 launch and crew systems authorized in this Act
21 should be scaled to the minimum necessary to meet
22 the core national mission capability needed to con-
23 duct cis-lunar missions. These initial missions, along
24 with the development of new technologies and in-
25 space capabilities can form the foundation for mis-

1 sions to other destinations. These initial missions
2 also should provide operational experience prior to
3 the further human expansion into space.

4 (b) REPORT ON INTERNATIONAL COLLABORATION.—

5 (1) REPORT REQUIRED.—Not later than 120
6 days after the date of the enactment of this Act, the
7 Administrator shall submit to the appropriate com-
8 mittees of Congress a report on the following assets
9 and capabilities:

10 (A) Any effort by NASA to expand and en-
11 sure effective international collaboration on the
12 ISS.

13 (B) The efforts of NASA, including its ap-
14 proach and progress, in defining near-term, cis-
15 lunar space human missions.

16 (2) NASA CONTRIBUTIONS.—In preparing the
17 report required by paragraph (1), the Administrator
18 shall assume that NASA will contribute to the ef-
19 forts described in that paragraph the following:

20 (A) A Space Launch System.

21 (B) A multi-purpose crew vehicle.

22 (C) Such other technology elements the
23 Administrator may consider appropriate, and
24 which the Administrator shall specifically iden-
25 tify in the report.

1 **SEC. 302. SPACE LAUNCH SYSTEM AS FOLLOW-ON LAUNCH**
2 **VEHICLE TO THE SPACE SHUTTLE.**

3 (a) UNITED STATES POLICY.—It is the policy of the
4 United States that NASA develop a Space Launch System
5 as a follow-on to the Space Shuttle that can access cis-
6 lunar space and the regions of space beyond low-Earth
7 orbit in order to enable the United States to participate
8 in global efforts to access and develop this increasingly
9 strategic region.

10 (b) INITIATION OF DEVELOPMENT.—

11 (1) IN GENERAL.—The Administrator shall, as
12 soon as practicable after the date of the enactment
13 of this Act, initiate development of a Space Launch
14 System meeting the minimum capabilities require-
15 ments specified in subsection (c).

16 (2) MODIFICATION OF CURRENT CONTRACTS.—

17 In order to limit NASA's termination liability costs
18 and support critical capabilities, the Administrator
19 shall, to the extent practicable, extend or modify ex-
20 isting vehicle development and associated contracts
21 necessary to meet the requirements in paragraph
22 (1), including contracts for ground testing of solid
23 rocket motors, if necessary, to ensure their avail-
24 ability for development of the Space Launch System.

25 (c) MINIMUM CAPABILITY REQUIREMENTS.—

1 (1) IN GENERAL.—The Space Launch System
2 developed pursuant to subsection (b) shall be de-
3 signed to have, at a minimum, the following:

4 (A) The initial capability of the core ele-
5 ments, without an upper stage, of lifting pay-
6 loads weighing between 70 tons and 100 tons
7 into low-Earth orbit in preparation for transit
8 for missions beyond low-Earth orbit.

9 (B) The capability to carry an integrated
10 upper Earth departure stage bringing the total
11 lift capability of the Space Launch System to
12 130 tons or more.

13 (C) The capability to lift the multipurpose
14 crew vehicle.

15 (D) The capability to serve as a backup
16 system for supplying and supporting ISS cargo
17 requirements or crew delivery requirements not
18 otherwise met by available commercial or part-
19 ner-supplied vehicles.

20 (2) FLEXIBILITY.—The Space Launch System
21 shall be designed from inception as a fully-integrated
22 vehicle capable of carrying a total payload of 130
23 tons or more into low-Earth orbit in preparation for
24 transit for missions beyond low-Earth orbit. The
25 Space Launch System shall, to the extent prac-

1 ticable, incorporate capabilities for evolutionary
2 growth to carry heavier payloads. Developmental
3 work and testing of the core elements and the upper
4 stage should proceed in parallel subject to appropria-
5 tions. Priority should be placed on the core elements
6 with the goal for operational capability for the core
7 elements not later than December 31, 2016.

8 (3) **TRANSITION NEEDS.**—The Administrator
9 shall ensure critical skills and capabilities are re-
10 retained, modified, and developed, as appropriate, in
11 areas related to solid and liquid engines, large di-
12 ameter fuel tanks, rocket propulsion, and other
13 ground test capabilities for an effective transition to
14 the follow-on Space Launch System.

15 (4) The capacity for efficient and timely evo-
16 lution, including the incorporation of new tech-
17 nologies, competition of sub-elements, and commer-
18 cial operations.

19 **SEC. 303. MULTI-PURPOSE CREW VEHICLE.**

20 (a) **INITIATION OF DEVELOPMENT.**—

21 (1) **IN GENERAL.**—The Administrator shall con-
22 tinue the development of a multi-purpose crew vehi-
23 cle to be available as soon as practicable, and no
24 later than for use with the Space Launch System.

25 The vehicle shall continue to advance development of

1 the human safety features, designs, and systems in
2 the Orion project.

3 (2) GOAL FOR OPERATIONAL CAPABILITY.—It
4 shall be the goal to achieve full operational capa-
5 bility for the transportation vehicle developed pursu-
6 ant to this subsection by not later than December
7 31, 2016. For purposes of meeting such goal, the
8 Administrator may undertake a test of the transpor-
9 tation vehicle at the ISS before that date.

10 (b) MINIMUM CAPABILITY REQUIREMENTS.—The
11 multi-purpose crew vehicle developed pursuant to sub-
12 section (a) shall be designed to have, at a minimum, the
13 following:

14 (1) The capability to serve as the primary crew
15 vehicle for missions beyond low-Earth orbit.

16 (2) The capability to conduct regular in-space
17 operations, such as rendezvous, docking, and extra-
18 vehicular activities, in conjunction with payloads de-
19 livered by the Space Launch System developed pur-
20 suant to section 302, or other vehicles, in prepara-
21 tion for missions beyond low-Earth orbit or servicing
22 of assets described in section 804, or other assets in
23 cis-lunar space.

24 (3) The capability to provide an alternative
25 means of delivery of crew and cargo to the ISS, in

1 the event other vehicles, whether commercial vehicles
2 or partner-supplied vehicles, are unable to perform
3 that function.

4 (4) The capacity for efficient and timely evo-
5 lution, including the incorporation of new tech-
6 nologies, competition of sub-elements, and commer-
7 cial operations.

8 **SEC. 304. UTILIZATION OF EXISTING WORKFORCE AND AS-**
9 **SETS IN DEVELOPMENT OF SPACE LAUNCH**
10 **SYSTEM AND MULTI-PURPOSE CREW VEHI-**
11 **CLE.**

12 (a) IN GENERAL.—In developing the Space Launch
13 System pursuant to section 302 and the multi-purpose
14 crew vehicle pursuant to section 303, the Administrator
15 shall, to the extent practicable utilize—

16 (1) existing contracts, investments, workforce,
17 industrial base, and capabilities from the Space
18 Shuttle and Orion and Ares 1 projects, including—

19 (A) space-suit development activities for
20 application to, and coordinated development of,
21 a multi-purpose crew vehicle suit and associated
22 life-support requirements with potential devel-
23 opment of standard NASA-certified suit and
24 life support systems for use in alternative com-

1 mercially-developed crew transportation sys-
2 tems; and

3 (B) Space Shuttle-derived components and
4 Ares 1 components that use existing United
5 States propulsion systems, including liquid fuel
6 engines, external tank or tank-related capa-
7 bility, and solid rocket motor engines; and

8 (2) associated testing facilities, either in being
9 or under construction as of the date of enactment of
10 this Act.

11 (b) DISCHARGE OF REQUIREMENTS.—In meeting the
12 requirements of subsection (a), the Administrator—

13 (1) shall, to the extent practicable, utilize
14 ground-based manufacturing capability, ground test-
15 ing activities, launch and operations infrastructure,
16 and workforce expertise;

17 (2) shall, to the extent practicable, minimize the
18 modification and development of ground infrastruc-
19 ture and maximize the utilization of existing soft-
20 ware, vehicle, and mission operations processes;

21 (3) shall complete construction and activation
22 of the A-3 test stand with a completion goal of Sep-
23 tember 30, 2013;

24 (4) may procure, develop, and flight test appli-
25 cable components; and

1 (5) shall take appropriate actions to ensure
2 timely and cost-effective development of the Space
3 Launch System and the multi-purpose crew vehicle,
4 including the use of a procurement approach that in-
5 corporates adequate and effective oversight, the fa-
6 cilitation of contractor efficiencies, and the stream-
7 lining of contract and procurement requirements.

8 **SEC. 305. NASA LAUNCH SUPPORT AND INFRASTRUCTURE**
9 **MODERNIZATION PROGRAM.**

10 (a) IN GENERAL.—The Administrator shall carry out
11 a program the primary purpose of which is to prepare in-
12 frastructure at the Kennedy Space Center that is needed
13 to enable processing and launch of the Space Launch Sys-
14 tem. Vehicle interfaces and other ground processing and
15 payload integration areas should be simplified to minimize
16 overall costs, enhance safety, and complement the purpose
17 of this section.

18 (b) ELEMENTS.—The program required by this sec-
19 tion shall include—

20 (1) investments to improve civil and national
21 security operations at the Kennedy Space Center, to
22 enhance the overall capabilities of the Center, and to
23 reduce the long term cost of operations and mainte-
24 nance;

1 (2) measures to provide multi-vehicle support,
2 improvements in payload processing, and partnering
3 at the Kennedy Space Center; and

4 (3) such other measures as the Administrator
5 may consider appropriate.

6 (c) REPORT ON NASA LAUNCH SUPPORT AND IN-
7 FRASTRUCTURE MODERNIZATION PROGRAM.—

8 (1) REPORT REQUIRED.—Not later than 120
9 days after the date of the enactment of this Act, the
10 Administrator shall submit to the appropriate com-
11 mittees of Congress a report on the plan for the im-
12 plementation of the NASA launch support and infra-
13 structure modernization program.

14 (2) ELEMENTS.—The report required by this
15 subsection shall include—

16 (A) a description of the ground infrastruc-
17 ture plan tied to the Space Launch System and
18 potential ground investment activities at other
19 NASA centers related to supporting the devel-
20 opment of the Space Launch System;

21 (B) a description of proposed initiatives in-
22 tended to be conducted jointly or in cooperation
23 with Cape Canaveral Air Force Station, Flor-
24 ida, or other installations or components of the
25 United States Government; and

1 (C) a description of plans to use funds au-
2 thorized to be appropriated by this Act to im-
3 prove non-NASA facilities, which plans shall in-
4 clude a business plan outlining the nature and
5 scope of investments planned by other parties.

6 **SEC. 306. REPORT ON EFFECTS OF TRANSITION TO SPACE**
7 **LAUNCH SYSTEM ON THE SOLID AND LIQUID**
8 **ROCKET MOTOR INDUSTRIAL BASES.**

9 (a) REPORT REQUIRED.—Not later than 120 days
10 after the date of the enactment of this Act, the Adminis-
11 trator shall submit to Congress a report setting forth an
12 assessment, prepared by the Administrator, in consulta-
13 tion with the Secretary of Defense and the Secretary of
14 Commerce, of the effects of the retirement of the Space
15 Shuttle, and of the transition to the Space Launch System
16 developed pursuant to section 302, on the solid rocket
17 motor industrial base and the liquid rocket motor indus-
18 trial base in the United States.

19 (b) MATTERS TO BE ADDRESSED.—In preparing the
20 assessment required by subsection (a), the Administrator
21 shall address the following:

22 (1) The effects of efficiencies and efforts to
23 stream-line the industrial bases referred to in sub-
24 section (a) for support of civil, military, and com-
25 mercial users.

1 (2) Such other matters as the Administrator, in
2 consultation with the Secretary of Defense and the
3 Secretary of Commerce, may consider appropriate.

4 **SEC. 307. SENSE OF CONGRESS ON OTHER TECHNOLOGY**
5 **AND ROBOTIC ELEMENTS IN HUMAN SPACE**
6 **FLIGHT AND EXPLORATION.**

7 It is the sense of Congress that a balance is needed
8 in human space flight between using and building upon
9 existing capabilities and investing in and enabling new ca-
10 pabilities. Technology development provides the potential
11 to develop an increased ability to operate and extend
12 human presence in space, while at the same time enhance
13 the nation's economic development and aid in addressing
14 challenges here on Earth. Additionally, the establishment
15 of in-space capabilities, use of space resources, and the
16 ability to repair and reuse systems in space can contribute
17 to the overall goals of extending human presence in space
18 in an international manner, consistent with section
19 301(a).

20 **SEC. 308. DEVELOPMENT OF TECHNOLOGIES AND IN-SPACE**
21 **CAPABILITIES FOR BEYOND NEAR-EARTH**
22 **SPACE MISSIONS.**

23 (a) DEVELOPMENT AUTHORIZED.—The Adminis-
24 trator may initiate activities to develop the following:

1 (1) Technologies identified as necessary ele-
2 ments of missions beyond low-Earth orbit.

3 (2) In-space capabilities such as refueling and
4 storage technology, orbital transfer stages, innova-
5 tive in-space propulsion technology, communications,
6 and data management that facilitate a broad range
7 of users (including military and commercial) and ap-
8 plications defining the architecture and design of
9 such missions.

10 (3) Spacesuit development and associated life
11 support technology.

12 (4) Flagship missions.

13 (b) INVESTMENTS.—In developing technologies and
14 capabilities under subsection (a), the Administrator may
15 make investments—

16 (1) in space technologies such as advanced pro-
17 pulsion, propellant depots, in situ resource utiliza-
18 tion, and robotic payloads or capabilities that enable
19 human missions beyond low-Earth orbit ultimately
20 leading to Mars;

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

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

1 (B) to provide opportunities for in-space
2 servicing of and delivery to multiple space-based
3 platforms; and

4 (C) to facilitate international efforts to ex-
5 pand human presence to deep space destina-
6 tions;

7 (3) in advanced life support technologies and
8 capabilities;

9 (4) in technologies and capabilities relating to
10 in-space power, propulsion, and energy systems;

11 (5) in technologies and capabilities relating to
12 in-space propellant transfer and storage;

13 (6) in technologies and capabilities relating to
14 in situ resource utilization; and

15 (7) in expanded research to understand the
16 greatest biological impediments to human deep space
17 missions, especially the radiation challenge.

18 (c) UTILIZATION OF ISS AS TESTBED.—The Admin-
19 istrator may utilize the ISS as a testbed for any tech-
20 nology or capability developed under subsection (a) in a
21 manner consistent with the provisions of this Act.

22 (d) COORDINATION.—The Administrator shall coordi-
23 nate development of technologies and capabilities under
24 this section through an overall agency technology ap-
25 proach, as authorized by section 905 of this Act.

1 **TITLE IV— DEVELOPMENT AND**
2 **USE OF COMMERCIAL CREW**
3 **AND CARGO TRANSPORTATION**
4 **CAPABILITIES**

5 **SEC. 401. COMMERCIAL CARGO DEVELOPMENT PROGRAM.**

6 The Administrator shall continue to support the ex-
7 isting Commercial Orbital Transportation Services pro-
8 gram, aimed at enabling the commercial space industry
9 in support of NASA to develop reliable means of launching
10 cargo and supplies to the ISS throughout the duration of
11 the facility's operation. The Administrator may apply
12 funds towards the reduction of risk to the timely start of
13 these services, specifically—

- 14 (1) efforts to conduct a flight test;
15 (2) accelerate development; and
16 (3) develop the ground infrastructure needed
17 for commercial cargo capability.

18 **SEC. 402. COMMERCIAL CREW DEVELOPMENT PROGRAM.**

19 (a) CONTINUATION OF PROGRAM DURING FISCAL
20 YEAR 2011.—The Administrator shall continue, and may
21 expand the number of participants and the activities of,
22 the Commercial Crew Development (CCDEV) program in
23 fiscal year 2011, subject to the provisions of this title.

24 (b) CONTINUATION OF ACTIVITIES AND AGREE-
25 MENTS OF FISCAL YEAR 2010.—In carrying out sub-

1 section (a), the Administrator may continue or expand ac-
2 tivities and agreements initiated in fiscal year 2010 that
3 reduce risk, develop technologies, and lead to other ad-
4 vancements that will help determine the most effective and
5 efficient means of advancing the development of commer-
6 cial crew services.

7 **SEC. 403. REQUIREMENTS APPLICABLE TO DEVELOPMENT**
8 **OF COMMERCIAL CREW TRANSPORTATION**
9 **CAPABILITIES AND SERVICES.**

10 (a) PROHIBITION ON CONTRACTS AND PROCURE-
11 MENT AGREEMENTS DURING FISCAL YEAR 2011.—The
12 Administrator may not enter into any contract or procure-
13 ment agreement with respect to follow-on commercial crew
14 services during fiscal year 2011.

15 (b) SUPPORT.—The Administrator may, beginning in
16 fiscal year 2012 through the duration of the program, sup-
17 port follow-on commercially-developed crew transportation
18 systems dependent upon the completion of each of the fol-
19 lowing:

20 (1) HUMAN RATING REQUIREMENTS.—Not later
21 than 60 days after the date of the enactment of this
22 Act, the Administrator shall develop and make avail-
23 able to the public detailed human rating processes
24 and requirements to guide the design of commer-
25 cially-developed crew transportation capabilities,

1 which requirements shall be at least equivalent to
2 proven requirements for crew transportation in use
3 as of the date of the enactment of this Act.

4 (2) COMMERCIAL MARKET ASSESSMENT.—Not
5 later than 180 days after the date of the enactment
6 of this Act, the Administrator shall submit to the
7 appropriate committees of Congress an assessment,
8 conducted, in coordination with the Federal Aviation
9 Administration’s Office of Commercial Space Trans-
10 portation, for purposes of this paragraph, of the po-
11 tential non-Government market for commercially-de-
12 veloped crew and cargo transportation systems and
13 capabilities, including an assessment of the activities
14 associated with potential private sector utilization of
15 the ISS research and technology development capa-
16 bilities and other potential activities in low-Earth
17 orbit.

18 (3) PROCUREMENT SYSTEM REVIEW.—The Ad-
19 ministrator shall review current Government pro-
20 curement and acquisition practices and processes, in-
21 cluding agreement authorities under the National
22 Aeronautics and Space Act of 1958, to determine
23 the most cost-effective means of procuring commer-
24 cial crew transportation capabilities and related serv-
25 ices in a manner that ensures appropriate account-

1 ability, transparency, and maximum efficiency in the
2 procurement of such capabilities and services, which
3 review shall include an identification of proposed
4 measures to address risk management and means of
5 indemnification of commercial providers of such ca-
6 pabilities and services, and measures for quality con-
7 trol, safety oversight, and the application of Federal
8 oversight processes within the jurisdiction of other
9 Federal agencies. A description of the proposed pro-
10 curement process and justification of the proposed
11 procurement for its selection shall be included in any
12 proposed initiation of procurement activity for com-
13 mercially-developed crew transportation capabilities
14 and services and shall be subject to review by the
15 appropriate committees of Congress before the initi-
16 ation of any competitive process to procure such ca-
17 pabilities or services. In support of the review by
18 such committees, the Comptroller General shall un-
19 dertake an assessment of the proposed procurement
20 process and provide a report to the appropriate com-
21 mittees of Congress within 90 days after the date on
22 which the Administrator provides the description
23 and justification to such committees.

24 (4) USE OF GOVERNMENT-SUPPLIED CAPABILI-
25 TIES AND INFRASTRUCTURE.—In evaluating any

1 proposed development activity for commercially-de-
2 veloped crew or cargo launch capabilities, the Ad-
3 ministrator shall identify the anticipated contribu-
4 tion of government personnel, expertise, tech-
5 nologies, and infrastructure to be utilized in support
6 of design, development, or operations of such capa-
7 bilities. This assessment shall include a clear delin-
8 eation of the full requirements for the commercial
9 crew service (including the contingency for crew res-
10 cue). The Administrator shall include details and as-
11 sociated costs of such support as part of any pro-
12 posed development initiative for the procurement of
13 commercially-developed crew or cargo launch capa-
14 bilities or services.

15 (5) FLIGHT DEMONSTRATION AND READINESS
16 REQUIREMENTS.—The Administrator shall establish
17 appropriate milestones and minimum performance
18 objectives to be achieved before authority is granted
19 to proceed to the procurement of commercially-devel-
20 oped crew transportation capabilities or systems.
21 The guidelines shall include a procedure to provide
22 independent assurance of flight safety and flight
23 readiness before the authorization of United States
24 government personnel to participate as crew onboard

1 any commercial launch vehicle developed pursuant to
2 this section.

3 (6) COMMERCIAL CREW RESCUE CAPABILI-
4 TIES.—The provision of a commercial capability to
5 provide ISS crew services shall include crew rescue
6 requirements, and shall be undertaken through the
7 procurement process initiated in conformance with
8 this section. In the event such development is initi-
9 ated, the Administrator shall make available any rel-
10 evant government-owned intellectual property deriv-
11 ing from the development of a multi-purpose crew
12 vehicle authorized by this Act to commercial entities
13 involved with such crew rescue capability develop-
14 ment which shall be relevant to the design of a crew
15 rescue capability. In addition, the Administrator
16 shall seek to ensure that contracts for development
17 of the multi-purpose crew vehicle contain provisions
18 for the licensing of relevant intellectual property to
19 participating commercial providers of any crew res-
20 cue capability development undertaken pursuant to
21 this section. If one or more contractors involved with
22 development of the multi-purpose crew vehicle seek
23 to compete in development of a commercial crew
24 service with crew rescue capability, separate legisla-
25 tive authority must be enacted to enable the Admin-

1 istrator to provide funding for any modifications of
2 the multi-purpose crew vehicle necessary to fulfill
3 the ISS crew rescue function.

4 **SEC. 404. REPORT ON INTERNATIONAL SPACE STATION**
5 **CARGO RETURN CAPABILITY.**

6 Not later than 120 days after the date of the enact-
7 ment of this Act, the Administrator shall submit to the
8 appropriate committees of Congress a report on potential
9 alternative commercially-developed means for the capa-
10 bility for a soft-landing return on land from the ISS of—

11 (1) research samples or other derivative mate-
12 rials; and

13 (2) small to mid-sized (up to 1,000 kilograms)
14 equipment for return and analysis, or for refurbish-
15 ment and redelivery, to the ISS.

16 **TITLE V—CONTINUATION, SUP-**
17 **PORT, AND EVOLUTION OF**
18 **THE INTERNATIONAL SPACE**
19 **STATION**

20 **SEC. 501. CONTINUATION OF THE INTERNATIONAL SPACE**
21 **STATION THROUGH 2020.**

22 (a) **POLICY OF THE UNITED STATES.**—It shall be the
23 policy of the United States, in consultation with its inter-
24 national partners in the ISS program, to support full and
25 complete utilization of the ISS through at least 2020.

1 (b) NASA ACTIONS.—In furtherance of the policy set
2 forth in subsection (a), NASA shall pursue international,
3 commercial, and intragovernmental means to maximize
4 ISS logistics supply, maintenance, and operational capa-
5 bilities, reduce risks to ISS systems sustainability, and off-
6 set and minimize United States operations costs relating
7 to the ISS.

8 **SEC. 502. MAXIMUM UTILIZATION OF THE INTERNATIONAL**
9 **SPACE STATION.**

10 (a) IN GENERAL.—With assembly of the ISS com-
11 plete, NASA shall take steps to maximize the productivity
12 and use of the ISS with respect to scientific and techno-
13 logical research and development, advancement of space
14 exploration, and international collaboration.

15 (b) NASA ACTIONS.—In carrying out subsection (a),
16 NASA shall, at a minimum, undertake the following:

17 (1) INNOVATIVE USE OF U.S. SEGMENT.—The
18 United States segment of the ISS, which has been
19 designated as a National Laboratory, shall be devel-
20 oped, managed and utilized in a manner that en-
21 ables the effective and innovative use of such facility,
22 as provided in section 504.

23 (2) INTERNATIONAL COOPERATION.—The ISS
24 shall continue to be utilized as a key component of
25 international efforts to build missions and capabili-

1 ties that further the development of a human pres-
2 ence beyond near-Earth space and advance United
3 States security and economic goals. The Adminis-
4 trator shall actively seek ways to encourage and en-
5 able the use of ISS capabilities to support these ef-
6 forts.

7 (3) DOMESTIC COLLABORATION.—The oper-
8 ations, management, and utilization of the ISS shall
9 be conducted in a manner that provides opportuni-
10 ties for collaboration with other research programs
11 and objectives of the United States Government in
12 cooperation with commercial suppliers, users, and
13 developers.

14 **SEC. 503. MAINTENANCE OF THE UNITED STATES SEGMENT**
15 **AND ASSURANCE OF CONTINUED OPER-**
16 **ATIONS OF THE INTERNATIONAL SPACE STA-**
17 **TION.**

18 (a) IN GENERAL.—The Administrator shall take all
19 actions necessary to ensure the safe and effective oper-
20 ation, maintenance, and maximum utilization of the
21 United States segment of the ISS through at least Sep-
22 tember 30, 2020.

23 (b) VEHICLE AND COMPONENT REVIEW.—

24 (1) IN GENERAL.—In carrying out subsection
25 (a), the Administrator shall, as soon as is prac-

1 ticable after the date of the enactment of this Act,
2 carry out a comprehensive assessment of the essen-
3 tial modules, operational systems and components,
4 structural elements, and permanent scientific equip-
5 ment on board or planned for delivery and installa-
6 tion aboard the ISS, including both United States
7 and international partner elements, for purposes of
8 identifying the spare or replacement modules, sys-
9 tems and components, elements, and equipment that
10 are required to ensure complete, effective, and safe
11 functioning and full scientific utilization of the ISS
12 through September 30, 2020.

13 (2) DATA.—In carrying out the assessment, the
14 Administrator shall assemble any existing data, and
15 provide for the development of any data or analysis
16 not currently available, that is necessary for pur-
17 poses of the assessment.

18 (c) REPORTS.—

19 (1) REPORT ON ASSESSMENT.—

20 (A) REPORT REQUIRED.—Not later than
21 90 days after the date of the enactment of this
22 Act, the Administrator shall submit to the ap-
23 propriate committees of Congress a report on
24 the assessment required by subsection (b).

1 (B) ELEMENTS.—The report required by
2 this paragraph shall include, at minimum, the
3 following:

4 (i) A description of the spare or re-
5 placement modules, systems and compo-
6 nents, elements, and equipment identified
7 pursuant to the assessment that are cur-
8 rently produced, in inventory, or on order,
9 a description of the state of their readi-
10 ness, and a schedule for their delivery to
11 the ISS (including the planned transpor-
12 tation means for such delivery), including
13 for each such module, system or compo-
14 nent, element, or equipment a description
15 of—

16 (I) its specifications, including
17 size, weight, and necessary configura-
18 tion for launch and delivery to the
19 ISS;

20 (II) its function;

21 (III) its location; and

22 (IV) its criticality for ISS system
23 integrity.

24 (ii) A description of the spare or re-
25 placement modules, systems and compo-

1 nents, elements, and equipment identified
2 pursuant to the assessment that are not
3 currently produced, in inventory, or on
4 order, including for each such module, sys-
5 tem or component, element, or equipment
6 a description of—

7 (I) its specifications, including
8 size, weight, and necessary configura-
9 tion for launch and delivery to the
10 ISS;

11 (II) its function;

12 (III) its location;

13 (IV) its criticality for ISS system
14 integrity; and

15 (V) the anticipated cost and
16 schedule for its design, procurement,
17 manufacture, and delivery to the ISS.

18 (iii) A detailed summary of the deliv-
19 ery schedule and associated delivery vehicle
20 requirements necessary to transport all
21 spare and replacement elements considered
22 essential for the ongoing and sustained
23 functionality of all critical systems of the
24 ISS, both in and of themselves and as an
25 element of an integrated, mutually depend-

1 ent essential capability, including an as-
2 sessment of the current schedule for deliv-
3 ery, the availability of delivery vehicles to
4 meet that schedule, and the likelihood of
5 meeting that schedule through such vehi-
6 cles.

7 (2) GAO REPORT.—

8 (A) REPORT REQUIRED.—Not later than
9 90 days after the submittal to Congress under
10 paragraph (1) of the assessment required by
11 subsection (b), the Comptroller General of the
12 United States shall submit to the appropriate
13 committees of Congress a report on the assess-
14 ment. The report shall set forth an evaluation
15 of the assessment by the Comptroller General,
16 including an evaluation of the accuracy and
17 level of confidence in the findings of the assess-
18 ment.

19 (B) COOPERATION WITH GAO.—The Ad-
20 ministrators shall provide for the monitoring and
21 participation of the Comptroller General in the
22 assessment in a manner that permits the Comp-
23 troller General to prepare and submit the re-
24 port required by subparagraph (A).

1 (d) UTILIZATION OF RESEARCH FACILITIES AND CA-
2 PABILITIES.—Utilization of research facilities and capa-
3 bilities aboard the ISS (other than exploration-related re-
4 search and technology development facilities and capabili-
5 ties, and associated ground support and logistics), shall
6 be planned, managed, and supported as provided in sec-
7 tion 504. Exploration-related research and technology de-
8 velopment facilities, capabilities, and associated ground
9 support and logistics shall be planned, managed, and sup-
10 ported by the appropriate NASA organizations and offi-
11 cials in a manner that does not interfere with other activi-
12 ties under section 504.

13 (e) SPACE SHUTTLE MISSION TO ISS.—

14 (1) SPACE SHUTTLE MISSION.—The Adminis-
15 trator shall fly the Launch-On-Need Shuttle mission
16 currently designated in the Shuttle Flight Manifest
17 dated February 28, 2010, to the ISS in fiscal year
18 2011, but no earlier than June 1, 2011, unless re-
19 quired earlier by an operations contingency, and
20 pending the results of the assessment required by
21 paragraph (2) and the determination under para-
22 graph (3)(A).

23 (2) ASSESSMENT OF SAFE MEANS OF RE-
24 TURN.—The Administrator shall provide for an as-
25 sessment by the NASA Engineering and Safety Cen-

1 ter of the procedures and plans developed to ensure
2 the safety of the Space Shuttle crew, and alternative
3 means of return, in the event the Space Shuttle is
4 damaged or otherwise unable to return safely to
5 Earth.

6 (3) SCHEDULE AND PAYLOAD.—The determina-
7 tion of the schedule and payload for the mission au-
8 thorized by paragraph (1) shall take into account
9 the following:

10 (A) The supply and logistics delivery re-
11 quirements of the ISS.

12 (B) The findings of the study required by
13 paragraph (2).

14 (4) FUNDS.—Amounts authorized to be appro-
15 priated by section 101(2)(B) shall be available for
16 the mission authorized by paragraph (1).

17 (f) SPACE SHUTTLE MANIFEST FLIGHT ASSUR-
18 ANCE.—

19 (1) IN GENERAL.—The Administrator shall
20 take all actions necessary to preserve Space Shuttle
21 launch capability through fiscal year 2011 in a man-
22 ner that enables the launch, at a minimum, of mis-
23 sions and primary payloads in the Shuttle flight
24 manifest as of February 28, 2010.

1 (3) PROHIBITION ON OTHER ACTIVITIES.—The
2 cooperative agreement shall require the organization
3 entering into the agreement to engage exclusively in
4 activities relating to the management of the ISS na-
5 tional laboratory and activities that promote its long
6 term research and development mission as required
7 by this section, without any other organizational ob-
8 jectives or responsibilities on behalf of the organiza-
9 tion or any parent organization or other entity.

10 (b) NASA LIAISON.—

11 (1) DESIGNATION.—The Administrator shall
12 designate an official or employee of the Space Oper-
13 ations Mission Directorate of NASA to act as liaison
14 between NASA and the organization with which the
15 Administrator enters into a cooperative agreement
16 under subsection (a) with regard to the management
17 of the ISS national laboratory.

18 (2) CONSULTATION WITH LIAISON.—The coop-
19 erative agreement shall require the organization en-
20 tering into the agreement to carry out its respon-
21 sibilities under the agreement in cooperation and
22 consultation with the official or employee designated
23 under paragraph (1).

24 (c) PLANNING AND COORDINATION OF ISS NATIONAL
25 LABORATORY RESEARCH ACTIVITIES.—The Adminis-

1 trator shall provide initial financial assistance to the orga-
2 nization with which the Administrator enters into a coop-
3 erative agreement under subsection (a), in order for the
4 organization to initiate the following:

5 (1) Planning and coordination of the ISS na-
6 tional laboratory research activities.

7 (2) Development and implementation of guide-
8 lines, selection criteria, and flight support require-
9 ments for non-NASA scientific utilization of ISS re-
10 search capabilities and facilities available in United
11 States-owned modules of the ISS or in partner-
12 owned facilities of the ISS allocated to United States
13 utilization by international agreement.

14 (3) Interaction with and integration of the
15 International Space Station National Laboratory
16 Advisory Committee established under section 602 of
17 the National Aeronautics and Space Administration
18 Authorization Act of 2008 (42 U.S.C. 17752) with
19 the governance of the organization, and review rec-
20 ommendations provided by that Committee regard-
21 ing agreements with non-NASA departments and
22 agencies of the United States Government, academic
23 institutions and consortia, and commercial entities
24 leading to the utilization of the ISS national labora-
25 tory facilities.

1 (4) Coordination of transportation requirements
2 in support of the ISS national laboratory research
3 and development objectives, including provision for
4 delivery of instruments, logistics support, and re-
5 lated experiment materials, and provision for return
6 to Earth of collected samples, materials, and sci-
7 entific instruments in need of replacement or up-
8 grade.

9 (5) Cooperation with NASA, other departments
10 and agencies of the United States Government, the
11 States, and commercial entities in ensuring the en-
12 hancement and sustained operations of non-explo-
13 ration-related research payload ground support fa-
14 cilities for the ISS, including the Space Life
15 Sciences Laboratory, the Space Station Processing
16 Facility and Payload Operations Integration Center.

17 (6) Development and implementation of sci-
18 entific outreach and education activities designed to
19 ensure effective utilization of ISS research capabili-
20 ties including the conduct of scientific assemblies,
21 conferences, and other fora for the presentation of
22 research findings, methods, and mechanisms for the
23 dissemination of non-restricted research findings and
24 the development of educational programs, course
25 supplements, interaction with educational programs

1 at all grade levels, including student-focused re-
2 search opportunities for conduct of research in the
3 ISS national laboratory facilities.

4 (7) Such other matters relating to the utiliza-
5 tion of the ISS national laboratory facilities for re-
6 search and development as the Administrator may
7 consider appropriate.

8 (d) RESEARCH CAPACITY ALLOCATION AND INTE-
9 GRATION OF RESEARCH PAYLOADS.—

10 (1) ALLOCATION OF ISS RESEARCH CAPAC-
11 ITY.—As soon as practicable after the date of the
12 enactment of this Act, but not later than October 1,
13 2011, ISS national laboratory managed experiments
14 shall be guaranteed access to, and utilization of, not
15 less than 50 percent of the United States research
16 capacity allocation, including power, cold stowage,
17 and requisite crew time onboard the ISS through
18 September 30, 2020. Access to the ISS research ca-
19 pacity includes provision for the adequate upmass
20 and downmass capabilities to utilize the ISS re-
21 search capacity, as available. The Administrator may
22 allocate additional capacity to the ISS national lab-
23 oratory should such capacity be in excess of NASA
24 research requirements.

1 (2) ADDITIONAL RESEARCH CAPABILITIES.—If
2 any NASA research plan is determined to require re-
3 search capacity onboard the ISS beyond the percent-
4 age allocated under paragraph (1), such research
5 plan shall be prepared in the form of a requested re-
6 search opportunity to be submitted to the process es-
7 tablished under this section for the consideration of
8 proposed research within the capacity allocated to
9 the ISS national laboratory. A proposal for such a
10 research plan may include the establishment of part-
11 nerships with non-NASA institutions eligible to pro-
12 pose research to be conducted within the ISS na-
13 tional laboratory capacity. Until September 30,
14 2020, the official or employee designated under sub-
15 section (b) may grant an exception to this require-
16 ment in the case of a proposed experiment consid-
17 ered essential for purposes of preparing for explo-
18 ration beyond low-Earth orbit, as determined by
19 joint agreement between the organization with which
20 the Administrator enters into a cooperative agree-
21 ment under subsection (a) and the official or em-
22 ployee designated under subsection (b).

23 (3) RESEARCH PRIORITIES AND ENHANCED CA-
24 PACITY.—The organization with which the Adminis-
25 trator enters into the cooperative agreement shall

1 consider recommendations of the National Acad-
2 emies Decadal Survey on Biological and Physical
3 Sciences in Space in establishing research priorities
4 and in developing proposed enhancements of re-
5 search capacity and opportunities for the ISS na-
6 tional laboratory.

7 (4) RESPONSIBILITY FOR RESEARCH PAY-
8 LOAD.—NASA shall retain its roles and responsibil-
9 ities in providing research payload physical, analyt-
10 ical, and operations integration during pre-flight,
11 post-flight, transportation, and orbital phases essen-
12 tial to ensure safe and effective flight readiness and
13 vehicle integration of research activities approved
14 and prioritized by the organization with which the
15 Administrator enters into the cooperative agreement
16 and the official or employee designated under sub-
17 section (b).

18 **TITLE VI—SPACE SHUTTLE**
19 **RETIREMENT AND TRANSITION**

20 **SEC. 601. SENSE OF CONGRESS ON THE SPACE SHUTTLE**
21 **PROGRAM.**

22 (a) FINDINGS.—Congress makes the following find-
23 ings:

24 (1) The Space Shuttle program represents a
25 national asset consisting of critical skills and capa-

1 bilities, including the ability to lift large payloads
2 into space and return them to Earth.

3 (2) The Space Shuttle has carried more than
4 355 people from 16 nations into space.

5 (3) The Space Shuttle has projected the best of
6 American values around the world, and Space Shut-
7 tle crews have sparked the imagination and dreams
8 of the world's youth and young at heart.

9 (b) SENSE OF CONGRESS.—It is the sense of Con-
10 gress that—

11 (1) it is essential that the retirement of the
12 Space Shuttle and the transition to new human
13 space flight capabilities be done in a manner that
14 builds upon the legacy of this national asset; and

15 (2) it is imperative for the United States to re-
16 tain the skills and the industrial capability to pro-
17 vide a follow-on Space Launch System that is pri-
18 marily designed for missions beyond near-Earth
19 space, while offering some potential for supplanting
20 shuttle delivery capabilities to low-Earth orbit, par-
21 ticularly in support of ISS requirements, if nec-
22 essary.

1 **SEC. 602. RETIREMENT OF SPACE SHUTTLE ORBITERS AND**
2 **TRANSITION OF SPACE SHUTTLE PROGRAM.**

3 (a) IN GENERAL.—The Administrator shall retire the
4 Space Shuttle orbiters pursuant to a schedule established
5 by the Administrator and in a manner consistent with pro-
6 visions of this Act regarding potential requirements for
7 contingency utilization of Space Shuttle orbiters for ISS
8 requirements.

9 (b) UTILIZATION OF WORKFORCE AND ASSETS IN
10 FOLLOW-ON SPACE LAUNCH SYSTEM.—

11 (1) UTILIZATION OF VEHICLE ASSETS.—In car-
12 rying out subsection (a), the Administrator shall, to
13 the maximum extent practicable, utilize workforce,
14 assets, and infrastructure of the Space Shuttle pro-
15 gram in efforts relating to the initiation of a follow-
16 on Space Launch System developed pursuant to sec-
17 tion 302 of this Act.

18 (2) OTHER ASSETS.—With respect to the work-
19 force, assets, and infrastructure not utilized as de-
20 scribed in paragraph (1), the Administrator shall
21 work closely with other departments and agencies of
22 the Federal Government, and the private sector, to
23 divest unneeded assets and to assist displaced work-
24 ers with retraining and other placement efforts.
25 Amounts authorized to be appropriated by section

1 101(2)(B) shall be available for activities pursuant
2 to this paragraph.

3 **SEC. 603. DISPOSITION OF ORBITER VEHICLES.**

4 (a) IN GENERAL.—Upon the termination of the
5 Space Shuttle program as provided in section 602, the Ad-
6 ministrators shall decommission any remaining Space
7 Shuttle orbiter vehicles according to established safety and
8 historic preservation procedures prior to their designation
9 as surplus government property. The orbiter vehicles shall
10 be made available and located for display and maintenance
11 through a competitive procedure established pursuant to
12 the disposition plan developed under section 613(a) of the
13 National Aeronautics and Space Administration Author-
14 ization Act of 2008 (42 U.S.C. 17761(a)), with priority
15 consideration given to eligible applicants meeting all condi-
16 tions of that plan which would provide for the display and
17 maintenance of orbiters at locations with the best potential
18 value to the public, including where the location of the
19 orbiters can advance educational opportunities in science,
20 technology, engineering, and mathematics disciplines, and
21 with an historical relationship with either the launch,
22 flight operations, or processing of the Space Shuttle orbit-
23 ers. The Smithsonian Institution, which, as of the date
24 of enactment of this Act, houses the Space Shuttle Enter-
25 prise, shall determine any new location for the Enterprise.

1 (b) DISPLAY AND MAINTENANCE.—The orbiter vehi-
2 cles made available under subsection (a) shall be displayed
3 and maintained through agreements and procedures es-
4 tablished pursuant to section 613(a) of the National Aero-
5 nautics and Space Administration Authorization Act of
6 2008 (42 U.S.C. 17761(a)).

7 (c) AUTHORIZATION OF APPROPRIATIONS.—There
8 are authorized to be appropriated to NASA such sums as
9 may be necessary to carry out this section. The amounts
10 authorized to be appropriated by this subsection shall be
11 in addition to any amounts authorized to be appropriated
12 by title I, and may be requested by the President as sup-
13 plemental requirements, if needed, in the appropriate fis-
14 cal years.

15 **TITLE VII—EARTH SCIENCE**

16 **SEC. 701. SENSE OF CONGRESS.**

17 It is the sense of Congress that—

18 (1) Earth observations are critical to scientific
19 understanding and monitoring of the Earth system,
20 to protecting human health and property, to growing
21 the economy of the United States, and to strength-
22 ening the national security and international posture
23 of the United States. Additionally, recognizing the
24 number of relevant participants and activities in-
25 volved with Earth observations within the United

1 States Government and internationally, Congress
2 supports the strengthening of collaboration across
3 these areas;

4 (2) NASA plays a critical role through its abil-
5 ity to provide data on solar output, sea level rise, at-
6 mospheric and ocean temperature, ozone depletion,
7 air pollution, and observation of human and environ-
8 ment relationships;

9 (3) programs should utilize open standards con-
10 sistent with international data-sharing principles and
11 obtain and convert data from other government
12 agencies, including data from the United States Ge-
13 ological Survey, and data derived from satellites op-
14 erated by NOAA as well as from international sat-
15 ellites are important to the study of climate science
16 and such cooperative relationships and programs
17 should be maintained;

18 (4) Earth-observing satellites and sustained
19 monitoring programs will continue to play a vital
20 role in climate science, environmental understanding,
21 mitigation of destructive environmental impacts, and
22 contributing to the general national welfare; and

23 (5) land remote sensing observation plays a
24 critical role in Earth science, and the national space

1 policy supports this role by requiring operational
2 land remote sensing capabilities.

3 **SEC. 702. INTERAGENCY COLLABORATION IMPLEMENTA-**
4 **TION APPROACH.**

5 The Director of OSTP shall establish a mechanism
6 to ensure greater coordination of the research, operations,
7 and activities relating to civilian Earth observation of
8 those Agencies, including NASA, that have active pro-
9 grams that either contribute directly or indirectly to these
10 areas. This mechanism should include the development of
11 a strategic implementation plan that is updated at least
12 every 3 years, and includes a process for external inde-
13 pendent advisory input. This plan should include a de-
14 scription of the responsibilities of the various Agency roles
15 in Earth observations, recommended cost-sharing and pro-
16 curement arrangements between Agencies and other enti-
17 ties, including international arrangements, and a plan for
18 ensuring the provision of sustained, long term space-based
19 climate observations. The Director shall provide a report
20 to Congress within 90 days after the date of enactment
21 of this Act on the implementation plan for this mecha-
22 nism.

1 **SEC. 703. TRANSITIONING EXPERIMENTAL RESEARCH TO**
2 **OPERATIONS.**

3 The Administrator shall coordinate with the Adminis-
4 trator of NOAA and the Director of the United States
5 Geological Survey to establish a formal mechanism that
6 plans, coordinates, and supports the transitioning of
7 NASA research findings, assets, and capabilities to NOAA
8 operations and United States Geological Survey oper-
9 ations. In defining this mechanism, NASA should consider
10 the establishment of a formal or informal Interagency
11 Transition Office. The Administrator of NASA shall pro-
12 vide an implementation plan for this mechanism to Con-
13 gress within 90 days after the date of enactment of this
14 Act.

15 **SEC. 704. DECADAL SURVEY MISSIONS IMPLEMENTATION**
16 **FOR EARTH OBSERVATION.**

17 The Administrator shall undertake to implement, as
18 appropriate, missions identified in the National Research
19 Council's Earth Science Decadal Survey within the scope
20 of the funds authorized for the Earth Science Mission Di-
21 rectorate.

22 **SEC. 705. EXPANSION OF EARTH SCIENCE APPLICATIONS.**

23 It is the sense of the Congress that the role of NASA
24 in Earth Science applications shall be expanded with other
25 departments and agencies of the Federal government,
26 State and local governments, tribal governments, aca-

1 demia, the private sector, nonprofit organizations, and
2 international partners. NASA's Earth science data can in-
3 creasingly aid efforts to improve the human condition and
4 provide greater security.

5 **SEC. 706. INSTRUMENT TEST-BEDS AND VENTURE CLASS**
6 **MISSIONS.**

7 The Administrator shall pursue innovative ways to fly
8 instrument-level payloads for early demonstration or as
9 co-manifested payloads. The Congress encourages the use
10 of the ISS as an accessible platform for the conduct of
11 such activities. Additionally, in order to address the cost
12 and schedule challenges associated with large flight sys-
13 tems, NASA should pursue smaller systems where prac-
14 ticable and warranted.

15 **SEC. 707. SENSE OF CONGRESS ON NPOESS FOLLOW-ON**
16 **PROGRAM.**

17 It is the Sense of the Congress that—

18 (1) polar orbiting satellites are vital for weather
19 prediction, climate and environmental monitoring,
20 national security, emergency response, and climate
21 research;

22 (2) the National Polar Orbiting Environmental
23 Satellite System has suffered from years of steadily
24 rising cost estimates and schedule delays and an
25 independent review team recommended that the Sys-

1 tem be restructured to improve the probability of
2 success and protect the continuity of weather and
3 climate data;

4 (3) the Congress supports the decision made by
5 OSTP in February, 2010, to restructure the pro-
6 gram to minimize schedule slips and cost overruns,
7 clarify the responsibilities and accountability of
8 NASA, NOAA, and the Department of Defense, and
9 retain necessary coordination across civil and de-
10 fense weather and climate programs;

11 (4) the Administrator of NOAA and the Sec-
12 retary of Defense should maximize the use of assets
13 from the NPOESS program as they establish the
14 NOAA Joint Polar Satellite System at NASA's God-
15 dard Space Flight Center, and the Department of
16 Defense's Defense Weather Satellite System;

17 (5) the Administrator of NOAA and the Sec-
18 retary of Defense should structure their programs in
19 order to maintain satellite data continuity for the
20 Nation's weather and climate requirements; and

21 (6) the Administrator of NOAA and the Sec-
22 retary of Defense should provide immediate notifica-
23 tion to the Congress of any impediments that may
24 require Congressional intervention in order for the

1 agencies to meet launch readiness dates, together
2 with any recommended actions.

3 **TITLE VIII—SPACE SCIENCE**

4 **SEC. 801. TECHNOLOGY DEVELOPMENT.**

5 The Administrator shall ensure that the Science Mis-
6 sion Directorate maintains a long term technology devel-
7 opment program for space and Earth science. This effort
8 should be coordinated with an overall Agency technology
9 investment approach, as authorized in section 905 of this
10 Act.

11 **SEC. 802. SUBORBITAL RESEARCH ACTIVITIES.**

12 (a) IN GENERAL.—The report of the National Acad-
13 emy of Sciences, *Revitalizing NASA’s Suborbital Program:*
14 *Advancing Science, Driving Innovation and Developing*
15 *Workforce*, found that suborbital science missions were ab-
16 solutely critical to building an aerospace workforce capable
17 of meeting the needs of current and future human and
18 robotic space exploration.

19 (b) MANAGEMENT.—The Administrator shall des-
20 ignate an officer or employee of the Science Mission Direc-
21 torate to act as the responsible official for all Suborbital
22 Research in the Science Mission Directorate. The designee
23 shall be responsible for the development of short- and long
24 term strategic plans for maintaining, renewing and ex-
25 tending suborbital facilities and capabilities, monitoring

1 progress towards goals in the plans, and be responsible
2 for integration of suborbital activities and workforce devel-
3 opment within the agency, thereby ensuring the long term
4 recognition of their combined value to the directorate, to
5 NASA, and to the Nation.

6 (c) ESTABLISHMENT OF SUBORBITAL RESEARCH
7 PROGRAM.—The Administrator shall establish a Sub-
8 orbital Research Program within the Science Mission Di-
9 rectorate that shall include the use of sounding rockets,
10 aircraft, high altitude balloons, suborbital reusable launch
11 vehicles, and commercial launch vehicles to advance
12 science and train the next generation of scientists and en-
13 gineers in systems engineering and systems integration
14 which are vital to maintaining critical skills in the aero-
15 space workforce. The program shall integrate existing sub-
16 orbital research programs with orbital missions at the dis-
17 cretion of the designated officer or employee and shall em-
18 phasize the participation of undergraduate and graduate
19 students and post-doctoral researchers when formulating
20 announcements of opportunity.

21 (d) REPORT.—The Administrator shall report to the
22 appropriate committees of Congress on the number and
23 type of suborbital missions conducted in each fiscal year
24 and the number of undergraduate and graduate students

1 participating in the missions. The report shall be made
2 annually for each fiscal year under this section.

3 (e) AUTHORIZATION.—There are authorized to be ap-
4 propriated to the Administrator such sums as may be nec-
5 essary to carry out this section.

6 **SEC. 803. OVERALL SCIENCE PORTFOLIO-SENSE OF THE**
7 **CONGRESS.**

8 Congress reaffirms its sense that a balanced and ade-
9 quately funded set of activities, consisting of research and
10 analysis grants programs, technology development, small,
11 medium, and large space missions, and suborbital research
12 activities, contributes to a robust and productive science
13 program and serves as a catalyst for innovation.

14 **SEC. 804. IN-SPACE SERVICING.**

15 The Administrator shall continue to take all nec-
16 essary steps to ensure that provisions are made for in-
17 space or human servicing and repair of all future observ-
18 atory-class scientific spacecraft intended to be deployed in
19 Earth-orbit or at a Lagrangian point to the extent prac-
20 ticable and appropriate. The Administrator should ensure
21 that agency investments and future capabilities for space
22 technology, robotics, and human space flight take the abil-
23 ity to service and repair these spacecraft into account,
24 where appropriate, and incorporate such capabilities into
25 design and operational plans.

1 **SEC. 805. DECADAL RESULTS.**

2 NASA shall take into account the current decadal
3 surveys from the National Academies' Space Studies
4 Board when submitting the President's budget request to
5 the Congress.

6 **SEC. 806. ON-GOING RESTORATION OF RADIOISOTOPE**
7 **THERMOELECTRIC GENERATOR MATERIAL**
8 **PRODUCTION.**

9 (a) FINDINGS.—The Congress finds the following:

10 (1) The United States has led the world in the
11 scientific exploration of space for nearly 50 years.

12 (2) Missions such as Viking, Voyager, Cassini,
13 and New Horizons have greatly expanded knowledge
14 of our solar system and planetary characteristics
15 and evolution.

16 (3) Radioisotope power systems are the only
17 available power sources for deep space missions
18 making it possible to travel to such distant destina-
19 tions as Mars, Jupiter, Saturn, Pluto, and beyond
20 and maintain operational control and systems viabil-
21 ity for extended mission durations.

22 (4) Current radioisotope power systems supplies
23 and production will not fully support NASA missions
24 planned even in the next decade and, without a new
25 domestic production capability, the United States

1 will no longer have the means to explore the major-
2 ity of the solar system by the end of this decade.

3 (5) Continuing to rely on Russia or other for-
4 eign sources for radioisotope power system fuel pro-
5 duction is not a secure option.

6 (6) Reestablishing domestic production will re-
7 quire a long lead-time. Thus, meeting future space
8 exploration mission needs requires that a restart
9 project begin at the earliest opportunity.

10 (b) IN GENERAL.—The Administrator shall, in co-
11 ordination with the Secretary of Energy, pursue a joint
12 approach beginning in fiscal year 2011 towards restarting
13 and sustaining the domestic production of radioisotope
14 thermoelectric generator material for deep space and other
15 science and exploration missions. Funds authorized by this
16 Act for NASA shall be made available under a reimburs-
17 able agreement with the Department of Energy for the
18 purpose of reestablishing facilities to produce fuel required
19 for radioisotope thermoelectric generators to enable future
20 missions.

21 (c) REPORT.—Within 120 days after the date of en-
22 actment of this Act, the Administrator and the Secretary
23 of Energy shall submit a joint report to the appropriate
24 committees of Congress on coordinated agreements,
25 planned implementation, and anticipated schedule, pro-

1 duction quantities, and mission applications under this
2 section.

3 **SEC. 807. COLLABORATION WITH ESMD AND SOMD ON**
4 **ROBOTIC MISSIONS.**

5 The Administrator shall ensure that the Exploration
6 Systems Mission Directorate and the Space Operations
7 Mission Directorate coordinate with the Science Mission
8 Directorate on an overall approach and plan for inter-
9 agency and international collaboration on robotic missions
10 that are NASA or internationally developed, including
11 lunar, Lagrangian, near-Earth orbit, and Mars spacecraft,
12 such as the International Lunar Network. Within 90 days
13 after the date of enactment of this Act, the Administrator
14 shall provide a plan to the appropriate committees of Con-
15 gress for implementation of the collaborative approach re-
16 quired by this section. The Administrator may not cancel
17 or initiate any Exploration Systems Mission Directorate
18 or Science Mission Directorate robotic project before the
19 plan is submitted to the appropriate committees of Con-
20 gress.

21 **SEC. 808. NEAR-EARTH OBJECT SURVEY AND POLICY WITH**
22 **RESPECT TO THREATS POSED.**

23 (a) POLICY REAFFIRMATION.—Congress reaffirms
24 the policy set forth in section 102(g) of the National Aero-

1 nautics and Space Act of 1958 (42 U.S.C. 2451(g)) relat-
2 ing to surveying near-Earth asteroids and comets.

3 (b) IMPLEMENTATION.—The Director of the OSTP
4 shall implement, before September 30, 2012, a policy for
5 notifying Federal agencies and relevant emergency re-
6 sponse institutions of an impending near-Earth object
7 threat if near-term public safety is at risk, and assign a
8 Federal agency or agencies to be responsible for protecting
9 the United States and working with the international com-
10 munity on such threats.

11 **SEC. 809. SPACE WEATHER.**

12 (a) FINDINGS.—The Congress finds the following:

13 (1) Space weather events pose a significant
14 threat to modern technological systems.

15 (2) The effects of severe space weather events
16 on the electric power grid, telecommunications and
17 entertainment satellites, airline communications dur-
18 ing polar routes, and space-based position, naviga-
19 tion and timing systems could have significant soci-
20 etal, economic, national security, and health impacts.

21 (3) Earth and Space Observing satellites, such
22 as the Advanced Composition Explorer, Geo-
23 stationary Operational Environmental Satellites,
24 Polar Operational Environmental Satellites, and De-

1 fense Meteorological Satellites, provide crucial data
2 necessary to predict space weather events.

3 (b) ACTION REQUIRED.—The Director of OSTP
4 shall—

5 (1) improve the Nation’s ability to prepare,
6 avoid, mitigate, respond to, and recover from poten-
7 tially devastating impacts of space weather events;

8 (2) coordinate the operational activities of the
9 National Space Weather Program Council members,
10 including the NOAA Space Weather Prediction Cen-
11 ter and the U.S. Air Force Weather Agency; and

12 (3) submit a report to the appropriate commit-
13 tees of Congress within 180 days after the date of
14 enactment of this Act that—

15 (A) details the current data sources, both
16 space- and ground-based, that are necessary for
17 space weather forecasting; and

18 (B) details the space- and ground-based
19 systems that will be required to gather data
20 necessary for space weather forecasting for the
21 next 10 years.

22 **TITLE IX—AERONAUTICS AND**
23 **SPACE TECHNOLOGY**

24 **SEC. 901. SENSE OF CONGRESS.**

25 It is the sense of Congress that—

1 (1) aeronautics research remains vital to
2 NASA's mission and deserves continued support;

3 (2) NASA aeronautics research should be guid-
4 ed by, and consistent with, the National Aeronautics
5 Research and Development Policy that guides the
6 Nation's aeronautics research and development ac-
7 tivities;

8 (3) the OSTP-led National Science and Tech-
9 nology Council Aeronautics Science and Technology
10 subcommittee remains essential to developing and
11 coordinating national aeronautics research and de-
12 velopment plans and their prioritization for funding,
13 and that it is also important that the plans include
14 a focus on research, development, test, and evalua-
15 tion infrastructure plans, as well as research and de-
16 velopment goals and objectives; and

17 (4) technology research conducted by NASA as
18 part of the larger national aeronautics effort would
19 help to secure, sustain, and advance the leadership
20 role of the United States in global aviation.

21 **SEC. 902. AERONAUTICS RESEARCH GOALS.**

22 The Administrator should ensure that NASA main-
23 tains a strong aeronautics research portfolio ranging from
24 fundamental research through systems research with spe-
25 cific research goals, including the following:

1 (1) AIRSPACE CAPACITY.—NASA’s Aeronautics
2 Research Mission Directorate shall address research
3 needs of the Next Generation Air Transportation
4 System, including the ability of the National Air-
5 space System to handle up to 3 times the current
6 travel demand by 2025.

7 (2) ENVIRONMENTAL SUSTAINABILITY.—The
8 Directorate shall consider and pursue concepts to re-
9 duce noise, emissions, and fuel consumption while
10 maintaining high safety standards and shall pursue
11 research related to alternative fuels.

12 (3) AVIATION SAFETY.—The Directorate shall
13 proactively address safety challenges with new and
14 current air vehicles and with operations in the Na-
15 tion’s current and future air transportation system.

16 **SEC. 903. RESEARCH COLLABORATION.**

17 (a) DEPARTMENT OF DEFENSE.—The Administrator
18 shall continue to coordinate with the Secretary of Defense,
19 through the National Partnership for Aeronautics Testing,
20 to develop and implement joint plans for those elements
21 of the Nation’s research, development, testing, and engi-
22 neering infrastructure that are of common interest and
23 use.

24 (b) FEDERAL AVIATION ADMINISTRATION.—The Ad-
25 ministrator shall continue to coordinate with, and work

1 closely with, the Administrator of the Federal Aviation
2 Administration, under the framework of the Senior Policy
3 Council, in development of the Next Generation Air Trans-
4 portation Program. The Administrator shall encourage the
5 Council to explore areas for greater collaboration, includ-
6 ing areas where NASA can help to accelerate the develop-
7 ment and demonstration of NextGen technologies.

8 **SEC. 904. GOAL FOR AGENCY SPACE TECHNOLOGY.**

9 It is critical that NASA maintain an Agency space
10 technology base that helps align mission directorate in-
11 vestments and supports long term needs to complement
12 mission-directorate funded research and support, where
13 appropriate, multiple users, building upon its Innovative
14 Partnerships Program and other partnering approaches.

15 **SEC. 905. IMPLEMENTATION PLAN FOR AGENCY SPACE**
16 **TECHNOLOGY.**

17 Within 120 days after the date of enactment of this
18 Act, NASA shall submit a plan to the appropriate commit-
19 tees of Congress that outlines how NASA's space tech-
20 nology program will meet the goal described in section
21 904, including an explanation of how the plan will link
22 to other mission-directorate technology efforts outlined in
23 sections 608, 801, and 802 of this Act.

1 **SEC. 906. NATIONAL SPACE TECHNOLOGY POLICY.**

2 (a) IN GENERAL.—The President or the President’s
3 designee, in consultation with appropriate Federal agen-
4 cies, shall develop a national policy to guide the space
5 technology development programs of the United States
6 through 2020. The policy shall include national goals for
7 technology development and shall describe the role and re-
8 sponsibilities of each Federal agency that will carry out
9 the policy. In developing the policy, the President or the
10 President’s designee shall utilize external studies that have
11 been conducted on the state of United States technology
12 development and have suggested policies to ensure contin-
13 ued competitiveness.

14 (b) CONTENT.—

15 (1) At a minimum, the national space tech-
16 nology development policy shall describe for
17 NASA—

18 (A) the priority areas of research for tech-
19 nology investment;

20 (B) the basis on which and the process by
21 which priorities for ensuing fiscal years will be
22 selected;

23 (C) the facilities and personnel needed to
24 carry out the technology development program;
25 and

1 (D) the budget assumptions on which the
2 policy is based, which for fiscal years 2011,
3 2012, and 2013 shall be the authorized level for
4 NASA's technology program authorized by this
5 Act.

6 (2) The policy shall be based on the premise
7 that the Federal Government has an established in-
8 terest in conducting research and development pro-
9 grams that help preserve the role of the United
10 States as a global leader in space technologies and
11 their application.

12 (3) CONSIDERATIONS.—In developing the na-
13 tional space technology development policy, the
14 President or the President's designee shall consider,
15 and include a discussion in the report required by
16 subsection (c), of the following issues:

17 (A) The extent to which NASA should
18 focus on long term, high-risk research or more
19 incremental technology development, and the
20 expected impact of that decision on the United
21 States economy.

22 (B) The extent to which NASA should ad-
23 dress military and commercial needs.

24 (C) How NASA will coordinate its tech-
25 nology program with other Federal agencies.

1 (D) The extent to which NASA will con-
2 duct research in-house, fund university re-
3 search, and collaborate on industry research
4 and the expected impact of that mix of funding
5 on the supply of United States workers for in-
6 dustry.

7 (4) CONSULTATION.—In the development of the
8 national space technology development policy, the
9 President or the President’s designee shall consult
10 widely with academic and industry experts and with
11 other Federal agencies. The Administrator may
12 enter into an arrangement with the National Acad-
13 emy of Sciences to help develop the policy.

14 (c) REPORT.—

15 (1) POLICY.—Not later than 1 year after the
16 date of enactment of this Act, the President shall
17 transmit a report setting forth national space tech-
18 nology policy to the appropriate committees of Con-
19 gress and to the Senate Committee on Appropria-
20 tions and the House of Representatives Committee
21 on Appropriations.

22 (2) IMPLEMENTATION.—Not later than 60 days
23 after the President transmits the report required by
24 paragraph (1) to the Congress, the Administrator

1 shall transmit a report to the same committees de-
2 scribing how NASA will carry out the policy.

3 **SEC. 907. COMMERCIAL REUSABLE SUBORBITAL RE-**
4 **SEARCH PROGRAM.**

5 (a) IN GENERAL.—The report of the National Acad-
6 emy of Sciences, *Revitalizing NASA's Suborbital Program:*
7 *Advancing Science, Driving Innovation and Developing*
8 *Workforce*, found that suborbital science missions were ab-
9 solutely critical to building an aerospace workforce capable
10 of meeting the needs of current and future human and
11 robotic space exploration.

12 (b) MANAGEMENT.—The Administrator shall des-
13 ignate an officer or employee of the Space Technology
14 Program to act as the responsible official for the Commer-
15 cial Reusable Suborbital Research Program in the Space
16 Technology Program. The designee shall be responsible for
17 the development of short- and long term strategic plans
18 for maintaining, renewing and extending suborbital facili-
19 ties and capabilities.

20 (c) ESTABLISHMENT.—The Administrator shall es-
21 tablish a Commercial Reusable Suborbital Research Pro-
22 gram within the Space Technology Program that shall
23 fund the development of payloads for scientific research,
24 technology development, and education, and shall provide
25 flight opportunities for those payloads to microgravity en-

1 vironments and suborbital altitudes. The Commercial Re-
2 usable Suborbital Research Program may fund engineer-
3 ing and integration demonstrations, proofs of concept, or
4 educational experiments for commercial reusable vehicle
5 flights. The program shall endeavor to work with NASA's
6 Mission Directorates to help achieve NASA's research,
7 technology, and education goals.

8 (d) REPORT.—The Administrator shall submit a re-
9 port annually to the appropriate committees of Congress
10 describing progress in carrying out the Commercial Reus-
11 able Suborbital Research program, including the number
12 and type of suborbital missions planned in each fiscal
13 year.

14 (e) AUTHORIZATION.—There are authorized to be ap-
15 propriated to the Administrator \$15,000,000 for each of
16 fiscal years 2011 through 2013 to carry out this section.

17 **TITLE X—EDUCATION**

18 **SEC. 1001. REPORT ON EDUCATION IMPLEMENTATION OUT-**
19 **COMES.**

20 Not later than 120 days after the date of the enact-
21 ment of this Act, the Administrator shall submit to the
22 appropriate committees of Congress a report on the
23 metrics, internal and external relationships, and resources
24 committed by NASA to each of the following:

1 (1) The development of a national STEM work-
2 force.

3 (2) The retention of students in STEM dis-
4 ciplines as reflected by their education progression
5 over time.

6 (3) The development of strategic partnerships
7 and linkages between STEM formal and informal
8 education providers.

9 **SEC. 1002. SENSE OF CONGRESS ON THE EXPERIMENTAL**
10 **PROGRAM TO STIMULATE COMPETITIVE RE-**
11 **SEARCH.**

12 It is the sense of Congress that—

13 (1) the Experimental Program to Stimulate
14 Competitive Research of NASA strengthens the re-
15 search capabilities of jurisdictions that historically
16 have not participated equally in competitive aero-
17 space and aerospace-related research activities;

18 (2) the Experimental Program to Stimulate
19 Competitive Research of NASA has provided the
20 American taxpayer with an excellent return on in-
21 vestment;

22 (3) the Experimental Program to Stimulate
23 Competitive Research of NASA has been successful
24 in helping to achieve broader geographical distribu-
25 tion of research and development support by improv-

1 ing the research infrastructure in States that his-
2 torically have received limited Federal research and
3 development funds; and

4 (4) in order to continue improvement and to in-
5 crease efficiency the award of grants under the Ex-
6 perimental Program to Stimulate Competitive Re-
7 search of NASA should be coordinated with the
8 award of grants under the Experimental Program to
9 Stimulate Competitive Research of the National
10 Science Foundation, the Department of Energy, the
11 Department of Agriculture, the Department of De-
12 fense, the Environmental Protection Agency, and the
13 National Institutes of Health.

14 **SEC. 1003. SCIENCE, TECHNOLOGY, ENGINEERING, AND**
15 **MATHEMATICS COMMERCIAL ORBITAL PLAT-**
16 **FORM PROGRAM.**

17 A fundamental and unique capability of NASA is in
18 stimulating science, technology, engineering, and mathe-
19 matics education in the United States. In ensuring max-
20 imum use of that capability, NASA shall—

21 (1) establish a program to annually sponsor sci-
22 entific and educational payloads developed with
23 United States student and educator involvement to
24 be flown on commercially available orbital platforms,
25 when available and operational, with the goal of

1 launching at least 50 such payloads (with at least
2 one from each of the 50 States) to orbit on at least
3 one mission per year;

4 (2) contract with providers of commercial or-
5 bital platform services for their use by the STEM-
6 Commercial Orbital Platform program, preceded by
7 the issuance of a request for proposal, not later than
8 90 days after the date of enactment of this Act, to
9 enter into at least one funded, competitively-awarded
10 contract for commercial orbital platform services and
11 make awards within 180 days after such date; and

12 (3) engage with United States students and
13 educators and make available NASA's science, engi-
14 neering, payload development, and payload oper-
15 ations expertise to student teams selected to partici-
16 pate in the STEM-Commercial Orbital Platform pro-
17 gram.

18 **TITLE XI—RE-SCOPING AND RE-**
19 **VITALIZING INSTITUTIONAL**
20 **CAPABILITIES**

21 **SEC. 1101. SENSE OF CONGRESS.**

22 It is the sense of Congress that NASA needs to re-
23 scope, and as appropriate, down-size, to fit current and
24 future missions and expected funding levels. Eighty per-
25 cent of NASA's facilities are over 40 years old. Addition-

1 ally, in a number of areas NASA finds itself “holding
2 onto” facilities and capabilities scaled to another era.

3 **SEC. 1102. INSTITUTIONAL REQUIREMENTS STUDY.**

4 Within 1 year after the date of enactment of this Act,
5 the Administrator shall provide to the appropriate com-
6 mittees of Congress a comprehensive study that, taking
7 into account the long term direction provided by this Act,
8 carefully examines NASA’s structure, organization, and
9 institutional assets and identifies a strategy to evolve to-
10 ward the most efficient retention, sizing, and distribution
11 of facilities, laboratories, test capabilities, and other infra-
12 structure consistent with NASA’s missions and mandates.
13 The Administrator should pay particular attention to iden-
14 tifying and removing unneeded or duplicative infrastruc-
15 ture. The Administrator should include in the study a sug-
16 gested reconfiguration and reinvestment strategy that
17 would conform the needed equipment, facilities, test equip-
18 ment, and related organizational alignment that would
19 best meet the requirements of missions and priorities au-
20 thorized and directed by this Act. As part of this strategy,
21 the Administrator should include consideration and appli-
22 cation of the findings and recommendations of the Na-
23 tional Research Council report, *Capabilities for the Future:*
24 *An Assessment of NASA Laboratories for Basic Research*,
25 prepared in response to section 1003 of the National Aero-

1 nomic impacts to those communities, workers, and busi-
2 nesses. Communities eligible for such aid would be those
3 in close proximity to NASA mission-related centers and
4 their component facilities located in Alabama, California,
5 Florida, Louisiana, Maryland, Mississippi, New Mexico,
6 Ohio, Texas, and Virginia which may be impacted by pro-
7 gram changes authorized or directed by this Act or by the
8 implementation strategy developed pursuant to section
9 1103.

10 **SEC. 1105. WORKFORCE STABILIZATION AND CRITICAL**
11 **SKILLS PRESERVATION.**

12 Prior to receipt by the Congress of the study, rec-
13 ommendations, and implementation strategy developed
14 pursuant to section 1103, none of the funds authorized
15 for use under this Act may be used to transfer the func-
16 tions, missions, or activities, and associated civil service
17 and contractor positions, from any NASA facility without
18 authorization by the Congress to implement the proposed
19 strategy. The Administrator shall preserve the critical
20 skills and competencies in place at NASA centers prior
21 to enactment of this Act in order to facilitate timely imple-
22 mentation of the requirements of this Act and to minimize
23 disruption to the workforce. The Administrator may not
24 implement any reduction-in-force or other involuntary sep-

1 arations, except for cause, prior to receipt by the Congress
2 of the implementation strategy required by section 1103.

3 **TITLE XII—OTHER MATTERS**

4 **SEC. 1201. REPORT ON SPACE TRAFFIC MANAGEMENT.**

5 The Administrator shall submit to the appropriate
6 committees of Congress a report on a status on the initi-
7 ation of discussions with other nations on a framework
8 to address space traffic management concerns, as required
9 by section 1102 of the National Aeronautics and Space
10 Administration Act Authorization Act of 2008 (42 U.S.C.
11 17821).

12 **SEC. 1202. NATIONAL AND INTERNATIONAL ORBITAL DE- 13 BRIS MITIGATION.**

14 (a) FINDINGS.—Congress makes the following find-
15 ings:

16 (1) A national and international effort is need-
17 ed to develop a coordinated approach towards the
18 prevention, negation, and removal of orbital debris.

19 (2) The guidelines issued by the Inter-Agency
20 Space Debris Coordination Committee provide a con-
21 sensus understanding of 10 national space agencies
22 (including NASA) plus the European Space Agency
23 on the necessity of mitigating the creation of space
24 debris and measures for doing so. NASA's participa-
25 tion on the Committee should be robust, and NASA

1 should urge other space-relevant Federal agencies
2 (including the Departments of State, Defense, and
3 Commerce) to work to ensure that their counterpart
4 agencies in foreign governments are aware of these
5 national commitments and the importance in which
6 the United States holds them.

7 (3) Key components of such an approach should
8 include—

9 (A) a process for debris prevention through
10 agreements regarding spacecraft design, oper-
11 ations, and end-of-life disposition plans to mini-
12 mize orbiting vehicles or elements which are
13 nonfunctional;

14 (B) the development of a robust Space Sit-
15 uational Awareness network that can identify
16 potential collisions and provide sufficient trajec-
17 tory and orbital data to enable avoidance ma-
18 neuvers;

19 (C) the interagency development of an
20 overall strategy for review by the President,
21 with recommendations for proposed inter-
22 national collaborative efforts to address this
23 challenge.

24 (b) INTERNATIONAL DISCUSSION.—

1 (1) IN GENERAL.—The Administrator shall, in
2 consultation with such other departments and agen-
3 cies of the Federal Government as the Administrator
4 considers appropriate, continue and strengthen dis-
5 cussions with the representatives of other space-
6 faring countries, within the Inter-Agency Space De-
7 bris Coordination Committee and elsewhere, to deal
8 with this orbital debris mitigation.

9 (2) INTERAGENCY EFFORT.—For purposes of
10 carrying out this subsection, the Director of OSTP,
11 in coordination with the Director of the National Se-
12 curity Council and using the President’s Council of
13 Advisors on Science and Technology coordinating
14 mechanism, shall develop an overall strategy for re-
15 view by the President, with recommendations for
16 proposed international collaborative efforts to ad-
17 dress this challenge.

18 **SEC. 1203. REPORTS ON PROGRAM AND COST ASSESSMENT**

19 **AND CONTROL ASSESSMENT.**

20 (a) FINDINGS.—Congress makes the following find-
21 ings:

22 (1) The adherence of NASA to program cost
23 and schedule targets and discipline across NASA
24 programs remains a concern.

1 (2) The James Webb Space Telescope has ex-
2 ceeded its cost estimate.

3 (3) In 2007 the Government Accountability Of-
4 fice issued a report on NASA's high risk acquisition
5 performance.

6 (4) In response, NASA prepared a corrective
7 action plan two years ago.

8 (b) REPORTS.—

9 (1) REPORTS REQUIRED.—Not later than 90
10 days after the date of the enactment of this Act, and
11 not later than April 30 of each year thereafter, the
12 Administrator shall submit to the appropriate com-
13 mittees of Congress a report on the implementation
14 during the preceding year for the corrective action
15 plan referred to in subsection (a)(4).

16 (2) ELEMENTS.—Each report under this sub-
17 section shall set forth, for the year covered by such
18 report, the following:

19 (A) A description of each NASA program
20 that has exceeded its cost baseline by 15 per-
21 cent or more or is more than 2 years behind its
22 projected development schedule.

23 (B) For each program specified under sub-
24 paragraph (A), a plan for such decrease in
25 scope or requirements, or other measures, to be

1 undertaken to control cost and schedule, includ-
2 ing any cost monitoring or corrective actions
3 undertaken pursuant to the National Aero-
4 nautics and Space Administration Authorization
5 Act of 2005 (Public Law 109–155), and the
6 amendments made by that Act.

7 **SEC. 1204. ELIGIBILITY FOR SERVICE OF INDIVIDUAL CUR-**
8 **RENTLY SERVING AS ADMINISTRATOR OF**
9 **NASA.**

10 The individual serving in the position of Adminis-
11 trator of the National Aeronautics and Space Administra-
12 tion as of the date of the enactment of this Act comes
13 from civilian life and is therefore eligible to serve in such
14 position, in conformance with section 202 of the National
15 Aeronautics and Space Act of 1958 (42 U.S.C. 2472(a)).

16 **SEC. 1205. SENSE OF CONGRESS ON INDEPENDENT**
17 **VERIFICATION AND VALIDATION OF NASA**
18 **SOFTWARE.**

19 It is the sense of Congress that—

20 (1) safety is at the heart of every NASA mis-
21 sion;

22 (2) the Office of Safety and Mission Assurance
23 remains vital to assuring the safety of all NASA ac-
24 tivities;

1 (3) among the most important activities of the
2 Office of Safety and Mission Assurance is the per-
3 formance of independent safety and mission assur-
4 ance assessments and process verification reviews;

5 (4) as NASA embarks on a new path, inde-
6 pendent verification and validation of software must
7 be of the highest priority to ensure safety through-
8 out all NASA programs;

9 (5) NASA's activities depend on software integ-
10 rity to achieve their goals and deliver a successful
11 mission to the American people;

12 (6) independent verification and validation is
13 necessary to ensure that safety-critical software will
14 operate dependably and support mission success;

15 (7) the creation of the Independent Verification
16 and Validation Facility of NASA was the direct re-
17 sult of recommendations made by the National Re-
18 search Council and the Report of the Presidential
19 Commission on the Space Shuttle Challenger Acci-
20 dent;

21 (8) the mission-critical software of NASA must
22 operate dependably and safely;

23 (9) the Independent Verification and Validation
24 Facility of NASA plays an important role in assur-
25 ing the safety of all NASA activities by improving

1 methodologies for risk identification and assessment,
2 and providing recommendations for risk mitigation
3 and acceptance; and

4 (10) the Independent Verification and Valid-
5 ation Facility shall be the sole provider of inde-
6 pendent verification and validation services for soft-
7 ware created by or for NASA.

8 **SEC. 1206. COUNTERFEIT PARTS.**

9 (a) IN GENERAL.—The Administrator shall plan, de-
10 velop, and implement a program, in coordination with
11 other Federal agencies, to detect, track, catalog, and re-
12 duce the number of counterfeit electronic parts in the
13 NASA supply chain.

14 (b) REQUIREMENTS.—In carrying out the program,
15 the Administrator shall establish—

16 (1) counterfeit part identification training for
17 all employees that procure, process, distribute, and
18 install electronic parts that will—

19 (A) teach employees how to identify coun-
20 terfeit parts;

21 (B) educate employees on procedures to
22 follow if they suspect a part is counterfeit;

23 (C) regularly update employees on new
24 threats, identification techniques, and reporting
25 requirements; and

1 (D) integrate industry associations, manu-
2 facturers, suppliers, and other Federal agencies,
3 as appropriate;

4 (2) an internal database to track all suspected
5 and confirmed counterfeit electronic parts that will
6 maintain, at a minimum—

7 (A) companies and individuals known and
8 suspected of selling counterfeit parts;

9 (B) parts known and suspected of being
10 counterfeit, including lot and date codes, part
11 numbers, and part images;

12 (C) countries of origin;

13 (D) sources of reporting;

14 (E) United States Customs seizures; and

15 (F) Government-Industry Data Exchange
16 Program reports and other public or private
17 sector database notifications; and

18 (3) a mechanism to report all information on
19 suspected and confirmed counterfeit electronic parts
20 to law enforcement agencies, industry associations,
21 and other databases, and to issue bulletins to indus-
22 try on counterfeit electronic parts and related coun-
23 terfeit activity.

24 (c) REVIEW OF PROCUREMENT AND ACQUISITION
25 POLICY.—

1 (1) IN GENERAL.—In establishing the program,
2 the Administrator shall amend existing acquisition
3 and procurement policy to purchase electronic parts
4 from trusted or approved manufacturers. To deter-
5 mine trusted or approved manufacturers, the Admin-
6 istrator shall establish a list, assessed and adjusted
7 at least annually, and create criteria for manufactur-
8 ers to meet in order to be placed onto the list.

9 (2) CRITERIA.—The criteria may include—

10 (A) authentication or encryption codes;

11 (B) embedded security markings in parts;

12 (C) unique, harder to copy labels and
13 markings;

14 (D) identifying distinct lot and serial codes
15 on external packaging;

16 (E) radio frequency identification embed-
17 ded into high-value parts;

18 (F) physical destruction of all defective,
19 damaged, and sub-standard parts that are by-
20 products of the manufacturing process;

21 (G) testing certifications;

22 (H) maintenance of procedures for han-
23 dling any counterfeit parts that slip through;

1 (I) maintenance of secure facilities to pre-
2 vent unauthorized access to proprietary infor-
3 mation; and

4 (J) maintenance of product return, buy
5 back, and inventory control practices that limit
6 counterfeiting.

7 (d) REPORT TO CONGRESS.—Within one year after
8 the date of enactment of this Act, the Administrator shall
9 report on the progress of implementing this section to the
10 appropriate committees of Congress.

11 **SEC. 1207. INFORMATION SECURITY.**

12 (a) MONITORING RISK.—

13 (1) UPDATE ON SYSTEM IMPLEMENTATION.—
14 Not later than 120 days after the date of enactment
15 of this Act, and on a biennial basis thereafter, the
16 chief information officer of NASA, in coordination
17 with other national security agencies, shall provide
18 to the appropriate committees of Congress—

19 (A) an update on efforts to implement a
20 system to provide dynamic, comprehensive, real-
21 time information regarding risk of unauthorized
22 remote, proximity, and insider use or access, for
23 all information infrastructure under the respon-
24 sibility of the chief information officer, and mis-

1 sion-related networks, including contractor net-
2 works;

3 (B) an assessment of whether the system
4 has demonstrably and quantifiably reduced net-
5 work risk compared to alternative methods of
6 measuring security; and

7 (C) an assessment of the progress that
8 each center and facility has made toward imple-
9 menting the system.

10 (2) EXISTING ASSESSMENTS.—The assessments
11 required of the Inspector General under section
12 3545 of title 44, United States Code, shall evaluate
13 the effectiveness of the system described in this sub-
14 section.

15 (b) INFORMATION SECURITY AWARENESS AND EDU-
16 CATION.—

17 (1) IN GENERAL.—In consultation with the De-
18 partment of Education, other national security agen-
19 cies, and other agency directorates, the chief infor-
20 mation officer shall institute an information security
21 awareness and education program for all operators
22 and users of NASA information infrastructure, with
23 the goal of reducing unauthorized remote, proximity,
24 and insider use or access.

25 (2) PROGRAM REQUIREMENTS.—

1 (A) The program shall include, at a min-
2 imum, ongoing classified and unclassified
3 threat-based briefings, and automated exercises
4 and examinations that simulate common attack
5 techniques.

6 (B) All agency employees and contractors
7 engaged in the operation or use of agency infor-
8 mation infrastructure shall participate in the
9 program.

10 (C) Access to NASA information infra-
11 structure shall only be granted to operators and
12 users who regularly satisfy the requirements of
13 the program.

14 (D) The chief human capital officer of
15 NASA, in consultation with the chief informa-
16 tion officer, shall create a system to reward op-
17 erators and users of agency information infra-
18 structure for continuous high achievement in
19 the program.

20 (e) INFORMATION INFRASTRUCTURE DEFINED.—In
21 this section, the term “information infrastructure” means
22 the underlying framework that information systems and
23 assets rely on to process, transmit, receive, or store infor-
24 mation electronically, including programmable electronic

1 devices and communications networks and any associated
2 hardware, software, or data.

3 **SEC. 1208. NATIONAL CENTER FOR HUMAN PERFORMANCE.**

4 (a) IN GENERAL.—The National Center for Human
5 Performance is located in Houston’s Texas Medical Center
6 which is home to 49 non-profit and academic patient care,
7 biomedical research, and health educational institutions
8 serving 6 million patients each year, and works collabo-
9 ratively with individuals and organizations, including
10 NASA, to advance science and research on human per-
11 formance in space, health, the military, athletics, and the
12 arts.

13 (b) DESIGNATION AS INSTITUTION OF EXCEL-
14 LENCE.—The National Center for Human Performance is
15 designated as an Institution of Excellence for Human Per-
16 formance dedicated to understanding and improving all
17 aspects of human performance.

18 **SEC. 1209. ENHANCED-USE LEASING.**

19 (a) SENSE OF THE CONGRESS.—It is the sense of the
20 Congress that the NASA enhanced-use leasing program
21 is a fiscally responsible program to further maintain the
22 exploration-related infrastructure of our Nation’s space
23 centers while ensuring continued private utilization of
24 these Federal assets, and every effort should be made to
25 ensure effective utilization of this program.

1 **SEC. 1210. SENSE OF CONGRESS CONCERNING THE STEN-**
2 **NIS SPACE CENTER.**

3 It is the sense of the Congress that the Stennis Space
4 Center represents the national capability for development
5 and certification of liquid propulsion technologies vital to
6 our Nation's space flight program, and that the Federal
7 government should fully utilize that resource and continue
8 to make the testing facility available for further develop-
9 ment of commercial aerospace capabilities.

Calendar No. 548

11TH CONGRESS
2^D SESSION
S. 3729

A BILL

To authorize the programs of the National Aeronautics and Space Administration for fiscal years 2011 through 2013, and for other purposes.

AUGUST 5, 2010

Read twice and placed on the calendar