

COMMITTEE ON SCIENCE
U.S. HOUSE OF REPRESENTATIVES

HEARING CHARTER

The Future of NASA

June 28, 2005
10:00 a.m. to 12:00 p.m.
2318 Rayburn House Office Building

Purpose:

On Tuesday, June 28, 2005 at 10:00 a.m., the Committee on Science will hold a hearing on the future of the National Aeronautics and Space Administration (NASA). NASA Administrator Michael D. Griffin will be the sole witness. The hearing will examine Administrator Griffin's guiding philosophy and plans for NASA's programs in human space flight, space science, earth science, and aeronautics, as well as plans for the agency's workforce, organization, and infrastructure. The hearing will set the stage for the Committee's action the following day on the NASA authorization bill.

Overarching Questions:

1. What are Administrator Griffin's priorities and how does he plan to maintain a balanced portfolio of science, aeronautics, and exploration programs?
2. What is the status of NASA's plans to define the final configuration of and research agenda for the International Space Station? What is the status of NASA's plans for returning the Space Shuttle to flight and for retiring it at the end of the decade?
3. What is the status of NASA's plans to define the Vision for Space Exploration, including accelerating the Crew Exploration Vehicle and selecting launch vehicles?
4. How does Administrator Griffin intend to ensure the agency has the appropriate size and skill mix in its workforce, as well as the facilities and infrastructure necessary to support the agency's goals?

Overview:

Dr. Michael D. Griffin was sworn in as NASA's 11th Administrator on April 14th. Administrator Griffin takes the reins of the agency at a crucial time, when NASA faces significant issues in nearly every facet of the agency's operations. Since taking office, Administrator Griffin has moved swiftly to begin tackling critical issues in many key areas. He has been personally involved in reviewing plans for returning the shuttle to flight later this year. He has directed a team to undertake a study, to be completed in July, to define the final configuration of the space station, its research agenda, and to develop plans to continue space station following the retirement of the shuttle, which he has stated will be in 2010. He has directed another team to undertake a study, to be completed in July as well, to better define plans for NASA's exploration program, including accelerating the Crew Exploration Vehicle (CEV) to minimize the gap after the shuttle is retired in 2010 and defining the launch vehicle options for missions back to the

moon. Griffin has also made several significant organizational and personnel changes, including removing many key managers at headquarters and realigning the reporting structure for NASA's field centers so they report directly to him.

Looking forward, Administrator Griffin will have many critical decisions to make over the next year. He will need to install a new management team to replace those leaving their posts, and key decisions will be made as to what the focus and responsibilities of the various field centers will be and what facilities at those field centers are necessary to implement the agency's goals. So far, Griffin has indicated a strong preference for giving the field centers more responsibility to manage programs and rebuild the expertise resident within the government.

Over the next year, Administrator Griffin will have many programmatic and technical issues to address. He will have to decide, once the shuttle has flown a couple of times, whether the agency should move forward with a Hubble servicing mission. Griffin will have to decide whether to recommend a Shuttle-derived launch vehicle or use existing rockets for heavy lift missions to the moon, a recommendation to be made jointly by the Administrator and the Secretary of Defense. He will also have to decide how to pay for increased costs on several programs, such as the recent cost increase on the Webb telescope, while maintaining a balanced portfolio of exploration, science, and aeronautics programs.

On the policy side, NASA and the Administration are still working out proposed legislative changes to the Iran Nonproliferation Act (INA), which currently prohibits the U.S. from purchasing or bartering for Soyuz capsules and Progress vehicles for the space station. Without a legislative proposal, it's difficult to know whether Congress would approve the change in law, but if the current law is not amended, the U.S. would not be able to have a permanent presence on the space station, at least not until the CEV was available. NASA is reportedly developing plans on how they would proceed with the station if the law is not changed, should that situation arise.

Issues:

Shuttle Return to Flight

Administrator Griffin's first priority has been to review NASA's progress in preparing the space shuttle for return to flight. He has personally participated in several technical reviews in preparation for the launch. Shortly after becoming Administrator, he postponed a planned shuttle launch in May because of technical concerns with the shuttle's External Tank and to provide additional time to complete some of the analysis. The launch is now scheduled for July 13th.

The Stafford-Covey Return to Flight Task Group, created to oversee NASA's implementation of the Columbia Accident Investigation Board's (CAIB) return-to-flight recommendations, has approved all but three of the CAIB's 15 return-to-flight recommendations. The three remaining items relate to developing an adequate tile repair capability, completing an analysis of potential sources of debris that could harm the shuttle, and hardening the shuttle against potential debris damage. The Stafford-Covey panel is scheduled to hold its final meeting on Monday, June 27th and will then provide NASA with its final results and recommendations.

Griffin will ultimately make the final decision on whether the shuttle is ready to launch. The launch window extends from July 13th through to July 31st. The next launch window occurs in September.

Planning for Human Space Flight: Shuttle Transition and CEV Acceleration

Administrator Griffin has indicated that he will take a different approach in developing the missions to return astronauts to the Moon. He has created a new Office of Program Analysis and Evaluation (PA&E) and charged it with developing two critical plans for NASA's human space flight programs: one to examine options for how to configure the space station to conduct the research NASA must do to enable human exploration in deeper space, to minimize the number of shuttle flights necessary to finish putting the station together, and to ensure the shuttle can retire by the end of 2010.

The second planning effort involves developing the strategy for how to return astronauts to the moon and possibly to Mars, including how to accelerate the development of the Crew Exploration Vehicle to minimize the gap between the retirement of the shuttle and the first flight of the CEV, when the U.S. will not have its own capability of putting an astronaut into space. Both studies will be completed this summer in time to aid key agency and Congressional decisions.

Administrator Griffin has set a goal to accelerate the Crew Exploration Vehicle (CEV) so it is ready as close to 2010 as possible to minimize any gap. Griffin has also directed that the CEV be designed to fly to the space station, a requirement that had not been set previously. NASA recently awarded contracts to two industry teams to begin preliminary design work for the CEV. Later this year, NASA is expected to release updated specifications and plans for accelerating the CEV. A key decision will be the selection of the launch vehicle for the CEV program.

Webb Telescope Cost Increase

Recently NASA announced that the cost of the James Webb Space Telescope, one of NASA's highest priority space science programs, was expected to increase by approximately \$1 billion to a total of \$4.5 billion. Under current plans, the mission is scheduled to be launched in 2011. NASA has convened a science panel and an engineering panel to review the mission, focusing on options to control costs and perhaps scale back the program. The panels' reports and recommendations are due to be completed later this summer. Any increases in cost will likely have to be borne by the science program. Both NASA and the scientific community will face tough choices as the options for dealing with Webb telescope become clear and a decision on whether NASA should conduct a Hubble servicing mission nears.

Workforce and Institutional Issues.

The reduction in aeronautics funding proposed in the fiscal year 2006 budget request would require the elimination of 1,100 civil service jobs at NASA centers, although NASA has also said that there will not be any layoffs in 2006. In addition, NASA officials insist that there are no plans to close any NASA centers. Also, the retirement of the space shuttle in 2010 will require NASA to address the size and skill mix of a significant segment of the workforce at some centers. Work on the CEV and other elements of the mission to the moon will significantly help offset the loss of shuttle work, but some jobs and skills may still need to be eliminated. NASA may be able to help affected employees take advantage of training, retraining, and job placement programs to help the transition.

How to "right size" NASA, its facilities, and its workforce, and ensure NASA has the necessary skill mix, are among the issues Griffin and Congress will have to face.

Iran Nonproliferation Act Limits Use of the Space Station

NASA faces a legal hurdle, the Iran Nonproliferation Act (INA), that could affect utilization of the space station after April 2006. The U.S. is totally dependent on Russian Soyuz capsules for crew rescue, and without access to Soyuz capsules, Americans will not be able to stay on space station for long duration missions. U.S. astronauts will still be able to visit the space station using the shuttle and will be able to continue construction of the station, but the shuttle is not capable of remaining docked to the space station long enough to provide a crew rescue capability. NASA policy prevents astronauts from being aboard the space station if there is no rescue capability. Russia is currently providing capsules under an agreement that was grandfathered into the INA. However, Russia fulfills its obligation under that agreement in April 2006 and will no longer provide capsules or other services without payment.

The INA prohibits the U.S. from purchasing or bartering for services from Russia in connection with the International Space Station unless the President certifies that the Russians are not proliferating nuclear or certain missile technologies to Iran – a certification the President is highly unlikely to make. NASA has no known alternative plans for providing a crew rescue capability beyond buying such services from the Russians, until the CEV is available.

The matter is currently the subject of an interagency review, and the Administration is expected to send up a legislative proposal to amend the INA as early as next month. However, it is unclear how Congress would react to such a proposal with Iran being such a focus of attention in foreign policy. The International Relations Committee shares jurisdiction with the Science Committee over the INA, so any legislative effort would involve both committees. If Congress fails to amend the INA, the U.S. would not be able to use the Soyuz as a rescue vehicle or to use Russian Soyuz and Progress vehicles to ferry astronauts and cargo, respectively, to and from the space station. NASA has begun the process of developing contingency plans for the space station in the event that an exception in INA is not made for whatever reason. Without access to Soyuz, U.S. astronauts could be there as long as the shuttle is docked, and thus could continue to utilize the station as long as the shuttle is flying, but only on short-term visits. After the shuttle is retired they would not be able to be there at all until the Crew Exploration Vehicle is available.

The Future of the Hubble Space Telescope

Two days after the President's speech announcing the Vision for Space Exploration in January of 2004, NASA announced that it would not use the shuttle to conduct further servicing missions to the Hubble Space Telescope. Then-Administrator Sean O'Keefe cited shuttle safety concerns as the primary reason for his decision. 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 fiscal year 2006 request, NASA requested funds only for a de-orbit mission (to ensure that Hubble reenters from orbit without posing danger to populated areas).

During his April 2005 confirmation hearing, however, Administrator Griffin pledged to revisit the decision after the shuttle returns to flight and its risks are better understood following the post-Columbia modifications. He also directed NASA engineers to resume planning for a shuttle servicing mission so they could move forward expeditiously if needed. Work on more advanced space telescopes, such as the Space Interferometry Mission and the Terrestrial Planet Finder, is being deferred in order to preserve the option to service Hubble and provide for its safe de-orbit.

Aeronautics Research, Wind Tunnels and Workforce

Over the last decade, funding for NASA's aeronautics budget has declined by more than 50 percent, to about \$900 million. For fiscal year 2006, NASA proposes a relatively small decrease (\$54 million, or about 6 percent) in aeronautics research and development compared to 2005. The proposed five-year budget projection for aeronautics contemplates substantial funding reductions (20 percent) for aeronautics research, together with significant cutbacks in its civil service and contractor workforces. Civil service personnel and infrastructure costs account for much of the aeronautics budget, largely because of the expenses involved in the operation and maintenance of NASA's 31 wind tunnels. Specifically, the aeronautics program receives only 6 percent of NASA's total budget, yet it employs more than 20 percent of the entire NASA workforce and is responsible for 40 percent of all of NASA's infrastructure costs.

NASA commissioned a study last year from RAND, which concluded that NASA should continue to operate 29 of its 31 wind tunnels. RAND estimated the annual operating cost of all 31 tunnels to be \$125-\$130 million. RAND argued that while some of the tunnels were not well used now, they offered capabilities that could be needed in the future and that would be hard to replicate if the tunnels were shut down. RAND also argued that while some questions that once needed to be solved with wind tunnels could now be answered through computer simulation, many critical questions still required wind tunnels. It also said that wind tunnel data were sometimes needed to develop computer simulation software.

The committee held a hearing on aeronautics earlier this year and the House appropriations bill restores the cuts to the fiscal year 2006 budget. In addition, the appropriations bill includes a legislative provision directing the Administration to develop a national aeronautics policy to guide NASA's aeronautics research program.

Balancing Science and Exploration

The President's Vision for Space Exploration provides the human space flight program with a clear set of goals to guide its programs. Many applaud the Administration for providing clear direction for the human space flight program, but it has also made others nervous, particularly in the science community, that the Vision will require a disproportionate amount of NASA's funding and that valuable science programs will suffer.

In the past, Congress has played an important role in ensuring that a balance exists between science and human space activities. However last year, because of the uncertainty surrounding the implementation of the Vision and the unknown costs of the return to flight costs for the shuttle, Congress provided an unprecedented level of authority to transfer funding between appropriations accounts. The effect of this authority was to remove the "wall" between science and human space activities.

Administrator Griffin has stated that the Vision is not intended to undermine other core functions of the agency, such as aeronautics, space science, and earth science, but it is not yet clear how NASA will maintain a balance between science and human space activities within its projected budget.

Organizational and Personnel Changes

Administrator Griffin has moved quickly in making key personnel and organizational changes. First, he announced that the directors for each of NASA's field centers would report directly to him, instead of through the Associate Administrators. Next, he informed three of the four Associate Administrators (human space flight, science, and exploration) of his intent to reassign them to other positions within the agency. The fourth Associate Administrator (for aeronautics) has decided to step down. Additional personnel changes are expected over the next several months as Griffin begins to install his own management team. An important issue is how quickly he will be able to fill key slots to completely staff his management team.

FY 2005 Operating Plan Update

On May 11, Administrator Griffin submitted an updated Operating Plan for fiscal year 2005. The plan provides the first complete picture of how NASA is prioritizing its funding for 2005. The plan fully funds the \$762 million increase above the appropriated amount for 2005 for returning the shuttle to flight and provides the full \$291 million appropriated to begin planning for a Hubble servicing mission, as well as re-programs over \$500 million in cost increases for several programs, most notably to cover costs for the Mars Reconnaissance Orbiter, scheduled for launch this August, and the New Horizons mission to Pluto set to launch in January 2006. The plan also fully funds Congressionally-directed items, as adjusted for the rescission.

Administrator Griffin has said that his overarching philosophy in finding offsets is to eliminate lower-priority programs rather than reducing all programs in the face of budget difficulties. To do so, he must set clear priorities within the budget that has been allocated. To pay for the increases included in the Operating Plan NASA is considering a two-year delay in the Mars Science Laboratory to 2011. To pay for the 2005 costs to prepare for a possible Hubble servicing mission, NASA will defer work on several advanced space telescopes, such as the Space Interferometry Mission (SIM) and the Terrestrial Planet Finder. NASA is also reviewing plans for its nuclear systems program, Project Prometheus. NASA has indefinitely deferred the Jupiter Icy Moons Orbiter (JIMO) and will focus on higher priority and more near-term needs for nuclear power, such as for use as a power source on the Moon's surface. A summary of NASA's Operating Plan changes is in the appendix.

APPENDIX A

Summary of Budget and Operating Plan Changes

National Aeronautics and Space Administration

(Budget authority, \$ in millions)				FULL COST				
By Appropriation Account	Initial Operating Plan	April Operating Plan	May Operating Plan					
By Mission Directorate	FY 2005	FY 2005	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
By Theme								
Science, Aeronautics, and Exploration	9,334.7	9,334.7	9,050.5	9,661.0	10,549.8	11,214.6	12,209.6	12,796.1
Science*	5,527.2	5,527.2	5,553.7	5,476.3	5,960.3	6,503.4	6,853.0	6,797.6
Solar System Exploration	1,858.1	1,858.1	1,787.1	1,900.5	2,347.7	2,831.8	2,998.9	3,066.1
The Universe	1,513.2	1,513.2	1,475.1	1,512.2	1,531.5	1,539.4	1,495.0	1,406.7
Earth-Sun System	2,155.8	2,155.8	2,291.4	2,063.6	2,081.2	2,132.2	2,359.0	2,324.8
Exploration Systems**	2,684.5	2,684.5	2,355.9	3,165.4	3,707.0	3,825.9	4,473.7	5,125.5
Constellation Systems	526.0	526.0	421.9	1,120.1	1,579.5	1,523.7	1,990.9	2,452.2
Exploration Systems Research and Technology	722.8	722.8	766.0	919.2	907.3	989.2	1,050.3	1,078.5
Prometheus Nuclear Systems and Technology	431.7	431.7	270.3	319.6	423.5	500.6	614.0	779.0
Human Systems Research and Technology	1,003.9	1,003.9	897.7	806.5	796.7	812.4	818.5	815.8
Aeronautics Research	906.2	906.2	962.0	852.3	727.6	730.7	727.5	717.6
Aeronautics Technology	906.2	906.2	962.0	852.3	727.6	730.7	727.5	717.6
Education Programs	216.7	216.7	178.9	166.9	154.9	154.7	155.4	155.4
Education Programs	216.7	216.7	178.9	166.9	154.9	154.7	155.4	155.4
Exploration Capabilities	6,704.4	6,704.4	6,998.4	6,763.0	6,378.6	6,056.7	5,367.1	5,193.8
Space Operations	6,704.4	6,704.4	6,988.4	6,763.0	6,378.6	6,056.7	5,367.1	5,193.8
International Space Station	1,676.3	1,676.3	1,676.3	1,856.7	1,835.3	1,790.9	2,152.3	2,375.5
Space Shuttle	4,543.0	4,543.0	4,838.2	4,530.6	4,172.4	3,865.7	2,815.1	2,419.2
Space and Flight Support	485.1	485.1	473.9	375.6	370.9	400.0	399.7	399.1
Inspector General	31.3	31.3	31.3	32.4	33.5	34.6	35.2	37.3
TOTAL	16,070.4	16,070.4	16,070.4	16,456.3	16,962.0	17,305.9	17,611.9	18,027.1
Year to year increase				2.4%	3.1%	2.0%	1.8%	2.4%
Emergency Hurricane Supplemental	126.0	126.0	126.0					

*Science Mission Directorate reflects the combination of the former Space Science and Earth Science Enterprises.

**Beginning in FY 2006, Exploration Systems moves from Exploration Capabilities to Science, Aeronautics and Exploration. Exploration Systems Mission Directorate reflects the combination of the former Biological & Physical Research and Exploration Systems Enterprises.

Totals may not add due to rounding.

