

Union Calendar No.

111TH CONGRESS
2^D SESSION

H. R. 5781

[Report No. 111-]

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

IN THE HOUSE OF REPRESENTATIVES

JULY 20, 2010

Mr. GORDON of Tennessee (for himself, Mr. HALL of Texas, Ms. GIFFORDS, and Mr. OLSON) introduced the following bill; which was referred to the Committee on Science and Technology

JULY --, 2010

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

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

[For text of introduced bill, see copy of bill as introduced on July 20, 2010]

A BILL

To authorize the programs of the National Aeronautics and
Space Administration, 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 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

4 (a) *SHORT TITLE.*—*This Act may be cited as the “Na-*
5 *tional Aeronautics and Space Administration Authoriza-*
6 *tion 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—HUMAN SPACE FLIGHT

Subtitle A—Exploration

Sec. 201. Reaffirmation of exploration policy.

Sec. 202. Restructured Exploration program.

Sec. 203. Space radiation.

Subtitle B—International Space Station

Sec. 211. Extension of ISS operations.

Sec. 212. ISS research management institution.

Sec. 213. ISS research management plan.

Sec. 214. Outreach plan for United States ISS research.

Sec. 215. ISS cargo resupply requirements and contingency capacity through
2020.

Sec. 216. Centrifuge.

Sec. 217. Exploration technology development using the ISS.

Sec. 218. Fundamental space life science and physical sciences and related tech-
nology research.

Subtitle C—Space Shuttle

Sec. 221. Contingent authorization of additional space shuttle mission.

Sec. 222. Expanded scope of Space Shuttle Transition Liaison Office.

Sec. 223. Post-Shuttle workforce transition initiative grant program.

Sec. 224. Disposition of orbiter vehicles.

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Subtitle D—Space and Flight Support

Sec. 231. 21st Century Space Launch Complex Initiative.

Subtitle E—Commercial Crew Transportation

Sec. 241. Affirmation of policy.

Sec. 242. Commercial crew and related commercial space initiatives.

Sec. 243. Federal assistance for the development of commercial orbital human space transportation services.

Subtitle F—General Provisions

Sec. 251. Use of program funds.

TITLE III—SCIENCE*Subtitle A—Earth Science*

Sec. 301. Earth science applications.

Sec. 302. Essential space-based Earth science and climate measurements.

Sec. 303. Commercial remote sensing data purchases pilot project.

Sec. 304. Report on temperature records.

Subtitle B—Space Science

Sec. 311. Suborbital programs.

Sec. 312. Review of Explorer program.

Sec. 313. Radioisotope thermoelectric generator material requirements and supply.

TITLE IV—AERONAUTICS

Sec. 401. Environmentally friendly aircraft research and development initiative.

Sec. 402. Research on NextGen airspace management concepts and tools.

Sec. 403. Research on aircraft cabin air quality.

Sec. 404. Research on on-board volcanic ash sensor systems.

Sec. 405. Aeronautics test facilities.

Sec. 406. Expanded research program on composite materials used in aerospace.

TITLE V—SPACE TECHNOLOGY

Sec. 501. Space technology program.

TITLE VI—EDUCATION AND OUTREACH

Sec. 601. STEM education and training.

Sec. 602. Assessment of impediments to space science and engineering workforce development for minority and underrepresented groups at NASA.

Sec. 603. Independent review of the National Space Grant College and Fellowship Program.

Sec. 604. Hands-on space science and engineering education and training.

TITLE VII—INSTITUTIONAL CAPABILITIES REVITALIZATION

Sec. 701. Institutional management.

Sec. 702. James E. Webb Cooperative Education Distinguished Scholar Program.

TITLE VIII—ACQUISITION MANAGEMENT

- Sec. 801. Prohibition on expenditure of funds when 30 percent threshold is exceeded.*
- Sec. 802. Project and program reserves.*
- Sec. 803. Independent reviews.*
- Sec. 804. Avoiding organizational conflicts of interest in major NASA acquisition programs.*
- Sec. 805. Report to Congress.*

TITLE IX—OTHER PROVISIONS

- Sec. 901. Cloud computing.*
- Sec. 902. Review of practices to detect and prevent the use of counterfeit parts.*
- Sec. 903. Preservation and management of lunar sites.*
- Sec. 904. Continuity of moderate resolution land imaging remote sensing data.*
- Sec. 905. Space weather.*
- Sec. 906. Use of operational commercial suborbital vehicles for research, development, and education.*
- Sec. 907. Study on export control matters related to United States astronaut safety and NASA mission operations.*
- Sec. 908. Amendment to the National Aeronautics and Space Act of 1958.*
- Sec. 909. Near-Earth objects.*
- Sec. 910. Sense of Congress.*
- Sec. 911. Ethics programs in the Office of General Counsel.*

1 SEC. 2. FINDINGS.

2 *The Congress finds the following:*

3 (1) *NASA is and should remain a multimission*
4 *agency with a balanced and robust set of core mis-*
5 *sions in science, aeronautics, and human space flight*
6 *and exploration.*

7 (2) *NASA's programs have the potential to in-*
8 *spire our youth to pursue studies and careers in*
9 *science, technology, engineering, and mathematics,*
10 *and the agency should carry out its activities in a*
11 *manner that enhances the educational and outreach*
12 *potential of its programs.*

13 (3) *NASA should begin to reinvest in sustained*
14 *fashion in a long-term space technology research and*

1 *development activity. Such investments are an impor-*
2 *tant catalyst for innovation, and they represent the*
3 *critically important “seed corn” on which NASA’s*
4 *ability to carry out challenging and productive mis-*
5 *sions in the future will depend.*

6 *(4) The Space Shuttle workforce, both civil serv-*
7 *ants and contractors, encompasses skills and experi-*
8 *ence that will be needed in the Nation’s future human*
9 *space flight activities, and the transition of that*
10 *workforce to a challenging human space flight and ex-*
11 *ploration program needs to be carried out in as expe-*
12 *ditious and nondisruptive a manner as possible.*

13 *(5) Human and robotic exploration of the solar*
14 *system will be a significant undertaking of humanity*
15 *in the 21st century and beyond, and it is in the na-*
16 *tional interest that the United States should assume*
17 *a leadership role in a cooperative international explo-*
18 *ration initiative. Continuity of exploration goals is*
19 *critical if progress is to be maximized and costly inef-*
20 *ficiencies are to be minimized.*

21 *(6) Commercial activities have long contributed*
22 *to the vitality and strength of the Nation’s space and*
23 *aeronautics programs, and the growth of a healthy,*
24 *self-sustaining United States commercial space and*
25 *aeronautics sector should continue to be encouraged.*

1 (7) *Congress agrees with the finding of the Re-*
2 *view of United States Human Spaceflight Plans Com-*
3 *mittee that: “While there are many potential benefits*
4 *of commercial services that transport crew to low-*
5 *Earth orbit, there are simply too many risks at the*
6 *present time not to have a viable fallback option for*
7 *risk mitigation.”.*

8 (8) *It is in the national interest for the United*
9 *States Government to develop a government system to*
10 *serve as an independent means—whether primary or*
11 *backup—of crewed access to low-Earth orbit and be-*
12 *yond so that it is not dependent on either non-United*
13 *States or commercial systems for its crewed access to*
14 *space.*

15 (9) *Development of the next crewed space trans-*
16 *portation system to low-Earth orbit should be guided*
17 *by the Columbia Accident Investigation Board’s rec-*
18 *ommendation that “the design of the system should*
19 *give overriding priority to crew safety, rather than*
20 *trade safety against other performance criteria, such*
21 *as low cost and reusability”.*

22 (10) *In an environment of constrained budgets,*
23 *responsible stewardship of taxpayer-provided re-*
24 *sources makes it imperative that NASA’s exploration*
25 *program be carried out in a manner that builds on*

1 *the investments made to date in the Orion, Ares I,*
2 *and heavy lift projects and other activities of the ex-*
3 *ploration program in existence prior to fiscal year*
4 *2011 rather than discarding them. A restructured ex-*
5 *ploration program should pursue the incremental de-*
6 *velopment and demonstration of crewed and heavy-lift*
7 *transportation systems in a manner that ensures that*
8 *investments to provide assured access to low-Earth*
9 *orbit also directly support the expeditious develop-*
10 *ment of the heavy lift launch vehicle system, minimize*
11 *the looming human space flight “gap”, provide a very*
12 *high level of crew safety, and enable challenging mis-*
13 *sions beyond low-Earth orbit in a timely manner.*

14 *(11) NASA’s programs in astrophysics,*
15 *heliophysics, planetary science, and Earth science and*
16 *climate research have greatly increased our under-*
17 *standing of both our home planet and the rest of the*
18 *universe, and they have also provided numerous bene-*
19 *fits to our society.*

20 *(12) NASA’s aeronautics program is under-*
21 *taking research and development that benefits our eco-*
22 *nommic development and competitiveness, enhances our*
23 *quality of life and enables environmentally respon-*
24 *sible aviation operations, and strengthens our na-*
25 *tional defense.*

1 (13) *The ISS provides a unique research envi-*
2 *ronment and capabilities for basic and applied re-*
3 *search, as well as having the potential to serve as a*
4 *testbed for human space flight technologies and oper-*
5 *ational concepts. It is critically important that NASA*
6 *make needed investments to promote productive ISS*
7 *utilization, including a meaningful program of*
8 *grants in the life and physical sciences microgravity*
9 *research disciplines.*

10 (14) *It is in the national interest for the United*
11 *States to have an export control policy that protects*
12 *the national security while also enabling the United*
13 *States aerospace industry to compete effectively in the*
14 *global marketplace and the United States to under-*
15 *take cooperative programs in science and human*
16 *space flight in an effective manner.*

17 (15) *A strong, robust NASA program is in the*
18 *national interest. Ensuring that it can continue to*
19 *pursue cutting-edge space and aeronautical research*
20 *and development activities and push back the frontier*
21 *of space exploration requires a sustained and ade-*
22 *quate commitment in resources. However, NASA's*
23 *share of the Federal discretionary budgetary author-*
24 *ity has declined significantly relative to its post-Apol-*
25 *lo historical average share of 2.07 percent. It should*

1 *be a national goal to restore NASA's funding share to*
2 *its post-Apollo historical average.*

3 *(16) NASA should be vigilant in taking all nec-*
4 *essary steps to control cost and schedule growth in*
5 *mission projects, including the development of an in-*
6 *tegrated cost containment strategy, and adopt meas-*
7 *ures that improve the performance and transparency*
8 *of its cost and acquisition management practices.*
9 *NASA should approach cost and schedule manage-*
10 *ment with the same level of innovation, rigor, and*
11 *technical excellence that it applies to the execution of*
12 *its mission projects.*

13 *(17) NASA has been inconsistent in its treat-*
14 *ment of termination liability costs for contracts*
15 *issued by different mission directorates and across*
16 *various agency programs relative to historical prac-*
17 *tice. This inconsistency has hampered NASA's ability*
18 *to effectively execute its Exploration programs.*

19 *(18) NASA's temperature records substantially*
20 *overlap with the records of the Climatic Research*
21 *Unit (CRU) at the University of East Anglia.*

22 **SEC. 3. DEFINITIONS.**

23 *In this Act:*

24 *(1) ADMINISTRATOR.—The term “Adminis-*
25 *trator” means the Administrator of NASA.*

1 (2) *ISS.*—*The term “ISS” means the Inter-*
2 *national Space Station.*

3 (3) *NASA.*—*The term “NASA” means the Na-*
4 *tional Aeronautics and Space Administration.*

5 (4) *NOAA.*—*The term “NOAA” means the Na-*
6 *tional Oceanic and Atmospheric Administration.*

7 (5) *OSTP.*—*The term “OSTP” means the Office*
8 *of Science and Technology Policy.*

9 **TITLE I—AUTHORIZATION OF**
10 **APPROPRIATIONS**

11 **SEC. 101. FISCAL YEAR 2011.**

12 *There are authorized to be appropriated to the Admin-*
13 *istrator for fiscal year 2011 \$19,000,000,000, to be allocated*
14 *as follows:*

15 (1) *For Science, \$5,015,700,000, of which—*

16 (A) *\$1,801,800,000 shall be for Earth*
17 *Science;*

18 (B) *\$1,485,700,000 shall be for Planetary*
19 *Science;*

20 (C) *\$1,076,300,000 shall be for Astro-*
21 *physics;*

22 (D) *\$646,900,000 shall be for Heliophysics,*
23 *of which \$5,000,000 shall be an augmentation to*
24 *the Explorers program; and*

1 (E) \$5,000,000 shall be an augmentation to
2 the total amount provided under subparagraphs
3 (C) and (D) for Astrophysics and Heliophysics
4 in order to augment the funding for the Science
5 Mission Directorate's suborbital research pro-
6 grams, to be allocated between the Astrophysics
7 and Heliophysics suborbital programs at the Ad-
8 ministrators' discretion.

9 (2) For Aeronautics, \$579,600,000.

10 (3) For Space Technology, \$572,200,000.

11 (4) For Exploration, \$4,535,300,000 of which—

12 (A) \$215,000,000 shall be for Human Re-
13 search;

14 (B) \$14,000,000 shall be for the Commercial
15 Orbital Transportation System demonstration
16 program;

17 (C) \$50,000,000 shall be for commercial
18 crew transportation-related activities;

19 (D) \$4,156,300,000 shall be for the restruc-
20 tured exploration program described in section
21 202; and

22 (E) \$100,000,000 shall be for the loan and
23 loan guarantee program described in section 243.

24 (5) For Space Operations, \$4,594,300,000, of
25 which—

1 (A) \$989,100,000 shall be for the Space
2 Shuttle program;

3 (B) \$2,804,800,000 shall be for the ISS, of
4 which \$75,000,000 shall be for fundamental
5 space life science and physical sciences and re-
6 lated technology research using ground-based,
7 free-flyer, and ISS facilities, including ISS Na-
8 tional Laboratory research;

9 (C) \$60,000,000 shall be for the Post-Shuttle
10 Workforce Transition Initiative grant program
11 described in section 223; and

12 (D) \$740,400,000 shall be for Space and
13 Flight Support, of which \$50,000,000 shall be for
14 the 21st Century Launch Complex Initiative.

15 (6) For Education, \$145,800,000.

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

18 (8) For Construction and Environmental Com-
19 pliance and Restoration, \$407,300,000, of which
20 \$10,000,000 is an augmentation to the President's re-
21 quested funding level in order to support the NASA
22 laboratory revitalization initiative described in sec-
23 tion 701.

24 (9) For Inspector General, \$38,400,000.

1 **SEC. 102. FISCAL YEAR 2012.**

2 *There are authorized to be appropriated to the Admin-*
3 *istrator for fiscal year 2012 \$19,450,000,000, to be allocated*
4 *as follows:*

5 (1) *For Science, \$5,278,600,000 of which—*

6 (A) *\$1,944,500,000 shall be for Earth*
7 *Science;*

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

10 (C) *\$1,109,300,000 shall be for Astro-*
11 *physics;*

12 (D) *\$672,600,000 shall be for Heliophysics,*
13 *of which \$25,000,000 shall be an augmentation*
14 *to the Explorers program; and*

15 (E) *\$5,000,000 shall be an augmentation to*
16 *the total amount provided under subparagraphs*
17 *(C) and (D) for Astrophysics and Heliophysics*
18 *in order to augment the funding for the Science*
19 *Mission Directorate's suborbital research pro-*
20 *grams, to be allocated between the Astrophysics*
21 *and Heliophysics suborbital programs at the Ad-*
22 *ministrator's discretion.*

23 (2) *For Aeronautics, \$598,700,000, of which*
24 *\$78,900,000 shall be for the Aviation Safety Program,*
25 *\$80,400,000 shall be for the Aeronautics Test Pro-*
26 *gram, \$83,900,000 shall be for the Airspace Systems*

1 *Program, \$233,500,000 shall be for Fundamental Aer-*
2 *onautics, and \$122,000,000 shall be for Integrated*
3 *Systems Research.*

4 *(3) For Space Technology, \$1,012,200,000.*

5 *(4) For Exploration, \$4,881,800,000 of which—*

6 *(A) \$215,000,000 shall be for Human Re-*
7 *search;*

8 *(B) \$50,000,000 shall be for commercial*
9 *crew transportation-related activities;*

10 *(C) \$4,516,800,000 shall be for the restruc-*
11 *tured exploration program described in section*
12 *202; and*

13 *(D) \$100,000,000 shall be for the loan and*
14 *loan guarantee program described in section 243.*

15 *(5) For Space Operations, \$3,930,300,000, of*
16 *which—*

17 *(A) \$86,100,000 shall be for the Space Shut-*
18 *tle program;*

19 *(B) \$3,033,600,000 shall be for the ISS, of*
20 *which \$100,000,000 shall be for fundamental*
21 *space life science and physical sciences and re-*
22 *lated technology research using ground-based,*
23 *free-flyer, and ISS facilities, including ISS Na-*
24 *tional Laboratory research;*

1 (C) \$40,000,000 shall be for the Post-Shuttle
2 Workforce Transition Initiative grant program
3 described in section 223; and

4 (D) \$770,600,000 shall be for Space and
5 Flight Support, of which \$50,000,000 shall be for
6 the 21st Century Launch Complex Initiative.

7 (6) For Education, \$145,800,000.

8 (7) For Cross-Agency Support Programs,
9 \$3,189,600,000.

10 (8) For Construction and Environmental Com-
11 pliance and Restoration, \$373,800,000, of which
12 \$10,000,000 is an augmentation to the President's re-
13 quested level in order to support the NASA laboratory
14 revitalization initiative described in section 701.

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

16 **SEC. 103. FISCAL YEAR 2013.**

17 There are authorized to be appropriated to the Admin-
18 istrator for fiscal year 2013 \$19,960,000,000, to be allocated
19 as follows:

20 (1) For Science, \$5,569,500,000, of which—

21 (A) \$2,089,500,000 shall be for Earth
22 Science;

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

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

3 (D) \$734,700,000 shall be for Heliophysics,
4 of which \$55,000,000 shall be an augmentation
5 to the Explorers program; and

6 (E) \$5,000,000 shall be an augmentation to
7 the total amount provided under subparagraphs
8 (C) and (D) for Astrophysics and Heliophysics
9 in order to augment the funding for the Science
10 Mission Directorate's suborbital research pro-
11 grams, to be allocated between the Astrophysics
12 and Heliophysics suborbital programs at the Ad-
13 ministrator's discretion.

14 (2) For Aeronautics, \$609,400,000, of which
15 \$81,200,000 shall be for the Aviation Safety Program,
16 \$79,600,000 shall be for the Aeronautics Test Pro-
17 gram, \$87,300,000 shall be for the Airspace Systems
18 Program, \$239,000,000 shall be for Fundamental Aer-
19 onautics, and \$122,300,000 shall be for Integrated
20 Systems Research.

21 (3) For Space Technology, \$1,059,700,000.

22 (4) For Exploration, \$4,888,500,000 of which—

23 (A) \$215,000,000 shall be for Human Re-
24 search;

1 (B) \$5,000,000, shall be for the *Exploration*
2 *Technology and Demonstration* program;

3 (C) \$5,000,000 shall be for the *Exploration*
4 *Precursor Robotic Missions* program;

5 (D) \$50,000,000 shall be for commercial
6 crew transportation-related activities;

7 (E) \$4,513,500,000 shall be for the restruc-
8 tured exploration program described in section
9 202; and

10 (F) \$100,000,000 shall be for the loan and
11 loan guarantee program described in section 243.

12 (5) For *Space Operations*, \$3,993,300,000, of
13 which—

14 (A) \$3,179,400,000 shall be for the *ISS*, of
15 which \$100,000,000 shall be for fundamental
16 space life science and physical sciences and re-
17 lated technology research using ground-based,
18 free-flyer, and *ISS* facilities, including *ISS* Na-
19 tional Laboratory research;

20 (B) \$40,000,000 shall be for the *Post-Shuttle*
21 *Workforce Transition Initiative* grant program
22 described in section 223; and

23 (C) \$773,900,000 shall be for *Space and*
24 *Flight Support*, of which \$50,000,000 shall be for
25 the *21st Century Launch Complex Initiative*.

1 (6) *For Education, \$145,800,000.*

2 (7) *For Cross-Agency Support Programs,*
3 *\$3,276,800,000.*

4 (8) *For Construction and Environmental Com-*
5 *pliance and Restoration, \$376,900,000, of which*
6 *\$10,000,000 is an augmentation to the President's re-*
7 *quested funding level in order to support the NASA*
8 *laboratory revitalization initiative described in sec-*
9 *tion 701.*

10 (9) *For Inspector General, \$40,100,000.*

11 **TITLE II—HUMAN SPACE FLIGHT**

12 **Subtitle A—Exploration**

13 **SEC. 201. REAFFIRMATION OF EXPLORATION POLICY.**

14 *Congress reaffirms its support for the exploration pol-*
15 *icy set forth in sections 401 and 402 of the National Aero-*
16 *nautics and Space Administration Authorization Act of*
17 *2008 (Public Law 110-422; 122 Stat. 4788-4789).*

18 **SEC. 202. RESTRUCTURED EXPLORATION PROGRAM.**

19 (a) *REQUIREMENTS.—Not later than 180 days after*
20 *the date of enactment of this Act, the Administrator shall*
21 *develop a plan to restructure the exploration program in*
22 *existence prior to fiscal year 2011 in order to develop and*
23 *demonstrate in an integrated manner and as expeditiously*
24 *and efficiently as practicable a governmentally owned crew*

1 *transportation system and heavy lift transportation system*
2 *that satisfies the following requirements:*

3 (1) *The plan shall make maximum practicable*
4 *use of the design, development, and test work com-*
5 *pleted to date on the Orion crew exploration vehicle,*
6 *Ares I crew launch vehicle, heavy lift launch vehicle*
7 *system, and associated ground support and explo-*
8 *ration enabling systems, including spacesuit develop-*
9 *ment and related life support technology, and take*
10 *best advantage of investments and contracts imple-*
11 *mented to date.*

12 (2) *The performance capabilities of the crew*
13 *transportation system shall be phased in a manner*
14 *that is consistent with available and anticipated re-*
15 *sources, with the initial operational goal of having*
16 *the crew transportation system developed under this*
17 *section available to assure crewed access to low-Earth*
18 *orbit and the ISS no later than December 31, 2015,*
19 *in order to minimize the duration of the United*
20 *States human space flight gap following the retire-*
21 *ment of the Space Shuttle fleet. If one or more United*
22 *States commercial entities are certified to provide*
23 *ISS crew transportation and rescue services, the crew*
24 *transportation system developed under this section*
25 *shall be available as a backup ISS crew transpor-*

1 *tation and rescue service as needed but shall not be*
2 *utilized as the primary means of ISS crew transpor-*
3 *tation and rescue or otherwise compete with the com-*
4 *mercial system for ISS crew transportation and res-*
5 *cue services.*

6 *(3) The crewed spacecraft element of the crew*
7 *transportation system shall be evolvable on a contin-*
8 *uous development path to support—*

9 *(A) ISS crew transportation and rescue ca-*
10 *pability;*

11 *(B) non-ISS missions to, from, and in low-*
12 *Earth orbit; and*

13 *(C) human missions beyond low-Earth*
14 *orbit.*

15 *(4) The crew transportation system shall be able*
16 *to serve as a testbed for demonstrating operations con-*
17 *cepts for exploration missions beyond low-Earth orbit,*
18 *as well as for demonstrating technologies and car-*
19 *rying out risk reduction for the heavy lift launch ve-*
20 *hicle development program.*

21 *(5) The crew transportation system shall have*
22 *predicted levels of safety during ascent to low-Earth*
23 *orbit, transit, and descent from low-Earth orbit that*
24 *are not less than those required of the Ares I/Orion*

1 *configuration that has completed program prelimi-*
2 *nary design review.*

3 *(6) In order to make the most cost-effective use*
4 *of the funds available for the restructured exploration*
5 *program, the Administrator shall pursue the expedi-*
6 *tious and cost-efficient development of a heavy lift*
7 *launch system that utilizes the systems and flight and*
8 *ground test activities of the crew transportation sys-*
9 *tem developed under this section to the maximum ex-*
10 *tent practicable. In developing the heavy lift launch*
11 *vehicle—*

12 *(A) the heavy lift launch vehicle shall be*
13 *sized to enable challenging missions beyond low-*
14 *Earth orbit and evolvable on a continuous devel-*
15 *opment path to enable the efficient and cost-effec-*
16 *tive conduct of crewed missions to the full range*
17 *of destinations envisioned in the National Aero-*
18 *nautics and Space Administration Authorization*
19 *Act of 2008, namely Lagrangian points, the*
20 *Moon, near-Earth objects, and Mars and its*
21 *moons;*

22 *(B) not later than 180 days after the date*
23 *of enactment of this Act, the Administrator shall*
24 *carry out a review of the heavy lift launch vehi-*
25 *cle requirements needed to support crewed mis-*

1 *sions to the full range of destinations envisioned*
2 *in the National Aeronautics and Space Adminis-*
3 *tration Authorization Act of 2008, and shall se-*
4 *lect an exploration launch vehicle architecture to*
5 *meet those requirements;*

6 *(C) the development of the heavy lift launch*
7 *vehicle authorized in this paragraph shall be*
8 *completed as expeditiously as possible within*
9 *available resources and shall take maximum ben-*
10 *efit from the prior investments made in the*
11 *Orion, Ares I, and heavy lift projects and from*
12 *investments made in the restructured program*
13 *on the development, demonstration, and test of*
14 *the crew transportation system; and*

15 *(D) the Administrator shall strive to meet*
16 *the goal of having the heavy lift launch vehicle*
17 *authorized in this paragraph available for oper-*
18 *ational missions by the end of the current dec-*
19 *ade.*

20 **(b) IMPLEMENTATION OF RESTRUCTURED PRO-**
21 **GRAM.**—*The restructured exploration program shall be im-*
22 *plemented in a manner that—*

23 *(1) facilitates the planned transition of Space*
24 *Shuttle program personnel to the restructured explo-*
25 *ration program upon the retirement of the Space*

1 *Shuttle fleet, while providing for cost effective man-*
2 *agement and vehicle development;*

3 *(2) provides for a robust flight and ground test*
4 *and demonstration program;*

5 *(3) streamlines program management processes*
6 *to the maximum extent practicable while ensuring*
7 *that the Government's ability to meet its responsibil-*
8 *ities for cost discipline, safety, and mission assurance*
9 *is maintained;*

10 *(4) working with industry, eliminates unneces-*
11 *sary NASA and industry institutional infrastructure,*
12 *other fixed costs, processes, and oversight, reducing ex-*
13 *ploration program fixed costs to the extent practicable*
14 *and maximizing the program's affordability;*

15 *(5) incentivizes, through innovative management*
16 *practices, NASA program and project managers and*
17 *industry counterparts to establish and maintain real-*
18 *istic cost and schedule estimates, and take necessary*
19 *steps to avoid cost and schedule growth;*

20 *(6) seeks to minimize to the extent practicable*
21 *the operating costs of the crew transportation system*
22 *developed under the restructured exploration program;*

23 *(7) enables the restructured exploration program*
24 *to undertake in an incremental fashion increasingly*

1 *challenging uncrewed and crewed demonstration*
2 *flights in and beyond low-Earth orbit;*

3 (8) *allows the systems developed under the re-*
4 *structured exploration program to serve as potential*
5 *testbeds for the demonstration of key enabling explo-*
6 *ration technologies and operational capabilities; and*

7 (9) *prepares for and enables human missions to*
8 *a variety of destinations in the inner solar system,*
9 *including cislunar space, the Moon, Lagrangian*
10 *points, near-Earth objects, and ultimately Mars and*
11 *its moons.*

12 (c) *SUPPORT SYSTEMS.—The restructured exploration*
13 *program shall continue work on ground systems and other*
14 *exploration-enabling technologies and capabilities needed to*
15 *support the exploration program, including spacesuit devel-*
16 *opment, as expeditiously as possible within available re-*
17 *sources.*

18 (d) *NASA LAUNCH SUPPORT AND INFRASTRUCTURE*
19 *MODERNIZATION PROGRAM FOR THE RESTRUCTURED EX-*
20 *PLORATION PROGRAM.—*

21 (1) *IN GENERAL.—The Administrator shall carry*
22 *out a program to prepare infrastructure at the Ken-*
23 *neddy Space Center that is needed to enable processing*
24 *and launch of the elements of the restructured explo-*
25 *ration program, including simplifying vehicle inter-*

1 *faces and other ground processing and payload inte-*
2 *gration areas to minimize overall costs, enhance safe-*
3 *ty, and complement the purpose of this section.*

4 (2) *ELEMENTS.—The program required by this*
5 *section shall include—*

6 (A) *investments in support of the restruc-*
7 *tured exploration program to—*

8 (i) *improve processing and launch op-*
9 *erations at the Kennedy Space Center;*

10 (ii) *enhance the overall capabilities of*
11 *the Eastern Range; and*

12 (iii) *reduce the long-term cost of oper-*
13 *ations and maintenance;*

14 (B) *measures in support of the restructured*
15 *exploration program to provide multivehicle sup-*
16 *port and improvements in payload processing;*
17 *and*

18 (C) *such other measures in support of the*
19 *restructured exploration program as the Admin-*
20 *istrator may consider appropriate.*

21 (e) *REPORT ON NASA LAUNCH SUPPORT AND INFRA-*
22 *STRUCTURE MODERNIZATION PROGRAM FOR THE RE-*
23 *STRUCTURED EXPLORATION PROGRAM.—Not later than*
24 *180 days after the date of enactment of this Act, the Admin-*
25 *istrator shall submit to the appropriate committees of the*

1 *Congress a report on the plan for the implementation of*
2 *the program authorized in subsection (d).*

3 (f) *INTERNATIONAL COLLABORATION.*—*The Adminis-*
4 *trator shall explore potential international collaborations*
5 *that would enable more ambitious exploration missions in*
6 *a timely manner and within available resources than would*
7 *otherwise be possible, such as human lunar landings or the*
8 *incremental establishment of a lunar research outpost.*

9 **SEC. 203. SPACE RADIATION.**

10 (a) *STRATEGY.*—*The Administrator shall develop a*
11 *space radiation mitigation and management strategy and*
12 *implementation plan that includes key milestones, a time-*
13 *table, and estimation of budget requirements. The strategy*
14 *shall include a mechanism to coordinate NASA research,*
15 *technology, facilities, engineering, operations, and other*
16 *functions required to support the strategy and plan. The*
17 *Administrator shall transmit the strategy and plan to the*
18 *Congress not later than 1 year after the date of enactment*
19 *of this Act.*

20 (b) *SPACE RADIATION RESEARCH FACILITIES.*—*The*
21 *Administrator, in consultation with the heads of other ap-*
22 *propriate Federal agencies, shall assess the national capa-*
23 *bilities for carrying out critical ground-based research on*
24 *space radiation biology, and shall identify any issues that*
25 *could affect the ability to carry out that research.*

1 (c) *RESEARCH ON SOLAR PARTICLE EVENTS.*—The
2 Administrator shall carry out research on solar particle
3 events to improve the predictions and forecasts of solar par-
4 ticle events that could affect human missions beyond low-
5 Earth orbit.

6 (d) *RADIATION RESEARCH ON NON-HUMAN PRI-*
7 *MATES.*—

8 (1) *IN GENERAL.*—The Administrator shall
9 transmit to the Congress not later than 1 year after
10 the date of enactment of this Act a report on prior
11 radiation research on non-human primates and the
12 justification and rationale for any additional re-
13 search involving non-human primates.

14 (2) *CONSULTATION.*—In preparing the report,
15 the Administrator shall consult with other Govern-
16 ment agencies that have previously conducted radi-
17 ation research on non-human primates.

18 ***Subtitle B—International Space***
19 ***Station***

20 ***SEC. 211. EXTENSION OF ISS OPERATIONS.***

21 (a) *IN GENERAL.*—The Administrator shall, in con-
22 sultation with the ISS partners, take all necessary measures
23 to support the operation and full utilization of the Inter-
24 national Space Station through at least the year 2020, if
25 it can continue to be operated safely over that period. The

1 *Administrator shall, in consultation with the ISS partners,*
2 *seek to minimize to the extent practicable the operating*
3 *costs of the ISS.*

4 *(b) VEHICLE AND COMPONENT REVIEW.—*

5 *(1) IN GENERAL.—In carrying out subsection*
6 *(a), the Administrator shall—*

7 *(A) conduct an in-depth assessment of all*
8 *essential modules, operational systems and com-*
9 *ponents, structural elements, and permanent sci-*
10 *entific equipment on board or planned for deliv-*
11 *ery and installation aboard the ISS, including*
12 *both United States and international partner*
13 *elements, to determine anticipated spare or re-*
14 *placement requirements to ensure complete, effec-*
15 *tive, and safe function and full scientific utiliza-*
16 *tion of the ISS; and*

17 *(B) provide the completed assessment to the*
18 *Congress within 90 days after the date of enact-*
19 *ment of this Act.*

20 *(2) REQUIREMENTS OF ASSESSMENT.—The re-*
21 *sults of the required assessment shall include, at a*
22 *minimum, the following:*

23 *(A) The identification of spare or replace-*
24 *ment elements and parts currently produced, in*
25 *inventory, or on order, and the state of readiness*

1 *and schedule for delivery to the ISS, including*
2 *the planned transportation means for such deliv-*
3 *ery. Each element identified shall include a de-*
4 *scription of its location, function, criticality for*
5 *system integrity, and specifications regarding*
6 *size, weight, and necessary configuration for*
7 *launch and delivery.*

8 *(B) The identification of anticipated re-*
9 *quirements for spare or replacement elements not*
10 *currently in inventory or on order, a description*
11 *of their location, function, criticality for system*
12 *integrity, the anticipated cost and schedule for*
13 *design, procurement, manufacture and delivery,*
14 *and specifications regarding size, weight, and*
15 *necessary configuration for launch and delivery,*
16 *including available launch vehicles capable of*
17 *transportation of such items to the ISS.*

18 *(C) The identification of spare or replace-*
19 *ment parts existing or planned that due to size,*
20 *weight, and launch configuration can only be*
21 *carried to the ISS by the Space Shuttle.*

22 *(3) COMPTROLLER GENERAL.—The Adminis-*
23 *trator shall enable the Comptroller General to monitor*
24 *and, as appropriate, participate in the assessment re-*
25 *quired by paragraph (1) in such a way as to enable*

1 *the Comptroller General to provide to the Congress an*
2 *independent review of the assessment.*

3 **SEC. 212. ISS RESEARCH MANAGEMENT INSTITUTION.**

4 *(a) DESIGNATION.—Pursuant to section 507 of the Na-*
5 *tional Aeronautics and Space Administration Authoriza-*
6 *tion Act of 2005 (42 U.S.C. 16767), the Administrator shall*
7 *designate an independent, nonprofit United States institu-*
8 *tion, based on the result of a competitive solicitation, for*
9 *the management of fundamental space life science and*
10 *physical sciences and related technology research to be con-*
11 *ducted on the ISS, as well as all research, including United*
12 *States commercial research, that is funded by non-NASA*
13 *United States domestic entities and carried out on the ISS.*

14 *(b) RESPONSIBILITIES.—The research management in-*
15 *stitution designated under subsection (a) shall make rec-*
16 *ommendations to the Administrator for—*

17 *(1) competitively selecting, prioritizing, and*
18 *overseeing United States ISS research projects across*
19 *all United States users, sponsors, and disciplines, in-*
20 *cluding domestic entities other than NASA, seeking to*
21 *carry out research on the ISS;*

22 *(2) establishing a process for governance of*
23 *United States ISS research users;*

24 *(3) conducting outreach and education to en-*
25 *hance the utilization of the ISS; and*

1 (4) *providing easily accessible information on*
2 *the United States capabilities, research facilities, and*
3 *resources associated with the United States research*
4 *use of the ISS.*

5 (c) *DEVIATIONS.—If the Administrator takes actions*
6 *that deviate from the recommendations provided by the re-*
7 *search management institution under subsection (b), the*
8 *Administrator shall transmit to the Congress a report ex-*
9 *plaining the reasons for such deviation.*

10 (d) *OTHER GOVERNMENT CONTRACTS.—Other govern-*
11 *ment agencies engaged in research and development are au-*
12 *thorized to enter into contracts with the nonprofit organiza-*
13 *tion designated under subsection (a) if it is determined by*
14 *those agencies to be beneficial to meeting their mission re-*
15 *quirements for use of the ISS.*

16 **SEC. 213. ISS RESEARCH MANAGEMENT PLAN.**

17 (a) *IN GENERAL.—The Administrator, in coordination*
18 *with the Associate Administrator for the Space Operations*
19 *Mission Directorate, shall require that the institution des-*
20 *ignated under section 212(a) prepare for the Administrator*
21 *a United States ISS research management plan that—*

22 (1) *establishes a process for selecting United*
23 *States ISS research;*

1 (2) *identifies the expertise and support available*
2 *to researchers selected to carry out research on the*
3 *ISS;*

4 (3) *establishes a process for determining alloca-*
5 *tion schedules for research to be carried out on the*
6 *ISS;*

7 (4) *establishes a process for accommodating*
8 *logistical and transportation requirements for ISS re-*
9 *search payloads;*

10 (5) *prescribes flight schedules for research pay-*
11 *loads to the ISS (and research materials to be re-*
12 *turned to Earth, if necessary); and*

13 (6) *addresses other factors associated with the se-*
14 *lection, management, and oversight of United States*
15 *ISS research.*

16 ***(b) TRANSMITTAL TO CONGRESS.—The plan shall be***
17 *transmitted to the Congress not later than 2 years after the*
18 *date of enactment of this Act.*

19 ***SEC. 214. OUTREACH PLAN FOR UNITED STATES ISS RE-***
20 ***SEARCH.***

21 *Not later than 2 years after the date of enactment of*
22 *this Act, the Administrator shall transmit to the Congress*
23 *a plan prepared by the institution designated under section*
24 *212(a) for broadening and enhancing the outreach to poten-*

1 *tial United States Government, academic, and commercial*
2 *users of the ISS.*

3 **SEC. 215. ISS CARGO RESUPPLY REQUIREMENTS AND CON-**
4 **TINGENCY CAPACITY THROUGH 2020.**

5 (a) *IN GENERAL.*—*The Administrator shall ensure the*
6 *availability of ISS cargo resupply capacity to support the*
7 *full and productive utilization and the extended operations*
8 *of the ISS through the year 2020.*

9 (b) *ASSESSMENT.*—*The Administrator shall conduct*
10 *an assessment of the ISS cargo resupply capacity required*
11 *to support the enhanced research utilization and extended*
12 *operations of the ISS through 2020. The assessment shall*
13 *describe the methodology and assumptions used to define*
14 *the cargo requirements and provide a breakdown of the*
15 *cargo resupply requirements (upmass and downmass) to*
16 *support scientific research, other research and development,*
17 *operations and maintenance, crew supplies, and other nec-*
18 *essary activities. In addition, the assessment shall identify*
19 *the systems to be used for ISS cargo resupply, the amount*
20 *of cargo those systems will transport, and the timeline for*
21 *cargo resupply services to the ISS.*

22 (c) *ADDITIONAL RESUPPLY OPTIONS.*—*The Adminis-*
23 *trator shall explore with ISS partners options for ensuring*
24 *the provision of needed upmass to and downmass from the*
25 *ISS in the event that adequate commercial cargo resupply*

1 *capabilities are not available during any extended period*
2 *after the date that the Space Shuttle is retired. Before rely-*
3 *ing on ISS partners to upmass or downmass cargo, the Ad-*
4 *ministrator must certify to the Congress that no United*
5 *States or commercial cargo resupply capabilities are avail-*
6 *able.*

7 **SEC. 216. CENTRIFUGE.**

8 *(a) ASSESSMENT.—The Administrator shall carry out*
9 *an assessment of innovative options for deploying a vari-*
10 *able-gravity centrifuge on the ISS. The assessment shall*
11 *identify the requirements for a variable-gravity centrifuge*
12 *to support fundamental and applied research on the ISS,*
13 *including research to help mitigate the risk of long-term*
14 *spaceflight beyond low-Earth orbit. The assessment shall*
15 *also—*

16 *(1) review the requirements for development,*
17 *launch, and operation of the facility on the ISS;*

18 *(2) provide an estimate of the potential cost and*
19 *timeline for developing and deploying the centrifuge*
20 *capabilities evaluated as part of the assessment;*

21 *(3) evaluate the status of previous work on devel-*
22 *opment of an in-flight centrifuge for the ISS and the*
23 *cost and time that would be required to complete the*
24 *work and launch the facility; and*

1 (4) *identify the potential for international col-*
2 *laboration and other potential partnerships or inno-*
3 *vative acquisition approaches that could facilitate the*
4 *development and deployment of a centrifuge facility*
5 *for the ISS.*

6 (b) *TRANSMITTAL TO CONGRESS.—The Administrator*
7 *shall transmit the assessment described in subsection (a) to*
8 *the Congress not later than 1 year after the date of enact-*
9 *ment of this Act.*

10 **SEC. 217. EXPLORATION TECHNOLOGY DEVELOPMENT**
11 **USING THE ISS.**

12 (a) *PLAN.—The Administrator shall develop priorities*
13 *for technology development, testing, and demonstration ac-*
14 *tivities that enable and support NASA’s long-term plans*
15 *for exploration beyond low-Earth orbit and that require the*
16 *capabilities of the ISS, and shall develop a plan, including*
17 *milestones, a schedule, and an estimate of resource require-*
18 *ments, for carrying out the prioritized activities. The plan*
19 *shall be developed for the period of fiscal years 2011 through*
20 *2020.*

21 (b) *TRANSMITTAL TO CONGRESS.—The Administrator*
22 *shall transmit the plan developed under subsection (a) to*
23 *the Congress not later than 270 days after the date of enact-*
24 *ment of this Act.*

1 **SEC. 218. FUNDAMENTAL SPACE LIFE SCIENCE AND PHYS-**
2 **ICAL SCIENCES AND RELATED TECHNOLOGY**
3 **RESEARCH.**

4 (a) *STRATEGIC PLAN FOR SCIENCE AND TECHNOLOGY*
5 *RESEARCH.*—

6 (1) *DEVELOPMENT.*—*The Administrator, in con-*
7 *sultation with academia, other Federal agencies, and*
8 *other potential stakeholders, shall develop a strategic*
9 *plan for carrying out competitive, peer-reviewed fun-*
10 *damental space life science and physical sciences and*
11 *related technology research, including research on*
12 *phenomena such as the response of fluids and mate-*
13 *rials to reduced gravity environments that need to be*
14 *understood in developing exploration-related tech-*
15 *nologies and systems. The plan shall—*

16 (A) *address the facilities and instrumenta-*
17 *tion that would enable and facilitate such re-*
18 *search;*

19 (B) *be consistent with the priorities and*
20 *recommendations established by the National*
21 *Academies in its decadal survey of life and*
22 *microgravity sciences;*

23 (C) *provide a research timeline and identify*
24 *the resource requirements for its implementation;*

25 (D) *include an estimate of the number of*
26 *students, including undergraduate, graduate,*

1 *and post-doctoral students, and early-career re-*
2 *searchers that would be supported in carrying*
3 *out the plan; and*

4 *(E) identify—*

5 *(i) criteria for the proposed space re-*
6 *search, including—*

7 *(I) a justification for the research*
8 *to be carried out in the space micro-*
9 *gravity environment;*

10 *(II) the use of model systems;*

11 *(III) the testing of flight hardware*
12 *to understand and ensure its func-*
13 *tioning in the microgravity environ-*
14 *ment;*

15 *(IV) the use of controls to help*
16 *distinguish among the direct and indi-*
17 *rect effects of microgravity, among*
18 *other effects of the flight or space envi-*
19 *ronment;*

20 *(V) approaches for facilitating*
21 *data collection, analysis, and interpre-*
22 *tation;*

23 *(VI) procedures to ensure repeti-*
24 *tion of experiments as needed; and*

1 (VII) support for timely presen-
2 tation of the peer-reviewed results of
3 the research;

4 (ii) instrumentation required to sup-
5 port the measurements and analysis of the
6 research to be carried out under the stra-
7 tegic plan, including the potential use of in-
8 strumentation developed by other countries
9 and the potential for a variable-gravity cen-
10 trifuge to support the research;

11 (iii) the capabilities needed to support
12 direct, real-time communications between
13 astronauts working on research experiments
14 onboard the ISS and the principal investi-
15 gator on the ground; and

16 (iv) a process for involving the external
17 user community in research planning, in-
18 cluding planning for relevant flight hard-
19 ware and instrumentation, and for utiliza-
20 tion of the ISS, free flyers, or other research
21 platforms.

22 (2) *TRANSMITTAL TO CONGRESS.*—Not later than
23 1 year after the date of enactment of this Act, the Ad-
24 ministrator shall transmit the strategic plan devel-
25 oped under paragraph (1) to the Congress.

1 **(b) INTEGRATED RESEARCH MANAGEMENT ORGANIZA-**
2 *TION.—*

3 **(1) RESPONSIBLE OFFICIAL.—**

4 **(A) IN GENERAL.—***The Administrator shall*
5 *ensure that a responsible official is designated at*
6 *NASA headquarters to lead a competitive, inte-*
7 *grated basic and applied research program in*
8 *fundamental space life science and physical*
9 *sciences and related technology.*

10 **(B) RESPONSIBILITIES.—***The official des-*
11 *ignated under subparagraph (A) shall be respon-*
12 *sible for—*

13 *(i) leading near-term and long-term*
14 *strategic planning pursuant to the research*
15 *plan developed under subsection (a);*

16 *(ii) ensuring the input of the external*
17 *user community in science planning proc-*
18 *esses;*

19 *(iii) ensuring the implementation of*
20 *an integrated, multidisciplinary and inter-*
21 *disciplinary, competitive research program*
22 *in fundamental space life and physical*
23 *sciences and related technology;*

24 *(iv) supporting the appropriate inter-*
25 *action of research investigators and agency*

1 *managers and engineers in planning, de-*
2 *signing, testing, and operations related to*
3 *such research projects;*

4 *(v) monitoring progress of the program*
5 *in achieving the objectives and milestones*
6 *identified in the strategic plan developed*
7 *under subsection (a)(1); and*

8 *(vi) other functions required to support*
9 *the research program under this section.*

10 *(C) COORDINATION AND COMMUNICA-*
11 *TIONS.—The Administrator shall ensure that the*
12 *responsible official coordinates and commu-*
13 *nicates the fundamental space life science and*
14 *physical sciences and related technology research*
15 *activities with relevant entities within NASA,*
16 *with the ISS research management institution*
17 *designated under section 212(a), and with other*
18 *relevant agencies and organizations.*

19 *(2) BUDGET REQUEST.—The Administrator*
20 *shall, as part of the annual NASA fiscal year budget*
21 *request—*

22 *(A) identify and include a description of re-*
23 *search being carried out pursuant to section 204*
24 *of the National Aeronautics and Space Adminis-*

1 *tration Authorization Act of 2005 (42 U.S.C.*
2 *16633);*

3 *(B) identify the percentage of the total re-*
4 *search budget for ISS research that the research*
5 *described in subparagraph (A) represents; and*

6 *(C) identify the programs proposed for car-*
7 *rying out research activities on the ISS and the*
8 *proposed funding to support those research pro-*
9 *grams, including a breakdown for each of the*
10 *programs identified of the funding requested for*
11 *competitive grants.*

12 ***Subtitle C—Space Shuttle***

13 ***SEC. 221. CONTINGENT AUTHORIZATION OF ADDITIONAL*** 14 ***SPACE SHUTTLE MISSION.***

15 *(a) SENSE OF THE CONGRESS.—It is the sense of the*
16 *Congress that it is very important, in view of the extension*
17 *of the life of the ISS until at least 2020, for the Shuttle*
18 *fleet to leave the ISS in the best possible configuration for*
19 *the post-Shuttle era and that NASA should take all nec-*
20 *essary steps to ensure the continued viability of the ISS*
21 *in the event that there are delays in the delivery or the in-*
22 *ability to deliver critical parts and supplies once the Shut-*
23 *tle is retired.*

24 *(b) CONTINGENT AUTHORIZATION OF ADDITIONAL*
25 *SHUTTLE MISSION BEYOND THE PLANNED MANIFEST.—*

1 *The Administrator is authorized to conduct 1 additional*
2 *Space Shuttle mission to the ISS beyond the missions con-*
3 *tained in the flight manifest as of February 1, 2010, if—*

4 (1) *the Administrator determines that an addi-*
5 *tional Space Shuttle mission is a useful and nec-*
6 *essary step to reduce risks to the operation and utili-*
7 *zation of the ISS that are associated with the retire-*
8 *ment of the Shuttle fleet; and*

9 (2) *the conditions in subsection (c) have been*
10 *met.*

11 (c) *CONDITIONS.—In order to comply with subsection*
12 *(b), the Administrator shall determine and certify that all*
13 *of the following conditions have been met:*

14 (1) *The importance of conducting the additional*
15 *Space Shuttle mission to the ISS outweighs the risks*
16 *associated with conducting a Shuttle mission without*
17 *a backup Shuttle launch-on-need capability.*

18 (2) *Any actions resulting from safety inspections*
19 *and reviews required by NASA's Orbiter Modification*
20 *Down Period (OMDP) and other safety guidance have*
21 *been successfully addressed.*

22 (3) *Workarounds addressing mandatory OMDP*
23 *requirements, if any, have been identified and the as-*
24 *sociated risks have been characterized.*

1 (4) *The Aerospace Safety Advisory Panel has re-*
2 *viewed the safety issues associated with the additional*
3 *Shuttle mission as well as NASA's plans to mitigate*
4 *any identified risks.*

5 (d) *CONTINGENT AUTHORIZATION OF APPROPRIA-*
6 *TIONS.—In the event that the additional Shuttle flight to*
7 *the ISS is authorized, funding for the incremental costs as-*
8 *sociated with the additional mission is authorized as follows*
9 *from within funds authorized in title I:*

10 (1) *For fiscal year 2011, \$700,000,000, to be*
11 *taken in the amounts specified below from within the*
12 *funding for the following accounts and transferred to*
13 *the Space Shuttle account:*

14 (A) *\$175,000,000 from the ISS, except that*
15 *at least \$50,000,000 shall remain available for*
16 *fundamental space life and physical sciences and*
17 *related technology research.*

18 (B) *\$525,000,000 from the restructured ex-*
19 *ploration program.*

20 (2) *For Fiscal Year 2012, \$200,000,000, to be*
21 *taken from within the funding for the ISS and trans-*
22 *ferred to the Space Shuttle account, except that at*
23 *least \$50,000,000 shall remain available for funda-*
24 *mental space life and physical sciences and related*
25 *technology research.*

1 **SEC. 222. EXPANDED SCOPE OF SPACE SHUTTLE TRANSI-**
2 **TION LIAISON OFFICE.**

3 *Section 613(b) of the National Aeronautics and Space*
4 *Administration Authorization Act of 2008 (42 U.S.C.*
5 *17761(b)) is amended—*

6 *(1) in paragraph (1), by striking “Space Shuttle*
7 *Transition Liaison Office” and inserting “Post-Shut-*
8 *tle Transition Liaison Office”; and*

9 *(2) in paragraph (3), by striking “2 years after*
10 *the completion of the last Space Shuttle flight” and*
11 *inserting “2 years after the award of the final grant*
12 *under section 223 of the National Aeronautics and*
13 *Space Administration Authorization Act of 2010”.*

14 **SEC. 223. POST-SHUTTLE WORKFORCE TRANSITION INITIA-**
15 **TIVE GRANT PROGRAM.**

16 *(a) ESTABLISHMENT.—*

17 *(1) IN GENERAL.—The Administrator, acting*
18 *through the Post-Shuttle Transition Liaison Office es-*
19 *tablished under section 613(b) of the National Aero-*
20 *nautics and Space Administration Authorization Act*
21 *of 2008 (42 U.S.C. 17761(b)), as amended by section*
22 *222, is authorized to make grants for the establish-*
23 *ment, operation, coordination, and implementation of*
24 *aerospace workforce and community transition strate-*
25 *gies.*

1 (2) *TRANSFER.*—*The Administrator may trans-*
2 *fer amounts made available under this section to*
3 *other Federal agencies for the purpose of assisting in*
4 *the transition of aerospace workers and communities*
5 *adversely affected by the termination of the Space*
6 *Shuttle program.*

7 (b) *USE OF FUNDS.*—*A recipient of a grant under sub-*
8 *section (a) shall use the funds made available through the*
9 *grant to—*

10 (1) *conduct community and business outreach;*

11 (2) *develop and implement regional revitaliza-*
12 *tion and facilities reuse strategies;*

13 (3) *support entrepreneurship and new business*
14 *development initiatives; and*

15 (4) *support workforce retraining.*

16 **SEC. 224. DISPOSITION OF ORBITER VEHICLES.**

17 (a) *IN GENERAL.*—*Upon the termination of the Space*
18 *Shuttle Program, the Administrator shall decommission*
19 *any remaining Space Shuttle orbiter vehicles according to*
20 *established safety and historic preservation procedures prior*
21 *to their designation as surplus government property. The*
22 *orbiter vehicles shall be made available and located for dis-*
23 *play and maintenance through a competitive procedure that*
24 *takes into account geographical diversity, established pursu-*
25 *ant to the disposition plan developed under section 613(a)*

1 *of the National Aeronautics and Space Administration Act*
2 *of 2008 (42 U.S.C. 17761(a)), with priority consideration*
3 *given to eligible applicants meeting all conditions of that*
4 *plan which would provide for the display and maintenance*
5 *of orbiters at locations with the best potential value to the*
6 *public, including where the location of the orbiters can ad-*
7 *vance educational opportunities in science, technology, en-*
8 *gineering, and mathematics disciplines, and with an histor-*
9 *ical relationship with the Space Shuttle orbiters.*

10 (b) *SMITHSONIAN INSTITUTION ORBITER.*—*Notwith-*
11 *standing the procedures in subsection (a), the Smithsonian*
12 *Institution shall be entitled to receive one of the remaining*
13 *Space Shuttle orbiter vehicles. The Administrator shall col-*
14 *laborate with the Secretary of the Smithsonian Institution*
15 *to determine which orbiter the Smithsonian Institution*
16 *shall receive, and otherwise determine the timing and proce-*
17 *dures of transfer from NASA to the Smithsonian Institu-*
18 *tion. The Smithsonian Institution, which, as of the date of*
19 *enactment of this Act, houses the Space Shuttle Enterprise,*
20 *shall determine any new location for the Enterprise.*

21 (c) *DISPLAY AND MAINTENANCE.*—*The orbiter vehicles*
22 *made available under subsection (a) shall be displayed and*
23 *maintained through agreements and procedures established*
24 *pursuant to section 613(a) of the National Aeronautics and*

1 *Space Administration Authorization Act of 2008 (42 U.S.C.*
2 *17761(a)).*

3 ***Subtitle D—Space and Flight***
4 ***Support***

5 ***SEC. 231. 21ST CENTURY SPACE LAUNCH COMPLEX INITIA-***
6 ***TIVE.***

7 (a) *PURPOSE.—Funding authorized in title I for the*
8 *21st Century Space Launch Complex Initiative shall be*
9 *available to carry out the following activities:*

10 (1) *Investments to improve civil and national se-*
11 *curity operations at the Kennedy Space Center and*
12 *Cape Canaveral Air Force Station to enhance the*
13 *overall capabilities of the Eastern Range and to re-*
14 *duce the long-term cost of operations and mainte-*
15 *nance.*

16 (2) *Measures to provide multivehicle support,*
17 *improvements in payload processing, and partnering*
18 *at the Kennedy Space Center and Cape Canaveral*
19 *Air Force Station.*

20 (3) *Measures to support the restructured explo-*
21 *ration program.*

22 (4) *Such other measures related to launch sup-*
23 *port and infrastructure modernization at the Ken-*
24 *neddy Space Center as the Administrator may consider*
25 *appropriate to carry out NASA’s launch operations.*

1 **(b) REPORT ON THE 21ST CENTURY SPACE LAUNCH**
2 **COMPLEX INITIATIVE.**—

3 **(1) REPORT REQUIRED.**—Not later than 60 days
4 after the date of enactment of this Act, the Adminis-
5 trator shall submit to the appropriate committees of
6 the Congress a report on the plan for the implementa-
7 tion of the 21st Century Space Launch Complex Ini-
8 tiative.

9 **(2) ELEMENTS.**—The report required by this
10 subsection shall include—

11 **(A)** a description of those initiatives tied to
12 the restructured exploration program;

13 **(B)** a description of proposed initiatives in-
14 tended to be conducted jointly or in cooperation
15 with Cape Canaveral Air Force Station, Florida,
16 or other installations or components of the
17 United States Government; and

18 **(C)** a timetable for carrying out activities
19 and initiatives planned for the 21st Century
20 Space Launch Complex Initiative.

21 **Subtitle E—Commercial Crew**
22 **Transportation**

23 **SEC. 241. AFFIRMATION OF POLICY.**

24 The Congress affirms the policy of—

1 (1) *making use of United States commercially*
2 *provided ISS crew transportation and crew rescue*
3 *services to the maximum extent practicable;*

4 (2) *limiting, to the maximum extent practicable,*
5 *the use of the system developed under section 202 to*
6 *non-ISS missions once commercial crew transpor-*
7 *tation and crew rescue services that meet safety re-*
8 *quirements become operational; and*

9 (3) *facilitating, to the maximum extent prac-*
10 *ticable, the transfer of NASA-developed technologies to*
11 *United States commercial orbital human space trans-*
12 *portation companies in order to help promote the de-*
13 *velopment of commercially provided ISS crew trans-*
14 *portation and crew rescue services.*

15 **SEC. 242. COMMERCIAL CREW AND RELATED COMMERCIAL**
16 **SPACE INITIATIVES.**

17 (a) *COMMERCIAL SERVICES OPPORTUNITIES.—NASA*
18 *shall seek, to the extent practicable, to make use of commer-*
19 *cially available space services, including commercially*
20 *available services to transport United States Government*
21 *astronauts to and from the ISS, provided that—*

22 (1) *those commercial services have demonstrated*
23 *the capability to meet NASA-specified ascent, transit,*
24 *entry, and ISS proximity operations safety require-*
25 *ments;*

1 (2) *the services provider has completed, and*
2 *NASA has verified, crewed flight demonstrations or*
3 *operational flights that comply with NASA standards,*
4 *policies, and procedures; and*

5 (3) *the per-seat cost to the United States is not*
6 *greater than the per-seat cost for the system developed*
7 *under section 202.*

8 (b) *HUMAN-RATING.—The Administrator shall estab-*
9 *lish requirements, standards, and processes for the human*
10 *rating of space transportation systems that are equivalent*
11 *to NASA safety processes and procedures.*

12 (c) *TECHNOLOGY TRANSFER.—The Administrator*
13 *shall make available, on a nonexclusive basis, NASA-devel-*
14 *oped technologies for transfer to potential United States*
15 *commercial orbital human space transportation companies.*
16 *NASA shall determine the appropriate means, through cost-*
17 *reimbursable arrangements or other mechanisms, to trans-*
18 *fer the technologies.*

19 (d) *TECHNICAL ASSISTANCE AND FACILITIES.—The*
20 *Administrator shall make available, to the extent prac-*
21 *ticable, NASA facilities and equipment to assist in the test-*
22 *ing and demonstration of commercial crew transportation*
23 *systems, including those associated with NASA's safety and*
24 *mission assurance activities, such as NASA's Independent*
25 *Verification and Validation facility for software*

1 *verification. The Administrator shall determine the appro-*
2 *priate means, through cost-reimbursable arrangements,*
3 *agreements entered into under section 203(c)(5) of the Na-*
4 *tional Aeronautics and Space Act of 1958 (42 U.S.C.*
5 *2473(c)(5)), or other mechanisms, to provide technical as-*
6 *sistance and access to facilities to the commercial space sec-*
7 *tor.*

8 *(e) NASA INSIGHT AND OVERSIGHT PROCESSES.—*
9 *Any company that seeks to provide commercial crew trans-*
10 *portation services under contract to NASA shall enter into*
11 *an arrangement with NASA that allows NASA to obtain*
12 *ongoing insight into the design methodologies, processes,*
13 *technologies, test data, and production and quality control*
14 *practices employed in the development of the commercial*
15 *crew transportation system throughout the development,*
16 *test, demonstration, and production phases. NASA may*
17 *offer early warning of conditions that could lead NASA to*
18 *withhold certification of the crew transportation systems for*
19 *the flight of United States Government personnel or to de-*
20 *cline to enter into a contract for services. NASA may not*
21 *require the company to make changes to its design, tech-*
22 *nologies, or processes during the development, test, dem-*
23 *onstration, or production phases.*

24 *(f) CONTRACTS FOR COMMERCIALLY AVAILABLE ISS*
25 *CREW TRANSPORTATION AND CREW RESCUE SERVICES.—*

1 (1) *CERTIFICATION OF SAFETY AND RELI-*
2 *ABILITY.—Before entering into a contract for the use*
3 *of commercially available commercial crew transpor-*
4 *tation or crew rescue services for United States Gov-*
5 *ernment astronauts, the Administrator shall certify*
6 *that a commercial ISS crew transportation and crew*
7 *rescue service provider with which a contract is*
8 *planned has demonstrated the safety and reliability of*
9 *its systems for crew transportation and crew rescue to*
10 *be equivalent to NASA-promulgated safety and reli-*
11 *ability policies, procedures, and standards for human*
12 *spaceflight. Individual certifications made under this*
13 *paragraph shall be provided to the Committee on*
14 *Science and Technology of the House of Representa-*
15 *tives and to the Committee on Commerce, Science,*
16 *and Transportation of the Senate.*

17 (2) *FLIGHT EXPERIENCE.—The Administrator*
18 *shall not enter into any contract or commit any*
19 *United States Government funds for a commercial*
20 *ISS crew transportation or rescue service to a service*
21 *provider until sufficient successful flight experience*
22 *has been accrued by the service provider's system to*
23 *provide to NASA the safety-related and reliability-re-*
24 *lated data and information needed to determine*
25 *whether to fly its astronauts on that system. The Ad-*

1 *ministrator shall require an amount of demonstrated*
2 *flight experience for a commercial crew transpor-*
3 *tation system that is at least as much as NASA re-*
4 *quires under Alternative 1 as delineated in the NASA*
5 *Policy Directive NPD 8610.7D, effective January 31,*
6 *2008, for common launch vehicle configurations before*
7 *Class A (high cost and high priority) payloads can be*
8 *flown on them.*

9 (3) *ADMINISTRATOR'S ACTIONS.—To facilitate*
10 *the ability of commercial crew transportation pro-*
11 *viders to comply with NASA human spaceflight safety*
12 *and reliability requirements, the Administrator*
13 *shall—*

14 (A) *develop and communicate the human-*
15 *rating requirements established under subsection*
16 *(b) to commercial space companies;*

17 (B) *establish minimum acceptable safety*
18 *levels;*

19 (C) *provide technical assistance, to the max-*
20 *imum extent practicable, to the commercial space*
21 *sector in understanding and applying NASA*
22 *human-rating requirements, standards, and*
23 *processes to commercial crew transportation and*
24 *crew rescue systems;*

1 (D) establish and communicate to the com-
2 mercial sector the process NASA will apply for
3 securing ongoing NASA insight into the design
4 methodologies, processes, technologies, test data,
5 and production and quality control practices
6 employed in the development of the commercial
7 crew transportation system throughout the devel-
8 opment, test, demonstration, and production
9 phases;

10 (E) establish and communicate to the com-
11 mercial sector NASA's process for certifying that
12 commercial human spaceflight systems (includ-
13 ing mission control, operations, ground systems,
14 and other supporting infrastructure) comply
15 with NASA human-rating requirements and
16 standards and related NASA policies and proce-
17 dures for safety and reliability, which process
18 shall be no less stringent than the NASA policies
19 and procedural requirements established for
20 launch of Class A (high cost and high priority)
21 payloads; and

22 (F) ensure that the certification established
23 under subparagraph (E) includes independent
24 verification and validation of compliance with
25 NASA policies, procedures, and standards.

1 (g) *ASAP REVIEW OF NASA'S HUMAN-RATING RE-*
2 *QUIREMENTS, STANDARDS, AND PROCESSES.*—

3 (1) *IN GENERAL.*—*The Aerospace Safety Advi-*
4 *sory Panel shall conduct a review to identify issues*
5 *pertinent to the establishment of human-rating re-*
6 *quirements, standards, and processes for commercial*
7 *crew transportation and rescue systems that are pro-*
8 *posed for transport of United States astronauts.*

9 (2) *REPORT.*—*Not later than 1 year after the*
10 *date of enactment of this Act, the Aerospace Safety*
11 *and Advisory Panel shall transmit to the Congress a*
12 *report describing—*

13 (A) *the Panel's assessment of NASA's cur-*
14 *rently established human-rating specifications*
15 *and guidance;*

16 (B) *the Panel's view of the mandatory safe-*
17 *ty requirements that must be met with regard to*
18 *human rating; and*

19 (C) *the steps NASA and the commercial*
20 *space industry need to take to ensure that com-*
21 *mercial crew transportation and rescue vehicles*
22 *have human rating requirements, standards, and*
23 *processes equivalent to those of NASA.*

24 (h) *INDEMNIFICATION AND LIABILITY.*—*The Adminis-*
25 *trator shall not proceed with a request for proposals, award*

1 *any contract, or commit any United States Government*
2 *funds for a commercial ISS crew transportation or rescue*
3 *service to be provided by a commercial service provider*
4 *until all indemnification and liability issues associated*
5 *with the use of such systems by the United States Govern-*
6 *ment shall have been addressed and the Administrator has*
7 *provided to the Congress a report describing the indem-*
8 *nification and liability provisions that are planned to be*
9 *included in such contracts.*

10 *(i) PREDICTED LEVEL OF SAFETY.—The Adminis-*
11 *trator shall not award any contract or commit any United*
12 *States Government funds for a commercial ISS crew trans-*
13 *portation system service to a service provider unless that*
14 *commercial crew transportation system has a predicted*
15 *level of safety during ascent to low-Earth orbit, transit, and*
16 *descent from low-Earth orbit that is not less than that speci-*
17 *fied for the Government system in section 202(a)(5).*

18 **SEC. 243. FEDERAL ASSISTANCE FOR THE DEVELOPMENT**
19 **OF COMMERCIAL ORBITAL HUMAN SPACE**
20 **TRANSPORTATION SERVICES.**

21 *(a) ESTABLISHMENT.—The Administrator shall estab-*
22 *lish a program to provide financial assistance in the form*
23 *of direct loans or loan guarantees to commercial entities*
24 *for the costs of development of orbital human space trans-*
25 *portation systems.*

1 (b) *ELIGIBLE PROJECTS.*—A loan or loan guarantee
2 may be made under such program only for a project in
3 the United States to develop commercial orbital human
4 space transportation systems that would be used to provide
5 transportation services to and from low-earth orbit.

6 (c) *ELIGIBLE BORROWER.*—A loan or loan guarantee
7 may be made under such program only for a borrower who
8 is determined by the Administrator to be eligible under the
9 criteria established pursuant to subsection (i).

10 (d) *LIMITATIONS.*—No loan or loan guarantee shall be
11 made unless the Administrator determines that—

12 (1) there is a reasonable prospect of repayment
13 of the principal and interest on the obligation by the
14 borrower;

15 (2) the amount of the obligation (when combined
16 with amounts available to the borrower from other
17 sources which shall be a minimum of 25 percent of
18 the total expected project development cost) is suffi-
19 cient to carry out the total development project.

20 (e) *SUPERIORITY OF RIGHTS.*—The rights of the Ad-
21 ministrator, with respect to any property acquired pursu-
22 ant to a loan, shall be superior to the rights of any other
23 person with respect to the property.

1 (f) *TERMS AND CONDITIONS.*—*Notwithstanding any*
2 *other provision of law, a loan or loan guarantee made pur-*
3 *suant to this section shall—*

4 (1) *bear interest at an annual rate, as deter-*
5 *mined by the Administrator, of—*

6 (A) *in the case of a direct loan—*

7 (i) *the cost of borrowing to the Depart-*
8 *ment of the Treasury for obligations of com-*
9 *parable maturity; or*

10 (ii) *4 percent; and*

11 (B) *in the case of a guaranteed loan, the*
12 *current applicable market rate for a loan of com-*
13 *parable maturity; and*

14 (2) *have a term not to exceed 30 years.*

15 (g) *CONSULTATION.*—*In establishing the terms and*
16 *conditions of a loan or loan guarantee under this section,*
17 *the Administrator shall consult with the Secretary of the*
18 *Treasury.*

19 (h) *FEEES.*—

20 (1) *IN GENERAL.*—*The Administrator shall*
21 *charge and collect fees for loans and loan guarantees*
22 *in amounts the Administrator determines are suffi-*
23 *cient to cover applicable administrative expenses.*

24 (2) *AVAILABILITY.*—*Fees collected under this*
25 *subsection shall—*

1 (A) be deposited by the Administrator into
2 the Treasury of the United States; and

3 (B) remain available until expended, subject
4 to such other conditions as are contained in an-
5 nual appropriations Acts.

6 (3) *LIMITATION.*—In charging and collecting fees
7 under paragraph (1), the Administrator shall take
8 into consideration the amount of the obligation.

9 (i) *REGULATIONS.*—The Administrator shall issue
10 final regulations before making any loan or loan guarantee
11 under the program. Such regulations shall include—

12 (1) criteria that the Administrator shall use to
13 determine eligibility for loans and loan guarantees
14 under this section, including whether a borrower dem-
15 onstrates that a non-governmental market exists for
16 the orbital human space transportation service, as
17 evidenced by written statements of interest from po-
18 tential purchasers of the services;

19 (2) criteria that the Administrator shall use to
20 determine the amount of any fees charged under sub-
21 section (h), including criteria related to the amount
22 of the obligation; and

23 (3) any other policies, procedures, or information
24 necessary to implement this section.

25 (j) *AUDIT.*—

1 (1) *ANNUAL INDEPENDENT AUDITS.*—*The Ad-*
2 *ministrator shall enter into an arrangement with an*
3 *independent auditor for annual evaluations of the*
4 *program under this section.*

5 (2) *COMPTROLLER GENERAL REVIEW.*—*The*
6 *Comptroller General of the United States shall con-*
7 *duct a biennial review of the Administrator’s execu-*
8 *tion of the program under this section.*

9 (3) *REPORT.*—*The results of the independent*
10 *audit under paragraph (1) and the Comptroller Gen-*
11 *eral’s review under paragraph (2) shall be provided*
12 *directly to the Committee on Science and Technology*
13 *of the House of Representatives and the Committee on*
14 *Commerce, Science, and Transportation of the Senate.*

15 (k) *REPORT TO CONGRESS.*—*Concurrent with the sub-*
16 *mission to the Congress of the President’s annual budget*
17 *request in each year after the date of enactment of this sec-*
18 *tion, the Administrator shall transmit to the Committee on*
19 *Science and Technology of the House of Representatives and*
20 *the Committee on Commerce, Science, and Transportation*
21 *of the Senate a report containing a summary of all activi-*
22 *ties carried out under this section.*

23 (l) *MINIMIZING RISK.*—*The Administrator shall pro-*
24 *mulgate regulations and policies to carry out this section*
25 *in accordance with Office of Management and Budget Cir-*

1 *cular No. A-129, entitled “Policies for Federal Credit Pro-*
2 *grams and Non-Tax Receivables”, as in effect on the date*
3 *of enactment of this section.*

4 *(m) DEFINITIONS.—In this section:*

5 *(1) COST.—The term “cost” has the meaning*
6 *given such term under section 502 of the Federal*
7 *Credit Reform Act of 1990 (2 U.S.C. 661a).*

8 *(2) OBLIGATION.—The term “obligation” means*
9 *the loan issued under this section or the loan or other*
10 *debt obligation that is guaranteed under this section.*

11 *(3) PROGRAM.—The term “program” means the*
12 *program established in subsection (a).*

13 ***Subtitle F—General Provisions***

14 ***SEC. 251. USE OF PROGRAM FUNDS.***

15 *For all programs authorized under this title, author-*
16 *ized funds may be obligated only for performance of the pro-*
17 *grams.*

18 ***TITLE III—SCIENCE***

19 ***Subtitle A—Earth Science***

20 ***SEC. 301. EARTH SCIENCE APPLICATIONS.***

21 *The Administrator shall develop guidelines and proce-*
22 *dures for entering into arrangements with State, local, re-*
23 *gional, tribal, and other Federal Government agencies that*
24 *seek to benefit from ongoing NASA technical information,*
25 *capabilities, and support related to Earth science applica-*

1 *tions and decision support systems. The guidelines and pro-*
2 *cedures shall include a definition of the partnership, mile-*
3 *stones, cost-sharing, and project-relevant criteria for the*
4 *project. The guidelines and procedures shall define arrange-*
5 *ments for reimbursement for Government services, as appro-*
6 *priate, including the use of NASA spacecraft and aircraft,*
7 *sensors, equipment, facilities, and associated personnel for*
8 *the purpose of aiding State, local, regional, tribal, and other*
9 *Federal Government needs.*

10 **SEC. 302. ESSENTIAL SPACE-BASED EARTH SCIENCE AND**
11 **CLIMATE MEASUREMENTS.**

12 *The Administrator, in cooperation with the Adminis-*
13 *trator of NOAA and other relevant Federal agencies, shall*
14 *enter into an arrangement with the National Academies for*
15 *a study, to be completed, and transmitted to the Congress*
16 *not later than 18 months after the date of enactment of this*
17 *Act, to provide a prioritized list and definition of essential*
18 *Earth science and climate measurements that should be col-*
19 *lected with space-based means, and maintained and*
20 *archived by the Federal Government on a continuous basis.*
21 *The study shall also identify which measurements could po-*
22 *tentially be obtained through international partnerships,*
23 *from data purchases or other arrangements with private or*
24 *commercial entities, or from other relevant sources.*

1 **SEC. 303. COMMERCIAL REMOTE SENSING DATA PUR-**
2 **CHASES PILOT PROJECT.**

3 (a) *WORKSHOP.*—Not later than 9 months after the
4 date of enactment of this Act, the Administrator shall orga-
5 nize a workshop including relevant commercial remote sens-
6 ing data providers, scientists, and remote sensing data
7 users, among other relevant stakeholders, to identify the es-
8 sential criteria for a pilot project for purchasing commer-
9 cial remote sensing data to support research in Earth
10 science and for applied uses of the data to address State,
11 local, regional, and tribal needs. The workshop shall address
12 lessons learned and recommendations related to past experi-
13 ence with commercial data purchases, including those out-
14 lined in the National Research Council report entitled “To-
15 ward New Partnerships in Remote Sensing: Government,
16 the Private Sector, and Earth Science Research”.

17 (b) *PILOT PROJECT.*—Not later than 18 months after
18 the date of enactment of this Act, after consideration of the
19 results of the workshop under subsection (a) and after ob-
20 taining relevant information from potential commercial re-
21 mote sensing data providers and users of such data, the Ad-
22 ministrator shall establish a pilot project for the provision,
23 through competitive solicitations, of commercial remote
24 sensing data to serve research and applied uses of the data
25 to serve State, local, regional, and tribal needs.

1 **SEC. 304. REPORT ON TEMPERATURE RECORDS.**

2 *Not later than 1 year after the date of enactment of*
3 *this Act, the Administrator shall issue a report to the Con-*
4 *gress detailing the extent and degree to which NASA's tem-*
5 *perature records overlap with the records at the Climatic*
6 *Research Unit at the University of East Anglia, the reasons*
7 *for and sources of that overlap, and the possibility that*
8 *NASA's temperature records have been compromised.*

9 ***Subtitle B—Space Science***

10 **SEC. 311. SUBORBITAL PROGRAMS.**

11 *(a) RESPONSIBLE OFFICIAL.—*

12 *(1) IN GENERAL.—The Administrator shall en-*
13 *sure that an individual who shall report directly to*
14 *the Associate Administrator of the Science Mission*
15 *Directorate is designated to lead NASA's suborbital*
16 *and airborne program.*

17 *(2) RESPONSIBILITIES.—The designated indi-*
18 *vidual shall be responsible for—*

19 *(A) leading near-term and long-term stra-*
20 *tegic planning for the suborbital and airborne*
21 *program;*

22 *(B) ensuring the implementation of stra-*
23 *tegic and other relevant plans;*

24 *(C) integrating NASA's suborbital and air-*
25 *borne programs;*

1 (D) ensuring the productivity of the sub-
2 orbital facilities and assets as necessary to carry
3 out the plans;

4 (E) coordinating NASA's suborbital activi-
5 ties with associated NASA offices and Centers,
6 universities, and other external institutions; and

7 (F) monitoring progress on meeting the
8 strategic objectives for enhanced suborbital and
9 airborne activities, NASA workforce develop-
10 ment, and integration of suborbital activities
11 within NASA's overall plans and priorities.

12 (b) *STRATEGIC PLAN.*—Not later than 1 year after the
13 date of enactment of this Act, the Administrator shall pro-
14 vide to the Congress a strategic plan to support the full and
15 productive use of NASA's suborbital and airborne assets as
16 a foundation for meeting its scientific research, engineering,
17 workforce development, and education goals and objectives
18 across NASA centers and mission directorates and in part-
19 nership with universities and other relevant external insti-
20 tutions. The strategic plan shall—

21 (1) be developed in consultation with relevant
22 NASA offices and Centers and with input from uni-
23 versities, nonprofit research institutions, and private
24 industry;

1 (2) *identify the needs and priorities for using*
2 *NASA's airborne and suborbital assets to support*
3 *NASA's scientific research, engineering, workforce de-*
4 *velopment, and educational goals;*

5 (3) *identify and prioritize the required infra-*
6 *structure investments, including maintenance, up-*
7 *grades, and any enhanced facility or equipment capa-*
8 *bilities, that are required to carry out the needs and*
9 *priorities described in paragraph (2); and*

10 (4) *provide an estimate of the budget require-*
11 *ments and a schedule and timeline for implementing*
12 *the plan.*

13 (c) *TRAINING AND PROFESSIONAL DEVELOPMENT.—*
14 *The Administrator shall, to the extent practicable, expand*
15 *the opportunities within NASA's suborbital programs for*
16 *training science and engineering students and for providing*
17 *professional development for early career professionals.*
18 *Training and development activities shall be expanded con-*
19 *sistent with the goals and objectives of the strategic plan*
20 *to be developed under subsection (b).*

21 **SEC. 312. REVIEW OF EXPLORER PROGRAM.**

22 (a) *ESTABLISHMENT.—Not later than 120 days after*
23 *the date of enactment of this Act, the Administrator shall*
24 *enter into an arrangement with the National Academies to*

1 *conduct a review of the Explorer Program and offer any*
2 *recommendations as it considers necessary.*

3 (b) *SCOPE.*—*Such review shall address at least the fol-*
4 *lowing:*

5 (1) *A review of existing or recent Explorer pro-*
6 *gram elements such as NASA’s University Class Ex-*
7 *plorer (UNEX), Small Explorer (SMEX), Medium*
8 *Class Explorer (MIDEX), Explorers (EX), and Mis-*
9 *sions of Opportunity to assess the degree of—*

10 (A) *innovation in instrumentation, and*
11 *other technology and space mission elements;*

12 (B) *flexibility and new approaches in man-*
13 *agement and collaboration;*

14 (C) *project implementation within the*
15 *planned budget and schedule; and*

16 (D) *training opportunities for space sci-*
17 *entists and engineers.*

18 (2) *The status, capability, and availability of*
19 *launch vehicles and infrastructure to support the Ex-*
20 *plorer program elements.*

21 (3) *Projected launch capabilities and facilities*
22 *for Explorers, including private sector launch capa-*
23 *bilities.*

24 (4) *The frequency of Explorer missions.*

1 (5) *The balance of Explorer missions among*
2 *theme areas and between larger and smaller mission*
3 *sizes.*

4 (6) *The opportunities and challenges for partner*
5 *participation in Explorer missions, including inter-*
6 *national and interagency collaborations.*

7 (7) *The contributions of Explorers to a robust*
8 *space science program, and the value of the Explorer*
9 *Program for the Nation's scientific research and engi-*
10 *neering community, including its impact on training*
11 *of younger researchers and engineers.*

12 (c) *REPORT.—Not later than 16 months after the date*
13 *of enactment of this Act, the Administrator shall transmit*
14 *to the Congress the review and a plan for responding to*
15 *the recommendations of the review.*

16 **SEC. 313. RADIOISOTOPE THERMOELECTRIC GENERATOR**
17 **MATERIAL REQUIREMENTS AND SUPPLY.**

18 (a) *ANALYSIS OF REQUIREMENTS AND RISKS.—The*
19 *Administrator, in consultation with other Federal agencies,*
20 *shall conduct an analysis of NASA requirements for radio-*
21 *isotope power system material which is needed to carry out*
22 *planned, high priority robotic missions in the solar system*
23 *and other surface exploration activities beyond low-Earth*
24 *orbit, as well as the risks to NASA missions in meeting*
25 *those requirements, or any additional requirements, due to*

1 *a lack of adequate domestic production of radioisotope*
2 *power system material. The analysis shall—*

3 *(1) detail NASA's current projected mission re-*
4 *quirements for radioisotope power system material;*

5 *(2) explain the assumptions used to determine*
6 *NASA's requirements for the material, including—*

7 *(A) the planned use of Advanced Stirling*
8 *Radioisotope Generator technology;*

9 *(B) the status of and timeline for com-*
10 *pleting development and demonstration of the*
11 *Advanced Stirling Radioisotope Generator tech-*
12 *nology, including the development of flight readi-*
13 *ness requirements; and*

14 *(C) the risks, implications, and contin-*
15 *gencies for NASA mission plans of any delays or*
16 *unanticipated technical challenges related to the*
17 *anticipated use of Advanced Stirling Radioiso-*
18 *tope Generator technology;*

19 *(3) assess the risk to NASA programs of any po-*
20 *tential delays in achieving the schedule and mile-*
21 *stones for planned domestic production of radioisotope*
22 *power system material;*

23 *(4) outline a process for meeting any additional*
24 *NASA requirements for the material; and*

1 (5) *estimate the incremental costs required to in-*
2 *crease the amount of material produced each year, if*
3 *such an increase is needed to support additional*
4 *NASA requirements for the material.*

5 (b) *TRANSMITTAL.—Not later than 180 days after the*
6 *date of enactment of this Act, the Administrator, in con-*
7 *sultation with other Federal agencies, shall transmit the re-*
8 *sults of the analysis to the Congress.*

9 **TITLE IV—AERONAUTICS**

10 **SEC. 401. ENVIRONMENTALLY FRIENDLY AIRCRAFT RE-** 11 **SEARCH AND DEVELOPMENT INITIATIVE.**

12 *Section 302 of the National Aeronautics and Space*
13 *Administration Authorization Act of 2008 (42 U.S.C.*
14 *17721) is amended—*

15 (1) *by striking “The Administrator” and insert-*
16 *ing the following:*

17 “*(a) IN GENERAL.—The Administrator*”; and

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

19 “*(b) PLAN.—*

20 “*(1) IN GENERAL.—The Administrator shall de-*
21 *velop a plan and associated timetable for this initia-*
22 *tive identifying key milestones, including projected*
23 *flight demonstrations to validate vehicle and tech-*
24 *nology concepts in a relevant environment.*

1 “(2) *SUBMISSION.*—Not later than 270 days
2 *after the date of enactment of the National Aero-*
3 *navitics and Space Administration Authorization Act*
4 *of 2010, the Administrator shall transmit the plan to*
5 *the Congress.”.*

6 **SEC. 402. RESEARCH ON NEXTGEN AIRSPACE MANAGEMENT**

7 **CONCEPTS AND TOOLS.**

8 *The Administrator shall review at least annually the*
9 *alignment and timing of NASA’s research and development*
10 *activities in support of the NextGen airspace management*
11 *modernization initiative and shall make any necessary ad-*
12 *justments by reprioritizing or retargeting NASA’s research*
13 *and development activities in support of the NextGen ini-*
14 *tiative.*

15 **SEC. 403. RESEARCH ON AIRCRAFT CABIN AIR QUALITY.**

16 *The Administrator shall initiate research on aircraft*
17 *cabin air quality that complements research conducted by*
18 *the Federal Aviation Administration and its Center of Ex-*
19 *cellence on Research in the Intermodal Transport Environ-*
20 *ment, including research on innovative aircraft cabin air*
21 *quality sensors operating during ground and flight oper-*
22 *ations and on innovative warning and mitigation tech-*
23 *nologies for poor air quality.*

1 **SEC. 404. RESEARCH ON ON-BOARD VOLCANIC ASH SENSOR**
2 **SYSTEMS.**

3 (a) *IN GENERAL.*—*The Administrator shall conduct a*
4 *study to assess the feasibility of establishing a project fo-*
5 *cused on the development of a low-cost on-board volcanic*
6 *ash sensor system.*

7 (b) *SPECIFICATIONS.*—*The study shall consider, at a*
8 *minimum—*

9 (1) *NASA's unique capabilities;*

10 (2) *opportunities for collaboration, both nation-*
11 *ally and internationally; and*

12 (3) *projected resource requirements, research*
13 *milestones, and potential accomplishments.*

14 **SEC. 405. AERONAUTICS TEST FACILITIES.**

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

17 (1) *NASA must reverse the deteriorating condi-*
18 *tion of its aeronautics ground test facilities and in-*
19 *frastructure, as this condition is hampering the effec-*
20 *tiveness and efficiency of aeronautics research per-*
21 *formed by both NASA and industry participants*
22 *making use of NASA facilities, thus reducing the com-*
23 *petitiveness of the United States aviation industry;*

24 (2) *NASA has a role in providing test capabili-*
25 *ties that are not economically viable as commercial*
26 *entities and thus are not available elsewhere; and*

1 (3) to ensure continued access to reliable and ef-
2 *ficent national-class test capabilities by researchers,*
3 *NASA should seek to establish strategic partnerships*
4 *with other Federal agencies, academic institutions,*
5 *and industry.*

6 (b) *PLAN.*—*The Administrator shall develop a plan to*
7 *stabilize and, where possible, reverse the deterioration of*
8 *NASA’s aeronautics ground test facilities. The Adminis-*
9 *trator shall transmit such plan to the Congress not later*
10 *than 1 year after the date of enactment of this Act.*

11 **SEC. 406. EXPANDED RESEARCH PROGRAM ON COMPOSITE**
12 **MATERIALS USED IN AEROSPACE.**

13 *The Administrator shall expand NASA’s research pro-*
14 *gram on composite materials used in aerospace applica-*
15 *tions to address—*

16 (1) *progressive damage analysis, aging, inspec-*
17 *tion techniques, and new manufacturing and repair*
18 *techniques; and*

19 (2) *ways to mitigate how the environment, oper-*
20 *ating fluids, and mechanical loads interact with com-*
21 *posite materials over time.*

22 **TITLE V—SPACE TECHNOLOGY**

23 **SEC. 501. SPACE TECHNOLOGY PROGRAM.**

24 (a) *ESTABLISHMENT.*—*The Administrator shall estab-*
25 *lish a space technology program to enable research and de-*

1 *velopment on advanced space technologies and systems that*
2 *are independent of specific space mission flight projects. The*
3 *program shall support—*

4 *(1) early-stage concepts and innovation;*

5 *(2) development of innovative technologies in*
6 *areas such as in-space propulsion, power generation*
7 *and storage, liquid rocket propulsion, avionics, struc-*
8 *tures, and materials that may enable new approaches*
9 *to human and robotic space missions;*

10 *(3) flight demonstrations of technologies, includ-*
11 *ing those that have the potential to benefit multiple*
12 *NASA mission directorates, other Federal Government*
13 *agencies, and the commercial space industry; and*

14 *(4) research, development, and demonstration of*
15 *enabling technologies in support of future exploration*
16 *missions.*

17 *(b) PROCEDURE.—In establishing the space technology*
18 *program under this section, the Administrator shall—*

19 *(1) to the maximum extent practicable, use a*
20 *competitive process to select projects to be supported*
21 *as part of the program;*

22 *(2) support the development of an organization*
23 *to investigate innovative concepts for technological*
24 *approaches, systems, architectures, or mission strate-*
25 *gies;*

1 (3) *make use of small satellites and NASA sub-*
2 *orbital platforms, to the extent practicable, to dem-*
3 *onstrate space technology concepts and developments;*
4 *and*

5 (4) *undertake partnerships with other Federal*
6 *agencies, universities, private industry, and other*
7 *spacefaring nations, as appropriate.*

8 (c) *DECADAL SURVEY.*—*The Administrator shall enter*
9 *into an arrangement with the National Academies for a*
10 *decadal survey study to make recommendations for research*
11 *and development priorities for NASA’s space technology*
12 *program over the next decade. Included in the decadal sur-*
13 *vey shall be an identification and prioritization of key tech-*
14 *nology research and development activities needed to enable*
15 *a robust exploration technology program, from basic re-*
16 *search and development through flight demonstrations. The*
17 *Administrator shall transmit the results of the study to the*
18 *Congress not later than 20 months after the date of enact-*
19 *ment of this Act.*

20 **TITLE VI—EDUCATION AND**
21 **OUTREACH**

22 **SEC. 601. STEM EDUCATION AND TRAINING.**

23 (a) *IN GENERAL.*—*In order to create the diverse,*
24 *skilled scientific and technical workforce essential to meet-*
25 *ing the challenges facing NASA and the Nation in the 21st*

1 *century, the Administrator shall develop, conduct, support,*
2 *promote, and coordinate formal and informal educational*
3 *and training activities that leverage NASA's unique content*
4 *expertise and facilities to—*

5 *(1) contribute to improving science, technology,*
6 *engineering and mathematics (STEM) education and*
7 *training at all levels in the United States; and*

8 *(2) enhance awareness and understanding of*
9 *STEM, including space and Earth sciences, aero-*
10 *nautics, and engineering.*

11 *(b) PROGRAMS.—*

12 *(1) IN GENERAL.—The Administrator shall carry*
13 *out evidence-based programs designed to—*

14 *(A) increase student interest and participa-*
15 *tion, including by women, underrepresented mi-*
16 *nority students, and students in rural schools;*

17 *(B) improve public literacy and support;*
18 *and*

19 *(C) improve the teaching and learning of*
20 *space and Earth sciences, aeronautics, engineer-*
21 *ing, and other STEM disciplines supported by*
22 *NASA.*

23 *(2) INCLUDED PROGRAMS.—Programs authorized*
24 *under this subsection may include—*

1 (A) *informal educational programming de-*
2 *signed to excite and inspire students and the*
3 *general public about space and Earth science,*
4 *aeronautics, engineering, and other STEM dis-*
5 *ciplines supported by NASA while strengthening*
6 *their content knowledge in these disciplines;*

7 (B) *teacher training and professional devel-*
8 *opment opportunities for pre-service and in-serv-*
9 *ice elementary and secondary school teachers de-*
10 *signed to increase the content knowledge of teach-*
11 *ers in space and Earth science, aeronautics, en-*
12 *gineering, and other STEM disciplines supported*
13 *by NASA, especially through hands-on research*
14 *and technology experiences;*

15 (C) *research opportunities for secondary*
16 *school students, including internships at NASA*
17 *and its field centers, that provide secondary*
18 *school students with hands-on research and tech-*
19 *nology experiences as well as exposure to working*
20 *scientists and engineers;*

21 (D) *research opportunities at NASA and its*
22 *field centers for undergraduate and graduate stu-*
23 *dents pursuing degrees in space and Earth*
24 *sciences, aeronautics, engineering, and other*
25 *STEM disciplines supported by NASA;*

1 (E) competitive scholarships, fellowships,
2 and traineeships for undergraduate and grad-
3 uate students in space and Earth sciences, aero-
4 nautics, engineering, and other STEM dis-
5 ciplines supported by NASA; and

6 (F) competitive grants for institutions of
7 higher education, with special consideration for
8 minority serving institutions, including 2-year
9 institutions of higher education, to establish or
10 expand degree programs or courses in space and
11 Earth sciences, aeronautics, engineering, and
12 other STEM disciplines supported by NASA.

13 (c) ORGANIZATION OF STEM EDUCATION PRO-
14 GRAMS.—

15 (1) DIRECTOR OF STEM EDUCATION.—The Ad-
16 ministrators shall appoint or designate a Director of
17 STEM Education, who shall have the principal re-
18 sponsibility to oversee and coordinate all NASA pro-
19 grams and activities in support of STEM education
20 and training, including space and Earth sciences,
21 aeronautics, and engineering.

22 (2) QUALIFICATIONS.—The Director shall be an
23 individual who, by reason of professional background
24 and experience, is specially qualified to advise the
25 Administrator on all matters pertaining to STEM

1 *education and training, including space and Earth*
2 *sciences, aeronautics, and engineering, at NASA.*

3 (3) *DUTIES.—The Director shall—*

4 (A) *oversee and coordinate all programs in*
5 *support of STEM education and training, in-*
6 *cluding space and Earth sciences, aeronautics,*
7 *and engineering;*

8 (B) *represent NASA as the principal inter-*
9 *agency liaison for all STEM education and*
10 *training programs, unless otherwise represented*
11 *by the Administrator or the Associate Adminis-*
12 *trator for Education;*

13 (C) *prepare the annual budget and advise*
14 *the Associate Administrator for Education and*
15 *the Administrator on all budgetary issues for*
16 *STEM education and training relative to the*
17 *programs of NASA;*

18 (D) *establish, periodically update, and*
19 *maintain a publicly accessible online inventory*
20 *of STEM education and training programs and*
21 *activities;*

22 (E) *develop, implement, and update the*
23 *STEM education and training strategic plan re-*
24 *quired under subsection (d);*

1 (F) increase, to the maximum extent prac-
2 ticable, the participation and advancement of
3 women and underrepresented minorities at every
4 level of STEM education and training; and

5 (G) perform such other matters relating to
6 STEM education and training as are required
7 by the Administrator or the Associate Adminis-
8 trator for Education.

9 (d) STRATEGIC PLAN.—The Director of STEM Edu-
10 cation shall develop, implement, and update once every 3
11 years a STEM education and training strategic plan for
12 NASA. The plan shall—

13 (1) identify and prioritize annual and long-term
14 STEM education and training goals and objectives
15 for NASA;

16 (2) describe the role of each NASA program or
17 activity in contributing to the goals and objectives
18 identified under paragraph (1);

19 (3) specify the metrics that will be used to assess
20 progress toward achieving those goals and objectives;
21 and

22 (4) describe the approaches that will be taken to
23 assess the effectiveness of each STEM education pro-
24 gram and activity supported by NASA.

1 (e) *OUTREACH TO STUDENTS FROM UNDERREP-*
2 *RESENTED GROUPS.*—*The Administrator shall seek to en-*
3 *sure that program participants include minority and*
4 *underrepresented groups, including students from a high-*
5 *need local education agency as defined in section 2102(3)*
6 *of the Elementary and Secondary Education Act of 1965*
7 *(20 U.S.C. 6602(3)).*

8 (f) *CONSULTATION AND PARTNERSHIP WITH OTHER*
9 *AGENCIES.*—*In carrying out the programs and activities*
10 *authorized under this section, the Administrator shall—*

11 (1) *consult with the Secretary of Education and*
12 *the Director of the National Science Foundation re-*
13 *garding activities designed to improve elementary*
14 *and secondary STEM education and training, and*
15 *recruit minorities that are underrepresented in*
16 *STEM teaching; and*

17 (2) *consult and partner with the Director of the*
18 *National Science Foundation in carrying out pro-*
19 *grams under this section designed to build capacity*
20 *in STEM education and training at the under-*
21 *graduate and graduate level.*

1 **SEC. 602. ASSESSMENT OF IMPEDIMENTS TO SPACE**
2 **SCIENCE AND ENGINEERING WORKFORCE DE-**
3 **VELOPMENT FOR MINORITY AND UNDERREP-**
4 **RESENTED GROUPS AT NASA.**

5 (a) *ASSESSMENT.*—*The Administrator shall enter into*
6 *an arrangement for an independent assessment of any im-*
7 *pediments to space science and engineering workforce devel-*
8 *opment for minority and underrepresented groups at*
9 *NASA, including recommendations on—*

10 (1) *measures to address such impediments;*

11 (2) *opportunities for augmenting the impact of*
12 *space science and engineering workforce development*
13 *activities and for expanding proven, effective pro-*
14 *grams; and*

15 (3) *best practices and lessons learned, as identi-*
16 *fied through the assessment, to help maximize the ef-*
17 *fectiveness of existing and future programs to increase*
18 *the participation of minority and underrepresented*
19 *groups in the space science and engineering workforce*
20 *at NASA.*

21 (b) *REPORT.*—*A report on the assessment carried out*
22 *under subsection (a) shall be transmitted to the Congress*
23 *not later than 15 months after the date of enactment of this*
24 *Act.*

1 (c) *IMPLEMENTATION.*—*To the extent practicable, the*
2 *Administrator shall take all necessary steps to address any*
3 *impediments identified in the assessment.*

4 **SEC. 603. INDEPENDENT REVIEW OF THE NATIONAL SPACE**
5 **GRANT COLLEGE AND FELLOWSHIP PRO-**
6 **GRAM.**

7 (a) *SENSE OF CONGRESS.*—*It is the sense of the Con-*
8 *gress that—*

9 (1) *the National Space Grant College and Fel-*
10 *lowship Program, established in title II of the Na-*
11 *tional Aeronautics and Space Administration Author-*
12 *ization Act of 1988 (42 U.S.C. 2486 et seq.), has been*
13 *an important program through which the Federal*
14 *Government has partnered with State and local gov-*
15 *ernments, universities, private industry, and other or-*
16 *ganizations to enhance the understanding and use of*
17 *space and aeronautics activities and their benefits*
18 *through education, the fostering of interdisciplinary*
19 *and multidisciplinary space research and training,*
20 *and supporting Federal funding for graduate fellow-*
21 *ships in space-related fields; and*

22 (2) *enhancing the National Space Grant College*
23 *and Fellowship Program's effectiveness will support*
24 *the program's maximum contribution to NASA's and*

1 *the Nation’s goals for science, technology, engineering*
2 *and mathematics (STEM) education and training.*

3 *(b) REVIEW.—The Administrator shall enter into an*
4 *arrangement with the National Academies for a review of*
5 *the National Space Grant College and Fellowship Program,*
6 *including its structure and capabilities for supporting*
7 *STEM education and training, and recommendations on*
8 *measures, if needed, to enhance the program’s effectiveness.*

9 *(c) TRANSMITTAL.—The Administrator shall transmit*
10 *the results of the review to the Congress not later than 18*
11 *months after the date of enactment of this Act.*

12 **SEC. 604. HANDS-ON SPACE SCIENCE AND ENGINEERING**
13 **EDUCATION AND TRAINING.**

14 *(a) PILOT PROJECTS.—*

15 *(1) IN GENERAL.—Not later than 180 days after*
16 *the date of enactment of this Act, the Administrator*
17 *shall competitively select pilot projects that test and*
18 *demonstrate new forms of collaborative and hands-on*
19 *education and training projects related to aero-*
20 *nautics, exploration, science, space operations, and*
21 *human spaceflight, that serve to stimulate and engage*
22 *students in science and engineering, and that foster*
23 *skills including engineering, teamwork, project man-*
24 *agement, and problem solving. In particular, the pilot*
25 *projects shall emphasize engineering and technology-*

1 *related education and training. The pilot projects*
2 *shall include a breadth of activities that range in*
3 *scope and complexity and shall also test and dem-*
4 *onstrate selection, evaluation, mentoring, and related*
5 *tools and services required to support the projects. The*
6 *program shall be directed at serving undergraduates.*
7 *The Administrator may include broader participation*
8 *from pre-collegiate and graduate students, as appro-*
9 *priate. To the extent practicable, the initiative shall*
10 *also be accessible to NASA's young science, technical,*
11 *and project management professionals.*

12 *(2) PROJECTS.—Pursuant to subsection (b), the*
13 *pilot projects shall be carried out through competitive*
14 *solicitations. The duration of a project awarded under*
15 *the pilot program shall be no more than 4 years. The*
16 *pilot projects program shall—*

17 *(A) include a range of projects of varying*
18 *scope and complexity;*

19 *(B) provide participants with experience in*
20 *areas such as—*

21 *(i) formulating, planning, designing,*
22 *developing, testing and integrating, and op-*
23 *erating mission or flight hardware;*

24 *(ii) systems engineering;*

1 (iii) analyzing data from a mission or
2 investigation; and

3 (iv) documentation, reporting, and re-
4 views;

5 (C) include defined and measurable objec-
6 tives;

7 (D) provide mentoring for participants;

8 (E) provide for evaluation of the project
9 and documentation of the outcomes of the project
10 and its contribution to education and training;
11 and

12 (F) encourage outreach to and partnerships
13 with universities, Federal agencies, private enti-
14 ties, and other institutions involved in student
15 collaborations and hands-on training and edu-
16 cation, including organizations that focus on en-
17 gaging young girls in science and engineering
18 hands-on education and training activities.

19 (3) *EMPHASIS ON PARTICIPATION OF INDIVID-*
20 *UALS FROM UNDERREPRESENTED MINORITY POPU-*
21 *LATIONS.—The Administrator shall make it an em-*
22 *phasis of the pilot projects to seek the involvement of*
23 *participants from underserved and underrepresented*
24 *minority populations.*

1 (4) *FLIGHT OPPORTUNITIES AND ACCESS TO*
2 *SPACE.*—*The Administrator shall ensure, to the extent*
3 *practicable, the availability and accessibility of plat-*
4 *forms for flying and launching into space student’s*
5 *collaborative and hands-on projects.*

6 (5) *FORUM FOR PARTICIPANT PRESENTATIONS.*—
7 *The Administrator shall organize a forum for stu-*
8 *dents and other participants in the pilot projects to*
9 *discuss and present their work, at an appropriate*
10 *stage of the project, and to engage with other students*
11 *and young professionals involved in ongoing collabo-*
12 *rative and hands-on training activities related to*
13 *space science and engineering, aeronautics, space ex-*
14 *ploration, and human spaceflight.*

15 (6) *WORKSHOP.*—*The Administrator shall orga-*
16 *nize a workshop or workshops involving the competi-*
17 *tively-selected pilot project teams for the purposes of*
18 *collecting information on the results of the pilot*
19 *projects (including on selection, evaluation tools, and*
20 *mentoring services) and identifying lessons learned*
21 *and best practices for NASA-supported collaborative*
22 *and hands-on education and training projects.*

23 (7) *REPORT AND STRATEGY.*—*Not later than 3*
24 *years after the date of enactment of this Act, the Ad-*
25 *ministrator shall transmit to the Committee on*

1 *Science and Technology of the House of Representa-*
2 *tives and the Committee on Commerce, Science, and*
3 *Transportation of the Senate a report—*

4 *(A) on the outcomes of existing student col-*
5 *laborative and hands-on projects such as those*
6 *being conducted as part of NASA's science pro-*
7 *grams;*

8 *(B) on the results of the pilot projects; and*

9 *(C) on best practices of NASA's student col-*
10 *laborations and hands-on education and train-*
11 *ing activities.*

12 *The report shall define decision criteria, a strategy,*
13 *and a process for extending successful projects or*
14 *transitioning them into an ongoing, competitive pro-*
15 *gram.*

16 *(b) INFORMATION EXCHANGE.—The Administrator*
17 *shall support mission directorates sponsoring student col-*
18 *laborative and hands-on education and training projects in*
19 *exchanging information, sharing knowledge, and leveraging*
20 *activities, as appropriate.*

21 *(c) AUTHORIZATION OF APPROPRIATIONS.—There are*
22 *authorized to be appropriated to the Administrator such*
23 *sums as may be necessary for fiscal years 2011, 2012, 2013,*
24 *and 2014 to carry out this section, to remain available until*
25 *expended.*

1 **TITLE VII—INSTITUTIONAL**
2 **CAPABILITIES REVITALIZATION**

3 **SEC. 701. INSTITUTIONAL MANAGEMENT.**

4 (a) *MODERNIZATION OF LABORATORIES, FACILITIES,*
5 *AND EQUIPMENT.—*

6 (1) *STRATEGY.—*

7 (A) *IN GENERAL.—The Administrator shall*
8 *develop a strategy for the maintenance, repair,*
9 *upgrading, and modernization of NASA’s lab-*
10 *oratories, facilities, and equipment.*

11 (B) *CRITERIA.—The strategy shall include*
12 *criteria for prioritizing deferred maintenance*
13 *tasks and also for upgrading or modernizing lab-*
14 *oratories, facilities, and equipment.*

15 (C) *OTHER CONSIDERATIONS.—The strategy*
16 *shall also include an assessment of modifications*
17 *needed to maximize usage of facilities that offer*
18 *unique and highly specialized benefits to the*
19 *aerospace industry and the American public.*

20 (2) *PLAN.—The Administrator shall develop a*
21 *plan for implementing the strategy in paragraph (1),*
22 *including a timeline, milestones, and an estimate of*
23 *resources required for carrying out the plan.*

24 (3) *TRANSMITTAL TO CONGRESS.—The Adminis-*
25 *trator shall transmit to the Congress the strategy*

1 *under paragraph (1) and the plan under paragraph*
2 *(2) not later than 180 days after the date of enact-*
3 *ment of this Act.*

4 *(b) ESTABLISHMENT OF CAPITAL FUND.—*

5 *(1) IN GENERAL.—The Administrator shall es-*
6 *tablish a capital fund at each of NASA’s field centers*
7 *for the modernization of facilities and laboratories.*

8 *(2) SOURCE OF FUNDING.— The Administrator*
9 *shall ensure to the maximum extent practicable that*
10 *all financial savings achieved by closing outdated or*
11 *surplus facilities at a NASA field center shall be*
12 *made available to that center’s capital fund for the*
13 *purpose of modernizing the field center’s facilities and*
14 *laboratories and for upgrading the infrastructure at*
15 *the field center.*

16 **SEC. 702. JAMES E. WEBB COOPERATIVE EDUCATION DIS-**
17 **TINGUISHED SCHOLAR PROGRAM.**

18 *(a) ESTABLISHMENT.—The Administrator is author-*
19 *ized to establish a national cooperative education program*
20 *to complement existing NASA Center-administered coopera-*
21 *tive education initiatives.*

22 *(b) APPLICATION PROCESS.—The Administrator shall*
23 *encourage and seek applications from the pool of American*
24 *students pursuing science, technology, engineering, or math-*

1 *ematics degrees who wish to gain working experience in*
2 *NASA.*

3 *(c) SELECTION.—From the applications, the Adminis-*
4 *trator shall select 10 finalists annually as James E. Webb*
5 *Cooperative Education Distinguished Scholars.*

6 *(d) AWARD.—The James E. Webb Cooperative Edu-*
7 *cation Distinguished Scholars shall be provided with—*

8 *(1) learning experiences that will enhance their*
9 *understanding of activities conducted in the various*
10 *NASA Centers in furtherance of NASA’s missions and*
11 *priorities;*

12 *(2) exposure to NASA headquarters functions*
13 *and activities; and*

14 *(3) stipends for living expenses.*

15 **TITLE VIII—ACQUISITION**

16 **MANAGEMENT**

17 **SEC. 801. PROHIBITION ON EXPENDITURE OF FUNDS WHEN**
18 **30 PERCENT THRESHOLD IS EXCEEDED.**

19 *Section 103(e) of the National Aeronautics and Space*
20 *Administration Authorization of 2005 (42 U.S.C. 16613(e))*
21 *is amended by striking “beginning 18 months after the date*
22 *the Administrator transmits a report under subsection*
23 *(d)(1)” and inserting “beginning 18 months after the Ad-*
24 *ministrator makes such determination”.*

1 **SEC. 802. PROJECT AND PROGRAM RESERVES.**

2 *To ensure that the establishment, maintenance, and al-*
3 *lotment of project and program reserves contribute to pru-*
4 *dent management, not later than 180 days after the date*
5 *of enactment of this Act, the Administrator shall transmit*
6 *to the Congress a report describing NASA's criteria for es-*
7 *tablishing the amount of reserves at the project and pro-*
8 *gram levels and how such criteria complement NASA's pol-*
9 *icy of budgeting at a 70 percent confidence level.*

10 **SEC. 803. INDEPENDENT REVIEWS.**

11 *Not later than 270 days after the date of enactment*
12 *of this Act, the Administrator shall transmit to the Congress*
13 *a report describing NASA's procedures for conducting inde-*
14 *pendent reviews of projects and programs at lifecycle mile-*
15 *stones and how NASA ensures the independence of the indi-*
16 *viduals who conduct those reviews prior to their assign-*
17 *ment.*

18 **SEC. 804. AVOIDING ORGANIZATIONAL CONFLICTS OF IN-**
19 **TEREST IN MAJOR NASA ACQUISITION PRO-**
20 **GRAMS.**

21 *(a) REVISED REGULATIONS REQUIRED.—Not later*
22 *than 270 days after the date of enactment of this Act, the*
23 *Administrator shall revise the NASA Supplement to the*
24 *Federal Acquisition Regulation to provide uniform guid-*
25 *ance and tighten existing requirements for preventing orga-*

1 *nizational conflicts of interest by contractors in major ac-*
2 *quisition programs.*

3 (b) *ELEMENTS.*—*The revised regulations required by*
4 *subsection (a) shall, at a minimum—*

5 (1) *address organizational conflicts of interest*
6 *that could potentially arise as a result of—*

7 (A) *lead system integrator contracts on*
8 *major acquisition programs and contracts that*
9 *follow lead system integrator contracts on such*
10 *programs, particularly contracts for production;*

11 (B) *the ownership of business units per-*
12 *forming systems engineering and technical as-*
13 *sistance functions, professional services, or man-*
14 *agement support services in relation to major ac-*
15 *quisition programs by contractors who simulta-*
16 *neously own business units competing to perform*
17 *as either the prime contractor or the supplier of*
18 *a major subsystem or component for such pro-*
19 *grams;*

20 (C) *the award of major subsystem contracts*
21 *by a prime contractor for a major acquisition*
22 *program to business units or other affiliates of*
23 *the same parent corporate entity, and particu-*
24 *larly the award of subcontracts for software inte-*

1 *gration or the development of a proprietary soft-*
2 *ware system architecture; or*

3 *(D) the performance by, or assistance of,*
4 *contractors in technical evaluations on major ac-*
5 *quisition programs;*

6 *(2) ensure that NASA receives advice, when ap-*
7 *propriate, on systems architecture and systems engi-*
8 *neering matters with respect to major acquisition pro-*
9 *grams from federally funded research and develop-*
10 *ment centers or other sources independent of the*
11 *prime contractor;*

12 *(3) require that a contract for the performance*
13 *of systems engineering and technical assistance func-*
14 *tions for a major acquisition program contains a pro-*
15 *vision prohibiting the contractor or any affiliate of*
16 *the contractor from participating as a prime con-*
17 *tractor or a major subcontractor in the development*
18 *of a system under the program; and*

19 *(4) establish such limited exceptions to the re-*
20 *quirement in paragraphs (2) and (3) as may be nec-*
21 *essary to ensure that NASA has continued access to*
22 *advice on systems architecture and systems engineer-*
23 *ing matters from highly qualified contractors with do-*
24 *main experience and expertise, while ensuring that*

1 *such advice comes from sources that are objective and*
2 *unbiased.*

3 **SEC. 805. REPORT TO CONGRESS.**

4 *The Administrator shall transmit to the Congress, not*
5 *later than April 30 of each year, an estimate of the total*
6 *termination liability as of the end of the second fiscal quar-*
7 *ter for all NASA contracts with a total value in excess of*
8 *\$200,000,000.*

9 **TITLE IX—OTHER PROVISIONS**

10 **SEC. 901. CLOUD COMPUTING.**

11 (a) *DEFINITION.*—*As defined by the National Institute*
12 *of Standards and Technology, for purposes of this section,*
13 *the term “cloud computing” means a model for enabling*
14 *convenient, on-demand network access to a shared pool of*
15 *configurable computing resources that can be rapidly*
16 *provisioned with minimal management effort or service*
17 *provider interaction.*

18 (b) *REPORT.*—*Not later than 1 year after NASA has*
19 *entered into a contract for its first use of a non-Federal*
20 *cloud computing facility, the Comptroller General shall*
21 *transmit to the Congress a report detailing whether sen-*
22 *sitive but unclassified and classified NASA information*
23 *was processed on that facility and if so, how NASA ensured*
24 *that data access and security requirements were in place*
25 *to safeguard NASA’s scientific and technical information.*

1 **SEC. 902. REVIEW OF PRACTICES TO DETECT AND PREVENT**
2 **THE USE OF COUNTERFEIT PARTS.**

3 *Not later than 1 year after the date of enactment of*
4 *this Act, the Comptroller General shall transmit to the Con-*
5 *gress a review of NASA's processes and controls to detect*
6 *and prevent the use of counterfeit parts in NASA mission*
7 *projects and related assets. The review shall examine—*

8 *(1) the trends in known and identified counter-*
9 *feit parts in NASA's supply chain;*

10 *(2) NASA's processes and controls to detect coun-*
11 *terfeit parts and prevent their incorporation into*
12 *NASA mission projects, instruments, and other mis-*
13 *sion-related assets; and*

14 *(3) any gaps in NASA's controls and processes*
15 *for detecting counterfeit parts and preventing their*
16 *incorporation into NASA missions and related assets.*

17 **SEC. 903. PRESERVATION AND MANAGEMENT OF LUNAR**
18 **SITES.**

19 *(a) INTERNATIONAL DIALOGUE.—The Director of*
20 *OSTP, in cooperation with the Administrator, other rel-*
21 *evant Federal agencies, commercial entities, and inter-*
22 *national bodies, shall enter into a dialogue to identify the*
23 *questions and research needed to understand—*

24 *(1) the potential adverse impacts of various uses*
25 *of the Moon on scientific research activities;*

1 (2) *the potential adverse impacts of such uses on*
2 *lunar areas of historical, cultural, or scientific value;*
3 *and*

4 (3) *how to prevent or mitigate such impacts.*

5 (b) *GRANTS PROGRAM.—The Administrator, in co-*
6 *operation with other relevant Federal agencies and stake-*
7 *holders, shall establish a grants program to conduct re-*
8 *search for the purpose of identifying and characterizing po-*
9 *tential impacts related to lunar activities and describing*
10 *potential means for managing and mitigating the impacts.*

11 (c) *INTERNATIONAL FRAMEWORK.—As a result of the*
12 *dialogue under subsection (a), the Director of OSTP shall*
13 *initiate an effort to establish an international framework*
14 *for identifying, protecting, and preserving lunar areas de-*
15 *termined to be of significant historical, cultural, or sci-*
16 *entific value.*

17 (d) *REPORT.—The Director of OSTP shall provide a*
18 *report on the results of the international dialogue under*
19 *subsection (a) and the establishment of an international*
20 *framework under subsection (c), to be transmitted to the*
21 *Congress not later than 2 years after the date of enactment*
22 *of this Act.*

1 **SEC. 904. CONTINUITY OF MODERATE RESOLUTION LAND**
2 **IMAGING REMOTE SENSING DATA.**

3 (a) *REAFFIRMATION OF POLICY.*—The Congress reaffirms the finding in section 2(1) of the Land Remote Sensing Policy Act of 1992 (15 U.S.C. 5601(1)) which states that “The continuous collection and utilization of land remote sensing data from space are of major benefit in studying and understanding human impacts on the global environment, in managing the Earth’s natural resources, in carrying out national security functions, and in planning and conducting many other activities of scientific, economic, and social importance.”.

13 (b) *CONTINUOUS LAND REMOTE SENSING DATA COLLECTION.*—The Director of OSTP shall take steps in consultation with other relevant Federal agencies to ensure, to the maximum extent practicable, the continuous collection of space-based medium-resolution observations of the Earth’s land cover and to ensure that the data are made available in such ways as to facilitate the widest possible use.

21 **SEC. 905. SPACE WEATHER.**

22 (a) *STRATEGY AND IMPLEMENTATION PLAN.*—The Director of OSTP, in coordination with the Administrator and with other relevant Federal agencies, space weather coordinating bodies, industry, academia, and other stakeholders, shall prepare a long-term strategy for a sustainable

1 *space weather program and develop a plan to implement*
2 *the strategy. The implementation plan shall—*

3 *(1) define individual agency responsibilities for*
4 *carrying out the strategy;*

5 *(2) identify the milestones and schedule required*
6 *for each agency's contributions;*

7 *(3) provide an estimate of the resources required*
8 *for each agency to carry out its responsibilities;*

9 *(4) establish a process for coordinating agency*
10 *responsibilities, programs, and budgets required for*
11 *implementing the plan; and*

12 *(5) identify opportunities for private sector and*
13 *international contributions to implementing the plan.*

14 *(b) STUDY ON PREDICTION.—The Director of OSTP*
15 *shall enter into an arrangement with the National Acad-*
16 *emies to assess the status of capabilities for space weather*
17 *prediction and recommend the highest priority basic re-*
18 *search, infrastructure, and operational needs required to*
19 *improve the Nation's ability to predict space weather*
20 *events. The study should also address the benefits of space*
21 *weather prediction. The Director shall transmit the results*
22 *of the study to the Congress not later than 18 months after*
23 *the date of enactment of this Act.*

1 **SEC. 906. USE OF OPERATIONAL COMMERCIAL SUBORBITAL**
2 **VEHICLES FOR RESEARCH, DEVELOPMENT,**
3 **AND EDUCATION.**

4 (a) *PLAN.*—*The Administrator shall prepare a plan*
5 *describing the processes required to support the use of com-*
6 *mercial reusable suborbital flight vehicles for carrying out*
7 *competitively selected scientific and engineering investiga-*
8 *tions and educational activities. The plan shall—*

9 (1) *describe NASA, space flight operator, and*
10 *supporting contractor responsibilities for developing*
11 *standard payload interfaces and conducting payload*
12 *safety analyses, payload integration and processing,*
13 *payload operations, and safety assurance for NASA-*
14 *sponsored space flight participants, among other func-*
15 *tions required to fly NASA-sponsored payloads and*
16 *space flight participants on commercial suborbital ve-*
17 *hicles;*

18 (2) *identify NASA-provided hardware, software,*
19 *or services that may be provided to space flight opera-*
20 *tors on a cost-reimbursable basis, through agreements*
21 *entered into under section 203(c)(5) of the National*
22 *Aeronautics and Space Act of 1958 (42 U.S.C.*
23 *2473(c)(5)), or on a contractual basis; and*

24 (3) *describe the United States Government and*
25 *space flight operator responsibilities for liability and*
26 *indemnification with respect to commercial suborbital*

1 *vehicle flights that involve NASA-sponsored payloads*
2 *or activities, NASA-supported space flight partici-*
3 *pants, or other NASA-related contributions.*

4 *(b) COMMERCIAL REUSABLE SUBORBITAL CAPABILI-*
5 *TIES AND RISKS.—The Administrator shall assess and*
6 *characterize the potential capabilities and performance of*
7 *commercial reusable suborbital vehicles for addressing sci-*
8 *entific research, including research requiring access to low*
9 *gravity and microgravity environments, for carrying out*
10 *technology demonstrations related to science, exploration, or*
11 *space operations requirements, and for providing opportu-*
12 *nities for educating and training space scientists and engi-*
13 *neers, once those vehicles become operational. The assess-*
14 *ment shall also characterize the risks of using potential*
15 *commercial reusable suborbital flights to NASA-sponsored*
16 *researchers, investigators, and scientific investigations and*
17 *flight hardware. The Administrator shall make a deter-*
18 *mination on the need to enter into arrangements with com-*
19 *mercial reusable suborbital service providers for flights or*
20 *flight services to acquire analytical data to inform the as-*
21 *essment.*

22 *(c) TRANSMITTAL.—The plan and assessment described*
23 *in subsections (a) and (b) shall be transmitted to the Con-*
24 *gress not later than 1 year after the date of enactment of*
25 *this Act.*

1 (d) *IN GENERAL.*—*The report of the National Acad-*
2 *emy of Sciences entitled “Revitalizing NASA’s Suborbital*
3 *Program: Advancing Science, Driving Innovation and De-*
4 *veloping Workforce” found that suborbital science missions*
5 *were critical to building an aerospace workforce capable of*
6 *meeting the needs of current and future human and robotic*
7 *space exploration.*

8 (e) *MANAGEMENT.*—*The Administrator shall designate*
9 *an officer or employee of the Space Technology Program*
10 *to act as the responsible official for the Commercial Reus-*
11 *able Suborbital Research Program in the Space Technology*
12 *Program. The designee shall be responsible for the develop-*
13 *ment of short-term and long-term strategic plans related to*
14 *the use of commercial reusable suborbital vehicles to support*
15 *NASA’s requirements for competitively-selected science,*
16 *technology demonstration, and educational activities.*

17 (f) *ESTABLISHMENT.*—*The Administrator shall estab-*
18 *lish a Commercial Reusable Suborbital Research Program*
19 *within the Space Technology Program that shall fund the*
20 *development of competitively selected payloads for scientific*
21 *research, technology development, and education, and shall*
22 *provide flight opportunities for those payloads to micro-*
23 *gravity environments and suborbital altitudes that meet the*
24 *requirements of such investigations. The Commercial Reus-*
25 *able Suborbital Research Program may fund engineering*

1 *and integration demonstrations, proofs of concept, or ex-*
2 *periments for commercial reusable vehicle flights, once the*
3 *vehicles have met the requirements consistent with sub-*
4 *section (h). The program shall coordinate with NASA's Mis-*
5 *sion Directorates to help achieve NASA's research, tech-*
6 *nology, and education goals.*

7 (g) *REPORT.—The Administrator shall submit a re-*
8 *port annually to the Congress describing progress in car-*
9 *rying out the Commercial Reusable Suborbital Research*
10 *program, including the number and type of suborbital mis-*
11 *sions planned in each fiscal year. The plan and assessment*
12 *described in subsections (a) and (b) shall be transmitted*
13 *to the Congress not later than 1 year after the date of enact-*
14 *ment of this Act, before the transmittal of which the Admin-*
15 *istrator shall not be constrained in the execution of this sec-*
16 *tion.*

17 (h) *INDEMNIFICATION AND LIABILITY.—The Adminis-*
18 *trator shall not proceed with a request for proposals, award*
19 *any contract, commit any United States Government funds,*
20 *or enter into any other agreement for the provision of a*
21 *commercial reusable suborbital vehicle launch service of a*
22 *NASA-sponsored payload or spaceflight participant until*
23 *all indemnification and liability issues associated with the*
24 *use of such systems by the United States Government shall*
25 *have been addressed and the Administrator has provided*

1 *to the Congress a report describing the indemnification and*
2 *liability provisions that are planned to be included in such*
3 *contracts or agreements.*

4 **SEC. 907. STUDY ON EXPORT CONTROL MATTERS RELATED**
5 **TO UNITED STATES ASTRONAUT SAFETY AND**
6 **NASA MISSION OPERATIONS.**

7 (a) *ESTABLISHMENT.*—*The Director of OSTP, in con-*
8 *sultation with the Administrator and other relevant Federal*
9 *agencies, shall conduct a study to examine the need for a*
10 *process for granting real-time, limited waivers to export*
11 *control license restrictions or regulations that are necessary*
12 *for United States Government entities and contractors to*
13 *enter into technical discussions and to share technical data*
14 *with foreign government entities and contractors to resolve*
15 *anomalies that may—*

16 (1) *threaten the safety of United States astro-*
17 *nauts aboard cooperative crewed spacecraft such as*
18 *the ISS; or*

19 (2) *impair the operations of international civil*
20 *research and other spacecraft that involve the na-*
21 *tional interests of the United States.*

22 (b) *TRANSMITTAL.*—*The results of the study shall be*
23 *transmitted to the Congress not later than 1 year after the*
24 *date of enactment of this Act.*

1 **SEC. 908. AMENDMENT TO THE NATIONAL AERONAUTICS**
2 **AND SPACE ACT OF 1958.**

3 *Section 202 of the National Aeronautics and Space Act*
4 *of 1958 (42 U.S.C. 2472) is amended by adding at the end*
5 *the following new subsection:*

6 *“(d) The Administrator and the Deputy Administrator*
7 *may be retired commissioned military personnel.”.*

8 **SEC. 909. NEAR-EARTH OBJECTS.**

9 *(a) RESPONSIBLE OFFICIAL.—The Administrator*
10 *shall designate a responsible official for coordinating*
11 *NASA’s near-Earth object observation activities and*
12 *NASA’s interactions with other Federal agencies and inter-*
13 *national entities on near-Earth object surveys, defense, and*
14 *efforts related to addressing any threats to the United States*
15 *posed by near-Earth objects. The responsible official shall*
16 *report directly to the Administrator.*

17 *(b) REAFFIRMATION OF POLICY ON NEAR-EARTH OB-*
18 *JECT SURVEY.—The Congress reaffirms the direction set*
19 *forth in section 321(d)(1) of the National Aeronautics and*
20 *Space Administration Authorization Act of 2005 (42 U.S.C.*
21 *16691(d)(1)) that directed the Administrator “to plan, de-*
22 *velop, and implement a Near-Earth Object Survey program*
23 *to detect, track, catalogue, and characterize the physical*
24 *characteristics of near-Earth objects equal to or greater than*
25 *140 meters in diameter in order to assess the threat of such*
26 *near-Earth objects to the Earth”.*

1 (c) *REAFFIRMATION OF POLICY WITH RESPECT TO*
2 *THREATS POSED BY NEAR-EARTH OBJECTS.*—*The Con-*
3 *gress reaffirms the direction set forth in section 804 of the*
4 *National Aeronautics and Space Administration Author-*
5 *ization Act of 2008 (42 U.S.C. 17794) that directed the Di-*
6 *rector of OSTP by October 15, 2010, to—*

7 (1) *develop a policy for notifying Federal agen-*
8 *cies and relevant emergency response institutions of*
9 *an impending near-Earth object threat, if near-term*
10 *public safety is at risk; and*

11 (2) *recommend a Federal agency or agencies to*
12 *be responsible for—*

13 (A) *protecting the United States from a*
14 *near-Earth object that is expected to collide with*
15 *Earth; and*

16 (B) *implementing a deflection campaign, in*
17 *consultation with international bodies, should*
18 *one be necessary.*

19 (d) *ARECIBO OBSERVATORY.*—*Congress reiterates its*
20 *support for the use of the Arecibo Observatory for NASA-*
21 *funded near-Earth object-related activities. The Adminis-*
22 *trator shall coordinate with the Director of the National*
23 *Science Foundation to ensure the availability of the Arecibo*
24 *Observatory’s planetary radar to support these activities.*

1 (e) *PLAN.*—Not later than 270 days after the date of
2 enactment of this Act, the Administrator shall transmit to
3 the Congress a plan for carrying out the direction re-
4 affirmed by subsection (b).

5 (f) *AUTHORIZATION OF APPROPRIATIONS.*—From the
6 funds authorized for Planetary Science in title I,
7 \$1,000,000 in fiscal year 2012 and \$1,000,000 in fiscal
8 year 2013 shall be for supporting competitively awarded
9 grants for investigation of innovative approaches to car-
10 rying out the congressionally mandated survey of near-
11 Earth objects equal to or greater than 140 meters in diame-
12 ter.

13 **SEC. 910. SENSE OF CONGRESS.**

14 It is the sense of Congress that NASA shall endeavor
15 to carry out, to the extent feasible and technologically pos-
16 sible, the top recommendation from the decadal survey in
17 each mission area.

18 **SEC. 911. ETHICS PROGRAMS IN THE OFFICE OF GENERAL**
19 **COUNSEL.**

20 (a) *REAFFIRMATION OF RESPONSIBILITIES OF COUN-*
21 *SEL.*—The legal staff of the Office of General Counsel of
22 NASA is reminded that as Government attorneys they have
23 a special obligation to instruct NASA staff to comply with
24 applicable Federal law and regulations.

1 **(b) BIENNIAL ETHICS TRAINING FOR COUNSEL.**—All
2 *NASA counsel shall be required to receive ethics training*
3 *in the legal obligations of Government attorneys on a bien-*
4 *nial basis.*

5 **(c) CERTIFICATION OF TRAINING.**—*Certification of*
6 *participation in such a program shall be included in each*
7 *counsel's personnel record.*

8 **(d) DESIGNATED ETHICS OFFICER.**—*The General*
9 *Counsel of NASA may not serve as NASA's designated eth-*
10 *ics officer.*