

111TH CONGRESS
2D SESSION

H. R. 4804

To reauthorize the National Aeronautics and Space Administration Human Space Flight Activities, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MARCH 10, 2010

Ms. KOSMAS (for herself, Mr. POSEY, Ms. JACKSON LEE of Texas, Ms. WASSERMAN SCHULTZ, Mr. LATOURETTE, Ms. CORRINE BROWN of Florida, Mr. GRAYSON, Ms. CASTOR of Florida, Mr. MELANCON, Mr. PUTNAM, Mr. KLEIN of Florida, Mr. MICA, Mr. COSTA, Ms. PINGREE of Maine, and Mr. TEAGUE) introduced the following bill; which was referred to the Committee on Science and Technology

A BILL

To reauthorize the National Aeronautics and Space Administration Human Space Flight Activities, 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
5 “Human Space Flight Capability Assurance and Enhance-
6 ment 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. Statement of human space flight policy.
- Sec. 4. Space Shuttle Operations.
- Sec. 5. International Space Station operations.
- Sec. 6. International Space Station management and utilization.
- Sec. 7. Transportation systems development.
- Sec. 8. Definitions.
- Sec. 9. Authorization of appropriations.
- Sec. 10. Application with other laws.

1 **SEC. 2. FINDINGS.**

2 The Congress finds the following:

3 (1) The United States Human Space Flight
 4 program has, since the first Mercury flight on May
 5 5, 1961, has been a source of pride and inspiration
 6 for the Nation.

7 (2) The extraordinary challenges of achieving
 8 access to space both motivated and accelerated the
 9 development of technologies and industrial capabili-
 10 ties that have had widespread applications which
 11 have contributed to the technological excellence of
 12 the United States.

13 (3) It is essential to the economic well-being of
 14 the Nation that the aerospace industrial capacity,
 15 highly skilled workforce, and embedded expertise re-
 16 main engaged in demanding, challenging, and excit-
 17 ing efforts that ensure United States leadership in
 18 space exploration and related activities.

19 (4) The completion of the International Space
 20 Station, the ability to sustain a crew of at least 6

1 members, and the ability to conduct unique micro-
2 gravity research that can only be accomplished in
3 the space environment, provides an opportunity for
4 scientific and technological advancement that must
5 be immediately and fully exploited.

6 (5) The designation of the U.S. Segment of the
7 International Space Station as a National Labora-
8 tory, as provided in section 507 of the National Aer-
9 onautics and Space Administration Authorization
10 Act of 2005 (42 U.S.C. 16767) and as further pro-
11 vided in subtitle A of title VI of the National Aero-
12 nautics and Space Administration Authorization Act
13 of 2008 (42 U.S.C. 17751 through 17753), provides
14 an opportunity for multiple United States Govern-
15 ment agencies, university-based researchers, com-
16 mercial research organizations, and others to utilize
17 the unique environment of microgravity for funda-
18 mental scientific research and potential commercial
19 developments.

20 (6) In order to assure the full and complete uti-
21 lization of the International Space Station, including
22 the ability to sustain the systems and physical infra-
23 structure of the vehicle, effective and timely trans-
24 portation systems are required, which must be able
25 to deliver the full range of logistics, support, and

1 maintenance items which may be necessary through
2 the year 2020.

3 (7) For some potential replacement elements
4 necessary for Space Station sustainability, the Space
5 Shuttle represents the only vehicle, existing or
6 planned, capable of carrying those elements to the
7 International Space Station in the near term.

8 (8) In order to ensure effective utilization of
9 Space Station research facilities, the capability for
10 returning processed experiment samples and re-
11 search-related equipment to Earth is essential.

12 (9) The maintenance of human exploration
13 goals, such as a return to the Moon, a voyage to
14 Mars, or other celestial bodies or locations is essen-
15 tial for providing the necessary long-term focus and
16 programmatic robustness of the United States civil-
17 ian space program.

18 (10) The United States must develop, as rap-
19 idly as possible, replacement vehicles capable of pro-
20 viding both human and cargo launch capability to
21 low-Earth orbit and, by expansion or modification of
22 core design features, capable of delivering large pay-
23 loads into low-Earth orbit or to destinations beyond
24 low-Earth orbit.

1 (11) While commercial transportation systems
2 may contribute valuable services, it is in the United
3 States national interest to maintain a Government-
4 operated space transportation system for crew and
5 cargo delivery to low-Earth orbit and beyond.

6 **SEC. 3. STATEMENT OF HUMAN SPACE FLIGHT POLICY.**

7 (a) USE OF NON-U.S. HUMAN SPACE FLIGHT
8 TRANSPORTATION CAPACITY.—It is the policy of the
9 United States that reliance upon and use of non-United
10 States human space flight capability shall only be under-
11 taken as a temporary contingency in circumstances where
12 no United States-owned and operated human space flight
13 capability is available, operational, and certified for flight
14 by appropriate Federal agencies.

15 (b) U.S. HUMAN SPACE FLIGHT CAPACITY.—The
16 Congress reaffirms the policy stated in section 501(a) of
17 the National Aeronautics and Space Administration Au-
18 thorization Act of 2005 (42 U.S.C. 16761(a)), that the
19 United States shall maintain an uninterrupted capability
20 for human space flight and operations in low-Earth orbit,
21 and beyond, as an essential instrument of national secu-
22 rity and the ability to ensure continued United States par-
23 ticipation and leadership in the exploration and utilization
24 of space.

1 **SEC. 4. SPACE SHUTTLE OPERATIONS.**

2 (a) RETENTION OF SPACE SHUTTLE OPERATIONS
3 CAPABILITY.—

4 (1) IN GENERAL.—The Administrator shall
5 take all necessary steps to ensure that all Space
6 Shuttle Program activities and operations are able
7 to continue, or to be resumed, including flight oper-
8 ations and support, pending the completion of the
9 reviews, requirements, and reports of this section.

10 (2) CURRENT SHUTTLE MANIFEST FLIGHT AS-
11 SURANCE.—The Administrator shall take all steps
12 necessary to ensure shuttle launch capability
13 through fiscal year 2011 to enable launch, at a min-
14 imum, of all payloads manifested as of February 28,
15 2010. In fulfillment of this requirement, the Admin-
16 istrator is prohibited from terminating any con-
17 tractor support which will endanger or inhibit the
18 launching of shuttle payloads manifested as of Feb-
19 ruary 28, 2010, should launches be required after
20 the first quarter of fiscal year 2011.

21 (b) CERTIFICATION OF SPACE SHUTTLE SYSTEMS;
22 VALIDATION OF FLIGHT READINESS DETERMINATION
23 PROCEDURES.—No later than 30 days after the date of
24 enactment of this Act the Administrator shall ask the Na-
25 tional Academies of Science to appoint a Flight Certifi-
26 cation Review Committee, consisting of 5 individuals with

1 appropriate engineering expertise and experience in certifi-
2 cation of space flight vehicle hardware, systems, and
3 equipment testing and validation procedures, to review
4 space shuttle certification activities undertaken or initi-
5 ated after February, 2003. The Committee shall provide
6 an assessment regarding the adequacy of those validation
7 procedures in assuring vehicle durability, flight worthi-
8 ness, and sustainability for continued operations through
9 a period of up to 5 years beyond the space shuttle flight
10 manifest planned as of February, 2010. The Committee
11 shall take into account current and historical trends in
12 anomaly detection and resolution within major compo-
13 nents of the space shuttle systems.

14 (c) COMPLETION OF CERTIFICATION REVIEW AND
15 REPORTING REQUIREMENT.—The Committee appointed
16 under subsection (b) shall complete its task within 90 days
17 of its appointment and shall provide its findings and deter-
18 minations concurrently to the Administrator and to the
19 committees of jurisdiction no later than 120 days after
20 the date of enactment of this Act.

21 (d) SPACE SHUTTLE CAPABILITY RETENTION.—Not-
22 withstanding any other provision of law, to the extent
23 practicable NASA shall operate the Space Shuttle Pro-
24 gram at a flight rate of no more than 2 missions in any
25 consecutive 12-month period beginning during the fiscal

1 years for which appropriations are authorized under sec-
2 tion 9 of this Act.

3 (e) EXISTING HARDWARE COMPONENTS.—The Ad-
4 ministrator shall ensure that hardware components in ex-
5 istence as of March, 2010, remain available for use in con-
6 nection with any additional flights required under sub-
7 section (g)(2) beyond those on the current flight manifest
8 schedule.

9 (f) PROHIBITION OF SCHEDULED TERMINATION.—
10 The Administrator may not terminate the Space Shuttle
11 Program as of a scheduled date certain.

12 (g) TERMINATION CONDITIONS.—Termination of
13 space shuttle missions operations shall be contingent
14 upon—

15 (1) completion of the space shuttle flights
16 planned as of February 28, 2010;

17 (2) delivery of remaining manufactured orbital
18 replacement units, research instrumentation, and
19 other maintenance materials and equipment origi-
20 nally scheduled for delivery to the International
21 Space Station in the flight manifest schedule pre-
22 pared no later than November, 2005, and which are
23 identified in the review required by section 5(b)(2)
24 and deemed essential for maintenance and support
25 of the International Space Station through the end

1 of fiscal year 2020, and which require the payload
2 capability of the space shuttle Orbiter for delivery to
3 the International Space Station; and

4 (3) a determination by the President that ter-
5 mination of space shuttle missions in support of
6 International Space Station operations—

7 (A) is consistent with paragraph (2) of this
8 subsection, and any other provision of this Act
9 regarding the provision of human space flight
10 capabilities; and

11 (B) will not cause a degradation of the
12 equipment, logistics, cargo up-mass and down-
13 mass delivery capability necessary to provide
14 full utilization of international space station
15 science and research capabilities for both
16 United States National Laboratory and Inter-
17 national Partner scientific research and experi-
18 mentation which the United States is obligated
19 by international agreement to provide.

20 (h) ADDITIONAL DETERMINATION REQUIRE-
21 MENTS.—The President shall include in such a determina-
22 tion a detailed description of alternate means for the pro-
23 vision of necessary support for the conduct of full utiliza-
24 tion of the International Space Station for research and
25 development in science, engineering, and technological de-

1 velopment, the scheduled availability of such alternative
2 means of support, and such materials as may be necessary
3 to justify the determination.

4 (i) NOTICE TO CONGRESS.—The President shall pro-
5 vide any determination under this section to the commit-
6 tees of jurisdiction, which shall review such determination
7 and consider whether to recommend legislative action to
8 establish further conditions for termination of space shut-
9 tle operations.

10 (j) TERMINATION.—The Administrator may not take
11 steps to terminate the Space Shuttle Program before the
12 later of—

13 (1) the date that is 60 legislative days after re-
14 ceipt of the determination by the Congress; or

15 (2) the date on which the Congress has taken
16 final action with respect to any bill reported by a
17 committee of jurisdiction pursuant to subsection (i).

18 (k) DECOMMISSIONING OF ORBITER VEHICLES.—

19 (1) IN GENERAL.—Upon the termination of the
20 Space Shuttle Program as provided in this section,
21 the Administrator shall assume responsibility for de-
22 commissioning the remaining Orbiter vehicles ac-
23 cording to established safety and historic preserva-
24 tion procedures prior to their designation as surplus
25 Government property. The remaining Orbiter vehi-

1 cles shall be made available and located for display
2 and maintenance by a competitive procedure estab-
3 lished pursuant to the disposition plan developed
4 under section 613(a) of the National Aeronautics
5 and Space Administration Authorization Act of 2008
6 (42 U.S.C. 17761(a)), with priority consideration
7 given to eligible applicants meeting all conditions of
8 that plan which would provide for the location, dis-
9 play, and maintenance of one Orbiter at or near the
10 Johnson Space Center, in Houston, Texas, and one
11 Orbiter at or near the Kennedy Space Center near
12 Titusville, Florida.

13 (2) DISPLAY AND MAINTENANCE.—The Orbiter
14 vehicles made available under paragraph (1) shall be
15 displayed and maintained through agreements and
16 procedures established pursuant to section 613(a) of
17 the National Aeronautics and Space Administration
18 Authorization Act of 2008 (42 U.S.C. 17761(a)).
19 NASA shall be responsible for the costs of safely de-
20 commissioning, transporting, and re-assembling the
21 Orbiter vehicle for display.

22 (3) AUTHORIZATION OF APPROPRIATIONS.—
23 There are authorized to be appropriated to NASA
24 such sums as may be necessary to carry out this
25 subsection.

1 (l) PRESERVATION OF VEHICLE AND SYSTEMS DE-
2 SIGN AND ENGINEERING DATA.—The Administrator shall
3 immediately take all necessary steps to ensure the collec-
4 tion and preservation of space shuttle structures, systems,
5 and infrastructure design, manufacturing, testing, and
6 maintenance data for historical archival purposes and for
7 possible use as technical resource material and pro-
8 grammatic lessons learned and technical interchange ap-
9 plicability for future space vehicle design and operations.

10 **SEC. 5. INTERNATIONAL SPACE STATION OPERATIONS.**

11 (a) POLICY STATEMENT.—It shall be the policy of
12 the United States, in consultation with its International
13 Partners in the International Space Station Program, to
14 support full and complete utilization of the Space Station
15 through at least the year 2020.

16 (b) MAINTENANCE OF U.S. SEGMENT.—

17 (1) IN GENERAL.—The Administrator shall
18 take all steps necessary to ensure the safe and effec-
19 tive operations, maintenance, and maximum utiliza-
20 tion of the United States Segment of the Inter-
21 national Space Station through fiscal year 2020.

22 (2) VEHICLE AND COMPONENT REVIEW.—In
23 carrying out paragraph (1), the Administrator shall,
24 immediately upon enactment of this Act, conduct an
25 in-depth assessment of all essential modules, oper-

1 ational systems and components, structural ele-
2 ments, and permanent scientific equipment on board
3 or planned for delivery and installation aboard the
4 International Space Station, including both United
5 States and international partner elements, to deter-
6 mine anticipated spare or replacement requirements
7 to ensure complete, effective, and safe function and
8 full scientific utilization of the ISS. The Adminis-
9 trator shall enable the Comptroller General to mon-
10 itor and, as appropriate, participate in the review re-
11 quired by this paragraph in such a way as to enable
12 the Comptroller General to provide an independent
13 assessment of the review to the committees of juris-
14 diction.

15 (3) REPORTING REQUIREMENTS.—No later
16 than 90 days after the date of enactment of this Act
17 the Administrator shall provide the completed as-
18 sessment to the committees of jurisdiction. The re-
19 sults of the required assessment shall include, at
20 minimum, the following:

21 (A) The identification of spare or replace-
22 ment elements and parts currently produced, in
23 inventory, or on order, and the state of readi-
24 ness and schedule for delivery to the ISS, in-
25 cluding the planned transportation means for

1 such delivery. Each element identified shall in-
2 clude a description of its location, function,
3 criticality for system integrity, and specifica-
4 tions regarding size, weight, and necessary con-
5 figuration for launch and delivery.

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

17 (c) RESEARCH FACILITIES AND CAPABILITIES.—Uti-
18 lization of research facilities and capabilities aboard the
19 International Space Station other than exploration-related
20 research and technology development activities, and asso-
21 ciated ground support and logistics, shall be planned,
22 managed, and supported by the organizations described in
23 section 6.

1 **SEC. 6. INTERNATIONAL SPACE STATION MANAGEMENT**
2 **AND UTILIZATION.**

3 (a) **ESTABLISHMENT OF OFFICE OF RESPONSIBILITY**
4 **FOR UNITED STATES SPACE STATION NATIONAL LAB-**
5 **ORATORY.**—The Administrator shall establish responsi-
6 bility for the International Space Station United States
7 National Laboratory within the Space Operations Mission
8 Directorate, ISS Program Office at NASA Headquarters,
9 or any successor entity within NASA. The head of the Of-
10 fice shall be an official, designated by the Administrator,
11 who shall serve as a Deputy Associate Administrator for
12 International Space Station, or at an equivalent rank, and
13 to whom responsibility shall be delegated for, at a min-
14 imum, the conduct of ISS operations, maintenance and
15 utilization by both NASA and non-NASA organizations.
16 The Officer shall serve as the formal liaison to the organi-
17 zation specified in subsection (b).

18 (b) **ESTABLISHMENT OF NATIONAL LABORATORY**
19 **MANAGEMENT ENTITY.**—The Administrator shall execute
20 an agreement with a cooperative organization described in
21 section 501(c)(3) of the Internal Revenue Code of 1986
22 that is exempt from taxation under section 501(a) of such
23 Code to manage the activities of the ISS United States
24 National Laboratory. The organization shall be designed
25 specifically for the unique purpose of developing and im-
26 plementing research and development projects utilizing the

1 International Space Station U.S. Segment, and to be en-
2 gaged exclusively in this enterprise without other organi-
3 zational objectives or responsibilities on behalf of the orga-
4 nization or any parent entity. The head of the office estab-
5 lished by subsection (a) is responsible for liaison and man-
6 agement of the agreement. The Administrator shall dele-
7 gate, at a minimum, the following responsibilities to the
8 organization, which shall carry out its responsibilities in
9 cooperation and consultation with the head of the office
10 established by subsection (a):

11 (1) Planning and coordinating the ISS National
12 Laboratory research activities.

13 (2) Development and implementation of guide-
14 lines, selection criteria, and flight support require-
15 ments for non-NASA scientific utilization of Inter-
16 national Space Station research capabilities and fa-
17 cilities available in United States-owned modules or
18 in partner-owned facilities allocated to United States
19 utilization by international agreement.

20 (3) Interaction with and support of the Inter-
21 national Space Station National Laboratory Advi-
22 sory Committee, established under section 602 of the
23 National Aeronautics and Space Administration Au-
24 thorization Act of 2008 (42 U.S.C. 17752), and the
25 review and implementation of recommendations pro-

1 vided by that Committee under the terms of the ena-
2 bling legislation and subsequent organizational docu-
3 ments, negotiation, approval, and implementation of
4 memoranda of understanding, Space Act Agree-
5 ments, or other authorized cooperative mechanisms,
6 with non-NASA United States Government entities,
7 academic institutions or consortia, and commercial
8 entities, leading to utilization of the United States
9 International Space Station National Laboratory fa-
10 cilities.

11 (4) Coordination of transportation requirements
12 in support of the United States International Space
13 Station National Laboratory facilities, including pro-
14 visions for delivery of instrumentation, logistics sup-
15 port, and related experiment materials, and provi-
16 sions for return to Earth of collected samples, mate-
17 rials, and scientific instruments in need of replace-
18 ment or upgrade.

19 (5) Cooperation with NASA, other Federal
20 Agencies, States, or commercial entities in ensuring
21 the enhancement and sustained operations of non-
22 exploration-related space-station research payload
23 ground support facilities, including the Space Life
24 Sciences Laboratory, Space Station Processing Fa-
25 cility and Payload Operations Control Center and

1 any other ground facilities critical to the utilization
2 of the International Space Station.

3 (6) Development and implementation of sci-
4 entific outreach and education activities designed to
5 ensure effective utilization of International Space
6 Station research capabilities, through such instru-
7 ments as memoranda of understanding, Space Act
8 Agreements executed by NASA, or other cooperative
9 agreements, and through the conduct of scientific
10 assemblies, conferences, etc., for presentation of re-
11 search findings, methods and mechanisms for dis-
12 semination of non-restricted research findings, and
13 development of educational programs, course supple-
14 ments, interaction with educational programs at all
15 grade levels, including student-focused research op-
16 portunities for conduct of research in the United
17 States International Space Station National Labora-
18 tory managed facilities.

19 (c) RESEARCH FACILITIES ALLOCATION AND INTE-
20 GRATION OF RESEARCH PAYLOADS.—

21 (1) ALLOCATION OF ISS RESEARCH FACILI-
22 TIES.—Beginning as soon as practicable after the
23 date of enactment of this Act, United States Inter-
24 national Space Station National Laboratory man-
25 aged experiments shall be guaranteed access to, and

1 utilization of, 50 percent of the United States re-
2 search facilities allocation and requisite crew time
3 through fiscal year 2014. Beginning with fiscal year
4 2015, the percentage allocation shall increase by an
5 additional 10 percent per year through fiscal year
6 2020.

7 (2) ADDITIONAL RESEARCH CAPABILITY.—If
8 the head of the ISS Program Office determines that
9 there are NASA research plans that would require
10 research capability beyond the percentage allocation
11 under paragraph (1), those research plans shall be
12 prepared in the form of requested research opportu-
13 nities submitted to the established process for con-
14 sideration of proposed research within the alloca-
15 tions and capabilities of the International Space Sta-
16 tion National Laboratory, as provided in paragraph
17 (1). These research proposals may include the estab-
18 lishment of partnerships with non-NASA institutions
19 eligible to propose research to be conducted within
20 National Laboratory-allocated research facilities.
21 Until fiscal year 2020, the head of the Office may
22 grant exceptions to this requirement if the proposed
23 experiment is deemed essential for purposes of pre-
24 paring for exploration beyond low-Earth orbit, as de-
25 termined by joint agreement between the organiza-

1 tion described in subsection (a) and the head of the
2 office established under subsection (b).

3 (3) RESEARCH PRIORITIES AND ENHANCED FA-
4 CILITIES.—The organization described in subsection
5 (b) and the head of the office established under sub-
6 section (a) shall take into account recommendations
7 of the National Academies of Science Decadal Sur-
8 vey on Life and Microgravity Sciences in estab-
9 lishing research priorities and in developing pro-
10 posed enhancements of research facilities and oppor-
11 tunities.

12 (4) RESEARCH PAYLOAD RESPONSIBILITY.—
13 NASA shall retain its roles and responsibilities in
14 providing research payload transportation integra-
15 tion and operations processes essential to ensure
16 safe and effective flight readiness and vehicle inte-
17 gration of research facilities and activities approved
18 and prioritized by the organization described in sub-
19 section (b) and the head of the office established
20 under subsection (a).

21 **SEC. 7. TRANSPORTATION SYSTEMS DEVELOPMENT.**

22 (a) IN GENERAL.—The Administrator shall take
23 steps to ensure that the development of space transpor-
24 tation vehicles, systems, and infrastructure shall occur in
25 such a way as to ensure the availability of complementary

1 and, where necessary, redundant transportation systems
2 capable of delivering crew and cargo to low-Earth orbit,
3 in particular to the International Space Station, and to
4 destinations beyond low-Earth orbit. Systems developed
5 and operated by the United States Government shall be
6 the primary means for delivering crew and cargo to des-
7 tinations in low-Earth orbit until such time as commercial
8 entities demonstrate, through a successful flight regime,
9 as determined by established milestones within current
10 Space Act Agreements, that they have the capability to
11 deliver cargo to destinations in low-Earth orbit, including
12 the International Space Station. Systems developed and
13 operated by the United States Government shall be the
14 primary means for delivering crew and cargo to destina-
15 tions beyond low-Earth orbit. Commercially developed
16 launch systems, such as those being developed under
17 NASA's Commercial Orbital Transportation System, for
18 which the United States Government will serve primarily
19 as a customer, shall be the primary means for delivering
20 cargo to the International Space Stations once they have
21 successfully demonstrated that capability, as required by
22 this subsection.

23 (b) NATIONAL SPACE TRANSPORTATION SYSTEM.—
24 The Administrator is directed to develop a plan, no later
25 than 90 days after the date of enactment of this Act, for

1 the establishment of a National Space Transportation Sys-
2 tem. The National Space Transportation System shall in-
3 clude—

4 (1) an architecture of Government developed
5 and operated space transportation systems, includ-
6 ing one or more launch vehicles and associated crew
7 and cargo carriers;

8 (2) a streamlined approach to development and
9 acquisition of such systems funded and overseen by
10 the United States Government, including possible
11 adoption or modification of effective acquisition
12 practices utilized by the Department of Defense,
13 where appropriate, to more effectively meet civil
14 space transportation requirements;

15 (3) an operational concept that utilizes existing
16 Government and industry personnel and infrastruc-
17 ture in an efficient and cost effective manner;

18 (4) continuation or modification of ongoing pro-
19 grams, associated contracts, and testing and evalua-
20 tion plans initiated under the Constellation Pro-
21 gram, including the Orion Crew Exploration Vehicle
22 and the Ares-1 Crew Launch Vehicle, to the extent
23 that such elements are determined to be cost effec-
24 tive and operationally effective;

1 (5) a plan for incrementally upgrading initially
2 developed and deployed systems so that such sys-
3 tems can be made operational with existing tech-
4 nology at the earliest possible opportunity and then
5 upgraded over time to fulfill more demanding mis-
6 sions and incorporate new technology as it becomes
7 available; and

8 (6) a United States Government-managed ap-
9 proach for overseeing and ensuring crew safety, with
10 safety standards for human life support, including
11 oversight of human ratings requirements established
12 under subsection (f)(2)(A) of this section.

13 (c) TECHNOLOGY DEVELOPMENT TO SUPPORT NA-
14 TIONAL SPACE TRANSPORTATION SYSTEMS EVO-
15 LUTION.—The Administrator shall develop and keep up
16 to date a technology development plan to support the
17 evolving requirements of the National Space Transpor-
18 tation System, both for low-Earth orbit requirements and
19 for missions beyond low-Earth orbit. Technology funding
20 provided pursuant to this subsection shall be determined
21 based on the specific mission benefits and the performance
22 requirements needed to achieve clearly identified mission
23 objectives, such as planning to reach destinations beyond
24 low-Earth orbit. There are authorized to be appropriated
25 to the Administrator such amounts for technology funding

1 for propulsion elements as may be necessary to advance
2 the state of the art in propulsion elements as a priority
3 over developments of current state of the art in propulsion
4 systems.

5 (d) HEAVY-LIFT VEHICLE DEVELOPMENT.—

6 (1) REVIEW.—As part of the National Space
7 Transportation system required in subsection (b) of
8 this section, the Administrator is directed to conduct
9 a review of alternative heavy-lift launch vehicle con-
10 figurations that may be developed by the United
11 States Government to transport crew and cargo to
12 low-Earth orbit and beyond.

13 (2) CONTENT.—The review shall—

14 (A) include shuttle-derived vehicles which
15 use existing United States propulsion systems,
16 including liquid fuel engines, external tank, and
17 solid rocket motor technology and related
18 ground-based manufacturing capability, launch
19 and operations infrastructure, and workforce
20 expertise;

21 (B) take into consideration technologies
22 developed under the Constellation Program, in-
23 cluding those developed for the Ares–1 system;

24 (C) include consideration of the degree to
25 which alternative vehicles may be developed in

1 an evolutionary fashion with the objective of
2 supporting initial crew and cargo transportation
3 to the International Space Station by the end
4 of 2013 and missions beyond low-Earth orbit by
5 the end of 2018; and

6 (D) include comparative development and
7 projected operational costs.

8 (e) NATIONAL SPACE TRANSPORTATION SYSTEM AU-
9 THORITY TO PROCEED.—The Administrator is directed to
10 select a heavy-lift launch vehicle and accompanying crew
11 vehicle design concept and to initiate detailed design ac-
12 tivities no later than 6 months after the date of enactment
13 of this Act. If ongoing program development elements and
14 activities from the Constellation Program are to be in-
15 cluded in such a National Space Transportation System,
16 the Administrator shall take appropriate steps to extend
17 or modify existing contracts to facilitate this objective.

18 (f) COMMERCIALLY DEVELOPED SPACE TRANSPOR-
19 TATION VEHICLES.—

20 (1) LAUNCH AND DELIVERY SYSTEMS.—The
21 Congress restates its commitment, expressed in the
22 National Aeronautics and Space Administration Acts
23 of 2005 and 2008, to the development of commer-
24 cially developed launch and delivery systems to the
25 International Space Station for crew and cargo mis-

1 sions, known as the Commercial Orbital Transpor-
2 tation System.

3 (2) PRELIMINARY REQUIREMENTS FOR COM-
4 MERCIAL CREW CAPABILITY DEVELOPMENT.—Before
5 undertaking any development activity in support of
6 commercially developed crew transportation systems,
7 the Administrator shall ensure that, at a minimum,
8 the following steps are completed:

9 (A) HUMAN RATING REQUIREMENTS.—Not
10 later than 60 days after the date of enactment
11 of this Act, the Administrator shall develop and
12 make publicly available detailed human ratings
13 requirements to guide the design of commer-
14 cially developed crew transportation capabilities.
15 The requirements shall be at least equivalent to
16 proven requirements in use as of the date of en-
17 actment of this Act.

18 (B) COMMERCIAL MARKET ASSESSMENT.—
19 The Administrator shall initiate, using an ap-
20 propriate and qualified independent entity, an
21 assessment of the potential non-Government
22 market for commercially developed crew and
23 cargo space transportation systems and capa-
24 bilities. The assessment shall—

1 (i) include activities associated with
2 potential private sector utilization of Inter-
3 national Space Station research and tech-
4 nology development capabilities and other
5 potential activities in low-Earth orbit; and

6 (ii) be completed and provided to the
7 committees of jurisdiction no later than
8 120 days after the date of enactment of
9 this Act.

10 (C) PROCUREMENT SYSTEM REVIEW.—The
11 Administrator shall review established Govern-
12 ment procurement and acquisition practices and
13 processes, including Space Act Agreement au-
14 thorities, to determine the most cost-effective
15 means of procuring commercial crew capabili-
16 ties and related services which will ensure ap-
17 propriate accountability, transparency, and
18 maximum efficiency in the procurement of such
19 services. The review shall include a description
20 of proposed measures to address risk manage-
21 ment processes and the means of indemnifica-
22 tion for third-party commercial entities, and
23 processes for quality control, safety oversight,
24 and application of Federal oversight processes
25 within the jurisdiction of other Federal agen-

1 cies. A description of the proposed procurement
2 process and justification for its selection shall
3 be included in any proposed initiation of pro-
4 curement activity for commercially developed
5 crew transportation services and shall be sub-
6 ject to review by the committees of jurisdiction
7 before the initiation of any competitive process
8 to procure such services. In support of the com-
9 mittee review, the Comptroller General shall un-
10 dertake an assessment of the review required by
11 this subparagraph and provide a report to the
12 committees of jurisdiction within 90 days after
13 the date on which the Administrator provides
14 the description and justification to the commit-
15 tees of jurisdiction.

16 (D) USE OF GOVERNMENT-SUPPLIED CA-
17 PABILITIES AND INFRASTRUCTURE.—In evalu-
18 ating any proposed development activity for
19 commercially developed crew or cargo launch
20 capabilities, the Administrator shall identify the
21 anticipated contribution of Government per-
22 sonnel, expertise, technologies, and infrastruc-
23 ture to be utilized in support of design, develop-
24 ment, or operations of such capabilities. The
25 Administrator shall include details and associ-

1 ated costs of such support as part of any pro-
2 posed development initiative for the procure-
3 ment of commercially developed crew or cargo
4 capabilities or services.

5 (E) ESTABLISHMENT OF FLIGHT DEM-
6 ONSTRATION AND READINESS REQUIRE-
7 MENTS.—The Administrator shall establish ap-
8 propriate milestones and minimum performance
9 accomplishments which must be completed be-
10 fore any authority is granted to proceed to pro-
11 curement of commercially developed crew trans-
12 portation systems or capabilities.

13 (3) SENSE OF THE CONGRESS.—It is the sense
14 of the Congress that the development of commercial
15 capabilities for the use of space may be of value in
16 maximizing the utility and productivity of the Inter-
17 national Space Station by providing a commercial
18 means of enabling crew transfer and crew rescue
19 services for the International Space Station. The
20 Congress further believes that once such commercial
21 services have demonstrated the capability to meet es-
22 tablished ascent, entry, and International Space Sta-
23 tion proximity operations safety requirements the
24 United States should make use of domestic commer-
25 cially provided crew transfer and crew rescue serv-

1 ices to the maximum extent practicable. The Con-
2 gress further believes that the National Aeronautics
3 and Space Administration should expedite, where
4 possible, the use of domestic commercially provided
5 International Space Station cargo missions, and that
6 upon the certification by appropriate Federal agen-
7 cies of operational flight readiness for the provision
8 of commercial crew transportation capabilities, the
9 Administrator should limit, to the maximum extent
10 practicable, the use of a United States Government
11 crew transportation vehicle to missions carrying crew
12 beyond low-Earth orbit.

13 (4) LIMITATION ON OBLIGATION OR EXPENDI-
14 TURE OF FUNDS.—No funds authorized to be appro-
15 priated by this Act may be obligated or expended for
16 the purpose of procuring a commercially developed
17 crew transportation vehicle prior to completion of
18 the requirements of paragraph (2) of this subsection.

19 (g) CARGO RETURN CAPABILITY.—The Adminis-
20 trator is directed to conduct a study of alternative means
21 for development of the capability for a soft-landing return
22 for return research samples or other derivative materials,
23 and small to mid-sized (up to 1,000 kilograms) equipment
24 for return and analysis, or refurbishment and redelivery
25 to the ISS. If the Administrator decides that an inde-

1 pendent study is appropriate, the results of the study shall
2 be transmitted to the committees of jurisdiction no later
3 than 120 days after the date of enactment of this Act.

4 (h) REPORT TO COMMITTEES OF JURISDICTION.—
5 The Administrator shall submit a report to the committees
6 of jurisdiction on plans for implementing the requirements
7 of this section no later than 90 days after the date of en-
8 actment of this act.

9 **SEC. 8. DEFINITIONS.**

10 In this Act:

11 (1) ADMINISTRATOR.—The term “Adminis-
12 trator” means the Administrator of NASA.

13 (2) COMMERCIAL ENTITY.—The term “commer-
14 cial entity” means a for-profit entity operating in
15 such a way that—

16 (A) private capital is at risk in the provi-
17 sion of a product, activity, or service;

18 (B) there are existing or potential non-gov-
19 ernmental customers for the product, activity,
20 or service conducted or provided by the entity;

21 (C) the commercial market ultimately de-
22 termines the viability of such product, activity,
23 or service; and

1 (D) primary responsibility and manage-
2 ment initiative for the entity resides with the
3 private sector.

4 (3) COMMITTEES OF JURISDICTION.—The term
5 “committees of jurisdiction” means—

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

8 (B) the Committee on Science and Tech-
9 nology of the House of Representatives.

10 (4) DOWN-MASS.—The term “down-mass”
11 means physical elements, such as equipment re-
12 moved for repair, replacement or analysis, experi-
13 ment products, samples and devices, tools, personal
14 crew items, manufactured goods, or other non-dis-
15 posable items, including historically significant mate-
16 rials or items, whether the property of the United
17 States or an international partner, or a non-Govern-
18 ment or commercial entity.

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

21 (6) ISS NATIONAL LABORATORY.—The term
22 “ISS National Laboratory” means the International
23 Space Station United States National Laboratory
24 Enterprise.

1 (7) LEGISLATIVE DAY.—The term “legislative
2 day” means any calendar day on which the Senate
3 and the House of Representatives are in session.

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

6 (9) SPACE ACT.—The term “Space Act” means
7 the National Aeronautics and Space Act of 1958 (42
8 U.S.C. 2451 et seq.).

9 (10) UNITED STATES SEGMENT OF THE INTER-
10 NATIONAL SPACE STATION.—The term “United
11 States Segment of the International Space Station”
12 includes all structural elements, supporting equip-
13 ment, external attachment locations, pressurized
14 modules, and associated contents, purchased or man-
15 ufactured by or for the United States, and partner-
16 supplied facilities allocated for utilization as deter-
17 mined through bilateral and multilateral agreements.

18 (11) UP-MASS.—The term “up-mass” means
19 physical elements, such as equipment, spare parts,
20 replacement parts, experimental facilities, and asso-
21 ciated materials, and various supplies necessary for
22 the operation and maintenance of the space station
23 vehicle, modules, hardware, and crew support.

1 **SEC. 9. AUTHORIZATION OF APPROPRIATIONS.**

2 (a) FY 2010.—There are authorized to be appro-
3 priated to the National Aeronautics and Space Adminis-
4 tration for fiscal year 2010:

5 (1) Space Science Mission Directorate,
6 \$4,493,300,000.

7 (2) Exploration Systems Mission Directorate,
8 \$3,779,800,000.

9 (3) Space Operations Mission Directorate,
10 \$6,180,600,000.

11 (4) Aeronautics and Space Research and Tech-
12 nology Mission Directorate, \$682,200,000.

13 (5) Education Programs, \$183,800,000.

14 (6) Cross-Agency Support, \$2,919,900,000.

15 (7) Construction and Environmental Compli-
16 ance and Restoration, \$448,300,000.

17 (8) Office of Inspector General, \$35,000,000.

18 (b) FY 2011.—There are authorized to be appro-
19 priated to the National Aeronautics and Space Adminis-
20 tration for fiscal year fiscal year 2011:

21 (1) Space Science Mission Directorate,
22 \$5,005,600,000.

23 (2) Exploration Systems Mission Directorate,
24 \$4.263,400,000.

25 (3) Space Operations Mission Directorate,
26 \$4,887,800,000.

1 (4) Aeronautics and Space Research and Tech-
2 nology Mission Directorate, \$1,151,800,000.

3 (5) Education Programs, \$145,800,000.

4 (6) Cross-Agency Support, \$3,111,400,000.

5 (7) Construction and Environmental Compli-
6 ance and Restoration, \$397,300,000.

7 (8) Office of Inspector General, \$36,000,000.

8 (c) FY 2012.—There are authorized to be appro-
9 priated to the National Aeronautics and Space Adminis-
10 tration for fiscal year 2012:

11 (1) Space Science Mission Directorate,
12 \$5,248,600,000.

13 (2) Exploration Systems Mission Directorate,
14 \$4,577,400,000.

15 (3) Space Operations Mission Directorate,
16 \$4,290,200,000.

17 (4) Aeronautics and Space Research and Tech-
18 nology Mission Directorate, \$1,596,900,000.

19 (5) Education Programs, \$145,800,000.

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

21 (7) Construction and Environmental Compli-
22 ance and Restoration, \$363,800,000

23 (8) Office of Inspector General, \$36,000,000.

24 (d) SPACE SHUTTLE SUSTAINING OPERATIONS.—
25 For purposes of implementing section 4, there are author-

1 ized to be appropriated an additional \$200,000,000 for
2 Space Shuttle Operations in fiscal year 2010,
3 \$1,200,000,000 for Space Shuttle Operations in fiscal
4 year 2011, and \$2,000,000,000 for Space Shuttle Oper-
5 ations in fiscal year 2012.

6 (e) ISS OPERATIONS.—For purposes of imple-
7 menting section 5, there are authorized to be appropriated
8 an additional \$36,000,000 for fiscal year 2010 for pro-
9 curement of necessary spares, replacement units, and as-
10 sociated transportation costs of elements necessary to en-
11 sure viable sustained vehicle maintenance and operations,
12 \$100,000,000 for fiscal year 2011, and \$100,000,000 for
13 fiscal year 2012.

14 (f) ISS UTILIZATION.—For purposes of imple-
15 menting section 6, there are authorized to be appropriated
16 an additional \$20,000,000 in fiscal year 2010,
17 \$15,000,000 for fiscal year 2011, and \$15,000,000 for fis-
18 cal year 2012.

19 (g) NO FISCAL YEAR LIMITATION ON FUNDING.—
20 All funds appropriated pursuant to this section shall re-
21 main available until expended.

22 (h) TRANSFER OF FUNDS.—The Administrator may
23 transfer funds among any of the accounts identified in this
24 section if, not less than 30 days before the date of any
25 such transfer, the Administrator provides a detailed expla-

1 nation of the needs for the transfer, the amount proposed
2 to be transferred, and an analysis of the impact on activi-
3 ties from which funding is proposed to be transferred, to
4 the committees of jurisdiction of the House of Representa-
5 tives and the Senate. No such transfer shall occur until
6 the Administrator has received an affirmative response in-
7 dicating agreement to the proposed transfer from the
8 chairs of the committees of jurisdiction.

9 **SEC. 10. APPLICATION WITH OTHER LAWS.**

10 The proviso under the heading “**EXPLORATION**”,
11 under the heading “**SCIENCE**” in the matter dealing with
12 the National Aeronautics and Space Administration in the
13 Science Appropriations Act, 2010 (title II of division B
14 of the Consolidated Appropriations Act, 2010; Public Law
15 111–117) shall not apply to any activity authorized under
16 this Act.

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