I

110TH CONGRESS
2D SESSION

H. R. 6063

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

IN THE HOUSE OF REPRESENTATIVES

MAY 15, 2008

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

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A BILL

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

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

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the ''National Aeronautics and Space Administration Authorization Act of 2008''.

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

SEC. 2. FINDINGS.

The Congress finds, on this, the 50th anniversary of the establishment of the National Aeronautics and Space Administration, the following:

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

(2) Investment in NASA's programs will promote innovation through research and development, and will improve the competitiveness of the United States.

(3) Investment in NASA's programs, like investments in other Federal science and technology activities, is an investment in our future.

(4) Properly structured, NASA's activities can contribute to an improved quality of life, economic vitality, United States leadership in peaceful cooperation with other nations on challenging undertakings in science and technology, national security, and the advancement of knowledge.

(5) NASA should assume a leadership role in a cooperative international Earth observations and research effort to address key research issues associated with climate change and its impacts on the Earth system.

(6) NASA should undertake a program of aeronautical research, development, and where appro-

priate demonstration activities with the overarching goals of—

(A) ensuring that the Nation's future air transportation system can handle up to 3 times the current travel demand and incorporate new vehicle types with no degradation in safety or adverse environmental impact on local communities;

(B) protecting the environment;

(C) promoting the security of the Nation; and

(D) retaining the leadership of the United States in global aviation.

(7) Human and robotic exploration of the solar system will be a significant long term undertaking of humanity in the 21st century and beyond, and it is in the national interest that the United States should assume a leadership role in a cooperative international exploration initiative.

(8) Developing United States human space flight capabilities to allow independent American access to the International Space Station, and to explore beyond low Earth orbit, is a strategically important national imperative, and all prudent steps should thus be taken to bring the Orion Crew Explo-

ration Vehicle and Ares I Crew Launch Vehicle to full operational capability as soon as practicable.

(9) NASA's scientific research activities have contributed much to the advancement of knowledge, provided societal benefits, and helped train the next generation of scientists and engineers, and those activities should continue to be an important priority.

(10) NASA should make a sustained commitment to a robust long-term technology development activity. Such investments represent the critically important ''seed corn'' on which NASA's ability to carry out challenging and productive missions in the future will depend.

(11) NASA, through its pursuit of challenging and relevant activities, can provide an important stimulus to the next generation to pursue careers in science, technology, engineering, and mathematics.

(12) Commercial activities have substantially contributed to the strength of both the United States space program and the national economy, and the development of a healthy and robust United States commercial space sector should continue to be encouraged.

(13) It is in the national interest for the United States to have an export control policy that protects

the national security while also enabling the United States aerospace industry to compete effectively in the global market place and the United States to undertake cooperative programs in science and human space flight in an effective and efficient manner.

SEC. 3. DEFINITIONS.

In this Act:

(1) ADMINISTRATOR.—The term ''Administrator'' means the Administrator of NASA.

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

(3) NOAA.—The term ''NOAA'' means the National Oceanic and Atmospheric Administration.

(4) OSTP.—The term ''OSTP'' means the Office of Science and Technology Policy.

TITLE I—AUTHORIZATION OF APPROPRIATIONS FOR FISCAL YEAR 2009

SEC. 101. FISCAL YEAR 2009.

(a) BASELINE AUTHORIZATION.—There are authorized to be appropriated to NASA for fiscal year 2009 $19,210,000,000, as follows:

(1) For Science, $4,932,200,000, of which—

(A) $1,518,000,000 shall be for Earth Science, including $29,200,000 for Suborbital

activities and $2,500,000 for carrying out section 313 of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155);

(B) $1,483,000,000 shall be for Planetary Science, including $486,500,000 for the Mars Exploration program, $2,000,000 to continue planetary radar operations at the Arecibo Observatory in support of the Near-Earth Object program, and $5,000,000 for radioisotope material production, to remain available until expended;

(C) $1,290,400,000 shall be for Astrophysics, including $27,300,000 for Suborbital activities;

(D) $640,800,000 shall be for Heliophysics, including $50,000,000 for Suborbital activities; and

(E) $75,000,000 shall be for Cross-Science Mission Directorate Technology Development, to be taken on a proportional basis from the funding subtotals under subparagraphs (A), (B), (C), and (D).

(2) For Aeronautics, $853,400,000, of which $406,900,000 shall be for system-level research, development, and demonstration activities related to—

(A) aviation safety;

(B) environmental impact mitigation, including noise, energy efficiency, and emissions;

(C) support of the Next Generation Air Transportation System initiative; and

(D) investigation of new vehicle concepts and flight regimes.

(3) For Exploration, $3,886,000,000, of which $100,000,000 shall be for the activities under sections 902(b) and 902(d); and $737,800,000 shall be for Advanced Capabilities, including $106,300,000 for the Lunar Precursor Robotic Program, $276,500,000 for International Space Station-related research and development activities, and $355,000,000 for research and development activities not related to the International Space Station.

(4) For Education, $128,300,000.

(5) For Space Operations, $6,074,700,000, of which—

(A) $150,000,000 shall be for an additional Space Shuttle flight to deliver the Alpha

Magnetic Spectrometer to the International Space Station;

(B) $100,000,000 shall be to augment funding for International Space Station Cargo Services to enhance research utilization of the International Space Station, to remain available until expended; and

(C) $50,000,000 shall be to augment funding for Space Operations Mission Directorate reserves and Shuttle Transition and Retirement activities.

(6) For Cross-Agency Support Programs, $3,299,900,000.

(7) For Inspector General, $35,500,000.

(b) ADDITIONAL AUTHORIZATION TO ADDRESS HUMAN SPACE FLIGHT GAP.—In addition to the sums authorized by subsection (a), there are authorized to be appropriated for the purposes described in subsection (a)(3) $1,000,000,000 for fiscal year 2009, to be used to accelerate the initial operational capability of the Orion Crew Exploration Vehicle and the Ares I Crew Launch Vehicle and associated ground support systems, to remain available until expended.

TITLE II—EARTH SCIENCE

SEC. 201. GOAL.

The goal for NASA's Earth Science program shall be to pursue a program of Earth observations, research, and applications activities to better understand the Earth, how it supports life, and how human activities affect its ability to do so in the future. In pursuit of this goal, NASA's Earth Science program shall ensure that securing practical benefits for society will be an important measure of its success in addition to securing new knowledge about the Earth system and climate change. In further pursuit of this goal, NASA shall assume a leadership role in developing and carrying out a cooperative international Earth observations-based research and applications program.

SEC. 202. GOVERNANCE OF UNITED STATES EARTH OBSERVATIONS ACTIVITIES.

(a) STUDY.—The Director of the OSTP shall enter into an arrangement with the National Academies for a study to determine the most appropriate governance structure for United States Earth Observations programs in order to meet evolving United States Earth information needs and facilitate United States participation in global Earth Observations initiatives.

(b) REPORT.—The Director shall transmit the study to the Committee on Science and Technology of the House

of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 18 months after the date of enactment of this Act, and shall provide OSTP's plan for implementing the study's recommendations not later than 24 months after the date of enactment of this Act.

SEC. 203. DECADAL SURVEY MISSIONS.

(a) IN GENERAL.—The missions recommended in the National Academies' decadal survey ''Earth Science and Applications from Space'' provide the basis for a compelling and relevant program of research and applications, and the Administrator should work to establish an international cooperative effort to pursue those missions.

(b) PLAN.—The Administrator shall prepare a plan for submission to Congress not later than 270 days after the date of enactment of this Act that shall describe how NASA intends to implement the missions recommended as described in subsection (a), whether by means of dedicated NASA missions, multi-agency missions, international cooperative missions, data sharing, or commercial data buys, or by means of long-term technology development to determine whether specific missions would be executable at a reasonable cost and within a reasonable schedule.

SEC. 204. TRANSITIONING EXPERIMENTAL RESEARCH INTO OPERATIONAL SERVICES.

(a) SENSE OF CONGRESS.—It is the sense of the Congress that experimental NASA sensors and missions that have the potential to benefit society if transitioned into operational monitoring systems be transitioned into operational status whenever possible.

(b) INTERAGENCY PROCESS.—The Director of OSTP, in consultation with the Administrator and the Administrator of NOAA, shall develop a process for Federal agencies to transition, when appropriate, NASA Earth science and space weather missions or sensors into operational status. The process shall include coordination of annual agency budget requests as required to execute the transitions.

(c) RESPONSIBLE AGENCY OFFICIAL.—The Administrator and the Administrator of NOAA shall each designate an agency official who shall have the responsibility for and authority to lead NASA's and NOAA's transition activities and interagency coordination.

(d) PLAN.—For each mission or sensor that is determined to be appropriate for transition under subsection (b), NASA and NOAA shall transmit to Congress a joint plan for conducting the transition. The plan shall include the strategy, milestones, and budget required to execute the transition. The transition plan shall be transmitted to

Congress not later than 60 days after the successful completion of the mission or sensor critical design review.

SEC. 205. LANDSAT THERMAL INFRARED DATA CONTINUITY.

(a) PLAN.—In view of the importance of Landsat thermal infrared data for both scientific research and water management applications, the Administrator shall prepare a plan for ensuring the continuity of Landsat thermal infrared data or its equivalent, including allocation of costs and responsibility for the collection and distribution of the data, and a budget plan. As part of the plan, the Administrator shall provide an option for developing a thermal infrared sensor at minimum cost to be flown on the Landsat Data Continuity Mission with minimum delay to the schedule of the Landsat Data Continuity Mission.

(b) DEADLINE.—The plan shall be provided to Congress not later than 60 days after the date of enactment of this Act.

SEC. 206. REAUTHORIZATION OF GLORY MISSION.

(a) REAUTHORIZATION.—Congress reauthorizes NASA to continue with development of the Glory Mission, which will examine how aerosols and solar energy affect the Earth's climate.

(b) BASELINE REPORT.—Pursuant to the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155), not later than 90 days after the date of enactment of this Act, the Administrator shall transmit a new baseline report consistent with section 103(b)(2) of such Act. The report shall include an analysis of the factors contributing to cost growth and the steps taken to address them.

SEC. 207. PLAN FOR DISPOSITION OF DEEP SPACE CLIMATE OBSERVATORY.

(a) PLAN.—NASA shall develop a plan for the Deep Space Climate Observatory (DSCOVR), including such options as using the parts of the spacecraft in the development and assembly of other science missions, transferring the spacecraft to another agency, reconfiguring the spacecraft for another Earth science mission, establishing a public-private partnership for the mission, and entering into an international cooperative partnership to use the spacecraft for its primary or other purposes. The plan shall include an estimate of budgetary resources and schedules required to implement each of the options.

(b) CONSULTATION.—NASA shall consult, as necessary, with other Federal agencies, industry, academic institutions, and international space agencies in developing the plan.

(c) REPORT.—The Administrator shall transmit the plan required under subsection (a) to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 180 days after the date of enactment of this Act.

TITLE III—AERONAUTICS

SEC. 301. ENVIRONMENTALLY FRIENDLY AIRCRAFT RESEARCH AND DEVELOPMENT INITIATIVE.

The Administrator shall establish an initiative of research, development, and demonstration, in a relevant environment, of technologies to enable the following commercial aircraft performance characteristics:

(1) Noise levels on takeoff and on airport approach and landing that do not exceed ambient noise levels in the absence of flight operations in the vicinity of airports from which such commercial aircraft would normally operate, without increasing energy consumption or nitrogen oxide emissions compared to aircraft in commercial service as of the date of enactment of this Act.

(2) Significant reductions in greenhouse gas emissions compared to aircraft in commercial services as of the date of enactment of this Act.

SEC. 302. RESEARCH ALIGNMENT.

In addition to pursuing the research and development initiative described in section 301, the Administrator shall, to the maximum extent practicable within available funding, align the fundamental aeronautics research program to address high priority technology challenges of the National Academies' Decadal Survey of Civil Aeronautics.

SEC. 303. RESEARCH PROGRAM TO DETERMINE PERCEIVED IMPACT OF SONIC BOOMS.

(a) IN GENERAL.—The ability to fly commercial aircraft over land at supersonic speeds without adverse impacts on the environment or on local communities would open new markets and enable new transportation capabilities. In order to have the basis for establishing an appropriate sonic boom standard for such flight operations, a research program is needed to assess the impact in a relevant environment of commercial supersonic flight operations.

(b) ESTABLISHMENT.—The Administrator shall establish a cooperative research program with industry, including the conduct of flight demonstrations in a relevant environment, to collect data on the perceived impact of sonic booms that would enable the promulgation of a standard that would have to be met for overland commercial supersonic flight operations.

SEC. 304. EXTERNAL REVIEW OF NASA'S AVIATION SAFETY-RELATED RESEARCH PROGRAMS.

(a) REVIEW.—The Administrator shall enter into an arrangement with the National Research Council for an independent review of NASA's aviation safety-related research programs. The review shall assess whether—

(1) the programs have well-defined, prioritized, and appropriate research objectives;

(2) the programs are properly coordinated with the safety research programs of the Federal Aviation Administration and other relevant Federal agencies;

(3) the programs have allocated appropriate resources to each of the research objectives; and

(4) suitable mechanisms exist for transitioning the research results from the programs into operational technologies and procedures and certification activities in a timely manner.

(b) REPORT.—Not later than 14 months after the date of enactment of this Act, the Administrator shall submit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a report on the results of the review.

SEC. 305. INTERAGENCY RESEARCH INITIATIVE ON THE IMPACT OF AVIATION ON THE CLIMATE.

(a) IN GENERAL.—The Administrator, in coordination with the United States Climate Change Science Program and other appropriate agencies, shall establish a research initiative to assess the impact of aviation on the climate and, if warranted, to evaluate approaches to mitigate that impact.

(b) RESEARCH PLAN.—Not later than 1 year after the date of enactment of this Act, the participating Federal entities shall jointly develop a plan for the research initiative that contains objectives, proposed tasks, milestones, and a 5-year budgetary profile.

(c) REVIEW.—The Administrator shall enter into an arrangement with the National Research Council for conducting an independent review of the interagency research program plan, and shall provide the results of that review to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 2 years after the date of enactment of this Act.

SEC. 306. RESEARCH PROGRAM ON DESIGN FOR CERTIFICATION.

(a) PROGRAM.—Not later than 6 months after the date of enactment of this Act, NASA, in consultation with other appropriate agencies, shall establish a research pro-

gram on methods to improve both confidence in and the timeliness of certification of new technologies for their introduction into the national airspace system.

(b) RESEARCH PLAN.—Not later than 1 year after the date of enactment of this Act, as part of the activity described in subsection (a), NASA shall develop a plan for the research program that contains objectives, proposed tasks, milestones, and a 5-year budgetary profile.

(c) REVIEW.—The Administrator shall enter into an arrangement with the National Research Council for conducting an independent review of the research program plan, and shall provide the results of that review to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 2 years after the date of enactment of this Act.

SEC. 307. AVIATION WEATHER RESEARCH.

The Administrator shall establish a program of collaborative research with NOAA on convective weather events, with the goal of significantly improving the reliability of 2-hour to 6-hour aviation weather forecasts.

SEC. 308. JOINT AERONAUTICS RESEARCH AND DEVELOPMENT ADVISORY COMMITTEE.

(a) ESTABLISHMENT.—A joint Aeronautics Research and Development Advisory Committee (in this section re-

ferred to as the ''Advisory Committee'') shall be established.

(b) DUTIES.—The Advisory Committee shall—

(1) assess, and make recommendations regarding, the coordination of research and development activities of NASA and the Federal Aviation Administration;

(2) assess, and make recommendations regarding, the status of the activities of NASA and the Federal Aviation Administration's research and development programs as they relate to the recommendations contained in the National Research Council's 2006 report entitled ''Decadal Survey of Civil Aeronautics'', and the recommendations contained in subsequent National Research Council reports of a similar nature; and

(3) not later than March 15 of each year, transmit a report to the Administrator, the Administrator of the Federal Aviation Administration, the Committee on Science and Technology of the House of Representatives, and the Committee on Commerce, Science, and Transportation of the Senate on the Advisory Committee's findings and recommendations under paragraphs (1) and (2).

(c) MEMBERSHIP.—The Advisory Committee shall consist of 10 members, none of whom shall be a Federal employee, including—

(1) 5 members selected by the Administrator; and

(2) 5 members selected by the Chair of the Federal Aviation Administration's Research, Engineering, and Development Advisory Committee (REDAC).

(d) SELECTION PROCESS.—Initial selections under subsection (c) shall be made within 3 months after the date of enactment of this Act. Vacancies shall be filled in the same manner as provided in subsection (c).

(e) CHAIRPERSON.—The Advisory Committee shall select a chairperson from among its members.

(f) COORDINATION.—The Advisory Committee shall coordinate with the advisory bodies of other Federal agencies, which may engage in related research activities.

(g) COMPENSATION.—The members of the Advisory Committee shall serve without compensation, but shall receive travel expenses, including per diem in lieu of subsistence, in accordance with sections 5702 and 5703 of title 5, United States Code.

(h) MEETINGS.—The Advisory Committee shall convene, in person or by electronic means, at least 4 times per year.

(i) QUORUM.—A majority of the members serving on the Advisory Committee shall constitute a quorum for purposes of conducting the business of the Advisory Committee.

(j) DURATION.—Section 14 of the Federal Advisory Committee Act shall not apply to the Advisory Committee.

SEC. 309. FUNDING FOR RESEARCH AND DEVELOPMENT ACTIVITIES IN SUPPORT OF OTHER MISSION DIRECTORATES.

Research and development activities performed by the Aeronautics Research Mission Directorate with the primary objective of assisting in the development of a flight project in another Mission Directorate shall be funded by the Mission Directorate seeking assistance.

SEC. 310. UNIVERSITY-BASED CENTERS FOR RESEARCH ON AVIATION TRAINING.

Section 427(a) of the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155) is amended by striking ''may'' and inserting ''shall''.

TITLE IV—INTERNATIONAL EXPLORATION INITIATIVE

SEC. 401. SENSE OF CONGRESS.

It is the sense of Congress that the President of the United States should invite America's friends and allies to participate in a long-term international initiative under the leadership of the United States to expand human and robotic presence into the solar system, including the exploration and utilization of the Moon, near Earth asteroids, Lagrangian points, and eventually Mars and its moons, among other exploration and utilization goals.

SEC. 402. STEPPING STONE APPROACH TO EXPLORATION.

In order to maximize the cost-effectiveness of the long-term exploration and utilization activities of the United States, the Administrator shall take all necessary steps to ensure that activities in its lunar exploration program shall be designed and implemented in a manner that gives strong consideration to how those activities might also help meet the requirements of future exploration and utilization activities beyond the Moon. The timetable of the lunar phase of the long-term international exploration initiative shall be determined by the availability of funding and agreement on an international cooperative framework for the conduct of the international exploration initiative. However, once an exploration-related project enters its de-

velopment phase, the Administrator shall seek, to the maximum extent practicable, to complete that project without undue delays.

SEC. 403. LUNAR OUTPOST.

(a) ESTABLISHMENT.—As NASA works toward the establishment of a lunar outpost, NASA shall make no plans that would require a lunar outpost to be occupied to maintain its viability. Any such outpost shall be operable as a human-tended facility capable of remote or autonomous operation for extended periods.

(b) DESIGNATION.—The United States portion of the first human-tended outpost established on the surface of the Moon shall be designated the ''Neil A. Armstrong Lunar Outpost''.

(c) CONGRESSIONAL INTENT.—It is the intent of Congress that NASA shall make use of commercial services to the maximum extent practicable in support of its lunar outpost activities.

SEC. 404. EXPLORATION TECHNOLOGY DEVELOPMENT.

(a) IN GENERAL.—A robust program of long-term exploration-related technology research and development will be essential for the success and sustainability of any enduring initiative of human and robotic exploration of the solar system.

(b) ESTABLISHMENT.—The Administrator shall establish and maintain a program of long-term exploration-related technology research and development that is not tied to specific flight projects and that has a funding goal of at least 10 percent of the total budget of the Exploration Systems Mission Directorate.

(c) GOALS.—The long-term technology program shall have the goal of having at least 50 percent of the funding allocated to external grants and contracts with universities, research institutions, and industry.

SEC. 405. EXPLORATION RISK MITIGATION PLAN.

(a) PLAN.—The Administrator shall prepare a plan that identifies and prioritizes the scientific and technical risks that will need to be addressed in carrying out human exploration beyond low Earth orbit and the research and development activities required to address those risks. The plan shall address the role of the International Space Station in exploration risk mitigation and include a detailed description of the specific steps being taken to utilize the International Space Station for that purpose.

(b) REPORT.—The Administrator shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate the plan de-

scribed in subsection (a) not later than one year after the date of enactment of this Act.

SEC. 406. EXPLORATION CREW RESCUE.

In order to maximize the ability to rescue astronauts whose space vehicles have become disabled, the Administrator shall enter into discussions with the appropriate representatives of spacefaring nations who have or plan to have crew transportation systems capable of orbital flight or flight beyond low Earth orbit for the purpose of agreeing on a common docking system standard.

SEC. 407. PARTICIPATORY EXPLORATION.

(a) IN GENERAL.—The Administrator shall develop a technology plan to enable dissemination of information to the public to allow the public to experience missions to the Moon, Mars, or other bodies within our solar system by leveraging advanced exploration technologies. The plan shall identify opportunities to leverage technologies in NASA's Constellation systems that deliver a rich, multimedia experience to the public, and that facilitate participation by the public, the private sector, and international partners. Technologies for collecting high-definition video, 3-dimensional images, and scientific data, along with the means to rapidly deliver this content through extended high bandwidth communications networks shall be considered as part of this plan. It shall include a review of high

bandwidth radio and laser communications, high-definition video, stereo imagery, 3-dimensional scene cameras, and Internet routers in space, from orbit, and on the lunar surface. The plan shall also consider secondary cargo capability for technology validation and science mission opportunities. In addition, the plan shall identify opportunities to develop and demonstrate these technologies on the International Space Station and robotic missions to the Moon.

(b) REPORT.—Not later than 270 days after the date of enactment of this Act, the Administrator shall submit the plan to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate.

SEC. 408. SCIENCE AND EXPLORATION.

It is the sense of Congress that NASA's scientific and human exploration activities are synergistic, i.e. science enables exploration and human exploration enables science. The Congress encourages the Administrator to coordinate, where practical, NASA's science and exploration activities with the goal of maximizing the success of human exploration initiatives and furthering our understanding of the Universe that we explore.

TITLE V—SPACE SCIENCE

SEC. 501. TECHNOLOGY DEVELOPMENT.

The Administrator shall establish a cross-Directorate long-term technology development program for space and Earth science within the Science Mission Directorate for the development of new technology. The program shall be independent of the flight projects under development. NASA shall have a goal of funding the cross-Directorate technology development program at a level of 5 percent of the total Science Mission Directorate annual budget. The program shall be structured to include competitively awarded grants and contracts.

SEC. 502. PROVISION FOR FUTURE SERVICING OF OBSERVATORY-CLASS SCIENTIFIC SPACECRAFT.

The Administrator shall take all necessary steps to ensure that provision is made in the design and construction of all future observatory-class scientific spacecraft intended to be deployed in Earth orbit or at a Lagrangian point in space for robotic or human servicing and repair.

SEC. 503. MARS EXPLORATION.

Congress reaffirms its support for a systematic, integrated program of exploration of the Martian surface to examine the planet whose surface is most like Earth's, to search for evidence of past or present life, and to examine

Mars for future habitability and as a long-term goal for future human exploration.

SEC. 504. IMPORTANCE OF A BALANCED SCIENCE PROGRAM.

It is the sense of Congress that a balanced and adequately funded set of activities, consisting of NASA's research and analysis grants programs, technology development, small, medium-sized, and large space science missions, and suborbital research activities, contributes to a robust and productive science program and serves as a catalyst for innovation. It is further the sense of Congress that suborbital flight activities, including the use of sounding rockets, aircraft, and high-altitude balloons, offer valuable opportunities to advance science, train the next generation of scientists and engineers, and provide opportunities for participants in the programs to acquire skills in systems engineering and systems integration that are critical to maintaining the Nation's leadership in space programs. The Congress believes that it is in the national interest to expand the size of NASA's suborbital research program.

SEC. 505. RESTORATION OF RADIOISOTOPE THERMOELECTRIC GENERATOR MATERIAL PRODUCTION.

(a) PLAN.—The Director of OSTP shall develop a plan for restarting and sustaining the domestic production of radioisotope thermoelectric generator material for deep space and other space science missions.

(b) REPORT.—The plan developed under subsection (a) shall be transmitted to Congress not later than 270 days after the date of enactment of this Act.

SEC. 506. ASSESSMENT OF IMPEDIMENTS TO INTERAGENCY COOPERATION ON SPACE AND EARTH SCIENCE MISSIONS.

(a) ASSESSMENT.—The Administrator shall enter into an arrangement with the National Academies to assess impediments to the successful conduct of interagency cooperation on space and Earth science missions, to provide lessons learned and best practices, and to recommend steps to help facilitate successful interagency collaborations on space and Earth science missions.

(b) REPORT.—The report of the assessment carried out under subsection (a) shall be transmitted to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 15 months after the date of enactment of this Act.

SEC. 507. ASSESSMENT OF COST GROWTH.

(a) STUDY.—The Administrator shall enter into an arrangement for an independent external assessment to identify the primary causes of cost growth in the large, medium-sized, and small space and Earth science spacecraft mission classes, and make recommendations as to what changes, if any, should be made to contain costs and ensure frequent mission opportunities in NASA's science spacecraft mission programs.

(b) REPORT.—The report of the assessment conducted under subsection (a) shall be submitted to Congress not later than 15 months after the date of enactment of this Act.

TITLE VI—SPACE OPERATIONS

Subtitle A—International Space Station

SEC. 601. UTILIZATION.

The Administrator shall take all necessary steps to ensure that the International Space Station remains a viable and productive facility capable of potential United States utilization through at least 2020 and shall take no steps that would preclude its continued operation and utilization by the United States after 2016.

SEC. 602. RESEARCH MANAGEMENT PLAN.

(a) RESEARCH MANAGEMENT PLAN.—The Administrator shall develop a research management plan for the

International Space Station. The plan shall include a process for selecting and prioritizing research activities (including fundamental, applied, commercial, and other research) for flight on the International Space Station. This plan shall be used to prioritize resources such as crew time, racks and equipment, and United States access to international research facilities and equipment. The plan shall also identify the organization to be responsible for managing United States research on the International Space Station, including a description of the relationship of the management institution with NASA (e.g., internal NASA office, contract, cooperative agreement, or grant), the estimated length of time for the arrangement, and the budget required to support the management institution. The plan shall be developed in consultation with other Federal agencies, academia, industry, and other relevant stakeholders. The plan shall be transmitted to Congress not later than 12 months after the date of enactment of this Act.

(b) ACCESS TO NATIONAL LABORATORY.—The Administrator shall—

(1) establish a process by which to support International Space Station National Laboratory users in identifying their requirements for transportation of research supplies to and from the Inter-

national Space Station, and for communicating those requirements to NASA and International Space Station transportation services providers; and

(2) develop an estimate of the transportation requirements needed to support users of the International Space Station National Laboratory and develop a plan for satisfying those requirements by dedicating a portion of volume on NASA supply missions to the International Space Station and missions returning from the International Space Station to Earth.

(c) ASSESSMENT.—The Administrator shall—

(1) identify existing research equipment and racks and support equipment that are manifested for flight; and

(2) provide a detailed description of the status of research equipment and facilities that were completed or in development prior to being cancelled, and provide the budget and milestones for completing and preparing the equipment for flight on the International Space Station.

(d) ADVISORY COMMITTEE.—Not later than 1 year after the date of enactment of this Act, the Administrator shall establish an advisory panel under the Federal Advisory Committee Act to monitor the activities and manage-

ment of the International Space Station National Laboratory.

SEC. 603. CONTINGENCY PLAN FOR CARGO RESUPPLY.

(a) IN GENERAL.—The International Space Station represents a significant investment of national resources, and it is a facility that embodies a cooperative international approach to the exploration and utilization of space. As such, it is important that its continued viability and productivity be ensured, to the maximum extent possible, after the Space Shuttle is retired.

(b) CONTINGENCY PLAN.—The Administrator shall develop a contingency plan and arrangements, including use of International Space Station international partner cargo resupply capabilities, to ensure the continued viability and productivity of the International Space Station in the event that United States commercial cargo resupply services are not available during any extended period after the date that the Space Shuttle is retired. The plan shall be delivered to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than one year after the date of enactment of this Act.

Subtitle B—Space Shuttle

SEC. 611. FLIGHT MANIFEST.

(a) BASELINE MANIFEST.—In addition to the Space Shuttle flights listed as part of the baseline flight manifest as of January 1, 2008, the Utilization flights ULF–4 and ULF–5 shall be considered part of the Space Shuttle baseline flight manifest and shall be flown prior to the retirement of the Space Shuttle.

(b) ADDITIONAL FLIGHT TO DELIVER THE ALPHA MAGNETIC SPECTROMETER TO THE INTERNATIONAL SPACE STATION.—In addition to the flying of the baseline manifest as described in subsection (a), the Administrator shall take all necessary steps to fly one additional Space Shuttle flight to deliver the Alpha Magnetic Spectrometer to the International Space Station prior to the retirement of the Space Shuttle.

(c) SPACE SHUTTLE RETIREMENT DATE.—The Space Shuttle shall be retired following the completion of the baseline flight manifest and the flight of the additional flight specified in subsection (b), events that are anticipated to occur in 2010.

SEC. 612. DISPOSITION OF SHUTTLE-RELATED ASSETS.

Not later than 90 days after the date of enactment of this Act, the Administrator shall provide a plan to Congress for the disposition of the remaining Space Shuttle

orbiters and other Space Shuttle program-related hardware and facilities after the retirement of the Space Shuttle fleet. The plan shall include a process by which educational institutions and science museums and other appropriate organizations may acquire, through loan or disposal by the Federal Government, Space Shuttle program-related hardware. The Administrator shall not dispose of any Space Shuttle-related hardware prior to the completion of the plan.

SEC. 613. SPACE SHUTTLE TRANSITION LIAISON OFFICE.

(a) ESTABLISHMENT.—The Administrator shall establish an office within NASA's Office of Human Capital Management that shall assist local communities affected by the termination of the Space Shuttle program. The office shall offer technical assistance and serve as a clearinghouse to assist communities in identifying services available from other Federal agencies.

(b) SUNSET.—The Office established under subsection (a) shall cease operations 24 months after the last Space Shuttle flight.

Subtitle C—Launch Services

SEC. 621. LAUNCH SERVICES STRATEGY.

(a) IN GENERAL.—In preparation for the award of contracts to follow up on the current NASA Launch Services (NLS) contracts, the Administrator shall develop a

strategy for providing domestic commercial launch services in support of NASA's small and medium-sized Science, Space Operations, and Exploration missions, consistent with current law and policy.

(b) REPORT.—The Administrator shall transmit a report to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate describing the strategy developed under subsection (a) not later than 90 days after the date of enactment of this Act. The report shall provide, at a minimum—

(1) the results of the Request for Information on small to medium-sized launch services released on April 22, 2008;

(2) an analysis of possible alternatives to maintain small and medium-sized lift capabilities after June 30, 2010, including the use of the Department of Defense's Evolved Expendable Launch Vehicle (EELV);

(3) the recommended alternatives, and associated 5-year budget plans starting in October 2010 that would enable their implementation; and

(4) a contingency plan in the event the recommended alternatives described in paragraph (3) are not available when needed.

TITLE VII—EDUCATION

SEC. 701. RESPONSE TO REVIEW.

(a) PLAN.—The Administrator shall prepare a plan identifying actions taken or planned in response to the recommendations of the National Academies report, ''NASA's Elementary and Secondary Education Program: Review and Critique''. For those actions that have not been implemented, the plan shall include a schedule and budget required to support the actions.

(b) REPORT.—The plan prepared under subsection (a) shall be transmitted to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 1 year after the date of enactment of this Act.

SEC. 702. EXTERNAL REVIEW OF EXPLORER SCHOOLS PROGRAM.

(a) REVIEW.—The Administrator shall make arrangements for an independent external review of the Explorer Schools program to evaluate its goals, status, plans, and accomplishments.

(b) REPORT.—The report of the independent external review shall be transmitted to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of

the Senate not later than 1 year after the date of enactment of this Act.

TITLE VIII—NEAR-EARTH OBJECTS

SEC. 801. IN GENERAL.

The Congress reaffirms the policy direction established in the National Aeronautics and Space Administration Authorization Act of 2005 (Public Law 109–155) for NASA to detect, track, catalogue, and characterize the physical characteristics of near-Earth objects equal to or greater than 140 meters in diameter. NASA's Near-Earth Object program activities will also provide benefits to NASA's scientific and exploration activities.

SEC. 802. FINDINGS.

Congress makes the following findings:

(1) Near-Earth objects pose a serious and credible threat to humankind, as many scientists believe that a major asteroid or comet was responsible for the mass extinction of the majority of the Earth's species, including the dinosaurs, nearly 65,000,000 years ago.

(2) Several such near-Earth objects have only been discovered within days of the objects' closest approach to Earth and recent discoveries of such

large objects indicate that many large near-Earth objects remain undiscovered.

(3) Asteroid and comet collisions rank as one of the most costly natural disasters that can occur.

(4) The time needed to eliminate or mitigate the threat of a collision of a potentially hazardous near-Earth object with Earth is measured in decades.

(5) Unlike earthquakes and hurricanes, asteroids and comets can provide adequate collision information, enabling the United States to include both asteroid-collision and comet-collision disaster recovery and disaster avoidance in its public-safety structure.

(6) Basic information is needed for technical and policy decisionmaking for the United States to create a comprehensive program in order to be ready to eliminate and mitigate the serious and credible threats to humankind posed by potentially hazardous near-Earth asteroids and comets.

(7) As a first step to eliminate and to mitigate the risk of such collisions, situation and decision analysis processes, as well as procedures and system resources, must be in place well before a collision threat becomes known.

SEC. 803. REQUESTS FOR INFORMATION.

The Administrator shall issue requests for information on—

(1) a low-cost space mission with the purpose of rendezvousing with and characterizing the Apophis asteroid, which scientists estimate will in 2029 pass at a distance from Earth that is closer than geostationary satellites; and

(2) a medium-sized space mission with the purpose of detecting near-Earth objects equal to or greater than 140 meters in diameter.

SEC. 804. ESTABLISHMENT OF POLICY.

The Director of OSTP shall—

(1) develop a policy for notifying Federal agencies and relevant emergency response institutions of an impending near-Earth object threat, if near term public safety is at stake; and

(2) recommend a Federal agency or agencies to be responsible for protecting the Nation from a near-Earth object that is anticipated to collide with Earth and implementing a deflection campaign, in consultation with international bodies, should one be required.

SEC. 805. PLANETARY RADAR CAPABILITY.

The Administrator shall maintain a planetary radar that is, at minimum, comparable to the capability provided

through the NASA Deep Space Network Goldstone facility.

SEC. 806. ARECIBO OBSERVATORY.

Congress reiterates its support for the use of the Arecibo Observatory for NASA-funded near-Earth object-related activities. The Administrator shall ensure the availability of the Arecibo Observatory's planetary radar to support these activities until the National Academies' review of NASA's approach for the survey and deflection of near-Earth objects, including a determination of the role of Arecibo, that was directed to be undertaken by the Fiscal Year 2008 Omnibus Appropriations Act, is completed.

TITLE IX—COMMERCIAL INITIATIVES

SEC. 901. SENSE OF CONGRESS.

It is the sense of Congress that a healthy and robust commercial sector can make significant contributions to the successful conduct of NASA's space exploration program. While some activities are inherently governmental in nature, there are many other activities, such as routine supply of water, fuel, and other consumables to low Earth orbit or to destinations beyond low Earth orbit, and provision of power or communications services to lunar outposts, that potentially could be carried out effectively and

efficiently by the commercial sector at some point in the future. Congress encourages NASA to look for such service opportunities and, to the maximum extent practicable, make use of the commercial sector to provide those services.

SEC. 902. COMMERCIAL CREW INITIATIVE.

(a) IN GENERAL.—In order to stimulate commercial use of space, help maximize the utility and productivity of the International Space Station, and enable a commercial means of providing crew transfer and crew rescue services for the International Space Station, NASA shall—

(1) make use of United States commercially provided International Space Station crew transfer and crew rescue services to the maximum extent practicable, if those commercial services have demonstrated the capability to meet NASA-specified ascent, entry, and International Space Station proximity operations safety requirements;

(2) limit, to the maximum extent practicable, the use of the Crew Exploration Vehicle to missions carrying astronauts beyond low Earth orbit once commercial crew transfer and crew rescue services that meet safety requirements become operational;

(3) facilitate, to the maximum extent practicable, the transfer of NASA-developed technologies to potential United States commercial crew transfer and rescue service providers, consistent with United States law; and

(4) issue a notice of intent, not later than 180 days after the date of enactment of this Act, to enter into a funded, competitively awarded Space Act Agreement with two or more commercial entities for a Phase 1 Commercial Orbital Transportation Services (COTS) crewed vehicle demonstration program.

(b) COTS AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to NASA for the program described in subsection (a)(4) $50,000,000 for fiscal year 2009, to remain available until expended.

(c) CONGRESSIONAL INTENT.—It is the intent of Congress that funding for the program described in subsection (a)(4) shall not come at the expense of full funding for Orion Crew Exploration Vehicle development, Ares I Crew Launch Vehicle development, or International Space Station cargo delivery.

(d) ADDITIONAL TECHNOLOGIES AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to NASA for the provision of International Space

Station-compatible docking adaptors and other relevant technologies to be made available to the commercial crew providers selected to service the International Space Station $50,000,000, to remain available until expended.

(e) CREW TRANSFER AND CREW RESCUE SERVICES CONTRACT.—If a commercial provider demonstrates the capability to provide International Space Station crew transfer and crew rescue services and to satisfy NASA ascent, entry, and International Space Station proximity operations safety requirements, NASA shall enter into an International Space Station crew transfer and crew rescue services contract with that commercial provider for a portion of NASA's anticipated International Space Station crew transfer and crew rescue requirements from the time the commercial provider commences operations under contract with NASA through calendar year 2016, with an option to extend the period of performance through calendar year 2020.

TITLE X—REVITALIZATION OF NASA INSTITUTIONAL CAPABILITIES

SEC. 1001. REVIEW OF INFORMATION SECURITY CONTROLS.

(a) REPORT ON CONTROLS.—Not later than one year after the date of enactment of this Act, the Comptroller General shall transmit to the Committee on Science and

Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a review of information security controls that protect NASA's information technology resources and information from inadvertent or deliberate misuse, fraudulent use, disclosure, modification, or destruction. The review shall focus on networks servicing NASA's mission directorates. In assessing these controls, the review shall evaluate—

(1) the network's ability to limit, detect, and monitor access to resources and information, thereby safeguarding and protecting them from unauthorized access;

(2) the physical access to network resources; and

(3) the extent to which sensitive research and mission data is encrypted.

(b) RESTRICTED REPORT ON INTRUSIONS.—Not later than one year after the date of enactment of this Act, and in conjunction with the report described in subsection (a), the Comptroller General shall transmit to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate a restricted report detailing results of vulnerability assessments con-

ducted by the Government Accountability Office on NASA's network resources. Intrusion attempts during such vulnerability assessments shall be divulged to NASA senior management prior to their application. The report shall put vulnerability assessment results in the context of unauthorized accesses or attempts during the prior two years and the corrective actions, recent or ongoing, that NASA has implemented in conjunction with other Federal authorities to prevent such intrusions.

SEC. 1002. MAINTENANCE AND UPGRADE OF CENTER FACILITIES.

(a) IN GENERAL.—In order to sustain healthy Centers that are capable of carrying out NASA's missions, the Administrator shall ensure that adequate maintenance and upgrading of those Center facilities is performed on a regular basis.

(b) REVIEW.—The Administrator shall determine and prioritize the maintenance and upgrade backlog at each of NASA's Centers and associated facilities, and shall develop a strategy and budget plan to reduce that maintenance and upgrade backlog by 50 percent over the next five years.

(c) REPORT.—The Administrator shall deliver a report to Congress on the results of the activities undertaken

in subsection (b) concurrently with the delivery of the fiscal year 2011 budget request.

SEC. 1003. ASSESSMENT OF NASA LABORATORY CAPABILITIES.

(a) IN GENERAL.—NASA's laboratories are a critical component of NASA's research capabilities, and the Administrator shall ensure that those laboratories remain productive.

(b) REVIEW.—The Administrator shall enter into an arrangement for an independent external review of NASA's laboratories, including laboratory equipment, facilities, and support services, to determine whether they are equipped and maintained at a level adequate to support NASA's research activities. The assessment shall also include an assessment of the relative quality of NASA's in-house laboratory equipment and facilities compared to comparable laboratories elsewhere.

TITLE XI—OTHER PROVISIONS

SEC. 1101. SPACE WEATHER.

(a) PLAN FOR REPLACEMENT OF ADVANCED COMPOSITION EXPLORER AT L–1 LAGRANGIAN POINT.—

(1) PLAN.—The Director of OSTP shall develop a plan for sustaining space-based measurements of solar wind from the L–1 Lagrangian point in space and for the dissemination of the data for

operational purposes. OSTP shall consult with NASA, NOAA, and other Federal agencies, and with industry, in developing the plan.

(2) REPORT.—The Director shall transmit the plan to Congress not later than 1 year after the date of enactment of this Act.

(b) RESEARCH PROGRAM ON SPACE WEATHER AND AVIATION.—

(1) ESTABLISHMENT.—The Administrator shall, in coordination with the National Science Foundation, NOAA, and other relevant agencies, initiate a research program to—

(A) conduct or supervise research projects on impacts of space weather to aviation, including impacts on communication, navigation, avionic systems, and airline passengers and personnel; and

(B) facilitate the transfer of technology from space weather research programs to Federal agencies with operational responsibilities and to the private sector.

(2) USE OF GRANTS OR COOPERATIVE AGREEMENTS.—The Administrator may use grants or cooperative agreements in carrying out this subsection.

(c) ASSESSMENT OF THE IMPACT OF SPACE WEATHER ON AVIATION.—

(1) STUDY.—The Administrator shall enter into an arrangement with the National Research Council for a study of the impacts of space weather on the current and future United States aviation industry, and in particular to examine the risks for Over-The-Pole (OTP) and Ultra-Long-Range (ULR) operations. The study shall—

(A) examine space weather impacts on at least communications, navigation, avionics, and human health in flight;

(B) assess the benefits of space weather information and services to reduce aviation costs and maintain safety;

(C) provide recommendations on how NASA, NOAA, and the National Science Foundation can most effectively carry out research and monitoring activities related to space weather and aviation; and

(D) provide recommendations on how to integrate space weather information into the Next Generation Air Transportation System.

(2) REPORT.—A report containing the results of the study shall be provided to the Committee on

Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 1 year after the date of enactment of this Act.

SEC. 1102. SPACE TRAFFIC MANAGEMENT.

(a) IN GENERAL.—As more nations acquire the capabilities for launching payloads into outer space, there is an increasing need for a framework under which information intended to promote safe access into outer space, operations in outer space, and return from outer space to Earth free from physical or radio-frequency interference can be shared among those nations.

(b) DISCUSSIONS.—The Administrator, in consultation with other appropriate agencies of the Federal Government, shall initiate discussions with the appropriate representatives of other spacefaring nations with the goal of determining an appropriate framework under which information intended to promote safe access into outer space, operations in outer space, and return from outer space to Earth free from physical or radio-frequency interference can be shared among those nations.

SEC. 1103. STUDY OF EXPORT CONTROL POLICIES RELATED TO CIVIL AND COMMERCIAL SPACE ACTIVITIES.

(a) REVIEW.—The Director of OSTP shall carry out a study of the impact of current export control policies and implementation directives on the United States aerospace industry and its competitiveness in global markets, and on the ability of United States Government agencies to carry out cooperative activities in science and technology and human space flight, including the impact on research carried out under the sponsorship of those agencies.

(b) CONSULTATION.—In carrying out the study, the Director shall seek input from industry, academia, representatives of the science community, all affected United States Government agencies, and any other appropriate organizations and individuals.

(c) REPORT.—The Director shall provide a report detailing the findings and recommendations of the study to the Committee on Science and Technology of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate not later than 9 months after the date of enactment of this Act.

SEC. 1104. ASTRONAUT HEALTH CARE.

(a) SURVEY.—The Administrator shall administer an anonymous survey of astronauts and flight surgeons to

evaluate communication, relationships, and the effectiveness of policies. The survey questions and the analysis of results shall be evaluated by experts independent of NASA. The survey shall be administered on at least a biennial basis.

(b) REPORT.—The Administrator shall transmit a report of the results of the survey to Congress not later than 90 days following completion of the survey.

SEC. 1105. NATIONAL ACADEMIES DECADAL SURVEYS.

(a) IN GENERAL.—The Administrator shall enter into agreements on a periodic basis with the National Academies for independent assessments, also known as decadal surveys, to take stock of the status and opportunities for Earth and space science discipline fields and Aeronautics research and to recommend priorities for research and programmatic areas over the next decade.

(b) INDEPENDENT COST ESTIMATES.—The agreements described in subsection(a) shall include independent estimates of the life cycle costs and technical readiness of missions assessed in the decadal surveys whenever possible.

(c) REEXAMINATION.—The Administrator shall request that each National Academies decadal survey committee identify any conditions or events, such as significant cost growth or scientific or technological advances,

that would warrant NASA asking the National Academies to reexamine the priorities that the decadal survey had established.

SEC. 1106. INNOVATION PRIZES.

(a) IN GENERAL.—Prizes can play a useful role in encouraging innovation in the development of technologies and products that can assist NASA in its aeronautics and space activities, and the use of such prizes by NASA should be encouraged.

(b) AMENDMENTS.—Section 314 of the National Aeronautics and Space Act of 1958 is amended—

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

''(b) TOPICS.—In selecting topics for prize competitions, the Administrator shall consult widely both within and outside the Federal Government, and may empanel advisory committees. The Administrator shall give consideration to prize goals such as the demonstration of the ability to provide energy to the lunar surface from space-based solar power systems, demonstration of innovative near-Earth object survey and deflection strategies, and innovative approaches to improving the safety and efficiency of aviation systems.''; and

(2) in subsection (i)(4) by striking ''$10,000,000'' and inserting ''$50,000,000''.

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