Order Code RS22063
Updated July 26, 2005

The National Aeronautics and Space Administration: Overview, FY2006 Budget in Brief, and Key Issues for Congress

Marcia S. Smith and Daniel Morgan
Resources, Science, and Industry Division

Summary

The National Aeronautics and Space Administration (NASA) conducts U.S. civilian space activities. For FY2006, NASA requested $16.456 billion, a 2.4% increase over the $16.070 billion NASA received in the FY2005 Consolidated Appropriations Act (P.L. 108-447), or a 1.6% increase over the total of $16.196 billion that the agency received for FY2005 if a supplemental for hurricane relief is included. Key issues center on whether to endorse President Bush's January 2004 Vision for Space Exploration. The FY2006 appropriations bill that includes NASA (H.R. 2862) passed the House with a $15 million increase above the request, and was reported in the Senate (S.Rept. 109-88) with a $60 million reduction. A NASA authorization bill (S. 1281) was reported from the Senate Commerce Committee with a $100 million increase; a House version (H.R. 3070) passed the House with a $510 million increase. This report is updated regularly.

Agency Overview

The National Aeronautics and Space Administration (NASA) was created by the 1958 National Aeronautics and Space Act (P.L. 85-568). NASA conducts civilian space and aeronautics activities. NASA opened its doors on October 1, 1958, almost exactly one year after the Soviet Union ushered in the Space Age with the launch of the world's first satellite, Sputnik, on October 4, 1957. In the more than 47 years since, NASA has conducted far reaching programs in human and robotic spaceflight, technology development, and scientific research.

Dr. Michael Griffin is the Administrator of NASA. The agency is managed from NASA Headquarters in Washington, D.C. Links to NASA's four Mission Directorates (Aeronautics Research, Exploration Systems, Science, and Space Operations) and individual NASA programs, are at [http://www.hq.nasa.gov/hq/org.html]. NASA has nine major field centers: **Ames Research Center**, Moffett Field, CA; **Dryden Flight Research Center**, Edwards, CA; **Glenn Research Center**, Cleveland, OH; **Goddard Space Flight Center**, Greenbelt, MD; **Johnson Space Center**, near Houston, TX; **Kennedy Space Center**, near Cape Canaveral, FL: **Langley Research Center**, Hampton,

VA; **Marshall Space Flight Center**, Huntsville, AL; and **Stennis Space Center**, in Mississippi, near Slidell, LA. The **Jet Propulsion Laboratory**, Pasadena, CA, is a Federally Funded Research and Development Center operated for NASA by the California Institute of Technology. According to NASA, the agency has approximately 19,000 civil servant full time equivalents (FTEs) budgeted for FY2005.

NASA's FY2006 Budget Request

NASA is requesting $16.456 billion, a 2.4% increase over the $16.070 billion appropriated in the FY2005 Consolidated Appropriations Act (adjusted for the rescission). NASA also received $126 million in a FY2005 supplemental for hurricane relief, giving it a total of $16.196 billion for FY2005. The FY2006 request is 1.6% more than that total. Last year, NASA was projected to receive a 4.7% increase for FY2006. NASA has substantially changed its budget structure again, as explained in footnotes to **Table 1**. NASA submitted a budget amendment on July 15; the total amount requested for the agency did not change, only how it is allocated within the agency. The "FY2006 Req" figures in Table 1 reflect the amendment. Some of the fields in Table 1 are blank because the committee bills and reports do not provide requisite data.

Table 1: NASA's FY2006 Budget Request

(Budget Authority, in millions of dollars)

Category	FY2005 Est*	FY2006 Req (Amended)	House App.	Senate App.	Senate Auth	House Auth
Science, Aero., and Expl.	****7,681**	****9,829**	**9,726**	**9,761**	**9,661**	
Science [A]	5,527	5,341				
Aeronautics	906	852				
Biological and Physical Research	1,004	— [B]				
Exploration Systems	25	3,468				
Education	217	167				
Exploration Capabilities	****8,358**	****6,595**	**6,713**	**6,603**	**6,863**	
Space Operations	6,704	6,595				
- Space Shuttle	*4,543*	*4,531*				
- International Space Station	*1,676*	*1,689*				
- Space and Flight Support	*485*	*376*				
Exploration Systems	1,654	— [C]				
Inspector General	**31**	**32**	**32**	**32**	**32**	
Total Regular Appropriations	**16,070**	**16,456**	**16,471**	**16,396**	**16,556**	**16,966**
FY2005 Hurricane Supp.	**126**					
Grand Total	**16,196**	**16,456**	**16,471**	**16,396**	**16,556**	**16,966**

Sources: Office of Management and Budget, NASA FY2006 budget request documents, and House and Senate bills and committee reports. Totals may not add due to rounding.

* Figures in this column are from NASA's Initial Operating Plan (IOP) and are not final. Updates to the operating plan have been submitted, but are not in a budget format compatible with the FY2006 budget.

** The FY2005 totals for the SA&E and Exploration Capabilities accounts are different from those in the table included in NASA's FY2006 budget justification documents because OMB shows the shift of "Exploration Systems" from one account to the other. The NASA table uses the FY2006 budget structure without showing that trace. Hence the OMB data are used in this report.
[A] In the FY2006 request, " Science" incorporates the former Space Science and Earth Science line items.
[B] In the FY2006 request, Biological and Physical Research became part of Exploration Systems.
[C] In the FY2006 request, funding for Exploration Systems was moved into the SA&E account.

NASA appropriations are included in FY2006 Science, State, Justice, and Commerce (SSJC) appropriations bill (H.R. 2862, H.Rept. 109-118, S.Rept. 109-88). The House passed the bill on June 16, 2005, approving a net increase of $15 million. Increases included $54 million for aeronautics research; $30 million for an Earth sciences mission, Glory; $10 million for the Space Interferometry Mission; $50 million for congressionally directed items; and $2 million for education. Reductions included $25 million from exploration systems research and technology (R&T); $25 million from human systems R&T; $31 million from corporate administrative costs; $10 million from the International Space Station (ISS); $10 million from ISS Crew/Cargo Services; $10 million from Rocket Propulsion Testing; $10 million from Space Communications; and $10 million from Launch Services. The Senate Appropriations Committee reported the bill on June 23, recommending a net cut of $60 million. The report specifies several increases, including $250 million for a Hubble servicing mission, but only two decreases — all $160 million from the ISS Crew/Cargo line item, and all $34 million from Centennial Challenges — that do not total the final recommended funding level.

The House passed a FY2006-2007 NASA authorization bill on July 22 (H.R. 3070, H.Rept. 109-173) after adopting a manager's amendment that significantly increased funding compared with the committee-reported bill. As passed, H.R. 3070 authorizes $16.966 billion, $510 million more than the request. (The bill uses a different budget structure than the request, so the breakdown cannot be incorporated into Table 1.) The Senate Commerce Committee reported a FY2006-2010 NASA authorization bill (S. 1281, S.Rept. 109-108) on July 26 that recommends a $100 million addition to Exploration Capabilities to enhance the use of the ISS for research.

The July 15 budget amendment reflects, in part, NASA's decision to move two programs into the Exploration Systems line — ISS Crew/Cargo Services ($168 million) was moved from the International Space Station, and the Lunar Robotic Exploration Program ($135 million) was moved from the Science Mission Directorate. Other changes also were made within the accounts (see CRS Report RL32988).

President Bush's "Vision for Space Exploration"

On January 14, 2004, President George W. Bush announced a new Vision for Space Exploration, directing NASA to focus its efforts on returning humans to the Moon by 2020, and someday sending them to Mars and "worlds beyond." The Vision involves both robotic and human space missions, and other countries were invited to participate. The President proposed adding only $1 billion to NASA's five-year (FY2005-2009) budget for the Vision. The remainder of the required funding is to be redirected from other NASA activities, for example by terminating the space shuttle program in 2010, and ending U.S. use of the International Space Station in 2016. NASA issued a "sand chart" [http://www.nasa.gov/pdf/54873main_budget_chart_14jan04.pdf] with projected NASA budgets through FY2020, but did not offer a cost estimate for the Vision at the time of

the speech. Later, NASA stated that returning humans to the Moon would cost $64 billion (2003 dollars) for FY2004-FY2020, not including robotic probes. NASA was directed to develop a new spacecraft, called a Crew Exploration Vehicle (CEV), to take astronauts to and from the Moon, with an Earth-orbit capability by 2014. A cost estimate for sending people to Mars has not been provided. For more information on the Vision, see CRS Report RS21720.

The President's speech came almost one year after the space shuttle *Columbia* tragedy that killed seven astronauts (see CRS Report RS21408). One of the conclusions of the *Columbia* Accident Investigation Board (CAIB) was that NASA lacked a national mandate providing it with a compelling mission requiring human presence in space. CAIB's chairman, Harold Gehman, said the nation needs an "agreed vision" that NASA can execute. President Bush's announcement of the Vision initiated the process of finding an "agreed vision." Whether or not a consensus has emerged on adopting the President's goals is debatable. Supporters point to Gallup polls in 2004 and 2005 that showed strong public support. Others note, however, that the polls were sponsored by the Coalition for Space Exploration, a group of companies and organizations that support the Vision [http://www.spacecoalition.org]. Supporters also point to congressional action funding the Vision as an endorsement of the President's Vision. Congressional committees, however, have stressed that while they agree with the "Moon/Mars" goal, they also think NASA should maintain a balanced set of program including science and aeronautics. Thus, they appear to support a somewhat modified version of the Vision wherein NASA would not become a "single mission" agency focusing exclusively on the Moon/Mars goals, but continues its diversified set of missions. For FY2006, the House has passed authorization (H.R. 3070) and appropriations (H.R. 2862) bills for NASA. The Senate Appropriations Committee and the Senate Commerce Committee have reported their versions of the appropriations (H.R. 2862) and authorization (S. 1281) bills, respectively. There are many differences among the bills, but all express support for the Vision, tempered by concern that NASA should maintain a balance among its programs. The only Vision-related funding cuts specified are: in the House Appropriations bill, $25 million from each of the two Exploration Systems research and technology subaccounts; and in the Senate Appropriations bill, all $34 million from Centennial Challenges. H.R. 3070 uses a different budget structure than NASA's request, placing "exploration systems" into its own budget account, instead of including it with science, aeronautics, and education. The additional $510 million in the House-passed version of H.R. 3070 would be allocated to the Vision.

Key Congressional Issues

The Relative Priority of NASA in the Federal Budget

With the current emphasis on cutting spending to reduce the federal budget deficit, some may question the amount of money proposed for NASA in FY2006 and beyond. Space program advocates often cite the small percentage of federal budget authority that is allocated to NASA — 0.7 % in FY2005 — as an indication that it is not a significant factor in the nation's overall spending. The Coalition for Space Exploration points out that benefits accrue from space exploration in terms of stimulating children to study math and science, and driving invention, which supports a robust economy. Skeptics counter that spending more than $16 billion on NASA is a luxury when many domestic

discretionary programs are being cut, and federal R&D spending overall is not keeping pace with inflation. Thus, a fundamental question facing Congress is the relative priority of NASA compared with other government programs, including other R&D programs.

The Relative Priority of the Vision Versus Other NASA Activities

Funding. The President's plan calls for most of the funding for the Vision to come from redirecting spending from other NASA activities. In the "sand chart" (discussed earlier), the programs that are not included in the Vision are labeled *Aeronautics and Other Science Programs*. Funding for those activities is shown as remaining flat through the FY2004-2020 time frame. Most space science programs are included in the Vision, but two disciplines, Sun-Earth Connections (SEC) and Structure and Evolution of the Universe (SEU), are not. Earth science also is not included. Advocates of aeronautics, Earth science, SEC, and SEU, worry that funding for their research will suffer. Tracking funding for the science activities is difficult because, in the FY2006 budget, they are merged with other programs. For example, SEC is merged with Earth science to form the new Earth-Sun Systems theme. Aeronautics funding, however, is separately identified. It would decline 32 percent, from $1 billion in FY2004 to $718 million in FY2010, according to NASA's FY2006 budget documents. As discussed earlier, the House and Senate appropriations and authorization bills express support for the Vision, but as part of a balanced program that includes science and aeronautics. NASA's July 15 budget amendment adds $88 million to Earth-Sun Systems, while reducing funds for other science missions. It should be noted that budget constraints at NASA are due not only to the need to fund the Vision, but also to cost growth in existing NASA programs (including several science missions), the cost of returning the space shuttle to flight status, and the need to fund congressionally directed items.

Workforce and Institutional Issues. Funding for various NASA activities also will affect NASA workforce levels. For example, according to NASA briefing charts, the reduction in aeronautics funding proposed in the FY2006 budget request would mean the elimination of 1,100 civil service jobs at NASA centers. NASA officials insist that there are no plans to close any NASA centers. In total, NASA's FY2006 budget assumes that the number of budgeted civil service full time equivalents (FTEs) will drop from 19,227 in FY2005 to 16,738 by the end of FY2006. How to "right size" NASA, its facilities, and its workforce, and ensure NASA has the necessary skill mix for the Vision, are among the issues facing Congress.

The Future of the Space Shuttle and International Space Station

The Vision calls for the space shuttle fleet to be retired in 2010, when ISS construction is expected to be completed. NASA Administrator Griffin emphasizes his intention to meet that deadline, citing the need to use that funding to implement other aspects of the Vision. Placing a fixed termination date on the shuttle system, however, may create schedule pressure similar to what the CAIB found to have contributed to the *Columbia* accident (see CRS Report RS21408). One alternative is to fly the shuttle until a replacement is available. Another is to specify how many more shuttle flights are needed, and continue the system until those requirements are met, whenever that is. S. 1281 directs NASA not to terminate the shuttle until a replacement is ready. That replacement is the Crew Exploration Vehicle (CEV). President Bush directed NASA to

build the CEV so that it would be available by 2014 to take astronauts to Earth orbit, although its main purpose is to take them to and from the Moon. Dr. Griffin wants to accelerate CEV development to reduce an expected multi-year gap between the end of the shuttle program and availability of the CEV. (The July 15 budget amendment shifts funds from other Exploration Systems activities into the CEV and a launch vehicle for it.) During such a gap, the United States would be dependent on Russia to take American crews to and from ISS. Russia has indicated that it will not provide ISS crew transport services to NASA for free after April 2006 (when an existing agreement will be fulfilled), but NASA is not permitted to pay Russia for such services under the Iran Nonproliferation Act (INA, see CRS Report RS22072 for more information). The Administration has submitted a proposed amendment to Congress that would modify the INA so that NASA could purchase ISS-related goods and services from Russia (see CRS Issue Brief IB93017); no legislative action has occurred.

NASA officials have indicated that NASA plans to complete its use of the ISS in 2016. Under the Vision, the only U.S. research that will be conducted on ISS is that needed to fulfill the Vision. NASA is currently downscaling its ISS research plan, which is being further eroded by NASA's decision to shift funds from ISS research into accelerating development of the CEV. NASA spends about $2 billion a year on ISS, in addition to the costs of the shuttle program. Some question whether ISS is worth that level of investment considering the modest research opportunities that remain. Some want to restore the ISS research program to what was planned prior to the Vision. NASA is building ISS in partnership with Canada, Japan, Russia, and 10 European countries. Others consider fulfilling U.S. commitments to those partners to be a sufficient rationale for continued U.S. involvement. In the appropriations bill (H.R. 2862), the House cut $20 million from ISS, and the Senate committee cut $160 million. In the authorization bills, S. 1281 adds $100 million and makes other recommendations to enhance ISS research. H.R. 3070 does not specify an ISS funding level, but directs that 15% of ISS research spending be used for non Vision-related research.

The Future of the Hubble Space Telescope

Two days after the President's Vision speech, NASA announced that it would not use the shuttle to conduct further servicing missions to the Hubble Space Telescope (see CRS Report RS21767). Then-Administrator Sean O'Keefe cited shuttle safety concerns as the primary reason. Widespread criticism led NASA to explore the possibility of a robotic servicing mission. A December 2004 report from the National Research Council, however, concluded that a robotic servicing mission was not likely to succeed in the time available. In the FY2006 request, NASA requested money only for a deorbit mission (to ensure that Hubble reenters from orbit without posing danger to populated areas). Dr. Griffin has pledged to revisit the decision after the shuttle completes its two "Return to Flight" missions. Meanwhile, he directed NASA engineers to resume planning for a shuttle servicing mission. The Senate Appropriations Committee designates $250 million for a Hubble servicing mission in its version of H.R. 2862. H.R. 3070 designates $150 million in FY2006 for a Hubble servicing mission. The July 15 NASA budget amendment allocates $30 million in FY2006 to preserve the option of a Hubble servicing mission.