

Legislative Bulletin.....September 29, 2010

Contents:

S. 3729—NASA Authorization Act of 2010

S. 3729—National Aeronautics and Space Administration Authorization Act of 2010 *Senator Rockefeller (D-WV)*

Order of Business: The bill is scheduled to be considered on Wednesday, September 28, 2010, under a motion to suspend the rules and pass the bill.

Summary: The bill authorizes \$19 billion for FY 2011, \$19.45 billion for FY 2012, and \$19.96 for FY 2013. S. 3729 authorizes funding for space flight and exploration, aeronautics research and development, and scientific research, including Earth observations and applications and other science related activities. The bill requires the development of a new Heavy Lift Vehicle (HLV), specifying it should be in service by 2016. Additionally, the bill provides for development of a multi-purpose crew vehicle capable of supporting missions beyond low-Earth orbit with a 2016 goal for full operational capabilities.

The bill authorizes approximately \$1.6 billion for commercial cargo and crew development to be closer toward reducing the NASA Constellation program and increasing the role of commercial carriers for both astronauts and cargo. The legislation includes one additional shuttle mission scheduled for next summer in an attempt to reduce the “shuttle gap.” Until a new government vehicle developed by NASA is ready (goal of end of 2016), or commercial space flight becomes feasible, NASA will have to rely on the Russian Space Agency to ferry American and other astronauts to the International Space Station (ISS). In our obligations to the International Space Station partners, the U.S. government has pledged to maintain access to the ISS by U.S. astronauts and researchers.

The FY 2010 NASA authorization bill had funding levels of approximately \$18.7 billion. However, the NASA Authorization Act of 2008 authorized \$20.2 billion for FY2009. The FY 2009 enacted appropriation was \$18.8 billion which included \$1 billion from the “stimulus.” Some of the highlights of the legislation are as follows:

Notable Authorizations:

- **NASA:** FY 2011 - \$19.0 billion, FY 2012 - \$19.450 billion, FY 2013 - \$19.960 billion.
 - ◆ **Science:** FY 2011 - \$5 billion, FY 2012 - \$5.25 billion, FY 2013 - \$5.51 billion.
 - ◆ **Aeronautics:** FY 2011 - \$929.6 million, FY 2012 - \$1.07 billion, FY 2013 - \$1.11 billion.

- ***Aeronautics Research:*** FY 2011 - \$580 million, FY 2012 - \$585 million, FY 2013 - \$590 million.
- ***Space Technology:*** FY 2011 - \$350 million, FY 2012 - \$486 million, FY 2013 - \$515 billion.
- ◆ ***Exploration:*** FY 2011 - \$3.87 billion, FY 2012 - \$5.25 billion, FY 2013 - \$5.26 billion.
 - ***Space Launch Systems:*** FY 2011 - \$1.63 billion, FY 2012 - \$2.65 billion, FY 2013 - \$2.64 billion.
 - ***Commercial Cargo & Crew Development:*** FY 2011 - \$612 million, FY 2012 - \$500 million, FY 2013 - \$500 million.
- ◆ ***Space Operations:*** FY 2011 - \$5.5 billion, FY 2012 - \$4.14 billion, FY 2013 - \$4.25 billion.
 - ***Space Shuttle:*** FY 2011 - \$1.6 billion, FY 2012 - \$0, FY 2013 - \$0.
 - ***Space Station:*** FY 2011 - \$2.78 billion, FY 2012 - \$2.95 billion, FY 2013 - \$3.13 billion.
 - ***Space & Flight Services:*** FY 2011 - \$1.12 billion, FY 2012 - \$1.19 billion, FY 2013 - \$1.12 billion.

Notable Policy Provisions: The bill states it is the policy of the human space flight capabilities, on vehicles not from the United States, should only be undertaken only as a contingency in circumstances where no United States-owned and operated human space flight capability is available, operational, and certified for flight by appropriate Federal agencies. However, the bill also reaffirms that the United States shall maintain an uninterrupted capability for human space flight and operations in low-Earth orbit, and beyond, as an essential instrument of national security. S. 3729 also establishes the goal to sustain the capability for long-duration presence in low-Earth orbit, initially through continuation of the ISS and full utilization of the United States segment of the ISS as a National Laboratory, and through assisting and enabling an expanded commercial presence in, and access to, low-Earth orbit, as elements of a low-Earth orbit infrastructure. The bill states it is the long term policy goal of the human space flight and exploration efforts of NASA to expand permanent human presence beyond low-Earth orbit. The bill requires NASA to contract with the National Academies for a review of the goals, core capabilities, and direction of human space flight based on previous authorizations.

Space Flight Beyond International Space Station & Low-Earth Orbit: The bill states it is the policy of NASA to develop a new Space Launch System to succeed the Shuttle with the ability to reach regions of space beyond low-Earth orbit. The System is required to meet minimum standards for cargo capabilities, capacity, supplying and supporting ISS cargo requirements, redundancy, flexibility to carry heavier payloads, and transitional needs with the goal for operational capability for the core elements not later than December 31, 2016.

The bill requires the Administrator to continue development of a multi-purpose crew vehicle to be available achieve full operational capability for the transportation vehicle developed pursuant to this subsection by not later than December 31, 2016. The vehicle is required to minimum requirements to serve as the primary crew missions beyond low-Earth orbit, work in conjunction with payloads delivered by the Space Launch System, the capability to provide an alternative means of delivery of crew and cargo to the ISS, and the incorporation of new technologies.

The NASA authorization bill requires, to the extent possible, for the Administrator to use existing contracts, investments, workforce, industrial base, and capabilities from the Space Shuttle and

Orion and Ares 1 projects for developing the Space Launch System and the multi-purpose crew vehicle.

The bill requires the Administrator to create a program with the primary purpose to prepare infrastructure at the Kennedy Space Center that is needed to enable processing and launch of the new Space Launch System.

The bill requires that within 120 days enactment, a report be provided to Congress setting forth an assessment of the effects of the retirement of the Space Shuttle, and of the transition to the Space Launch System developed, on the solid rocket motor industrial base and the liquid rocket motor industrial base in the United States.

The bill requires the Administrator to develop in-space capabilities identified as necessary elements of missions beyond low-Earth orbit and in-space technologies such as advanced propulsion, propellant depots, in situ resource utilization, and robotic payloads or capabilities that enable human missions beyond low-Earth orbit ultimately leading to Mars.

Finally, the bill requires the Administrator to issue a Congressional report, within 90 days of the Act or completion of the design phase for the Space Launch System and Multi-purpose Crew Vehicle (whichever comes first), including a comprehensive description of the reference vehicle design, capability requirements, contact requirements, civil service and contract workforce requirements, and procurement strategy, among other items.

Commercial Crew & Cargo: The bill requires the Administrator to continue the existing Commercial Orbital Transportation Services program, “aimed at enabling the commercial space industry in support of NASA to develop reliable means of launching cargo and supplies to the ISS throughout the duration of the facility's operation.”

The bill allows the Administrator to enter into contacts or procurement agreements with commercial crew services during fiscal year 2011 if the following requirements are met:

- 1) The Administrator develops and makes available to the public detailed human rating processes and requirements to guide the design of commercially-developed crew transportation capabilities, which requirements shall be at least equivalent to proven requirements for crew transportation.
- 2) The Administrator provides an assessment to Congress on the potential non-government market for commercially-developed crew and cargo transportation systems and capabilities, including an assessment of the activities associated with potential private sector utilization of the ISS research and technology development capabilities and other potential activities in low-Earth orbit.
- 3) The Administrator determines the most cost-effective means of procuring commercial crew transportation capabilities and related services in a manner that ensures appropriate accountability, transparency, and maximum efficiency in the procurement of such capabilities and services. The review must include an identification of proposed measures to address risk management and means of indemnification of commercial providers of such capabilities and services, and measures for quality control, safety oversight, and the application of Federal oversight processes within the jurisdiction of other federal agencies.

- In addition to fulfilling the requirements above, the total amount involved for all contracts and procurement agreements executed during fiscal year 2011 cannot exceed \$50 million for fiscal year 2011.

Beginning in fiscal year 2012 through the duration of the program, support follow-on commercially-developed crew transportation systems dependent upon the completion of these requirements (in addition to the completing the three requirements above).

- 4) The Administrator identifies the anticipated contribution of government personnel, expertise, technologies, and infrastructure to be utilized in support of design, development, or operations in evaluating any proposed development activity for commercially-developed crew or cargo launch capabilities.
- 5) The Administrator establishes appropriate milestones and minimum performance objectives to be achieved before authority is granted to proceed to the procurement of commercially-developed crew transportation capabilities or systems, including safety concerns.
- 6) The Administrator takes the steps to honor the commitment to developing commercial crew rescue capabilities by making available any relevant government-owned intellectual property deriving from the development of a multi-purpose crew vehicle authorized by this Act to commercial entities involved with such crew rescue capability development which shall be relevant to the design of a crew rescue capability, among other requirements.

International Space Station: The bill states it is the policy of the United States, in consultation with its international partners in the ISS program, to support full and complete utilization of the ISS through at least 2020 and for NASA to pursue international, commercial, and intra-governmental means to maximize ISS logistics supply, maintenance, and operational capabilities, reduce risks to ISS systems sustainability, and offset and minimize United States operations costs relating to the ISS. The bill also requires the Administrator to ensure the safe and effective operation, maintenance, and maximum utilization of the United States segment of the ISS through at least September 30, 2020.

The bill requires the Administrator to fly the Launch-On-Need Shuttle mission currently designated in the Shuttle Flight Manifest dated February 28, 2010, to the ISS in fiscal year 2011, but no earlier than June 1, 2011, unless required earlier by an operational contingency and pending the results of a required safety assessment.

The bill requires the Administrator to provide initial financial assistance and enter into a cooperative agreement with non-profit organizations to manage the activities of the ISS national laboratory. The agreement requires the entity entering into the agreement to engage exclusively in activities relating to the management of the ISS national laboratory and activities that promote its long term research and development mission as required by this section, without any other organizational objectives or responsibilities on behalf of the organization or any parent organization or other entity. The financial assistance provided will be for the purposes of the organization to plan and coordinate ISS national laboratory research activities, criteria for flight support requirements for non-NASA scientific utilization of ISS research capabilities and facilities available in United States-owned modules, integration, and the development of scientific outreach and education activities.

The bill requires national laboratory managed experiments to be guaranteed access to, and utilization of at least 50 percent of the United States research capacity allocation: including power, cold stowage, and requisite crew time onboard the ISS through September 30, 2020.

Shuttle Retirement: The NASA authorization requires the Administrator to retire the Space Shuttle orbiters pursuant to a schedule established by the Administrator and in a manner consistent with the priorities listed under this bill. In addition, to the maximum extent possibly, the bill requires the Administrator to utilize the workforce, assets, and infrastructure of the Space Shuttle program in efforts relating to the initiation of a follow-on Space Launch System.

The bill requires the Administrator to decommission any remaining Space Shuttle orbiter vehicles in accordance with established safety and historic preservation procedures and be made available for display and maintenance through a competitive procedure established under the 2008 NASA authorization bill. The bill requires an emphasis that the competitive process takes into account locations with the best potential value to the public, particularly to advance educational opportunities in science, technology, engineering, and mathematics, and with an historical connection to the Shuttle program.

Earth Science: The bill requires the Director of the Office of Science and Technology Policy to provide greater coordination of the research, operations, and activities of government agencies that have programs that either contributes directly or indirectly to activities involving civilian Earth observation. *The bill provides a sense of Congress that the role of NASA in Earth Science applications shall be expanded with other departments and agencies of the federal government,* State and local governments, tribal governments, academia, the private sector, nonprofit organizations, and international partners. NASA's Earth science data can increasingly aid efforts to improve the human condition and provide greater security.

Space Science: The bill requires the Administrator to designate an officer or employee of the Science Mission Directorate to act as the responsible official for all Suborbital Research in the Science Mission Directorate and be responsible for developing short and long term strategic plans for maintaining, renewing and extending suborbital facilities and capabilities, and monitoring progress towards goals in the plans. The bill request the Director to establish a Suborbital Research Program within the Science Mission Directorate that includes the use of sounding rockets, aircraft, high altitude balloons, suborbital reusable launch vehicles, and commercial launch vehicles to advance science and train the next generation of scientists and engineers in systems engineering and systems integration which are vital to maintaining critical skills in the aerospace workforce.

The bill requires the Administrator, in conjunction with the Department of Energy, to pursue a joint approach towards restarting and sustaining the domestic production of radioisotope thermoelectric generator material for deep space and other science and exploration missions. The funds authorized by this Act for NASA would be made available under a reimbursable agreement with the Department of Energy for the purpose of reestablishing facilities to produce fuel required for radioisotope thermoelectric generators to enable future missions.

Additionally, the bill requires that before September 30, 2012, 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 risk, and assign a Federal agency or agencies to be responsible for protecting the United States and working with the international community on such threats.

Aeronautics & Space Technology: The bill requires the Administrator to coordinate with the Secretary of Defense to develop and implement joint plans for those elements of the nation's research, development, testing, and engineering infrastructure that are of common interest and use. In addition, the bill requires NASA coordination with the Federal Aviation Administration in the development of the Next Generation Air Transportation Program to explore areas for greater collaboration, including areas where NASA can help to accelerate the development and demonstration of NextGen technologies.

The bill requires the President, or designee, to develop a national policy to guide the space technology development programs of the United States through 2020. The policy shall include national goals for technology development and shall describe the role and responsibilities of each federal agency that will carry out the policy. The policy must utilize external studies that have been conducted on the state of United States technology development and have suggested policies to ensure continued competitiveness.

The bill requires the Administration to establish a Commercial Reusable Suborbital Research Program within the Space Technology Program that shall fund the development of payloads for scientific research, technology development, and education, and shall provide flight opportunities for those payloads to microgravity environments and suborbital altitudes. The bill authorizes \$15 million per year from FY 2011 through FY 2013 to carry out this provision.

Education: The bill requires NASA to establish a program to annually sponsor scientific and educational payloads developed with student and educator involvement to be flown on commercially available orbital platforms, when available and operational, with the goal of launching at least 50 such payloads. In addition, the bill requires NASA to contract with providers of commercial orbital platform services for their use by the STEM-Commercial Orbital Platform program within 90 days of enactment and to enter into at least one funded, competitively-awarded contract for commercial orbital platform services and make awards within 180 days of enactment of S. 3729.

Possible Conservative Concerns:

Process: Some conservatives believe it is inappropriate to place a \$60 billion authorization bill on the suspension calendar. While the Democratic majority has not provided open rules to allow conservative ideas, at least a placing the bill under a rule would provide members some way to express ways to improve it. Many individuals supportive of S. 3729 have stated the bill is far from perfect. Some conservatives believe that we should not pass a problematic bill simply because “we are running out of time.”

Accountability: Unlike the House version, the Senate bill does not require a minimum investment of company funds by companies who submit proposals for taxpayer funds. Additionally, the bill does not return profits potentially made on commercial flight, and provides no requirement for the companies proposals to provide fixed-seat prices for crew to the ISS (in return for up to 99% taxpayer funding of their proposal).

NASA Mission: Some conservatives believe they Senate Bill may go too far in supporting the “commercial flight” industry and that NASA must continue to operate the Constellation program in order to ensure a robust human space exploration program. The original House Bill provided significantly less funding of approximately \$400 million compared to S. 3729, which totals approximately \$1.6 billion. Additionally, some conservatives may believe NASA has failed to provide adequate evidence that providing

taxpayer funding for commercial crew initiatives would succeed or provide enough consideration regarding concerns over safety, marketability, liability, indemnification and intellectual property. Additionally, some conservatives have expressed concern that Congress should not abandon the Constellation Program. Former NASA Administrator under President Bush, Mike Griffin, [has been critical](#) of President Obama's goals.

However, some conservatives believe we should encourage growth in the private sector commercial flight industry because the current mission of NASA is unsustainable and authorizing legislations must be passed to have a clear vision of NASA's future mission as the shuttle retires. Additionally, conservatives objected to the House bill because they viewed a number of programs funded under it and the continuation of certain Constellation programs as wasteful. The Citizens Council for Citizens Against Government Waste [urged](#) opposition to the House version. Finally, some conservatives believe it is important to pass legislation today, as [NASA will face numerous layoffs](#) if an authorization bill is not passed before leaving for the elections. The final scheduled flight for the shuttle to the ISS is a cargo delivery scheduled to launch on November 1.

Additional Information: While both NASA authorization bills proposed the same amount of authorized spending, significant differences exist between the Senate and House versions. This is primarily involving the issues proposed by President Obama to rely on the "commercial" space industry to supplement space flight and how to proceed on getting astronauts to the International Space Station (ISS) as the shuttle retires. A review of these issues is highlighted [in this](#) Washington Post article. Representative Gordon (D-TN) attempted to author an alternative bill to make the requests more inline with the Senate. However, it has become clear the Senate does not have the votes to agree to it. According to Rep. Gordon and others who support the House proposal, "It has become clear that there is not time remaining to pass a Compromise bill through the House and the Senate. For the sake of providing certainty, stability, and clarity to the NASA workforce and larger space community, I felt it was better to consider a flawed bill than no bill at all as the new fiscal year begins. I will continue to advocate to the Appropriators for the provisions in the Compromise language."

In 2004, President Bush proposed the "Vision for Space Exploration" which has been the projected policy for the planning and operations of NASA for the remainder of his Administration. Congress has approved many of the goals of the mission in the form of passing authorizations twice since its introduction in 2004. The original Bush proposal centered on the theme of returning the focus of NASA to human exploration of outer space, specifically a return to the moon in pursuit of the long-term goal of a manned flight to Mars. The goal included ending U.S. involvement in the International Space Station and phasing out the long standing shuttle program in favor of a new module to deliver American astronauts to distant destinations. The Constellation Program was developed after the "Vision for Space Exploration" with the purpose of designing and building such a module. The Program has begun development of the Ares series of boosters to facilitate various launches and the Orion Spacecraft which will replace the shuttle as the crew compartment for future space missions.

After taking office in 2009, President Obama ordered an independent review of the program. The [Augustine Report](#) concluded that meaningful human exploration of outer space would require an additional \$3 billion in funding per year and offered five alternative plans for NASA. In his FY 2011 Budget, President Obama has proposed a number of changes from the original "Vision for Space Exploration" in his FY2011 budget. Major changes include elimination of the Constellation spacecraft development program, abandoning the goal of returning humans to the moon, encouraging private sector development in crew launch services, and an increased

emphasis on technology development and science. The plan also pushed back the end use date of the International Space Station for the US from 2015 to 2020. The president eased congressional concerns of those who supported the Constellation program earlier this year by modifying his proposal so that NASA would continue to develop a heavy-lift vehicle and a crew module of its own, in addition to increased support for commercial carries.

The proposed cancellation of the Constellation has drawn the most attention because NASA has already invested around \$10 billion in the program, most of which has gone toward the development of the Ares boosters and Orion spacecraft. However, [GAO](#) has found that costs for the program are expected to continue to rise beyond projections and could force out other NASA priorities. Additionally, it is considered unlikely that the program will be able to meet deadlines proposed in President Bush's Vision.

The Senate bill authorizes one additional flight for shuttle missions. The space shuttle was the world's first orbital vehicle designed for reuse and has been operational since 1982. An icon of American space exploration, the space shuttle has flown in 18 successful missions in almost 30 years of service. Unfortunately the legacy of the program has been hindered by a questionable safety record including the explosions of the Challenger and the Columbia. If NASA is to end the shuttle program as planned under S. 3729 Congress must find alternatives to get U.S. astronauts to the ISS. The current proposal is to lease spaces from Russian Rockets at a cost until a government vehicle comes online or commercial travel becomes viable. This gap is expected to last at least through 2016. NASA currently has a program in place to provide commercial cargo access to the ISS called Commercial Orbital Transportation Services (COTS). Space X and Orbital Sciences Corporation are the two companies contracted through COTS, and both could potentially fulfill the role of delivering humans to space as well.

Committee Action: On August 5, 2010, the bill was introduced in the Senate and passed an amendment to S. 3729 by unanimous consent. The Senate then passed S. 3729 by unanimous consent.

Administration Position: No Statement of Administration Policy (SAP) is available.

Cost to Taxpayers: Assuming appropriation of the authorized and necessary amounts, CBO estimates that "implementing S. 3729 would cost \$58 billion over the 2011-2015 period." The bill authorizes \$58.58 billion over the FY 2011-2015 period.

Does the Bill Expand the Size and Scope of the Federal Government? Yes, the bill expands the mission of NASA and the federal government's role in assistance for the private sector to launch a feasible commercial space industry. However, the bill also reduces the number of shuttle missions and the role of the Constellation program.

Does the Bill Contain Any New State-Government, Local-Government, or Private-Sector Mandates? No.

Does the Bill Comply with House Rules Regarding Earmarks/Limited Tax Benefits/Limited Tariff Benefits? Senate report 111-278 does not cite compliance with House rules regarding earmarks, limited tax benefits, or limited tariff benefits.

Constitutional Authority: Senate report 111-278 does not cite the Constitutional authority of enacting this bill. However, some conservatives believe NASA is included in the role of providing as "common defense."

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