

**COMMERCE, JUSTICE, SCIENCE, AND RE-  
LATED AGENCIES APPROPRIATIONS FOR  
FISCAL YEAR 2007**

---

**WEDNESDAY, APRIL 26, 2006**

U.S. SENATE,  
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,  
*Washington, DC.*

The subcommittee met at 2:07 p.m., in room SD-192, Dirksen Senate Office Building, Hon. Richard C. Shelby (chairman) presiding.

Present: Senators Shelby and Mikulski.

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
STATEMENT OF HON. MICHAEL D. GRIFFIN, ADMINISTRATOR**

**CHAIRMAN'S OPENING REMARKS**

Senator SHELBY. The subcommittee will come to order. Today we welcome the NASA Administrator Dr. Michael Griffin, who has joined us to testify on the President's fiscal year 2007 budget request for the National Aeronautics and Space Administration (NASA).

The proposed budget for NASA is \$16.8 billion. After accounting for one-time supplemental funds provided for Katrina-related expenses, the increase to NASA-based programs becomes \$519 million, an increase of just over 3 percent. The requested increase can be attributed to nearly \$900 million to fund the Vision and Exploration Program. While this is a significant increase, there are a number of programs slated for decreases that are troubling. Specifically, funding for aeronautics and education have been cut, and science has been shortchanged with little hope for funding in future years that I see now.

Dr. Griffin, I feel that fulfilling NASA's goals including returning to the Moon are important and will take more than just plans for rockets and research missions. It will also take a sound financial structure, as we've talked about, a skilled workforce, and capable management. One of the greatest challenges that I believe NASA faces is building and retaining a technical workforce that we have talked about. NASA is one of the most publicly recognized agencies within the Federal Government. Such high visibility can be a powerful tool for aspiring future scientists, engineers, and explorers. The success of NASA programs in science and exploration seen by students today is the inspiration needed to attract the young people of this Nation to the careers of tomorrow.

Further investment in education is the direct link to future generations. I believe we agree that we must continue to encourage young people to explore these educational avenues and endeavor to carry on the important research and exploration capabilities for which NASA is so well known. It is a serious issue that must be addressed in order to ensure that future exploration in space can occur, and one that I do not believe should be sacrificed.

Dr. Griffin, this budget before us reflects the process of implementing the Vision for Space Exploration, and I understand that the path was laid out in the exploration systems architecture study. I believe that the intent of the study is commendable in its aim to reach the goal of returning to the Moon in a fiscally prudent, and safe manner. However, it is my hope that such implementation can be accomplished while maintaining the capabilities that NASA has developed in other areas of its mission. I do not believe that we should sacrifice important capabilities that will be vital to future missions and efforts at NASA in trying to attain this goal. I believe that we can and should find a balance, and I believe you will.

The path laid out for returning to the Moon is contingent on several factors. However, we are both keenly aware that any unexpected bump in the path could pose significant challenges to NASA's long-term plans. Today we can point to the sizable funding requirements of the space shuttle, as well as the ongoing construction of the International Space Station (ISS) as hefty fiscal burdens on NASA's ability to continue down the path laid out in the Vision for Space Exploration.

The evident strain on funding in the science missions and aeronautics budgets for NASA are indicators that we are traveling down a tenuous path. Return to Flight and the implementation of the Exploration Vision are a significant financial strain on NASA, and, therefore, require other aspects of NASA to remain relatively flat or decline over the next 5 years. It is all important.

I also believe that we will have an ongoing dialogue over the course of the year about NASA's ability to achieve the President's vision for space exploration. I am very interested in discussing how NASA will preserve its ongoing programs and how it will modernize its institutions and facilities which are critical to NASA's success in the coming years. Again, I believe that we can, and we have to, strike an appropriate balance.

The Vision laid out by the President in 2004 calls for a return to the Moon, and building upon that foundation to eventually set foot on another planet. I am excited by the opportunities that lay ahead with the Exploration Vision at NASA, but I must point out that there are fiscal realities that may affect the vision.

Dr. Griffin, I believe that this subcommittee has made every effort to work with you, and we will continue to do that, to provide NASA with the appropriate level of funding in an effort to ensure that roles and missions are protected and preserved. Along with that funding comes a fair amount of direction, but the subcommittee has provided NASA with reprogramming flexibility to react to those bumps in the path that I discussed. However, in return, there is the expectation that NASA will be a wise steward of taxpayers' dollars. I am concerned that the financial systems for

NASA have earned the worst rating possible from the administration with little progress toward correcting the problem over the past 3 years. I realize that you have not been there all that time. Even more troubling is a recent report of NASA having violated the anti-deficiency laws. These reports come at a time when NASA is holding an unprecedented amount of unobligated funds while claiming to need every additional dollar in order to accomplish the missions they have set out before them. Such reports have a tendency to erode confidence in NASA's ability to responsibly manage the funds that have been appropriated. Dr. Griffin, I appreciate, as I said a minute ago, that you have only been in your position for about 1 year, and I trust that you are working diligently, and I want to work with you to correct these problems, and ensure that there will be no further issues in complying with anti-deficiency laws. In addition, I expect that we will continue to discuss the unobligated balances that NASA has accumulated over the years and how those best can be utilized toward moving forward.

I look forward to hearing your insights on how NASA can do better, your views, and the challenges ahead.

Senator SHELBY. Senator Mikulski.

#### RANKING MINORITY MEMBER MIKULSKI OPENING REMARKS

Senator MIKULSKI. Thank you very much, Mr. Chairman, and again I, too, wish to welcome Dr. Griffin.

It has been a very busy and in many ways successful year for NASA, and I believe it is today that we celebrate the 25th anniversary of the first shuttle flight, in which we thought the shuttle was going to do wonderful things, and it did, but now the shuttle is getting old and we need to be able to look ahead.

There have also been an amazing set of accomplishments in science. Dr. Bennett, of my very own Johns Hopkins, saw the first light, and actually almost the beginning, of the Big Bang through a gamma ray burst. We are looking at how we can successfully launch the mission to Pluto by a team at APL; Cassini, the probe that gave us the best pictures on Saturn; and of course, the Hubble telescope and many other things.

Despite what we have been able to do, and despite the successes of NASA, it has been a difficult year for NASA. The cost of running the space shuttle to flight has run into delays which are absolutely crucial to ensure our number one priority, the safety of the astronauts, but it has also increased by \$2.4 billion. Hurricane Katrina caused over \$600 million of damage to two NASA centers, and hats off to how the employees saved so much of the facility, and know even slept on floors, but nevertheless, will be a tremendous cost to rebuild, and the years of flat budgets have put great stress on all of NASA's programs.

In looking at areas ahead, we know that we are facing new external challenges; a challenge from China. We know China wants to go to the Moon. We know that they want to be the first to go back to the Moon. We cannot let China be the first back to the Moon. I know we have to go to the Moon and go in a way that we can stay there for a variety of reasons.

At the same time, the President has challenged us and worked with us on a bipartisan basis to be competitive, to promote innova-

tion and discovery, to focus on education and research, innovation-friendly government. But we are concerned as we have responded to the call raised in the excellent report "Gathering Storm," that NASA was left out of that. I felt so strongly about that in a bipartisan meeting at the White House, to talk with the President about how his bold vision of returning to Mars was exactly what could inspire people, promote the development of incredible technology and breakthroughs that would help inspire the next generation of scientists, engineers and technologists, but also the kinds of new technologies that end up in the marketplace and help us be an economic superpower.

What we have seen though is a fairly flat budget, a modest increase, but we are deeply concerned about the consequences of what we see here. NASA's role in promoting science is not included in the budget in the way we had hoped. Science is cut over \$2 billion; Mars; solar system research; aeronautics research which is cut by \$100 million which is so crucial. We need a robust science program, we do need human exploration, we do need a crew return vehicle (CRV), but we know that we have enormous stresses in our own appropriations.

I'm going to work with my colleague, Senator Shelby, to find a balanced space program, to get that shuttle flying again and fix that shuttle, so as to move on to our next generation of science, technology, and aeronautics. But I am concerned that we are doing too much with too little money, that we have an aging workforce, we have aging technology, and that, quite frankly, I believe we have to find a way to do more, and we cannot continue to do more with less.

So we look forward to your ideas. We thank you for your leadership and we thank you for your candor. I particularly want to express my appreciation for the way you have handled the question of the ability to speak your scientific views and so on, truth through power, and so we look forward to hearing your testimony today.

Senator SHELBY. Dr. Griffin, your written testimony will be made part of the record without objection, and you may proceed as you wish. Welcome to the subcommittee, sir.

#### OPENING REMARKS OF MICHAEL D. GRIFFIN

Dr. GRIFFIN. Thank you, Senator Shelby and Senator Mikulski. I am pleased to be here to discuss our fiscal year 2007 budget request and how we are carrying out our missions of space exploration, scientific discovery, and aeronautics research, within the resources provided. With a 3.2 percent increase over last year's appropriation, this budget does represent the President's commitment to our Nation's civil space program, and especially so in view of the many pressures in the wake of Hurricane Katrina and the war on terrorism.

As we begin, I want to thank this subcommittee for its leadership over the past year in providing emergency supplemental funds for NASA's recovery and repair efforts after Hurricane Katrina. We are also very appreciative of the action taken by the Committees on Appropriations, and by the Congress as a whole, in providing \$16.5 billion in fiscal year 2006 appropriations to the agency, and

essentially the level of the President's fiscal year 2006 request before the application of rescissions, as well as the strong endorsement of the Vision for Space Exploration, timely development of the crew exploration vehicle (CEV) and the crew launch vehicle (CLV), and support for NASA's other core programs. We need the help of this subcommittee now, and will continue to need it in the future. Senator Shelby, I want specifically to address the concerns you raised, because I think they are very fair.

#### NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FINANCIAL MANAGEMENT

With regard to NASA's financial management, we delivered to the Congress this past February an integrated cross-NASA corrective action plan to address the findings and recommendations to which you referred that were made by Ernst & Young in the 2005 financial audit. Through this plan we are working toward resolution of those audit issues by the third quarter of this fiscal year, fiscal year 2006. NASA does not control the opinion delivered by its auditors, but we fully expect that resolution of the issues they raised by the third quarter of this year will allow the auditors to perform a complete audit of NASA's 2006 financial statements. We will know when their opinion is released on November 15 of this year. I could not take your concerns more seriously, nor be more personally concerned about them myself.

#### ANTI-DEFICIENCY ACT VIOLATIONS

You mentioned the ADA violations, Anti-Deficiency Act violations. Two of these did occur as a result of the agency's failure to file apportionment requests in fiscal 2004. The first was of magnitude \$1.6 billion that was obligated in 2005, and a smaller one, \$30.4 million, obligated in 2004. The funds were not willfully or knowingly obligated or overly expended, but that does not excuse the fact that it was done. We did catch it ourselves, and we brought both instances to OMB's attention. Again, that does not excuse the behavior, but we sought to mitigate it to the maximum extent possible. We addressed both of those issues without the need for supplemental funds, and we have implemented corrective actions in our financial accounting chain of command to see to it that they do not happen again. I am certain that our auditors will explore those issues as well.

#### UNOBLIGATED BALANCES

With regard to the point you made about unobligated balances, it is true that as we sit here today we have \$625 million presently unobligated. Ninety-six percent of funds have been obligated. Of the \$625 million, \$108 million is for construction, and \$517 million is for nonconstruction activities. We have definite plans for all of these funds. All of them will be obligated, and all of the funds are required or programs that have been approved by this Congress. I say again, I am happy to work with your staff or with you as Members to convince you that these statements that I am making today are true. I have been here but a year, however, I fully accept and in fact require ownership of these problems that you have raised.

They became my problems on April 14 of last year when the Senate confirmed me, I do own them and we are working toward a resolution.

In many ways, Mr. Chairman, NASA is a victim of its own success. Our can-do attitude toward the Nation's greatest technical challenges has left many people believing that NASA can do anything and everything. I hate to say it, but I am here to testify before you that NASA cannot do everything that our many constituencies would like us to do within our proposed \$16.8 billion budget. I am truly sorry that this is so, but it is a fact. Given this fact, I believe that the President's fiscal year 2007 budget request before this Congress strikes a careful, disciplined approach to meeting congressional priorities and Presidential priorities for the Nation's civil space program within the resources we have. NASA must go as we can afford to pay across our entire mission portfolio of human space flight, science, and aeronautics.

To gain a sense of perspective, I think it is useful to recall that at the peak of the Apollo Program, NASA's budget represented 4.4 percent of Federal outlays. Today, NASA's top line is six-tenths of 1 percent of the Federal budget. During Apollo, NASA funding employed over 400,000 contractors, civil servants, technicians, scientists, and engineers across all of its programs, and more than that. Today, NASA employs about 75,000 full-time equivalent employees throughout the aerospace industry. NASA cannot and should not in this fiscal environment try to do everything. We need to set priorities carefully, and we need to execute our programs to match the resources available with incredible schedules.

#### NATIONAL PRIORITIES

The national priorities that we have that have been agreed upon by this Congress are, to fly the space shuttle as safely as possible while using it to complete the assembly of the International Space Station, using the minimum number of flights necessary to do that, and to fulfill our commitments to international partners. To conduct a space shuttle servicing mission if technically possible to the Hubble space telescope, pending outcome of the next Return to Flight mission. To retire the space shuttle in 2010, and to bring online a new crew exploration vehicle and crew launch vehicle not later than 2014, and possibly sooner. To develop a space shuttle derived heavy lift launch vehicle to enable lunar missions not later than 2020, and later missions to Mars and other destinations. To develop a balanced program of space and Earth science, along with aeronautics research, that appropriately leverage the new direction of NASA's Human Space Flight Program. To pursue appropriate commercial and international partnerships, especially with the International Space Station.

These priorities require a careful balance of time, money, and energy within the overall agency budget. Thus, our budget request shifts resources to the space shuttle and the International Space Station from both science and exploration, to ensure that our highest priorities have the resources necessary to accomplish them between now and 2010. NASA's science missions remain one of our Nation's greatest achievements, but we must defer some missions that we would prefer to do sooner but simply cannot afford at this

time. We will continue to maintain a robust portfolio of missions and research within the \$5.33 billion science budget requested for fiscal year 2007. NASA is listening to the priorities of the science community in this process, and we will keep this subcommittee informed if we believe that any adjustments in mission or research priorities within that planned total funding are necessary.

#### AERONAUTICS RESEARCH

In aeronautics research, NASA is developing a national policy and plan in concert with the White House, Office of Science and Technology Policy, and other Federal agencies, including the Department of Defense (DOD) and the Federal Aviation Administration (FAA), a policy which dedicates us to the mastery and intellectual stewardship of the core competencies of aeronautics in all of its flight regimes. This plan will focus our research efforts on those areas appropriate to NASA's unique capabilities. We hope to provide this plan which will inform future budget resource decisions to the Congress by December as required in our authorization act.

#### BALANCING THE BUDGET

Mr. Chairman and members of the subcommittee, NASA's fiscal year 2007 budget request represents a careful balance, conscientiously apportioned. We will need your help to maintain that balance. As this subcommittee proceeds to mark up our appropriation for fiscal year 2007, I most strongly urge you to avoid the temptation to rob Peter to pay Paul by taking funds from NASA's replacements for the space shuttle, the CEV and CLV, to pay for science missions beyond the \$5.33 billion requested. Doing so will delay the CEV beyond 2014, and will exacerbate problems in safety, workforce, and, frankly, perceptions of a loss of U.S. leadership in space during this gap in human space flight.

Likewise, it is important to fly out and retire the space shuttle in a safe and orderly manner. The next several years are critical as we effect this transition from the space shuttle to the crew exploration vehicle. Indeed, this is NASA's greatest management challenge, and we will need your help to meet it.

The Space Shuttle Program is dealing with many technical issues today, not least of which is fixing the external tank foam shedding problems. I believe we have a grasp on those issues, and I invite Members and staff of this subcommittee to their next launch which will be space shuttle *Discovery* STS-121. The launch window opens in July, and we are making preparations for it, but we will fly only when we are ready.

I must also ask your help in considering limits to redirection of funds to pay for congressional interest items. Back in fiscal 1997, specific direction for NASA constituted only \$74 million for six specific projects. In fiscal year 2006, NASA was earmarked at a total of \$568.5 million for 198 projects and programmatic increases. We and I fully acknowledge the prerogative of the Congress to direct and appropriate funds, but we desperately need your help and that of your staff to minimize impact on our proposed programs and activities. We simply cannot afford everything that everyone would like us to do.

## EMERGENCY SUPPLEMENTAL FUNDS

We are also asking for this subcommittee's help in providing some flexibility to use as much as \$60 million in emergency supplemental funds to reimburse our space shuttle and space station programs for the funds used last fall to pay for immediate Hurricane Katrina damage recovery. We are still refining estimates of the total cost for the repair, refurbishment, and hardening of our facilities at Michoud assembly facility and the Stennis Space Center, but our most recent estimate is a little bit less than \$500 million. As you consider the pending emergency supplemental appropriations bill, I ask that you favorably consider this legislative provision enabling flexibility for NASA. As we continue to refine our total estimates for Katrina recovery, we will keep the subcommittee fully informed as to how we would use this flexibility. I look forward to working with you to address this matter, and I think at this point it is good to thank the subcommittee for the help you have provided within the last two hurricane seasons which have been especially tough on NASA's facilities in Florida, Louisiana, and Mississippi. I regret to say that I will probably be counting on your help in the future.

## HUMAN SPACE FLIGHT

Space flight remains a dangerous endeavor. Following the loss of space shuttle *Columbia*, the Nation's leadership in both the White House and the Congress recognized that the broader goals of human space flight must be worth the cost and risk involved. The Vision for Space Exploration articulates just such goals, goals which are worthy of pursuit by a great nation. Our purpose is not to impress others, or merely even to explore the Moon and Mars, but, rather, to advance U.S. scientific, security, and economic interests through leadership in the grandest expression of human imagination of which we can conceive. Put simply, human space flight is today one of those strategic capabilities that define a nation as a superpower. Other nations and societies aspire to this capability and have achieved it, or will. The United States once surpassing command of this arena has vanished, but international cooperation leavened with a healthy dose of competition is what makes the United States the greatest country in the world. The pursuit of this vision requires technical excellence, hard work, sacrifice, and the necessary resources, but we also need leadership and we need the help of this Congress.

## PREPARED STATEMENT

Mr. Chairman and ranking member Mikulski, we have a long journey ahead of us. We need your help. I look forward to working with you and the members of the committee. Thank you.

Senator SHELBY. Thank you, Dr. Griffin.

[The statement follows:]

## PREPARED STATEMENT OF MICHAEL D. GRIFFIN

Mr. Chairman and Members of the Subcommittee, thank you for this opportunity to appear today to discuss NASA's plans as represented in the President's fiscal year 2007 budget request for NASA. I will outline the highlights of our budget request and discuss the strategic direction for NASA in implementing the priorities

of the President and Congress within the resources provided. The President's fiscal year 2007 budget request for NASA of \$16,792 million demonstrates his commitment to the Vision for Space Exploration and our Nation's commitment to our partners on the International Space Station. The fiscal year 2007 budget request is a 3.2 percent increase above NASA's fiscal year 2006 appropriation, not including the \$349.8 million emergency supplemental for NASA's recovery and restoration efforts following Hurricane Katrina. However, let me put NASA's budget into perspective. NASA's budget is roughly 0.7 percent of the overall Federal budget. This is a prudent investment to extend the frontiers of space exploration, scientific discovery, and aeronautics research. With it, we enhance American leadership, our safety and security, and our global economic competitiveness through the technological innovations stemming from our space and aeronautics research programs. Our Nation can afford this investment in NASA.

On January 14, 2004, President George W. Bush announced the Vision for Space Exploration to advance U.S. scientific, security, and economic interests through a robust space exploration program. NASA is very appreciative of the action by the Committees on Appropriations and Congress in providing regular fiscal year 2006 appropriations for the Agency totaling \$16,456.8 million—essentially the level of the President's fiscal year 2006 request before application of rescissions—including a strong endorsement for the Vision for Space Exploration, timely development of the Crew Exploration Vehicle (CEV) and Crew Launch Vehicle (CLV) and support for NASA's other core programs. NASA is also grateful to the Congress for endorsing this Vision last December in the NASA Authorization Act of 2005 (Public Law 109-155) and providing guidance and expectations for us in carrying out the Agency's missions of space exploration, scientific discovery, and aeronautics research. To that end, NASA is implementing the priorities of the President and Congress within the resources available. NASA carries out its missions with a "go as you can afford to pay" approach where we assume NASA's top line budget will grow at the moderate rate laid out in the President's 2007 budget request. NASA's Strategic Plan and fiscal year 2007 Congressional Budget Justification, provided to the Congress in February, reflect those priorities and describe how NASA is implementing those policies into practice by describing our programs, projected resources, and workforce needs.

As part of his fiscal year 2007 budget request to Congress, the President proposed the American Competitiveness Initiative, or ACI, to encourage American innovation and strengthen our Nation's ability to compete in the global economy. Many have asked why NASA is not a part of the ACI. My response is that it is the mission of NASA to pioneer the future of space exploration, scientific discovery, and aeronautics research, while the ACI is focused on bolstering the Nation's economic competitiveness in areas such as information technology and nanotechnology. NASA contributes to the Nation's competitiveness through all of the cutting-edge exploration, science, and aeronautics investments accomplished by our Mission Directorates. As part of the President's Vision for Space Exploration, NASA expects to spawn entire new industries in this Nation. Furthermore, NASA's education and training initiatives are designed to enhance math and science education, as well as to provide research opportunities at the university level. We are currently reviewing our portfolio of education programs to assess opportunities for potential collaboration at the invitation of the Department of Education, National Science Foundation, and other Federal agencies. NASA can offer opportunities and inspiration to students as no one else can. For example, a University of Colorado-Boulder student-built experiment on the New Horizons mission is currently being activated and will be operated by university students all the way to Pluto and beyond.

#### IMPLEMENTING THE VISION

Later this year, NASA will continue the assembly of the International Space Station (ISS) with the minimum number of Space Shuttle flights necessary to fulfill our commitments to our international partners before the Space Shuttle's retirement in 2010. The commitment of resources in the President's budget has shown our international partners that NASA and the United States are good partners through thick and thin and this commitment will encourage them to team with us in future endeavors of space exploration and scientific discovery. NASA has consulted with our international partners on the configuration of the ISS, and is working closely with them to determine the crew size and logistics necessary during this assembly period as well as the period following the retirement of the Space Shuttle. The heads of space agencies from Canada, Europe, Japan, Russia and the United States met at Kennedy Space Center on March 2, 2006, to review ISS cooperation and endorse a revision to the ISS configuration and assembly sequence. The partners reaffirmed their agencies' commitment to meet their mutual obligations, to implement six per-

son crew operations in 2009, and to conduct an adequate number of Space Shuttle flights to complete the assembly of ISS by the end of the decade. The partners also affirmed their plans to use a combination of transportation systems provided by Europe, Japan, Russia, and the United States in order to complete ISS assembly in a timeframe that meets the needs of the partners and to ensure full utilization of the unique capabilities of the ISS throughout its lifetime. The fiscal year 2007 budget request provides the necessary resources to purchase Soyuz crew transport and rescue for U.S. astronauts as well as needed Progress vehicle logistics support for the ISS from the Russian Federal Space Agency. Likewise, the fiscal year 2007 budget request provides necessary funds for U.S. commercial industry to demonstrate the capability to deliver cargo and/or crew to the ISS. If such cost-effective commercial services are successfully demonstrated, NASA will welcome and use them.

The next return to flight test mission, STS-121 commanded by Colonel Steve Lindsey, will confirm that we can safely return the Space Shuttle to its primary task of assembling the ISS. We have continued to reduce the risk associated with the release of foam debris from the external tank by eliminating the liquid hydrogen and the liquid oxygen protuberance air load ramps. We are now working toward a July launch, which is the next available lighted launch window as mandated for STS-121. The window is open from July 1 through July 19. NASA will launch when ready. Pending the results of this test flight, I plan to convene my senior management team for space operations as well as my Chief, Safety and Mission Assurance and my Chief Engineer in order to determine whether the Space Shuttle can safely conduct a fifth servicing mission to the Hubble Space Telescope in 2007-08. NASA's fiscal year 2007 budget provides the necessary resources to conduct this mission.

In previous budget requests, NASA reported only placeholder budget estimates for the Space Shuttle for fiscal year 2008-2010. The Agency's management focus on return to flight efforts of the Space Shuttle resulted in NASA deferring this analysis until the fiscal year 2007 budget. As I testified before Congress last year, NASA's estimates of the budget shortfall required to safely fly out the Space Shuttle with the minimum number of flights necessary to complete ISS assembly and meet our international partner commitments were \$3-\$5 billion. With the fiscal year 2007 budget runout, NASA has added \$2.4 billion to the Space Shuttle program and almost \$1.5 billion to the International Space Station in fiscal year 2008-2010 compared to the fiscal year 2006 budget runout. There is no "new money" for NASA's top line budget within the budget projections available given our Nation's other pressing issues, so, working with the White House, NASA provided sufficient funds for the Space Shuttle and ISS programs to carry out their missions by redirecting funds from the Science and Exploration budgets.

There are several strategic implications behind this decision. Foremost among them is that our Nation will keep its commitment to our international partners on the ISS. Thus, with limited resources, we made some difficult decisions. Leadership means setting priorities of time, energy, and resources, and I have tried to make these decisions with the best available facts and analysis. The plain fact is that NASA simply cannot afford to do everything that our many constituencies would like the Agency to do. We must set priorities, and we must adjust our spending to match those priorities. NASA needed to reallocate budgeted funds from the Science and Exploration budget projections for fiscal year 2007-2011 in order to ensure that enough funds were available to properly support the Space Shuttle and the ISS. Thus, NASA cannot afford the costs of starting some new science missions at this time. It is important to know that NASA is simply delaying missions, not abandoning them. With the limited resources available, I believe that fulfilling our commitments on the International Space Station and bringing the Crew Exploration Vehicle (CEV) online in a timely manner, not later than 2014 and possibly much sooner, is a higher priority than these science missions during this period.

There are several reasons not to delay the CEV farther. First and foremost is increased risk to the Vision due to an extended gap in our Nation's ability to launch humans into space after we retire the Space Shuttle in 2010. I experienced firsthand the stagnancy in the aerospace industry that existed during the gap in human spaceflight between the end of the Apollo program and the first flight of the Space Shuttle in 1981, and I know that our Nation's space program suffered greatly from the unintended loss of critical expertise. Our Nation's space industrial base withered. A longer gap in U.S. human spaceflight capabilities will increase risk and overall costs and lead to even more delays in pursuing the Nation's vision. Equally important, the United States may risk a perceived, if not a real loss of leadership in space exploration, if we are unable for an extended period to launch our astronauts into space when other nations are establishing or building on their own abilities to do so. An extended gap in U.S. human spaceflight capabilities also increases

our risk posture to adequately maintain and utilize the ISS and, unless a commercial capability arises to transport our astronauts, NASA would continue to be reliant on the Russian Soyuz.

Thus, further delays in the CEV are strategically more damaging to our Nation's space program than delays to these other science missions. I stand by my decision regarding how to implement the priorities of the President and Congress within the resources provided, and I will work closely with our stakeholders in Congress and the scientific community to make sure they understand my rationale. Some of our stakeholders will not agree with my position, but it is important for everyone to understand the rationale. These are difficult decisions, but we must balance the competing priorities for our Nation's civil space and aeronautics research endeavors with the limited resources available.

If the funds budgeted for Exploration Systems were to be used to provide additional funds for Science missions, additional Aeronautics Research, or other Congressionally-directed items, I must advise the Congress that such redirection of already-budgeted funds will directly impact NASA's ability to effectively and efficiently transition the workforce and capabilities from the Space Shuttle to the new CEV systems. Funds available to carry out this transition are already lean, with little management reserve or margin for error. This transition from the Space Shuttle to the CEV is NASA's greatest management challenge over the next several years, and we will need everyone's help within NASA, industry, and our stakeholders to make the transition successful.

Beyond fulfilling our existing commitment, NASA's fiscal year 2007 budget provides the necessary resources to carry out the next steps of the Vision for Space Exploration. The fiscal year 2007 budget provides \$3,978 million for Exploration Systems. Last summer, NASA defined the architecture for the exploration systems that will be necessary in carrying forth that Vision, and we notified the Congress of NASA's need to curtail several research and technology activities not directly contributing to the near-term priorities of timely development of the CEV and Crew Launch Vehicle (CLV) based on the results of that exploration architecture study and the limited funds available. I want to thank the Congress for its endorsement of the general architecture plans in the fiscal year 2006 Appropriations Act for NASA (Public Law 109-108) as well as the NASA Authorization Act of 2005 (Public Law 109-155).

The fiscal year 2007 budget request is sufficient to bring the CEV online no later than 2014, and potentially much sooner. Given the analysis I have today and the need to balance budgets with proposed development work for the CEV and launch vehicles along with the cost estimates for that work, I cannot be more specific for our stakeholders in the White House and Congress at this time about the specific point between 2010 and 2014 when NASA will be able to bring the CEV online. NASA requested industry proposals for the CEV, and we have considerable incentives for an industry bidder to propose a planned development for the CEV as close to 2010 as possible. NASA has begun to evaluate those industry proposals, with a planned contract award in late summer/early fall 2006. NASA plans to select one industry contractor team for the design and development of the CEV. Concurrently, NASA will refine its independent cost estimates for the CEV and launch systems as well as find cost savings through workforce synergies and contract efficiencies between the Space Shuttle and CEV launch systems within the budget profile projected in fiscal year 2007. We believe we can find synergies and contract efficiencies by sharing or transferring subsystems, personnel, resources, and infrastructure between the Space Shuttle propulsion elements and the CEV, CLV, and Heavy-Lift Launch Vehicle. I believe that with the fiscal year 2007 budget, NASA and industry have a real opportunity to make the CEV operational sooner than 2014. I should be able to report a more definitive date for bringing the CEV online by the time we award the CEV contract. Until then, NASA is in the midst of source selection for the CEV procurement, and we are limited in our ability to provide information in this competitive environment involving a multi-billion dollar procurement.

For the CLV, NASA has directed two industry teams to begin initial development of the vehicle's propulsion systems, and to develop designs for the CLV upper stage. The Agency also plans to award design, development, test, and evaluation contracts later this year. NASA is planning a systems requirements review for this project in the fall with a preliminary design review in 2008 in order for this new launch vehicle to be ready for when the CEV comes on-line.

While NASA needed to significantly curtail projected funding for biological and physical sciences research on the ISS as well as various research and technology projects in order to fund development for the CEV, the U.S. segment of the ISS was designated a National Laboratory in the NASA Authorization Act. Thus, NASA is seeking partnerships with other government agencies like the National Science

Foundation, Department of Defense, National Institutes of Health (NIH), Department of Energy, and the National Institute of Standards and Technology as well as the commercial sector to conduct research onboard the ISS. However, the research utilization of the ISS is impacted due to limited cargo and crew transportation. For this reason, NASA's need for investment to spur a commercial cargo and/or crew transportation service is even more compelling.

#### SCIENTIFIC DISCOVERY

In 2005, NASA's science missions enjoyed a year of significant achievements. Deep Impact traveled 268 million miles to meet comet Tempel 1, sending its impactor to collide with the comet and providing researchers with the best-ever comet data and images. The Mars twin rovers continue studying the harsh Martian environment, well beyond their expected mission life. Cassini may have found evidence of liquid water erupting from below the surface of Saturn's moon Enceladus. The Mars Reconnaissance Orbiter successfully launched and went into orbit around Mars, to help us better understand the history of water on Mars. The Voyager 1 spacecraft entered the vast, turbulent expanse of the heliosheath, 8.7 billion miles from the Sun, where no human-made object has traveled before. The Hubble Space Telescope continues its successful mission of discovery and exploration. Among its many achievements was the discovery that Pluto may have three moons, offering more insights into the nature and evolution of the Pluto system and Kuiper Belt. Through coordination of observations from several ground-based telescopes and NASA's Swift and other satellites, scientists solved the 35-year old mystery of the origin of powerful, split-second flashes of light called gamma-ray bursts. The Tropical Rainfall Measuring Mission (TRMM) provided data to aid our understanding of the changes inside a hurricane, helping scientists re-create storms on computer forecast models, which can assist in the forecasting of future tropical cyclone transformations. On January 19, 2006, we successfully launched the New Horizons Mission, beginning its nine year journey to Pluto for scientific discovery. In the near future, we will launch CALIPSO (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) and Cloudsat from Vandenberg Air Force Base. Together, they will provide new perspectives on Earth's clouds and aerosols, answering questions about how they form, evolve, and affect water supply, climate, weather, and air quality. Truly, this has been a successful year of science achievements—a trend I expect to continue.

NASA's fiscal year 2007 budget request provides \$5,330 million for the Agency's Science portfolio to explore the universe, solar system, and Earth. My decision to curtail the rate of growth for NASA's Science missions is not intended in any way to demonstrate any lack of respect for the work done by NASA Science. On the contrary, NASA's science missions remain one of the nation's crowning achievements, and NASA is a world leader with 54 satellites and payloads currently operating in concert with the science community and our international partners. My decision to slow the rate of growth for NASA's Science missions is simply a matter of how the Agency will use the available resources within the overall NASA portfolio. In fact, the Agency's Science budget has grown much faster than NASA's total budget since fiscal year 1993. In 1992, the Science budget represented only 24 percent of the overall NASA budget while it represents 32 percent of the Agency's budget in fiscal year 2007. NASA's Science budget is moderated to 1.5 percent growth in the fiscal year 2007 budget request compared with the amount appropriated for NASA in fiscal year 2006 (in accordance with NASA's Initial Operating Plan provided to the Committee) and then 1 percent per year thereafter through fiscal year 2011.

In the fiscal year 2007 budget, there are some additional budget shifts within the Science portfolio to rebalance the program to better reflect our original science priorities and consistent with the fiscal year 2006 Budget Amendment. Within the Science budget, the Solar System Exploration budget provides \$1,610 million to fund missions to all solar system bodies and to maintain the Deep Space Network. Mars exploration is kept at roughly its current level of funding which allows missions every 26 months when the Earth and Mars are in planetary alignment. Mars will be the most thoroughly studied planet besides our own Earth. NASA continues a series of openly competed missions for Discovery, New Frontiers, and Scout missions to various planetary bodies in the solar system. Juno, a competitively-selected mission to study Jupiter, is slated to be the next New Frontiers mission, following the New Horizons mission on its way to Pluto after its successful launch in January.

After extensive reviews, NASA has extended the mission operating life of several Earth Science missions including TRMM and Terra, Heliophysics missions such as both Voyager spacecraft, and Astrophysics missions including Chandra and the Wilkinson Microwave Anisotropy Probe.

## AERONAUTICS RESEARCH

NASA's fiscal year 2007 request for the Aeronautics Research Mission Directorate is \$724 million. Proper stewardship of this funding requires a coherent strategic vision for aeronautics research, which we are working to develop. While I am concerned that our Nation's aviation industry not lose market share to global competitors, NASA's research must benefit the American public by supporting a broad base of aeronautics research. NASA's aeronautics research cannot and will not directly subsidize work to specific corporate interests. There are fundamental questions in aeronautics research needing to be answered, and NASA will focus its aeronautics research on those issues. NASA will take responsibility for the intellectual stewardship of the core competencies of aeronautics for the Nation in all flight regimes, from subsonic through hypersonic flight. We will also conduct the fundamental research that is needed to meet the substantial challenges of the Next Generation Air Transportation System (NGATS), and we intend to work closely with our agency partners in the Joint Planning and Development Office (JPDO).

Across our aeronautics portfolio, NASA is taking a long-term, strategic approach to our research plans to ensure that we pursue the cutting-edge across the breadth of aeronautics disciplines that will be required to support revolutionary capabilities in both air vehicles and the airspace in which they fly. NASA's commitment to technical excellence requires a commitment to rigor and discipline and will not focus on demonstrations that lack the traceability and scalability required for true scientific and engineering advancement. Hence, we are turning away from the four-demo approach proposed last year under the Vehicle Systems Program. Instead, our Fundamental Aeronautics Program will focus on fundamental research that addresses aeronautics challenges in areas such as aerothermodynamics, acoustics, propulsion, materials and structures, computational fluid dynamics, and experimental measurement techniques. The Fundamental Aeronautics Program will generate data, knowledge, and design tools that will be applicable across a broad range of air vehicles in subsonic (both fixed and rotary wing), supersonic, and hypersonic flight.

In the Aviation Safety Program, NASA is developing strategic research plans, ensuring that the research conducted will lead to capabilities and technologies for improving safety consistent with the revolutionary changes anticipated in air vehicles foreseen in the future. The focus will be vehicle-centric, with areas of research that include vehicle health management, resilient aircraft control, aging and durability challenges, and advanced flight deck technologies.

In the Airspace Systems Program, NASA will conduct the fundamental research required to bring about the revolutionary capabilities articulated in the JPDO's vision for the NGATS. Our research will focus on the development of future concepts, capabilities, and technologies that will enable major measurable increases in air traffic management effectiveness, flexibility, and efficiency.

In addition to the Aeronautics Research Mission Directorate's three research programs, NASA is committed to preserving as national assets those aeronautics test facilities which are deemed mission critical and necessary to meet the needs and requirements of the Agency and the Nation. NASA has established the Aeronautics Test Program (ATP), a component of the Shared Capability Assets Program (SCAP), as a long-term, funded commitment by NASA to retain and invest in test capabilities that are considered important to the Agency and the Nation. ATP's purpose is to ensure the strategic availability of the requisite, critical suite of wind tunnel and ground test facilities which are necessary to meet immediate and future National requirements.

As part of our overall portfolio, NASA program managers and researchers will work closely and constructively with industry, academia, and other Government entities to enhance our Nation's aeronautics capability. In this vein, as a principal member of the interagency JPDO, NASA has established investment priorities that directly address the research and development needs of the NGATS which will enable major increases in the capacity and mobility of the U.S. Air Transportation System. NASA also plans to collaborate closely with industry and academia through the use of competitive research awards and Space Act agreements on prospective research work in line with the critical thrust areas of the Aeronautics program that will enable numerous commercial aviation and scientific applications. Our goal is to focus our total research investments on fundamental aeronautics questions that need to be answered, and that will benefit the broader community of academia, industry, and Government researchers. We will transition the achievements from NASA's Aeronautics research and technology for use by both Government and industry. Additionally, and in line with the refocused program's priorities, NASA will leave to others work more appropriately performed or funded by other Agencies or the private sectors.

In accordance with the fiscal year 2006 Science, State, Justice, Commerce, and Related Agencies Appropriations Act (Public Law 109-108), NASA and the Office of Science and Technology Policy have been jointly developing a National Aeronautics Research and Development Policy which will establish a long term policy and guidance for future aeronautics research and development activities. This policy will establish the appropriate role for Federal investment in U.S. aeronautics research: near- and far-term, high-priority objectives; roles and responsibilities of the multiple agencies involved; and, guidance on related infrastructure and workforce challenges.

#### CROSS-AGENCY SUPPORT PROGRAMS

In the fiscal year 2007 budget, NASA proposes a new direct budget category for programs that cut across NASA's portfolio of space exploration, scientific discovery, and aeronautics research. These Cross-Agency Support Programs include: NASA's Education programs funded at \$153.3 million; Advanced Business Systems, or more commonly known as the Integrated Enterprise Management program, is called out as a separate program rather than being budgeted from within Corporate and Center General and Administrative accounts and is funded at \$108.2 million; NASA's Innovative Partnership Program, including Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR), has been transferred from Exploration Systems so that these partnerships may better address Agency-wide needs and is funded at \$197.9 million. Also, the Shared Capabilities Assets Program is funded at \$32.2 million (with additional funding located in the Mission Directorates) and will ensure that NASA's unique facilities (e.g., wind tunnels, rocket engine test stands, high-end computing, thermal vacuum chambers, and other capital assets) are adequately managed with agency-level decision-making to address NASA's and the Nation's needs.

NASA's Education budget request sustains our commitment to excellence in science, technology, engineering and mathematics (STEM) education to ensure that the next generation of Americans can accept the full measure of their roles and responsibilities in shaping the future and meeting the workforce needs to implement the Vision for Space Exploration. NASA will continue to provide innovative programs that use STEM resources (NASA content, people and facilities) to inspire the next generation of explorers and innovators. I have outlined three primary goals for our education investments: (1) strengthening NASA and the nation's future workforce; (2) attracting and retaining students in the STEM pipeline; and, (3) engaging Americans in NASA's mission through partnerships and alliances. The greatest contribution that NASA makes in educating the next generation of Americans is providing worthy endeavors for which students will be inspired to study difficult subjects like math, science, and engineering because they too share the dream of exploring the cosmos. These students are our future workforce. Our education investment portfolio is directly linked to our overall workforce strategy.

#### NASA WORKFORCE STRATEGY

The Vision for Space Exploration is a unique endeavor that will last many generations. The NASA management team has been working to build NASA as an institution having ten healthy field Centers known for technical excellence. We continue to define program management and research roles and responsibilities for each Center in order to carry out NASA's missions of space exploration, scientific discovery, and aeronautics research. All of our centers must contribute to NASA's primary missions. We are beginning the process of assigning specific research programs and projects to appropriate NASA Centers. We are not done, but we are taking the necessary steps to make it happen.

We have many challenges in the Agency, but none more important than the technical excellence of NASA's workforce. Likewise, we are beginning to address the problems posed by the aging of NASA's facilities and physical assets. The overall objective is to transform the composition of NASA's workforce so that it remains viable for the long-term goals of NASA's missions. We have a lot of work cut out for us in the coming months and year ahead in assigning these program responsibilities and re-building the Agency's technical competence in performing cutting-edge work. NASA has been addressing the challenge of mitigating the number of civil service employees in the Agency that are not currently assigned or supporting NASA programs (the so-called "uncovered capacity") through a number of means, which were addressed in a draft report, shared with the Subcommittee in February in compliance with the NASA Authorization Act of 2005. The final workforce report, reflecting input from our unions, was provided to the Subcommittee earlier this month. NASA will conduct a reduction in force of our civil servants only as an action of last resort consistent with our statutory constraints. Instead, NASA is focusing its

efforts to solve its uncovered capacity workforce problems through a number of other actions, including the assignment of new projects to research Centers that will strengthen their base of in-house work, the Shared Capability Assets Program that should stabilize the skills base necessary for a certain specialized workforce; the movement of certain research and technology development projects from certain centers not suffering from uncovered capacity problems to centers that are; retraining efforts at field centers so that the technical workforce can develop new skills; and the pursuit of reimbursable work for projects and research to support other government agencies and the private sector through Space Act Agreements.

#### NASA'S FINANCIAL MANAGEMENT

Earlier this month, NASA notified the Committee that it had two violations of the Antideficiency Act. The violations resulted from the Agency's failure to request from the Office of Management and Budget timely reappropriation of Congressionally-approved fiscal year 2004 funds and timely apportionments of unobligated balances carried over from fiscal year 2004 to fiscal year 2005. The Agency has corrected the errors without the need for additional appropriations. The Agency has also identified the root cause of these errors and has addressed them through its aggressive staff training and process improvements.

NASA has continued to make progress in addressing its other financial management and reporting challenges. The Office of Management and Budget has recently provided feedback to NASA affirming the Agency's progress. The Agency finalized a Corrective Action Plan addressing financial weaknesses identified in NASA's 2005 financial audit. The plan was delivered to the Congress, specifically at the request of the Subcommittee on Space and Aeronautics of the Committee on Science and the Subcommittee on Government Management, Finance and Accountability of the Committee on Government Reform, on February 15, 2006. It incorporates the expert advice of NASA's Inspector General. In addition, we have reviewed the plan with the Office of Management and Budget. This Corrective Action Plan provides an integrated, cross-NASA approach to resolving the Agency's outstanding deficiencies. Implementation of these corrective actions is reviewed regularly by the NASA Deputy Administrator. While these corrective actions will require some time to implement, NASA remains committed to improving its financial management and reporting.

#### IMPACT OF EARMARKS ON NASA'S MISSION

NASA pioneers the future in space exploration, scientific discovery and aeronautics research. In order to carry out this mission, NASA awards peer-reviewed science grants and conducts competitively-selected procurements to select research and development projects to benefit the public based on the priorities of the Congress, President, and scientific community. NASA is implementing these priorities within the resources provided. NASA's fiscal year 2006 appropriation totals \$16.623 billion, including \$349.8 million in emergency supplemental appropriations for Hurricane Katrina recovery at NASA facilities in Louisiana and Mississippi. Within this fiscal year 2006 appropriation is a total of \$568.5 million in directed funding for 198 discrete site-specific and programmatic Congressional interest items, a record high in both dollar amount and number of individual items. These Congressional interest items are offset by reductions within NASA's budget, to ongoing and planned NASA programs. Earmarks have increased by a factor of more than 30 in number and almost 8 in dollar value since fiscal year 1997, when NASA was earmarked \$74 million, for 6 discrete items. The growth of these Congressional directions is eroding NASA's ability to carry out its mission of space exploration and peer-reviewed scientific discovery.

In formulating our budget, NASA prioritizes activities to achieve an integrated package of programs and projects to best achieve the priorities that have been provided us by both the President and the Congress. The redirection of funding erodes the integrity of our plans, has resulted in delays and/or cancellation of planned activities, and may conflict with timely development of the CEV. In fiscal year 2006, as a result of earmarks, NASA had to redirect a significant portion of many planned budgets. Fully 50 percent of the planned Education program required redirection, 16 percent of the Innovative Partnerships Program, 5 percent of the Exploration Systems budget, and 4 percent of the Science budget. Further, the scientific community bases its research priorities on a peer-review process. Congressional site-specific earmarks circumvent this process for setting research priorities within the science community and erode the integrity of that process. Site specific earmarks to institutions outside of NASA exacerbate the problems of NASA's "uncovered capacity" workforce, where NASA civil servant scientists and engineers do not have funds for their own research and development projects. As stated in the President's ACI, "The

rapidly growing level of legislatively directed research funds undermines America's research productivity." NASA seeks the assistance of this Committee and Congress in reducing earmarks in the fiscal year 2007 budget process.

#### NASA'S NEXT STEPS

For the last three decades, NASA and the Nation's human spaceflight program have been focused on the development and operation of the Space Shuttle and the ISS. In its final report, the Columbia Accident Investigation Board (CAIB) was very forthright in its judgment that these goals are too limited to justify the expense, difficulty, and danger inherent to manned spaceflight, given the limitations of today's technology. The CAIB was equally forthright in calling for a national consensus in the establishment of a program having broader strategic goals. The Vision for Space Exploration is that endeavor. The Congress has endorsed it, and NASA is working to implement it. But to effect these changes, NASA must engage in a major transformation—taking the capabilities we have throughout the Agency and restructuring them to achieve a set of goals for the 21st Century that we have outlined earlier this month in our 2006 NASA Strategic Plan. This is an enormous challenge, but we have begun to transform our entire organization to foster these changes and to enhance a positive, mission-driven culture.

The CAIB was also clear in its assessment that the lack of open communication on technical and programmatic matters was a direct cause of the loss of *Columbia*. We have understood and embraced this assessment, and are absolutely and completely committed to creating an environment of openness and free-flowing communication. However, NASA still has to make a number of improvements in its internal communications as well as how we communicate externally to our stakeholders, the scientific community, and the public. NASA is making a concerted effort to address all problems in this area.

For America to continue to be preeminent among nations, it is necessary for us also to lead in space exploration, scientific discovery, and aeronautics research. It is equally true that great nations need allies and partners. The spirit of innovation and the muscle of government and industry are needed to turn the Nation's Vision for Space Exploration into reality. These journeys to the ISS, the Moon, Mars, or even Pluto are the most difficult things our nation does. June Scobee Rodgers, the widow of Dick Scobee, Commander of the Space Shuttle *Challenger* on that ill-fated day twenty years ago, recently noted, "Without risk there's no discovery, there's no new knowledge, there's no bold adventure . . . the greatest risk is to take no risk." We must continue our journey. America, through NASA, leads the way.

#### INTERNAL WEAKNESSES IN INTERNAL CONTROLS

Senator SHELBY. Can you be a little more specific on addressing the material weaknesses in internal controls that have been reported for several years?

Dr. GRIFFIN. I can be.

Senator SHELBY. Could you do that for the record?

Dr. GRIFFIN. I will do that for the record.

[The information follows:]

#### INTERNAL WEAKNESSES IN INTERNAL CONTROLS

NASA's independent financial auditors identified three material weaknesses and one reportable condition through its fiscal year 2005 financial audit. The weaknesses are repeat findings from prior financial audits. NASA submitted a Corrective Action Plan in February 2006 to Congress, OMB and NASA's Office of Inspector General that addresses each of the recommendations made by the independent financial auditors. NASA has been executing this plan throughout fiscal year 2006.

For your convenience, we have attached NASA's Financial Management Corrective Action Plan, which provides a complete list of in-process actions to address each material weakness.

#### ANTI-DEFICIENCY ACT VIOLATIONS PREVENTIVE STEPS

Senator SHELBY. And the next question, what steps have you taken to prevent this type of ADA violation from occurring again? Do you want to do that for the record?

Dr. GRIFFIN. We will do it for the record to get the details right and proper.

Senator SHELBY. That will be fine.  
[The information follows:]

#### ADA VIOLATIONS PREVENTIVE STEPS

NASA agrees with each of the OIG's specific recommendations:

—*OIG Recommendation #1.*—We recommend that the Administrator report the ADA violations for the funds carried over from fiscal year 2004 to fiscal year 2005 for each affected account and for the \$30,413,590 to the President of the United States through the OMB Director, the Speaker of the House of Representatives, the President of the Senate, and the Comptroller General of the Government Accountability Office, as required by the ADA and by OMB Circular A-11, section 145.7

—*OIG Recommendation #2.*—We recommend that the Administrator request a comprehensive demonstration by the OCFO that the appropriations available to be spent in fiscal year 2006 can be traced from appropriation to apportionments to allotments to commitments and to obligations to help ensure that NASA is not violating the ADA for fiscal year 2006

In addition to accepting and acting upon NASA's OIG two specific recommendations, NASA has implemented specific correction actions in the OCFO. These corrective actions include:

- Certification of reconciliations by responsible financial management personnel. Both the Directors of Accounting and Budgeting reconcile NASA appropriations to OMB apportionments. They jointly certify apportionment requests to OMB. This ensures that the operations of each organization, the budget and execution of the budget, are appropriately reflected in NASA financial systems. In addition, a manual of all related apportionment transactions is maintained;
- Met with the NASA OIG to demonstrate that the core financial system has effective system controls that prevent obligations from exceeding apportionment control totals;
- Conducted Appropriations Law training for 30 staff in January 2006, and 8 in March 2006;
- Conducted OMB Circular A-11 training for 24 staff in February 2006. An additional course is currently being scheduled;
- Increased the staff size in the Funds Distribution branch from 7 to 14; and
- Documenting enhanced internal controls, to include: Logging and tracking of all OMB apportionment requests and approvals; and reconciliation of OMB apportionments to Congressionally approved Operating Plans to the funds loaded into the Agency's centralized financial system.

Dr. GRIFFIN. But, basically, we have put additional cross-checks in. We are working on training staff, and we have put additional cross-checks into the system so that it, frankly, does not happen again.

Senator SHELBY. We think that that is important, but I want to say again, Dr. Griffin, you may have inherited a lot of this, and you are strong to say it is your deal now, and it was not always your deal, but it does have to be addressed, as you know.

Dr. GRIFFIN. I thank you for that observation, Senator. You hired me to fix the problems, and we will fix them.

#### INTEGRATED ENTERPRISE MANAGEMENT PROGRAM

Senator SHELBY. What is NASA's current estimated cost to develop, implement, and maintain the Integrated Enterprise Management Program including those costs incurred to resolve data integrity issues resulting from the initial implementation of the core financial system?

Dr. GRIFFIN. Sir, again, I do not have those figures.

Senator SHELBY. Will you do that for the record?

Dr. GRIFFIN. I will be happy to provide that for the record. We do have that data. I just don't have it right here.

[The information follows:]

INTEGRATED ENTERPRISE MANAGEMENT PROGRAM

The development and implementation costs for NASA's Integrated Enterprise Management Program, including all the hardware, software, civil service labor, contractor labor, travel, and overhead costs associated with re-engineering business processes and implementing business systems for human capital management, financial management, asset management, and procurement and contract management are estimated at \$842 million for the development years 2000 through 2011, consistent with the fiscal year 2007 President's budget request.

Of this total development estimate, \$82.6 million is being expended to update NASA's financial system, which, among other benefits, helps resolve data integrity issues identified with the initial core financial system implementation. Approximately \$50 million per year is expended operating and maintaining this business systems environment.

ROBOTIC LUNAR EXPLORATION PROGRAM (RLEP)

Senator SHELBY. I know it is a complicated question. The Robotic Lunar Exploration Program?

Dr. GRIFFIN. Yes, sir.

Senator SHELBY. Let's get into that. Last December, NASA announced that the Marshall Space Flight Center would be the project lead for the second mission under the Robotic Lunar Exploration Program (RLEP-2). The intent of the announced mission is to land on the lunar surface and search for deposits of water and ice as a precursor to later human missions. Unfortunately, no funding for this mission was included in the President's budget request for fiscal year 2007, and there are concerns that RLEP-2 is no longer a priority for NASA. Could you provide us an update on the overall RLEP program and the current projects under the program, and is the RLEP-2 mission still proceeding as announced, and so forth?

Dr. GRIFFIN. Yes, sir. The concern that you cite that the RLEP Program is not a priority is not a well-founded concern. Indeed, it is a priority. As you know, sir, in order to meet our unfunded obligations for the space shuttle and space station, we had to remove from the Science Program \$2.2 billion over the 5-year run-out, and \$1.6 billion from exploration, the crew launch vehicle and crew exploration vehicle, and those budget hits to the tune of almost \$4 billion have resulted in deferring some missions. We probably will not start RLEP-2 in fiscal year 2007. We will do that mission. Marshall Space Flight Center will continue to retain the project lead for that mission.

Senator SHELBY. You are committed to the mission?

Dr. GRIFFIN. I have committed to the mission. In the wake of difficult funding decisions, I cannot commit to the date, but I have committed to the mission, and to the leadership of the mission and to do so in a timely way to provide precursor information for returning humans to the Moon, but it probably will not start in fiscal year 2007.

Senator SHELBY. Would you give us a status of each of the elements for the next manned spacecraft, specifically focusing on the crew exploration vehicle, the crew launch vehicle, and the launch

operations aspect of the program? I know it is early in the program.

Dr. GRIFFIN. It is, but I can give you a top-level status. If you want more when I am done, I will be happy to provide it for the record.

Senator SHELBY. Sure.

Dr. GRIFFIN. At the top level, since I last met with you in this formal setting, we have refined and issued the request for proposals for the crew exploration vehicle. There are two bidders on that. They have completed and submitted their proposals. The Source Evaluation Board is considering those proposals as we sit here at this moment. Later this spring we will enter into negotiations and oral presentations by those bidders, and this summer we will make a selection for the crew exploration vehicle which will represent a real milestone. It will be the first new development of a piloted space vehicle by this Nation in 35 years.

The crew launch vehicle is the launch side of that. In fact, Marshall Space Flight Center has the lead for that. The crew launch vehicle is coming along slightly behind the crew exploration vehicle. The folks down there are actually led by Program Manager Steve Cook under the management of Center Director Dave King, and are doing a great job pulling together the concept design for that vehicle. We expect to have a request for information out on the street shortly. It will be followed by a request for proposals to industry. That program is on track.

Launch operations modifications down at the Cape are at this point I can only say under study. We have asked for bids from construction contractors to begin work on those systems. Of course, the launch operations infrastructure has to follow from the nature of the launch vehicle and the crew vehicle that it serves, and so it necessarily follows a bit behind. But I am, frankly, real pleased with where we are on that.

Senator SHELBY. I understand progress has been made in the overall Constellation architecture by establishing project offices for the various elements involved. What is the time line for establishing the project offices for the remaining elements of the architecture such as the lunar lander?

Dr. GRIFFIN. The lunar lander is not the current first thing on our plate. We don't need that until starting out around 2012. As I think I just mentioned, Johnson Space Center has the crew exploration vehicle, Marshall Space Flight Center has got the launch vehicles, both the crew launch vehicle and the heavy lift launch vehicle. Kennedy Space Center, of course, will be the site for launch operations. Within those broad assignments of responsibility are our other seven centers. Each will have pieces because the effort overall must occupy all of NASA. By mid-May we will be I think prepared to say at the next level of detail down which elements of the system are going where.

#### VISION FOR SPACE EXPLORATION

Senator SHELBY. The Vision for Space Exploration is an initiative that will last a long time. While a lot of interest is paid on how much the exploration initiative will cost, an area that must also be addressed is the current state of NASA facilities. Many of the cen-

ters that will play significant roles in the Vision have aging infrastructures, we have talked about this before, and in many cases, buildings that were inherited from other agencies when we last went to the Moon. How does NASA address the need for facilities in this budget? What are the actual funding requirements to truly address the shortfalls in facilities? And do you believe that a worthwhile use of the billions in unobligated balances would provide the agency with the facilities? How do we attack this, I guess is what I'm saying.

Dr. GRIFFIN. Yes, sir, I understand the intent of the question. I must lead by saying that whatever the problem, the source of those funds cannot and should not be the unobligated balances, because although those are unobligated, in the sense that the fiscal accounting people go off in a corner and talk about unobligated funds, yes, they are unobligated.

Senator SHELBY. You have specific plans for them?

Dr. GRIFFIN. Precisely, sir. They are not unspoken for.

Senator SHELBY. That is a good phase, unspoken.

Dr. GRIFFIN. They are not unspoken for. You raise a very important point. NASA's physical infrastructure like many of the other bridges, roads, and buildings that are important to this country's public life, is an aging infrastructure, much of it in our newest buildings in our overall NASA infrastructure, all 10 centers. The newest buildings, the newest centers, by and large are approaching 50 years old, and many go back to World War II, and some are pre-World War II. They are aging, they are expensive to heat, and expensive to maintain. In a perfect world, we would have plenty of money to fix all those buildings. We do not. We have to set priorities.

If I must be made to choose between executing missions, being run out of old buildings, or having new buildings and not being able to execute missions, then I'm going to choose the former. We replace buildings or modify or upgrade them in ones and twos as the need expresses itself, but we simply do not have the funding to embark on a substantial building campaign. I wish that we did.

With regard to the buildings, infrastructure, and facilities needed for the Vision for Space Exploration, just exactly as the launch operations infrastructure at the Cape must follow the definition of the launch vehicle and the crew vehicle, so, too, must the buildings to support the mission follow the definition of all these things. I do not today have a plan for you regarding which of our NASA infrastructure we need for the future and which should be mothballed or demolished. I do not have that plan today.

Senator SHELBY. I agree with you to some extent that the mission must go on and just brick and mortar will not do it, it has to be beyond that, but sometimes you have to have a little brick and mortar to cover the roof.

Dr. GRIFFIN. You do, indeed. We try in our construction of facilities as compared with our mission priorities to set a reasonable balance and to make sure that this subcommittee and your staff knows where we are on that balance.

## PROPULSION RESEARCH

Senator SHELBY. On propulsion, the Vision for Space Exploration will require many new technologies and systems to be developed in order to maximize our investment in returning to the Moon. One of these areas that will require ongoing research and development is in the area of, as you have told me before, propulsion. The Marshall Space Flight Center has expertise in this area and has worked on propulsion systems from the time of the last missions to the Moon and to the present. As research and development on Vision-related vehicles and systems begins, what do you anticipate we will need for propulsion research and development this year and in the future? In other words, where are we going and what do we need to get there?

Dr. GRIFFIN. That is an excellent question, and with all respect, the propulsion research needs to implement the Vision for Exploration are at this point rather minimal, and likely to remain so for a little while. One of the things that I tried very hard to do in crafting our exploration architecture was to utilize the technology and infrastructure for which the Nation had already paid in past years and decades. We have available or can restore to production the rocket engines that are needed for the Vision for Space Exploration. We have those today, by and large. That is not the most critical need. In some cases, we may need to resume or restore production on certain units, we may need to make modifications, but it is not in the nature of propulsion research.

If we look much further out to when we are really ready to go to Mars in another 20 years, I would like to believe that the Nation will allocate funding for new propulsion research. I would like to believe that the decisionmakers of those later times will be able to restore research in, for example, nuclear thermal propulsion, one of my highest interest items. We do not need that technology for the Moon which means we do not need it anytime in the next 15 years, and certainly we do not in the next 15 years have the money for it. So what we need to do is we need to restore in this Nation's space program basic capabilities and basic infrastructure that we once owned and we have allowed to atrophy.

Senator SHELBY. When would that research you are talking about begin?

Dr. GRIFFIN. Sometime in the next decade. The research levels would begin sometime in the next decade.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S SCIENCE  
BUDGET

Senator SHELBY. Dr. Griffin, in order to address the budget needs for the exploration program, NASA has reduced the rate of growth of the agency's science budget from about 6 percent to about 1 percent. I understand that the science budget at NASA is on a growth path, although at a reduced rate than previously projected. I also understand that the science activities at Marshall are actually taking a 10-percent cut over the next fiscal years. Would you provide us some insight into that reduction?

Dr. GRIFFIN. I can provide the specifics of that 10-percent reduction at Marshall Space Flight Center for the record.

Senator SHELBY. That would be fine.  
[The information follows:]

SCIENCE REDUCTIONS AT THE MARSHALL SPACE FLIGHT CENTER

In the fiscal year 2007 budget request, there is a reduction of approximately 10 percent for Marshall Space Flight Center (MSFC) Science activities compared with fiscal year 2006. This is due, in part, to the fact that some projects are ending as planned. However, since release of the fiscal year 2007 budget, additional work for MSFC has been defined in several Science projects, and additional funding is likely, particularly in projects with pending competitive selections. Additional funding is likely in New Frontiers, James Webb Space Telescope, Chandra, Solar Terrestrial Probes, and other areas. When this new work (actual and likely) is factored in, fiscal year 2007 Science funding to MSFC is expected to be equal to or higher than fiscal year 2006.

At the same time, it should be noted that, as one of NASA's premier space flight centers, MSFC has been given project management responsibility for the new Crew Launch Vehicle (CLV) and Cargo Launch Vehicle (CaLV), both critical elements to our Nation's plans for humans to explore the frontiers of space. These responsibilities are supported by the President's fiscal year 2007 request from Exploration Systems.

Specifically, Marshall's responsibilities include:

- Responsible for achieving all CLV and CaLV objectives for the agency.
- Lead associated systems engineering and integration activities, all CLV and CaLV safety and mission assurance activities.
- First stage design and upper stage engine development contracts management, as well as leading or otherwise overseeing CLV associated demonstration testing.
- Responsibility for advanced development flight test-0 and other flight demonstrations.
- Support responsibilities for the Crew Exploration Vehicle.
- Support for launch abort systems, service module, and abort test booster.

Level II or project tasks include:

- Safety, Reliability & Quality assurance (SR&QA)—Support integrated hazards analysis and probabilistic risk assessment; represent SR&QA at assigned systems integration groups; support quality assurance, risk management, and safety software system development; support Constellation SR&QA panels.
- System engineering and integration: Co-Lead for several system integration groups including thermal and environmental control and life support, environments, human factors/human rating, loads and structures.
- Test and verification lead for loads/structures and environments system integration group.

In support of lunar exploration, Marshall will:

- Establish a Lunar Precursor and Robotic Program Office, which includes the Lunar Reconnaissance Orbiter and the Lunar Crater Observation and Sensing Satellite.
- Establish a Lunar Lander Project Office, under the Constellation Program, responsible for performing early trade studies and developing requirements for the Lunar descent stage.
- Plan to use the Michoud Assembly for CLV and CaLV tank construction.

Dr. GRIFFIN. But do understand, please, that Marshall Space Flight Center is receiving, and will receive substantial increases as we embark on the Crew Launch Vehicle Program. So although the skill mix of those employed at Marshall Space Flight Center may change, the overall employment base at Marshall Space Flight Center is and will continue to be quite healthy. Yes, it is true, prior to my tenure the science community had been promised growth rates of 5, 6, or 7 percent in science, but NASA's growth rate as a whole is only 2.4 percent, averaged over the next several years.

Senator SHELBY. I agree with you that we need more money.

Dr. GRIFFIN. I did not say that.

Senator SHELBY. I can say it.

Dr. GRIFFIN. Yes, sir. Within the amount of money that the administration has chosen to allocate to the program, I cannot have

science growing at 6 percent while the agency is growing at 2.4 percent and the science program at NASA is a full one-third of our overall program, and in my judgement, sir, it is a very robust program.

#### SPACE SHUTTLE FLIGHT RATE SCHEDULE

Senator SHELBY. Dr. Griffin, assuming a successful shuttle launch this summer, NASA will begin a very aggressive flight schedule for construction of the International Space Station and the Hubble space telescope servicing mission. We pray you will be successful there. In order to accomplish the 16 to 18 flights necessary for these missions and to retire the shuttle by 2010, as you mentioned earlier, would require a flight rate that has not been achieved for many years. How much flexibility, Dr. Griffin, is there in the schedule for the remainder of the flights of the space shuttle? Is there any room for unexpected delays that will not compromise both the retirement date of the shuttle and the completion of our agreements on the ISS? And how does NASA intend to balance the need for such a sizable workforce to maintain the shuttle program until it is retired and at the same time to build up Moon missions and so forth? I know it is a tough question.

Dr. GRIFFIN. But it is a good one, and I understand the question, so let me try to answer. First of all, I must simply say it is not correct that the flight rate required of the shuttle to complete the International Space Station by the shuttle's retirement date is something that we have not seen. In fact, the required flight rate is nothing more than our average flight rate over 25 years of history, and that includes, as I know you recall because you have been here, that includes basically 6 years of down time due to shuttle accidents and other technical problems. So even factoring in all of that down time, our average flight rate for the shuttle program over 25 years has been 4½ flights per year. If we fly successfully in July or if we fly successfully in September and then merely execute our average flight rate for the balance of the program, we will finish with margin to spare. So I believe we can do it.

#### WORKFORCE TRANSITIONING

Now with regard to your question about transitioning the workforce, you are correct, and I have said this in many forums, our biggest challenge over the next 5 years is to develop a plan that allows us to fly the last shuttle mission as safely as the next one. At the same time, to be able to have the appropriately skilled workforce involved with the design and development of the replacement vehicle, the CEV, and to not damage either program in the process of doing so. We are working on that. We spend time on that at every Management Council meeting I have in NASA. We care about that problem a lot. I have top-level plans that I can share with your staff, and are those plans in their detail, we will be happy to share those plans with your staff as well.

Senator SHELBY. Thank you very much. I am going to go vote. Senator Mikulski has voted, and she is recognized.

Dr. GRIFFIN. Thank you, sir.

## AGING AND DAMAGED FACILITIES

Senator MIKULSKI. Thank you very much, Mr. Chairman, and I know Administrator Griffin, you probably have covered some of these issues. We know that you and the NASA budget is under a lot of stress.

Let me go to the question about aging facilities and damaged facilities. I know that Senator Shelby talked about the aging facility issue. You talked about some of these go back to Apollo.

Dr. GRIFFIN. Or before.

Senator MIKULSKI. Yes, sir. But let's go to what was damaged because of Katrina, again, acknowledging the magnificent efforts of the NASA staff and local responders, et cetera. The subcommittee provided \$300 and some million last year toward this. The President's supplemental request had nothing in it. We had \$35 million which is just a chunk of change. You estimate that it is going to be \$500 million to really restore these facilities properly. Where are we, and where is this money going to come from?

Dr. GRIFFIN. Yes, ma'am. Yes, Senator Mikulski.

Senator MIKULSKI. You need to know I was very disappointed that there was not money in the President's budget to do this, and it's beyond the scope of an individual Member, for example like myself, to find a \$500 million offset, and we could not take it from the troops.

Dr. GRIFFIN. Of course not. I'm sorry, the damage estimate that we have is just under \$500 million, \$484 million to be specific. As we have continued to refine our estimates, we have kept you and your staff current on what those are. And you are right, last year the subcommittee, of course, appropriated roughly \$330 million in supplemental funding to repair the damage. The balance of the money must come out of program funds which is shuttle and station unless we move money across accounts, and that would require special permission from our oversight committees.

Senator MIKULSKI. How much would you need this year?

Dr. GRIFFIN. Pardon me?

Senator MIKULSKI. No construction occurs at once.

Dr. GRIFFIN. At once, right.

Senator MIKULSKI. What do you think for both Stennis and Louisiana would be required for this year?

Dr. GRIFFIN. I will answer for the record on the phasing of the money. The total that we know we need is \$484 million at this point.

Senator MIKULSKI. And that would take care of both?

Dr. GRIFFIN. That would take care of all years.

Senator MIKULSKI. But it would take care of both Stennis and Louisiana?

Dr. GRIFFIN. Yes, Senator.

[The information follows:]

## AGING AND DAMAGED FACILITIES

After a detailed review by the Katrina Headquarters Recovery Team, as of April 25, 2006, the Agency reduced its total estimate of all costs for responding to Katrina and for catastrophic risk mitigation projects that would protect against future hurricanes to \$483.8 million. This estimate includes the following:

- Michoud Assembly Facility—\$220.2 million;
- Stennis Space Center—\$208.7 million;

- NASA Shared Services Center—\$7.7 million;
- Other NASA Centers/HQ Support—\$8.1 million; and
- Program Contingency/Reserves—\$39.2 million.

Review of the content of this estimate is ongoing and will continue to be revised; NASA will keep the Committee informed of future adjustments to the estimate.

As has been discussed during hearings and in briefings with Committee staff, NASA borrowed \$100 million in fiscal year 2005 funds from the Space Shuttle and International Space Station (ISS) crew/cargo programs to provide immediate support of hurricane recovery efforts in the Gulf region before any supplemental funds were provided. The intent was to eventually repay these programs for this initial outlay of funds, and NASA repaid \$20 million of the amount borrowed in the May update to the fiscal year 2006 Operating Plan.

NASA currently has available \$384.8 million in fiscal year 2006 funding from two emergency supplemental appropriations and \$80 million in fiscal year 2005 funding that was borrowed from the Shuttle and ISS crew/cargo programs. NASA may repay approximately \$20 million in additional borrowed fiscal year 2005 funds that are not yet spent in a future Operating Plan update. The Agency continues to require transfer authority to use up to \$60 million in available fiscal year 2006 supplemental funding to repay the balance of funds borrowed and expended in fiscal year 2005 to allow the Agency to adequately fund the requirements of the Space Shuttle and ISS programs.

Hurricane-related Center recovery and operations costs, along with real property repairs and programmatic recovery requirements are accommodated within the current funding availability. Catastrophic loss mitigation projects will be addressed on a priority basis depending on the availability of funding.

The following Center recovery operations, real property repairs, and programmatic recovery activities are likely covered within available funding:

[In millions of dollars]

	Estimated Cost
STENNIS SPACE CENTER	
Center Recovery Operations Support .....	17.0
IT/Communications/Environmental/Other .....	6.0
Programmatic Recovery .....	3.0
Real Property Repairs .....	<sup>1</sup> 82.61
Repair Site wide Electrical Distribution System .....	7.79
Repair/Replace Roofing Various Administration Buildings .....	7.95
Replace Bldg 2204 Roof .....	7.91
Repair Administration Building 1100 .....	7.65
Repair and Replace Perimeter Fencing .....	7.95
Replace Bldg 1100 North Wing & Bldg 1105 Roof .....	1.03
Repair Bldg 2205 High Bay Roof (complete) .....	.73
Repair Building 1100 North Wing—Interior .....	2.70
Site wide Mold Remediation and Asbestos Abatement .....	2.44
Replace Bldg 2201 Roof .....	3.50
Repair/Replace Roofing Various Industrial Complex Buildings .....	1.74
Repair/Replace Roofing Various Test Complex Buildings .....	1.99
Site wide Debris Cleanup .....	1.59
Replace Bldg 8100/8110 Roofs .....	3.04
Site wide Lightning Protection Repairs (Multiple Projects) .....	.80
Relocate Roads and Grounds Building .....	.87
Repair and Pave Roads for Heavy Vehicles .....	2.88
Education Center (Replacement for Bldg 1200) .....	1.93
Site wide Electrical Panel Enhancements and Database .....	1.06
Local Projects (<\$500,000) and Maintenance Items .....	7.06
MICHOU D ASSEMBLY FACILITY	
Center Recovery Operations Support .....	20.9
IT/Communications/Environmental/Other .....	2.4
Programmatic Recovery .....	42.5
Real Property Repairs .....	<sup>2</sup> 69.00
Hazardous Materials Investigation .....	.05
Repairs of B103, Phase 1 .....	2.50
Repairs of B451, Phase 1 .....	.75

[In millions of dollars]

	Estimated Cost
Repairs of B114 .....	.60
Repairs to Damaged Elevator B110 .....	.10
B303 Temporary Roof Repair .....	.09
TBD Projects during test and checkout .....	.50
MSFC—COSS Contractor Support for damage assessment .....	.04
MSFC—M1 Yard Roof Repairs .....	.01
MSFC—Remove Damaged Trees and Repair B4707 Tower Roof .....	.02
Work Plans for B420, 110, 114, 103, 303, 451, 220, 101, 102, 173, 175, 320, 404 .....	.94
Local Projects (<\$500,000) and Maintenance Items .....	5.21
Repairs of B110, Phase 2 .....	6.40
Repairs of B173 .....	2.02
Repairs of B175 .....	.68
Repairs of B220 .....	1.37
Repairs of B303 .....	6.60
Repairs of B320A .....	1.54
Repairs of B320B .....	.94
Repairs of B404 .....	1.49
Repairs of B420 .....	5.63
Repairs of B103, Phase 2 .....	4.77
Repairs of B451, Phase 2 .....	1.50
Repairs of B101 .....	5.04
Repairs of B102 .....	8.22
Repairs B75, 105, 106, 107, 109, 113, 119, 127, 130, 131, 135, 140, 171, 176, 177, 178, 179, 201, 203, 206, 207, 221, 232, 239, 301, 302, 304, 305, 307, 308, 318, 321, 327, 329, 359, 351, 360, 361, 406, 409, 421, 423, 424, 419, 450, 480, 485 .....	12.00
<b>NASA SHARED SERVICES CENTER</b>	
Recovery/Workarounds .....	7.7
<b>OTHER NASA CENTERS/HQ SUPPORT/RESERVE</b>	
Center Recovery Operations Support .....	2.2
Other General Support .....	4.0
FEMA Volunteers .....	1.9
Program contingency/Reserves .....	39.2

<sup>1</sup> Does not include \$13.7 million in program manager reserve.

<sup>2</sup> Does not include \$10 million in program manager reserve.

The following potential catastrophic loss risk mitigation projects been identified. Unless noted, the majority of these projects have not yet been approved for funding. Projects for each Center are listed in order of priority.

[In millions of dollars]

	Estimated Cost
<b>STENNIS SPACE CENTER</b>	
Hurricane Proof Emergency Operations Center .....	<sup>1</sup> 14.90
Replace and Enhance Backup Generator Capability Site-wide .....	3.00
Enhance Site-Wide Electrical Distribution System Hardening .....	18.65
Add Additional Bulk Diesel Storage .....	.50
Enhancement to Potable Water Pump Houses .....	.10
Emergency Communications and EMCS Enhancements .....	.90
Hurricane Proof Record Retention Facility .....	2.50
Relocate Electrical Equipment Building 1200 .....	1.00
Expand and Enhance Communication Ductbank .....	3.00
Inspect Bridge and Locks .....	1.00
Dredge Canal .....	3.00
Enhance Administration Building 1100 .....	3.00
Test Complex High Pressure System Uninterruptible Power .....	30.00
Design Cost (6 percent) .....	4.89
<b>Total</b> .....	<b>86.44</b>
<b>MICHOU D ASSEMBLY FACILITY</b>	
Upgrades to Pump House .....	<sup>2</sup> 11.00

[In millions of dollars]

	Estimated Cost
Install levee floodgate at barge dock .....	.70
Upgrades to Emergency Operations Building .....	2 3.30
Rewire security cameras to operate on emergency power .....	2.70
Replace electrical feeders on poles below ground .....	5.00
Reconfigure computer servers to provide critical ops during severe weather .....	5.00
Replace main manufacturing building exterior siding .....	7.00
Levee improvements (requires Corp of Engineers coordination and app) .....	5.00
100 percent increased labor, materials, and transportation costs .....	37.7
<b>Total</b> .....	<b>75.4</b>

<sup>1</sup>Project is approved for funding. The total project cost is \$21.4 million; the remaining \$6.5 million will be funded with fiscal year 2005 Institutional CoF funds.

<sup>2</sup>\$1.7 million in funding has been approved for MAF projects as follows: \$300,000 for designs and studies, \$600,000 for remote controls for the existing Pump House, \$500,000 for relocating the MAF Emergency Operations Building, and \$300,000 for security cameras. The "Install levee floodgate at barge dock" project will be approved for funding as soon as design is complete.

#### CUTS IN SCIENCE

Senator MIKULSKI. As we look ahead to our own mark up, I have not had a chance really to confer with Senator Shelby in-depth until we complete all of our hearings. We have heard from Justice, the Byrne grants and COPS Programs have been cut. This is not to lay this on you. In just looking at NASA and know that it was flat-lined now and it has been flat-lined under this administration and the previous one, President Clinton, I feel we need more money. One of the things that I am going to suggest to Senator Shelby is that we look at the repair related to the Katrina damage in some kind of an emergency way so that it does not add further stress to the NASA budget. I don't even know if it is possible, but I am looking for legitimate ways to bring other revenue into our subcommittee, so just know that. That is why the sequencing of how much, so that we do ask for or even ponder appropriate amounts. You need to have your facilities, dedicated people have to work somewhere, and we have to be dedicated in restoring it as they did to protecting it.

Your comments were don't rob Peter to pay Paul, don't go after the science budget, to some back to the other priorities, but in some ways I feel that is what we are doing. We are juggling and rearranging, and that you robbed Paul to give it to Peter, and you are telling us don't rob Peter to give it back to Paul. We don't see it as robbing, we see it as a give-back.

Could you tell us about the consequences of this deferral in science? I know you are committed to science programs, but we are troubled about the cuts in science. Could you tell us what you think the consequences are in this deferral? We are particularly concerned about all science. We are concerned about the impact on big science as people talk about it, the Webb telescope mission, like Earth science and some of the others? Could you share with us?

Dr. GRIFFIN. At the top level I can, and, again, as always I am happy to coordinate details with your staff at your discretion.

Yes, I did propose and I am proposing taking money from both exploration and science in order to pay our bills for our nearer-term priorities to finish out the station and fly out the shuttle. The shuttle and station accounts as we both know when I took this job in the out-years had placeholder amounts in them. We did not have realistic amounts. Those were in the out-years at the time. The

out-years have arrived, and if we are going to fly the shuttle and finish the station, then those bills had to be paid, and the only other source of money was exploration and science. So that is why I did what I did.

As to the impact of deferrals, first of all, James Webb telescope mission as I think everyone knows is the National Academy's highest priority in their decade-old survey plan for astronomy, and that priority continues to be respected. James Webb telescope mission may be delayed a bit, but only because, I exaggerate to make a point, about 15 minutes after I was confirmed, the folks on the James Webb Program brought to me a \$1 billion plus overrun on the program which is presently in its formulation stages. So we are currently in the middle of re-baselining that program not, to alter its priority within the queue. But I do not have over that time period an extra billion dollars laying around to fix it. So it will slip a little bit in schedule, not because of anything going on with the shuttle and station, but just because it is overrun.

With regard to Earth science, before I took office, Earth science had been I would say damaged in the budgetary planning, and I have acted to restore that. It is not all the way back, but I know that you know, and that your staff will tell you, that I have acted to restore that as I have with heliophysics, but I cannot do it instantaneously.

Senator MIKULSKI. They have shared that with me, and I appreciate it.

Dr. GRIFFIN. Other missions that we believe are very important to do like the space interferometry mission will be delayed for a couple of years.

Senator MIKULSKI. So could I say what you are saying is though that they have not been eliminated, they have been deferred?

Dr. GRIFFIN. Correct.

Senator MIKULSKI. But given where we are, do you think is deferral going to become a de facto elimination in some categories? I am not going to ask you to enumerate.

Dr. GRIFFIN. There may be smaller missions which just will not make the cut, but the major mission priorities that had been established and were on the table when I took office will continue to be respected. We must defer something. We will either defer the CEV, the Nation's replacement for the shuttle, or we will defer some of these science missions. In truth, I have delayed both of them a bit and I would be very uncomfortable delaying the CEV any more.

#### SPACE SHUTTLE

Senator MIKULSKI. This brings me back to, first of all, Senator Shelby and me, and the whole committee, we are absolutely committed to the shuttle mission. The safety of the astronauts is a committee obsession that we share with you, so we know that is the priority. Second, I appreciate your willingness to consider a Hubble rejuvenation mission.

Dr. GRIFFIN. If we can possibly do Hubble, we will do Hubble.

Senator MIKULSKI. And I understand now that it is up to the technical matters, but I appreciate your commitment to analyze as we progress, so we know what that is going to take, but we do not know how much more it is going to take. Am I correct? And it has

cost \$2 billion more to do the shuttle and return to flight than we had originally anticipated. And that is not a fault-finding. It is just a fact-finding.

Dr. GRIFFIN. Of course. I understand. I just want to answer accurately. We needed \$3.8 billion more to fly out the shuttle and finish the station; \$3.8 billion more was needed for those accounts than was bookkept in those accounts in the fiscal year 2006 run-out. So as we prepared the fiscal year 2007 run-out, we had to fix that problem, so the total was \$3.8 billion.

Senator MIKULSKI. I am glad we are getting this out in the sunshine, quite frankly, because the only way we can truly get the proper national priorities, and the framework is there, but in other words, you inherited something that you have had to straighten out and get real life-cycle costs and accounting into it. Am I correct?

Dr. GRIFFIN. Yes, Senator. The way that I would phrase it is to say that, in having decided a couple of years ago that we would retire the shuttle, there was considerable uncertainty as to how much the run-out costs would be in retirement. As we have analyzed it as carefully as we can, we have concluded that the run-out costs to retire it do not drop off as rapidly as—

Senator MIKULSKI. We are committed to this, and, again, I think I feel secure in saying this, I liked what you said when you said the next shuttle flight is going to be as safe as it possibly can be made, but that the last shuttle flight will be as safe. So we have a big kind of shaking-hands commitment that we need to make with you to ensure that safety of the next astronauts or the last astronauts to fly that shuttle, so we are in agreement with that. Then that is like a fixed cost that we have to almost be neurotic about. Am I correct?

Dr. GRIFFIN. Exactly, Senator. Exactly, and I have been neurotic about it, and the amount was \$3.8 billion.

#### INTERNATIONAL SPACE STATION

Senator MIKULSKI. I say that, because, again, it is the safety of our people.

That takes me then to the station itself. Having done that, completed it, do all those things along the questions that Senator Shelby has raised, the 16 flights, et cetera, are we going to use the station? And how are we going to get to the station to use the station? Soyuz has been a lifesaver, but it is little, it cannot do cargo.

Dr. GRIFFIN. You are right, Senator.

Senator MIKULSKI. We have this fantastic machinery at tremendous cost to build and maintain.

Dr. GRIFFIN. Let me try to answer.

Senator SHELBY. Is this going to be a techno-whoops? Then what will that take if we are talking about science and Webb and going to the Moon and so on? Or is this going to be one of those, well, now we have it, but we cannot afford to use it?

Dr. GRIFFIN. I certainly hope not. For the station for the next few years, the choices which confronted us were, given the available shuttle flights, that we could use the station approximately as it exists today, which is fairly stable but does not have much power and does not have a lot of research facilities, we could use it to a very limited extent. Or we could finish assembling it but not use

it. I do not have enough shuttle flights to assemble it and utilize it at the same time. We have talked about this, we have committed to finishing the assembly.

As the assembly is finished, it will be the full-up station that you have come to know and love with substantial research capability and a crew of six. In the period between retirement of the shuttle and deployment of the CEV, we will have no choice but to depend on international partner logistics and resupply. Or if our COTS initiative, our commercial initiative, works well, we hope that we may be able to bring some U.S. commercial capability on-line with seed funding from NASA. But the CEV, which is, of course, intended to service the station as well as go to the Moon, will not be available for operational use until, at this point, 2013–2014.

Senator MIKULSKI. Then my question is, why should we do this now if we are not going to use it? We thought we are going to build it and they will come, but we are going to be building it but we cannot get there. I have not been harsh or sarcastic, and yet we are making a tremendous investment for the shuttle to go up there, for the safety of our astronauts, only then to complete an assembly of something.

Dr. GRIFFIN. We can use the station in concert with our international partners, and we can use it as soon as the CEV becomes available, and this, of course, addresses the gap that you have been so forceful about, and we can use it if we can get some commercial capability in space flight.

Senator MIKULSKI. There are a lot of ifs.

Dr. GRIFFIN. But with our existing budgetary resources, there will be a gap between retirement of the shuttle and deployment of the CEV.

Senator MIKULSKI. I think this is a dilemma.

Dr. GRIFFIN. Yes, Senator, it is.

#### INTERNATIONAL PARTNERS

Senator MIKULSKI. Within the scope of the hearing it is difficult to discuss, and I am not advocating what we should do, but I am advocating that we need to come to grips with this dilemma, and a tremendous cost to finish our commitment. What do our international partners say about this, Dr. Griffin? Would they be able to use it? They have been very patient and steadfast, I think, in their ongoing commitment, and the Russians have proved to be a fairly reliable partner.

Dr. GRIFFIN. All of that is true. You, I believe, understand the situation perfectly. The international partners are appreciative of the renewed United States commitment to finish the station, because unless it is finished, the laboratory modules that they have worked on for many years will not fly. So they are appreciative of that. They, we, and I are concerned about what we will do in the period following retirement of the shuttle and prior to deployment of the CEV. We, as you say, are very grateful to our Russian partners for the reliability with which the Soyuz and Progress systems have worked, but they have, frankly, very minimal capability to really utilize the assets of the station and other partner capabilities.

Senator MIKULSKI. So it will be hard for our international partners to get up there to use it.

Dr. GRIFFIN. Until we have the CEV deployed, right.

Senator MIKULSKI. Let me try to get a timeframe. If everything works the way we hope and anticipate, when will the completion of the assembly of the station be done?

Dr. GRIFFIN. 2010.

Senator MIKULSKI. Then at the same time, that is when you hope to retire the shuttle upon the completion?

Dr. GRIFFIN. Correct.

#### CREW VEHICLE DEVELOPMENT

Senator MIKULSKI. Then with hopefully the new crew vehicle, with your time table, that would be 2013?

Dr. GRIFFIN. The first test flight, which is not the same as an operational flight, of course, of the CEV, at this point with the resources we believe we have to bring to bear on it, we project for 2012, and then operational use would be in the 2013–2014 timeframe.

Senator MIKULSKI. So there will be 4 years in which the United States of America will, number one, have a space gap? And, number two, 4 years where the station will be up there but will not be utilized, and I presume could even begin to deteriorate. Space, as you would share with me, is a harsh and demanding environment. I wonder where we are going here with the station.

Dr. GRIFFIN. That is, on the face of it, correct. I remind you again that we have the ISS Crew Cargo Program, our commercial orbital transportation or COTS initiative, where we are making available as seed funding to industry \$500 million over the next few years to bring on-line, hopefully, a capability to ferry cargo and later crew to and from the station. If that works and industry invests, they stand to make a good profit, and we stand to be able to buy services.

Senator MIKULSKI. First of all, we have been through the X-Plane, and X-Planes have not come out too well. I would hope that the private sector could develop a cargo vehicle.

Dr. GRIFFIN. I hope they can. I hope they can. I consider it be a good gamble. It is well past time for NASA to do everything it can to stimulate commercial space transportation capability, and I am trying to do that. But you raise an excellent point, we cannot count on it.

Senator MIKULSKI. And we will not know until 2012 whether it is going to happen. Is there any way you can accelerate in a prudent way, prudent, again, meaning always the safety factors, and prudent in fiscal reality, the development of a crew vehicle?

Dr. GRIFFIN. Again, Senator, not without moving money from other things which we all also like.

Senator MIKULSKI. What do you think from a technological and engineering standpoint, and you are the expert in this?

Dr. GRIFFIN. From a technical and engineering standpoint, I could have a crew vehicle deployed in 2011, following right on the heels of the shuttle, from a technical and engineering standpoint.

Senator MIKULSKI. What would it take to do that?

Dr. GRIFFIN. Fiscally I will have to take that for the record. I do not have that in my head because that is not a program we have been studying. We know we do not have that money, and so we are funding limited, as you have said.

Senator MIKULSKI. Again, I do not know if we could even contemplate that. I know our colleague, Senator Hutchison has raised that with you yesterday at the Commerce hearing in which you testified.

Dr. GRIFFIN. She did.

Senator MIKULSKI. I know we are troubled by the gap, and yet we do not want to take from Peter to pay Paul, and we do not want to take from Paul to pay Peter.

Senator SHELBY. Senator Mikulski, if you would yield, it is obvious that we need more money to fund NASA.

Senator MIKULSKI. I think that that is it, Mr. Chairman, and that is where I was trying to ponder as we went through this.

Senator SHELBY. Absolutely. You are absolutely right.

Dr. GRIFFIN. From a technical point of view, the crew vehicle could be delivered to you in 2011. Anything after that is controlled by the funding.

Senator MIKULSKI. Why don't you share with us what you think would be a realistic option?

#### AERONAUTICS RESEARCH

One last point which goes to the aeronautics issue when we talk about commercial cargo in space. I really do not want us to lose ground aeronautically in the international marketplace, and I know we have declined an aeronautic research at 18 percent. What do you think we can do about this? Again, I am concerned about the consequences, not only in futuristic sonic, hypersonic flight, but even aviation safety. We have a consortium in Maryland that is working on cockpit safety. One is at our historically black college, Morgan, the largest producer of African-American engineers in the State, and maybe even in the country. They are so enthusiastic. They feel they are working on things that are going to spur our economy, and working on cockpit safety. That is the next generation. They will be sitting there 20 years from now. So what can we do?

Dr. GRIFFIN. I am ready to give it to them sooner if you would like. With regard to aeronautics research, I share your concern. I think when you look at the loss of competitiveness in aeronautics to which you refer and that you see about you today, I believe that in actuality that is a consequence not of funding decisions, but of strategic decisions, what the money is spent on, that go back a decade or two.

We have not in my opinion been doing in some areas the right things with our aeronautics funding. We are recrafting our Aeronautics Program to focus on basic aeronautical science which underlies the entire discipline of all flight regimes to learn new things and to be out at the frontiers of the state of knowledge in aeronautics. That, I believe, is in past decades what provided the kind of capability that allowed American air frame manufacturers to be second to none.

When we started focusing on demonstrations and point designs and things that were off the beaten track for NASA's research skills, I believe that is when we started to lose ground. So I am trying to recraft and put into place—

Senator MIKULSKI. Is that what we will get in the December report?

Dr. GRIFFIN. Yes, ma'am, that is what you will get.

Senator MIKULSKI. What I would hope we could try to do, Senator Shelby, is stay the course or do a bit better, but that we really join hands and focus on this, because I think we are going to win the international markets not because we are going to be the most subsidized like other countries, but because we are going to be the smartest and the best, and we want to help you get there.

Dr. GRIFFIN. We have to be the best.

Senator MIKULSKI. Mr. Chairman, I think I have gone over my questions.

#### AMERICAN COMPETITIVE INITIATIVE

Senator SHELBY. No, you have asked some good questions. Dr. Griffin, I will get into the American competitiveness initiative. I was surprised to see that NASA was not included as part of the American competitiveness initiative, ACI. The goal of ACI, as I understand it, is to ensure that the United States prominence in technology and our continued competitiveness in an ever-evolving global economy and ensure that we are there. Your stated goals for the education component of NASA's budget are to strengthen the Nation's future workforce, attract and retain students in science and engineering, as in your own background, and to engage Americans in NASA's missions, coupled with high public visibility and recognition that NASA enjoys. It seems that NASA would be a natural fit for such an initiative. Why was not NASA not included in this initiative in your judgment? I was surprised.

Dr. GRIFFIN. Senator, I have spoken with Dr. Marburger on precisely that issue, and the point that I would make is that the ACI was designed to target those agencies or portions of agencies such as physical science within the Department of Energy, which have not received good support in the recent past and which need significant help to get back to even. NASA received a 3.2 percent increase even without being part of the ACI in an environment where overall domestic nondefense discretionary funding is down by one-half of 1 percent. So NASA was treated by the President 3.7 percent better than the average domestic discretionary nondefense agency.

It is hard to do better than that. I believe that we were well treated within the context of the overall administration, and to be part of the American competitiveness initiative was not really on point.

Senator SHELBY. I think it was not either.

Senator Mikulski.

Senator MIKULSKI. Senator Shelby, I just want to comment and share this with Dr. Griffin. I was part of a group at the White House with Senators Alexander and others talking about this, and I asked the President the same thing in a very cordial way because I thought his Mars statement was to inspire the next generation,

and they said that they were going to give it more consideration. I wanted to follow-up with some of the staff.

Senator SHELBY. I think you are absolutely right.

Senator MIKULSKI. Perhaps that is something that you and I could follow-up with.

#### CHAIRMAN'S CLOSING REMARKS

Senator SHELBY. We could work together because we think it is important, and Dr. Griffin is a product of it himself of many years.

If I could, Dr. Griffin, I want to thank you on behalf of the subcommittee for your appearance here. We both are committed to NASA and we want to continue to work with you. I personally believe that NASA is still underfunded, as Senator Mikulski does.

Senator MIKULSKI. Yes.

Senator SHELBY. We know that it is a tough environment, but we have some, I think, lofty goals out there and we want you to implement them, and you have the capability to do that.

#### ADDITIONAL COMMITTEE QUESTIONS

We appreciate your appearance before the subcommittee today. There are a number of Senators, and we have been voting, and I keep the record open where they can submit questions for the record. I am going to ask you to, if you could, respond to them no later than June 9, which is a month or so.

Dr. GRIFFIN. We absolutely will do that, sir.

[The following questions were not asked at the hearing, but were submitted to the agency for response subsequent to the hearing:]

#### QUESTIONS SUBMITTED BY SENATOR RICHARD C. SHELBY

##### FINANCIAL MANAGEMENT

*Question.* NASA was recently cited for violation of the Antideficiency Act (ADA). According to the Inspector General, a lack of internal controls within the Office of the Chief Financial Officer (OCFO) was a major cause of the violations. It is also troubling that the Inspector General was unable to determine the exact size or number of ADA violations due to the unreliability of the agency's financial management system.

What are the Agency's plans for addressing the material weaknesses in internal controls that have been reported for several years?

*Answer.* NASA's independent financial auditors identified three material weaknesses and one reportable condition through its fiscal year 2005 financial audit. The weaknesses are repeat findings from prior financial audits. NASA submitted a Corrective Action Plan in February 2006 to Congress, OMB and NASA's Office of Inspector General (OIG) that addresses each of the recommendations made by the independent financial auditors. NASA has been executing this plan throughout fiscal year 2006.

For your convenience, we have attached NASA's Financial Management Corrective Action Plan, which provides a complete list of in-process actions to address each material weakness.

CORRECTIVE ACTION PLAN FISCAL YEAR 2005 FINANCIAL AUDIT—FEBRUARY 15, 2006

##### CHIEF FINANCIAL OFFICER'S MESSAGE

I am pleased to present the National Aeronautics and Space Administration's (NASA) financial audit corrective action plan. Achieving financial management excellence is essential to achieving NASA's Vision for Space Exploration. Efficiently managing all of our precious resources will maximize the opportunities for creative and safe programs and projects. In the Office of the Chief Financial Officer, from Headquarters to Field Centers, we are working hard to improve the financial management of our Agency.

Reviewed by NASA's Office of Inspector General, the plan represents the collaborative efforts of the Office of the Chief Financial Officer, the Integrated Enterprise Management Program (IEMP), and the Office of Infrastructure and Administration. The plan articulates NASA's strategy for eliminating the root cause(s) of the four reportable conditions (three of which are material) identified in the 2005 financial audit:

- 1. Financial Systems, Analyses and Oversight (material weakness)
- 2. Fund Balance with Treasury (material weakness)
- 3. Property, Plant and Equipment (material weakness)
- 4. Environmental Liabilities

For each of the four reportable conditions and related recommendations, the plan defines NASA's goals, objectives, strategies, activities, due dates and responsibilities for execution. Progress will be monitored throughout the execution of this plan.

Our ability to improve the quality of the Agency's financial information, to better manage our assets, and to achieve business efficiencies is dependent on the successful execution of this plan with the support of the entire NASA community. NASA has always had a well-deserved reputation for successfully meeting challenges head on, and this effort will be no different.

GWENDOLYN SYKES,  
*Chief Financial Officer.*

#### INTRODUCTION TO THE FINANCIAL AUDIT CORRECTIVE ACTION PLAN (CAP)

This corrective action plan addresses the material and significant weaknesses identified through NASA's 2005 financial audit. Those weaknesses reflect process, system and internal control issues that cross NASA functional areas, including procurement, infrastructure and administration, systems management, and financial management. Accordingly, this plan was developed through a coordinated effort with all NASA organizations that have a critical role and primary responsibility in the execution of it. In addition, the NASA Office of the Inspector General (OIG) reviewed and provided comments to this plan. The OIG's comments were considered in the final product.

For each noted weakness, this plan documents the goals, objectives, strategies and planned corrective actions determined to be the most effective and efficient means for mitigating or eliminating those weaknesses. Through the course of implementation, changes to strategies or corrective actions may be either required or advisable given new information or events. The implementation approach and progress toward plan goals and objectives will be monitored, and plan adjustments made, by the Office of the Chief Financial Officer on a regular and ongoing basis until the those goals and objectives have been met. Status reviews will be conducted with NASA's Deputy Administrator.

The weaknesses addressed in this plan are not new to NASA's 2005 financial audit. They have, in fact, been noted in previous NASA financial audits. Significant work has already been performed to address them. The repetition of the recommendations is an indication of the technical complexity and organizational breadth of the issues. This corrective action plan reflects the work planned by NASA organizations over the next year, and highlights the work performed in previous years to address the audit recommendations. The integration of strategies and plans from multiple NASA organizations is an important success factor and reduces the risk of potentially disjointed, non-complementary solutions to common issues. Several other challenges to the successful accomplishment of plan goals have been identified and will be managed throughout plan implementation. These include:

- Resource constraints.* Sufficient resources to appropriately staff the corrective action implementation teams have not yet been fully secured. Authority for additional Office of the Chief Financial Officer staff at both Headquarters and Field Center locations was provided by NASA's Administrator in 2005. The OCFO is in the process of hiring additional staff to support NASA's financial management improvement initiative efforts. While additional resources are being secured, there is a familiarization and training lag before these resources are fully able to contribute. Other areas of NASA, such as asset management, which are critical to the success of this plan, have identified additional staffing needs for which staffing plans will be developed. These plans will identify staffing shortfalls and associated options.
- Change management.* The anticipated process changes necessary to resolve NASA's identified weaknesses, particularly in the area of Property, Plant & Equipment (PP&E), will impact the way business is conducted at NASA. These changes will require a significant portion of NASA's workforce, both institutional and programmatic, to change the way they currently perform their daily

activities. Communicating the need for change, documenting new procedures and delivering training are key elements embedded in each of the corrective action initiatives. Additionally, initiative owners will work with NASA leadership to build buy-in and support at the most senior levels of the organizations for the changes that must take place. The strong commitment provided by NASA's Executive leadership will be a major factor in overcoming this challenge.

—*External support.* Some of the proposed strategies—such as those for PP&E and Environmental Liabilities—include changes to policy or procedures that will require support from NASA vendors and contractors. Just as process changes will impact employees' daily activities and procedures, so will they impact the activities and reporting requirements of NASA's vendors and contractors. Contract changes, procedural changes, reporting changes; all will take time and money to implement. Through the course of executing the improvement initiatives, the OCFO will be evaluating the risk, cost, benefit and trade-offs of each of the changes that may be required to ensure the actions taken are the most cost effective.

While the challenges and risks are considerable, the strategies and plans presented in this corrective action plan are designed to achieve NASA's goals and objectives within the targeted timeframes.

#### CHAPTER 1: FINANCIAL AUDIT IMPROVEMENT

##### WHY NASA NEEDS A CORRECTIVE ACTION PLAN

NASA's vision for Space Exploration is an ambitious and bold journey into areas of space that man has never visited and into areas of science and research that man has yet to fully comprehend or master. Complex research and development projects, like those at NASA, require effective project planning and management to meet quality, schedule and budget requirements. Having ready access to accurate and reliable financial information is critical for NASA's program and project managers to achieve their own technical goals. Budget constraints combined with the uncertainties inherent in primary research and development further highlight the need for effective program and project financial management information.

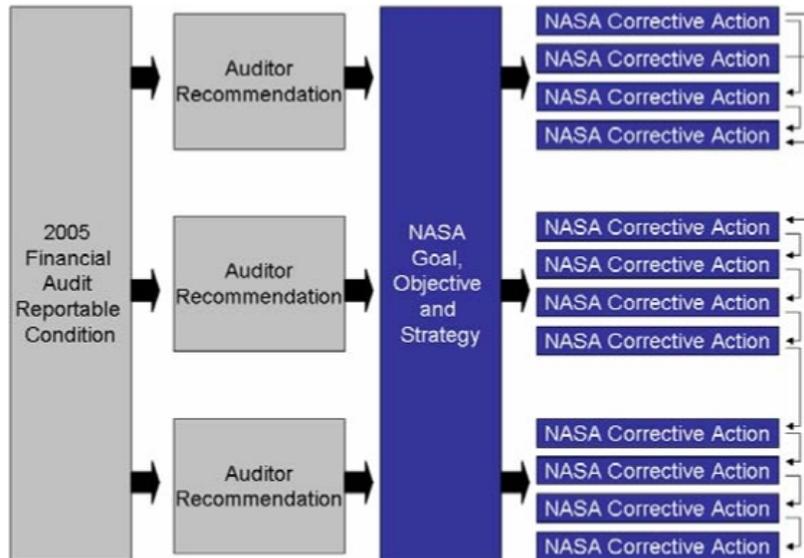
While NASA's program and project managers are the ultimate users of financial information, NASA management and external stakeholders have an important need for information that helps them to prioritize the allocation of scarce Federal dollars. Congress and the White House must be assured that NASA is using its resources in the most effective manner to achieve the goals they have set for the Agency. Only through well designed and implemented processes and systems, effective internal controls and well trained and disciplined staff will the Agency be able to deliver the fidelity of financial information that is required.

Today it is clear from audit reports and the OCFO's own analysis of its processes, systems and data that improvement is necessary before the required fidelity is achieved. This comprehensive and integrated financial audit corrective action plan is an important tool for organizing and efficiently managing NASA's financial audit improvements. The problems cited in IG audit reports did not appear overnight; nor will they disappear quickly, either. This plan is a realistic reflection of the time and effort required to make the necessary improvements.

This plan takes a holistic view of the financial management challenges at NASA. It recognizes the interrelatedness of process across the organization; how problems in an operations process can ultimately contribute to problems with how costs are captured and reported in financial management processes. With that perspective, this plan identifies and resolves the root causes of NASA's financial audit weaknesses.

##### WHAT THE CAP IS AND WHAT IT DOES

NASA's financial audit corrective action plan (CAP) is NASA's response to the financial audit recommendations made by IG auditors in the 2005 financial audit. The CAP is organized around the reportable conditions contained in the auditor's *Report on Internal Control* (NASA Fiscal Year 2005 Performance and Accountability Report, pages 190–212). For each reportable condition, the plan is further organized by the specific recommendations contained in the *Report on Internal Control*. For each recommendation, NASA has developed, and has begun implementation of, logical, interdependent sets of specific actions that directly address that recommendation. The CAP lays out how NASA will address each recommendation made by the IG auditors. The graphic depicts the layout of the plan for one sample reportable condition.



The CAP is designed to provide NASA's framework for resolving the internal control and management weaknesses identified by the IG auditors. These extend beyond financial accounting into the operations of the agency. Effectively resolving the identified weaknesses will take a coordinated and integrated effort involving the support, buy-in and ownership of many NASA offices and directorates. Affected organizations have been involved in the creation of this plan, and, in many cases, have been assigned the primary responsibility for taking the necessary actions to resolve the identified weaknesses.

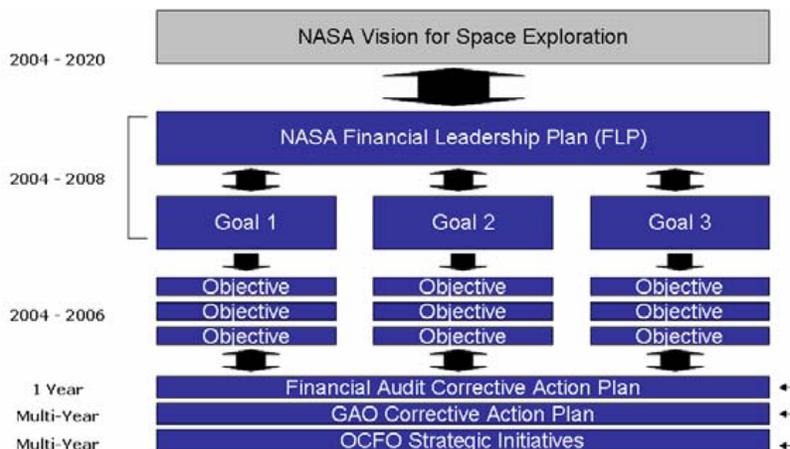
The financial audit CAP is a living document. Performance against the plan will be monitored on a regular basis and initiatives will be adjusted as needed to ensure that results continue to meet the goals and objectives of the plan. The plan projects actions and target dates for resolving the issues. All projections are based on currently known information and may change over time.

#### LINKING THE CAP TO NASA'S FINANCIAL LEADERSHIP PLAN (RP)

In 2004, NASA's Office of the Chief Financial Officer published a four-year Financial Leadership Plan. This plan lays out the vision for financial management at NASA through three comprehensive goals:

- 1. Provide the Agency's Mission Directorates and Mission Support Areas with the financial knowledge, information and tools required to effectively manage programs, projects, institutions and overall NASA resources.
- 2. Ensure that all stakeholders have a clear understanding and accurate assessment of how NASA resources effectively and efficiently support NASA's vision.
- 3. Enable the OCFO workforce to provide world-class management and processes in support of the Agency's Mission Directorates and Mission Support Areas.

Each of these four-year goals is supported by a set of one to two-year objectives. Each objective, or set of objectives, has associated with it initiatives intended to help NASA achieve that objective. Financial Leadership Plan initiatives are solution sets to known issues or improvements to current operations that contain specific activities scheduled, sequenced, and assigned in documented project plans. These initiatives are led by staff members from headquarters or one of the NASA Field Centers, and staffed by appropriate subject matter experts from across NASA. The graphic depicts the relationships throughout the planning process.



This corrective action plan represents one set of initiatives that specifically addresses NASA's ability to provide accurate, reliable and timely financial information to decision-makers and external stakeholders. The Financial Leadership Plan includes other financial management improvement initiatives not directly linked to NASA audit recommendations.

#### MANAGEMENT OVERSIGHT

NASA's commitment to making financial management improvements is evident at all levels of the organization, not just in the Office of the Chief Financial Officer. This plan was developed through a combined effort of the owners and operators of both the financial and those non-financial processes that are contributing to the identified weaknesses. Through the sponsorship of NASA's Administrator and Deputy Administrator, the Agency is clear about the importance of resolving these outstanding management and internal control weaknesses. Several infrastructure elements are in place to help ensure the plan's success.

#### *OCFO Governance Structure*

The Office of the Chief Financial Officer has developed a governance structure that will help to guide and speed information flow during the implementation of the corrective action plan. Recommendations for change that result from implementation of the plan will be presented to either the OCFO Financial Steering Group or the Financial Executive Roundtable, depending on the scope and magnitude of the anticipated changes, for approval and disposition. These groups are made up of OCFO headquarters and Field Center leadership who will have the ultimate responsibility for implementing changes in NASA financial processes and systems. The use of the governance structure will add discipline to the corrective action process, and speed communications and implementation.

#### *Monthly and Quarterly Oversight*

Measuring progress against the corrective action plan begins with regular status reports from the initiative owners. The OCFO's program management function will assess progress, make project management recommendations, and suggest changes to specific initiatives, as necessary. Progress is measured both in terms of completed activities and assessments of work products.

The OCFO will report on overall corrective action plan progress monthly to the Agency's Deputy Administrator. The Deputy Administrator has the authority to determine Agency improvement priorities and to address resource needs.

The OCFO will provide regular updates to NASA's Inspector General and, as needed, with IG auditors.

#### *Enhanced Human Resources*

Having the necessary resources to implement the plan is a recognized challenge. The Office of the Chief Financial Officer has received the authority to hire the staff and engage the contractors it needs to execute its responsibilities against the plan. The challenge lies in finding the right people at the right time, quickly familiarizing

those people with the current issues, processes and systems, and doing all of this while managing the day-to-day operations of the office.

## CHAPTER 2: THE ELEMENTS OF THE CORRECTIVE ACTION PLAN (CAP)

### CHALLENGES IDENTIFIED BY THE NASA INSPECTOR GENERAL

Each year the Inspector General (IG) conducts financial audits assessing NASA's operations and facilities as required by the Chief Financial Officers' Act of 1990 (Public Law 101-576) as amended. In 2005, as in 2004 and 2003, the IG's independent public auditors determined that the scope of their work was not sufficient to enable them to express an opinion on NASA's financial statements.

From the work that the independent public auditors were able to perform, they identified four reportable conditions, three of which they considered to be material. Each of these reportable conditions is a repeat condition from the fiscal year 2004 financial audit. A material weakness is an identified problem that may impact the accuracy and reliability of financial information. NASA is committed to implementing solutions that best resolve these weaknesses.

The reportable conditions and NASA's goals, objectives and strategies for resolving them are contained in this section of the plan.

#### *Initiative Overviews*

Financial Systems, Analyses, and Oversight  
Fund Balance With Treasury  
Property, Plant & Equipment  
Environmental Liabilities

#### *1. Financial Systems, Analyses, and Oversight. (Material Weakness)*

"Although progress was made [since the 2004 audit], significant financial management issues continue to impair NASA's ability to accumulate, analyze, and distribute reliable financial information." (Reference: NASA Fiscal Year 2005 Performance and Accountability Report (PAR), Part 3, page 193)

#### *Background*

The implementation of NASA's Core Financial system in fiscal year 2003 represented a major transformation in NASA's financial management systems and processes. Immediately following the completion of the system's implementation, challenges were identified in system processing, configuration and capabilities. While challenges from this major change were anticipated, it has taken longer than expected to stabilize the financial environment. The current version of NASA's automated financial system has capability limitations which have required the definition and implementation of compensating controls. Examples of these limitations include:

- Audit trails within the system do not distinguish between source documents of original entry and correction transactions
- Lack of fully automated support for adjustments to prior year obligations

The independent public auditors specifically noted that documentation regarding significant accounting events, recording of non-standard transactions, and post closing adjustments, as well as corrections and other adjustments made in connection with data conversion issues must be strengthened. (Fiscal Year 2005 PAR, page 211)

Future versions of the Core Financial system promise to provide capabilities to improve the integrity of budgetary ledger postings and to further automate accounting processes. NASA has scheduled a system update early in fiscal year 2007 that is intended to address many of these issues through enhanced system capabilities and process improvements.

Implementation of a Commercial Off-the-Shelf Software (COTS) package in the federal government has presented its own set of challenges. The alignment of NASA processes and its enterprise resource planning (ERP) system is an ongoing activity.

#### *Goal*

NASA's goal for resolving this material weakness is to improve NASA's financial management system and processes to achieve accurate, reliable and timely financial information.

#### *Objective*

Supporting that goal is the objective of developing core standard agency-wide procedures and tools to review and validate that financial data and processes are consistent with authoritative guidance issued by FASAB, Treasury and OMB.

*Strategy*

The strategy for achieving that objective is to develop and implement procedures to identify and validate financial data and processes in IEMP, to strengthen internal controls to ensure consistency with authoritative guidance, and to implement automated financial system enhancements to complement process changes.

*Accomplishments in Fiscal Year 2005*

NASA made progress in 2005 towards resolving this material weakness, which was also identified in 2004. Highlights of these accomplishments are provided below, grouped by categories identified in the 2004 financial audit.

*“Lack of Integrated Financial Management System” (2004 Audit Finding Category)*

—NASA eliminated noted weaknesses in its Integrated Enterprise Management (IEM) information technology control environment (NASA’s financial system is one component of IEM). The weaknesses were identified in three control areas: access controls; systems software; and, segregation of duties.

—NASA implemented compensating controls and improved system capabilities to improve its ability to identify and document correction activities within the Core Financial system. With these improvements, audit trails have been established by identifying and linking certain system transactions between original, reversal and re-post transactions.

—Through systems configuration analysis and modification, and through the reconciliation of remaining data anomalies from conversion in 2003, NASA generated fully supported year-end financial statements directly from the Agency’s Core Financial system. Year-end balances are now supported by the Core Financial system.

*“Financial Statement Preparation and Analysis” (2004 Audit Finding Category)*

—Through policies and procedures established in NASA’s Financial Management Requirements (FMR), Volume 19, *Periodic Monitoring Controls Activities*, all NASA Field Centers are performing 23 financial reconciliations or verifications on a scheduled basis. Field Center CFOs are providing certifications for each reconciliation or verification to Headquarters, where they are tracked and reviewed.

—NASA Field Center CFOs and Deputy CFOs reviewed and certified the year-end financial management data from their Centers, and included a statement that all corrections were fully documented, for audit trail purposes, in NASA’s official audit tracking system.

—NASA developed and adopted enhanced financial statement validation procedures and checklists for use at all Field Centers and Headquarters. Through the preparation of extensive crosswalks between NASA and Treasury financial data, the Agency has validated that both the data and the business rules for posting data into specific accounts are accurate. Also, checklists are now in place for the preparation of financial statements. These checklists are reviewed and certified by Field Center management.

*“Additional Controls Need to be Strengthened” (2004 Audit Finding Category)*

—NASA’s Office of the Chief Financial Officer (OCFO) increased staffing to support financial management activities. In May 2005, NASA’s OCFO received relief from a NASA-wide hiring freeze and approval to increase its headcount in fiscal year 2006 at Headquarters by 34 positions (including 2 Senior Executive Service leadership positions) and at Field Centers by 50 positions. As of February 1, 2006, 90 percent of these positions have been filled.

—NASA published the first volumes of the NASA Financial Management Requirements (FMR) to ensure complete and consistent application of NASA financial management policy. The FMR has been distributed to appropriate Headquarters and Center staff.

—NASA established a financial quality assurance function to provide direction and focus for NASA Internal Control activities. This function has developed an agency-wide Policy Compliance Review Plan, a corporate quality assurance strategy, and a comprehensive internal control strategy to ensure that the agency is positioned to successfully meet OMB A-123 requirements. In addition, all Centers have received internal control training in conjunction with quality assurance visits.

—Other noted weaknesses have been addressed through compensating controls for subsidiary ledgers and systems, including property, to ensure the quality of data entered into the official accounting system. A new system was created for Contractor held assets, Contractor-Held Asset Tracking System (CHATS). CHATS implementation has provided additional validation and checks and balances for property data input.

*Approach for Fiscal Year 2006*

NASA has developed a comprehensive set of planned corrective actions to further address each of the financial audit recommendations. Following is a set of tables that track each planned corrective action to the recommendations in the financial audit report.



PCA 5	Established procedures to ensure that all system configuration changes are subject to regression tests and year-end test procedures which validate that changes made to the Core Financial System are valid, appropriate, and do not adversely impact end-to-end business processes, including external reporting.	Complete
PCA 1	Update Center workplans to capture remaining data anomalies from fiscal year 2003.	2/10/06
PCA 2	Coordinate corrective actions with Centers and IEMP Competency Center to determine necessary steps.	3/31/06
PCA 3	Monitor progress until remaining data anomalies are resolved	6/30/06
PCA 4	Perform monthly reconciliation of financial data residing in the core financial system.	Monthly
PCA 5	Verify that Centers and IEMP Competency Center are executing standard reconciliation procedures.	Monthly
PCA 6	Review results of Center and IEMP Competency Center reconciliation procedures.	Monthly
PCA 1	Establish and implement an error correction and prior period adjustment procedure consistent with the FASAB (SFFAS #7) standards that allows for the tracking of these items within SAP.	2/28/06
PCA 1	Established safeguards to ensure that system does not pay cost in excess of obligation.	Complete
PCA 2	Develop compensating procedures to analyze Business Warehouse on a quarterly basis to ensure that liabilities are appropriately recorded.	3/31/06
PCA 3	Formed cross-functional task team to review current process and identify opportunities for reengineering.	Complete
PCA 4	Conducted benchmarking sessions with Dept. of Education, Dept. of Agriculture, and others to identify best practices and lessons learned for funds control, cost collection, and accrual processing.	Complete
PCA 5	Drafted proposed process design and high level requirements	Complete
PCA 6	Obtained OCFD and Center CFO approval of SAP Version Update Project Scope Document which incorporated requirements from task team efforts.	Complete
PCA 7	Incorporate process design into Core Financial System Update Version project.	3rd Quarter Fiscal Year 2006
PCA 8	Implement Core Financial System Version Update project, including improved process designs.	10/1/06

#1 Financial Systems, Analyses, and Oversight (1a-g)  
 Recommendation 1c2: NASA should continue to validate its data within the Core Financial Module to resolve issues with data integrity that date back to the system conversion in fiscal year 2003 to ensure that date is accurate and complete.

#1 Financial Systems, Analyses, and Oversight (1a-g)  
 Recommendation 1c3: In addition, NASA should continue to develop a long-term solution within IEMP to identify, support, and track adjustments made to general ledger accounts.

#1 Financial Systems, Analyses, and Oversight (1a-g)  
 Recommendation 1d: Continue to devise short-term and long-term resolutions to IEMP systematic and integration issues. Lack of internal controls surrounding costs in excess of obligations and downward adjustments.

Material Weakness or Reportable Condition with Recommendation	Number	Planned Corrective Action (PCA)	Target Date for PCA Completion
<p>#1 Financial Systems, Analyses, and Oversight (1a-g)                      Recommendation 1e1: Formally document roles and responsibilities of Headquarters, IEMP Competency Center, and center financial management personnel across all levels to ensure that appropriate responsibilities are aligned with job functions and that accountability is achieved at each level.</p>	<p>PCA 1  PCA 2  PCA 3  PCA 4 PCA 5  PCA 6</p>	<p>Developed an Operational Level Agreement (OLA) for the IEMP Competency Center and Agency CFO to operate under that prescribes their respective responsibilities pertaining to master data management and periodic closing processes.                      Finalized the OCF0 Governance Structure, which encompasses the decision making process within the financial management community and its communications with IEMP.                      Developed performance metrics for Center CFOs to monitor compliance with OCF0 priorities, strategies, and objectives, as documented in the Financial Leadership Plan.                      Shared performance metrics with Center CFO's .....                      Begin capturing metric information .....                      Conduct quarterly evaluations or progress with Center CFO's .....</p>	<p>Complete  Complete  Complete  2/1/06 2/28/06, utilizing 1st Quarter data Quarterly beginning 4/26/06  On-going</p>
<p>#1 Financial Systems, Analyses, and Oversight (1a-g)                      Recommendation 1e2: Additionally, we recognize that resource limitations may constrain NASA's ability to execute its mission. Management should continue to focus on filling key vacancies within the financial management organization.</p>	<p>PCA 1</p>	<p>Continue to hire as expeditiously as possible up to allocated ceiling .....</p>	<p>On-going</p>
<p>#1 Financial Systems, Analyses, and Oversight (1a-g)                      Recommendation 1f: Provide additional "hands-on" training for financial personnel—at headquarters and center levels—to ensure that they understand their roles in processing transactions, performing account analyses and reconciliations, maintaining supporting documentation, and updating their knowledge of financial reporting requirements.</p>	<p>PCA 1 PCA 2  PCA 3</p>	<p>Issued quarterly report documenting all training conducted during the 1st quarter of fiscal year 2006.                      Utilize a needs assessment and develop a training plan for providing the following training: Processing transactions, Performing account analyses and reconciliations, Maintenance of supporting documentation, and Financial reporting requirements.                      Execute and monitor the plan on a quarterly basis .....</p>	<p>Complete 3/31/2006  9/30/2006</p>
<p>#1 Financial Systems, Analyses, and Oversight (1a-g)                      Recommendation 1g: Develop reports from the Core Financial Module to facilitate reviews and ensure that aging of transactions and open items, unliquidated obligations, grants, and other key areas are periodically assessed, re-searched, and resolved.</p>	<p>PCA 1</p>	<p>Produce a series of management reports to facilitate financial management oversight and analysis; e.g. aging, delinquencies, prompt payment, etc. Suite of reports will be continually enhanced based on management requests.</p>	<p>Monthly 15th working day</p>

2. *Further Research Required to Resolve Fund Balance With Treasury Differences. (Material Weakness)*

“Although we were informed that many errors from fiscal year 2003 were resolved, significant errors within the accounting system were still being identified by NASA in fiscal year 2005. Fund balance with Treasury reconciliation processes were ineffective in fiscal year 2004 and much of fiscal year 2005, through the date of our visits to centers, but it is our understanding that steps taken by NASA in the last quarter of the year are believed by NASA management to have substantially improved the effectiveness of such reconciliations.” (Reference: NASA Fiscal Year 2005 Performance and Accountability Report (PAR), Part page 201)

*Background*

NASA’s Fund Balance with Treasury represents monies the agency can spend for authorized transactions. Each month, NASA is required to reconcile the difference between the amount of money it reports to be in its Fund Balance with Treasury with the amount that Treasury reports to be in the account. The 2005 audit identified FBWT as a material weakness due to unreconciled discrepancies between Treasury’s balance and the balance represented in NASA’s Core Financial system.

IG auditors indicated that documentation to support the application of rigorous reconciliation processes was not available for their review. (Fiscal Year 2005 PAR, page 211)

*Goal*

NASA’s goal for resolving this material weakness is to fully reconcile the agency’s Fund Balance with Treasury and to process any future corrections in a timely manner.

*Objective*

Supporting that goal is the objective of monitoring Fund Balance With Treasury on a regular basis to ensure compliance with NASA and Treasury policies, procedures and practices.

*Strategy*

The strategy for achieving that objective is three-fold:

- 1. Center CFOs will perform monthly reconciliations and certify their completion with Agency OCFO.
- 2. Agency OCFO will perform monthly reviews of Center reconciliations to ensure compliance with reconciliation policies and procedures.
- 3. OCFO will institute management reviews and monitor compliance with the following metrics:
  - a. Reconciliations performed every 30 days
  - b. Corrections processed within 120 days of discovery

*Accomplishments in Fiscal Year 2005*

In fiscal year 2005, NASA enhanced its funds distribution process through policy and procedural changes to minimize manual and repetitive process steps. The Agency will continue to refine and implement enhancements.

In addressing previous year differences in NASA’s Fund Balance with Treasury, the OCFO reduced the out of balance condition through the following actions:

- Developed and implemented a standard process that requires a review and approval process be followed to correct errors, supported with appropriate documentation.
- Implemented across all Field Centers standard reconciliation procedures and associated templates to monitor FBWT status on a monthly basis. These procedures will help to ensure timely resolution of variances. The procedures make up the *Periodic Monitoring Controls Activities* handbook, Volume 19 of NASA’s Financial Management Requirements (FMR). Policy was also implemented requiring each Field Center CFO to review and certify to Headquarters monthly that the reviews and reconciliations were performed, and are complete and accurate.
- Developed and implemented a standard process to review and approve the write-off of unsupported differences.
- Established teams to resolve identified FBWT issues at targeted NASA Field Centers.
- Implemented monthly Agency cash monitoring procedures and guidelines to track reconciliations and the timely resolution of differences.
- Implemented across all Field Centers an automated cash reconciliation tool to identify differences and augment timely processing of transactions.

*Approach for Fiscal Year 2006*

NASA has developed a comprehensive set of planned corrective actions to address each of the financial audit recommendations. Following is a set of tables that track each planned corrective action to the recommendations from the financial audit report.



3. *Enhancements needed for controls over Property, Plant and Equipment (PP&E) and materials. (Material Weakness)*

“Consistent with prior year audit reports, our review of property, plant, and equipment (PP&E), totaling approximately \$35.0 billion, identified serious weaknesses in internal control that, if not corrected, could prevent material misstatements from being detected and corrected in a timely manner.” (Reference: NASA Fiscal Year 2005 Performance and Accountability Report (PAR), Part 3, page 203)

*Background*

NASA Mission-related products are designed, built and deployed to carry-out the agency’s exploration and research objectives. Given the unique scientific nature of the agency’s work, these programs, such as Hubble and the International Space Station, are highly specialized, and to develop and maintain them, NASA contracts with industry. Often multiple contractors participate in the design and creation of these products in a cycle that, in some cases, has taken as long as forty years from concept through deployment.

The primary issues related to NASA property, plant and equipment are threefold:

- 1. the accuracy and completeness of the financial records—meaning the classification (expense or asset) and valuation—of project property, plant and equipment, as well as the coding of documents at obligation that carry through expenditure
- 2. the accountability for the materials and equipment used in the construction of physical products
- 3. the accuracy and timeliness of contractor provided financial information—including the classification (expense or asset) and valuation—related to the status of contractor-held property, plant and equipment and materials

First, given the complex and unique nature of its research and development work, NASA and its respective auditors and GAO representatives, have struggled over the years to define and agree upon an approach, and related policies, for reporting program and product costs in a manner consistent with FASAB guidelines. This impacts the classification of PP&E costs (asset or expense), the valuation of interim and finished products, and, ultimately NASA’s financial statements.

Second, as contractors develop parts and components of an overall product, they ship them from the manufacturing location to various NASA Centers across the country in preparation for assembly into a finished product. NASA has been working to ensure proper control over these components.

Finally, preparation of NASA’s financial statements is dependent upon contractors and their NASA program counterparts reporting costs associated with developing these parts. The accuracy, completeness and timeliness of this reporting must be improved.

IG auditors specifically noted that controls relating principally to contractor-held PP&E and materials and NASA-held assets in space (Theme Assets) need improvement, and that headquarters oversight needs improvement. (Fiscal Year 2005 PAR, page 211)

*Goal*

NASA’s goal for resolving this material weakness is to improve the agency’s internal controls over its property, plant and equipment (PP&E).

*Objective*

Supporting that goal are the objectives to:

- 1. Develop core standard agency-wide procedures and tools to review and validate that financial data and processes are consistent with generally accepted accounting principles (GAAP) for Federal reporting entities.
- 2. Provide relevant, accurate, reliable, and timely financial property information to stakeholders.

*Strategy*

The strategy for achieving that objective has six elements:

- 1. Define Asset Categories (NASA-Held vs. Contractor-Held and Program Related vs. Non-Program Related), based on published accounting guidance (e.g. SFFAS #'s 6, 8, & 11 and SFAS #2)
- 2. Define appropriate accounting treatment of an asset based upon its use (Alternative vs. No Alternative Future Use), based on published accounting guidance (e.g. SFFAS #'s 6, 8, & 11 and SFAS #2);
- 3. Review NASA’s revised capitalization policy with OMB, OIG, GAO, FASAB, and E&Y;

- 4. Review and revise, as necessary, the PP&E policy regarding the accounting treatment;
- 5. Engage the entire NASA community (OCFO, Project/Program Managers, Procurement, Logistics and Facilities) in improving PP&E financial management and internal controls;
- 6. Define, Communicate, Train and Implement procedures for effective Property, Plant & Equipment Lifecycle Management, to include valuation of Assets.

*Accomplishments in Fiscal Year 2005*

NASA has made great strides toward enhancing its internal controls and addressing the weaknesses in NASA's accounting for its Property, Plant and Equipment and Materials.

NASA successfully implemented a system to account for assets held by contractors, Contractor Held Asset Tracking System (CHATS) to address the potential concern of inadequate supervisory reviews of the Contractor submitted data and have a data base for the costs of these fixed assets. The system is currently being used and was in place when DCAA conducted its audit of agreed upon procedures on NASA's largest contractors. As a part of the audit, DCAA reviewed whether Contractor policies and procedures provide for detecting and correcting errors reported on the Monthly CHATS reports.

The DCAA reviews were conducted closer to the end of the fiscal year than had previously been the case in order to support the asset balance on NASA's Balance Sheet at year-end. DCAA was also tasked with reviewing contractor compliance in resolving prior year reported deficiencies. Preliminary feedback from the draft reports indicates that progress has been made during fiscal year 2005 toward resolving these deficiencies.

NASA now performs the following activities to ensure reconciliations of asset transfers between contractors:

- Completion of a monthly validation checklist requiring that all transfers of \$1 million or more be supportable with appropriate documentation.
- Preparation monthly of a Transfer Matrix report by the NASA Center property accountants. This report, using the data in CHATS, lists all transfers made between and among contractors or with NASA Field Centers. This reporting will assist NASA Headquarters with readily identifying inter-contract transfers.

In keeping with the auditors' recommendation to fundamentally revisit its approach to capitalizing property, NASA developed a proposed change in accounting policy for the capitalization of Theme Assets—the largest portion of NASA's PP&E. This policy would require NASA to expense all costs as incurred for projects that are exploratory in nature, that have no alternative future uses and are not reusable or repairable (i.e. research and development type costs). The change would more accurately reflect the nature of program and project expenditures.

NASA also implemented the Project Management Information Improvement (PMI<sup>2</sup>) initiative in 2005. PMI<sup>2</sup> is a project work breakdown coding structure that tracks a project from obligation through expenditure. PMI<sup>2</sup> benefits include:

- Alignment of the Agency's technical WBS with the financial coding structure
- Data standardization and configuration management
- Consistent and standardized tool for project management reporting
- Timely, consistent and reliable information for management decisions
- Program and Project managers gain the ability to view detailed costs and obligations at the project level

*Approach for Fiscal Year 2006*

NASA has developed a comprehensive set of planned corrective actions to address each of the financial audit recommendations. Following is a set of tables that track each planned corrective action to the recommendations from the financial audit report.

Material Weakness or Reportable Condition with Recommendation	Number	Planned Corrective Action (PCA)	Target Date for PCA Completion
<p>#3. Enhancements Needed for Controls Over Property, Plant, and Equipment and Materials.</p> <p>Recommendation 3a1: We recommend that NASA continue to focus on resolving prior year issues and completing its implementation of suggested recommendations and developing detailed corrective action plans.</p> <p>Recommendation 3a2a: In addition, we once again place further emphasis on recommending that NASA fundamentally revisit its approach to capitalizing property.</p> <p>Recommendation 3a2b: Documenting, analyzing, and implementing robust control changes from end to end to all categories of PP&amp;E.</p> <p>Recommendation 3a3: We also recommend that all NASA obligation documents and expenditures be coded to identify whether they relate to a property acquisition to create a control for comparison to recorded property transactions and subsidiary ledgers, be they NASA activities or contractors.</p>	PCA 1	Defined Asset Categories based on published accounting guidance and NASA's business environment—Finalized how property will be classified (e.g., NASA Held and Contractor Held Program Related vs. Non-Program Related, etc.).	Complete
	PCA 2	Completed draft defining appropriate accounting treatment per Asset category and use (based on published accounting guidance and NASA's business environment).	Draft Complete Final Complete
	PCA 3	Provide OMB, GAO, FASAB, and OIG NASA's revised capitalization policy .....	2/28/06
	PCA 4	Adjust capitalization policy as necessary .....	3/15/06
	PCA 5	Flowchart and document desired business processes and procedures, and define roles and responsibilities for effective PP&E lifecycle management, to include valuation of Assets.	3/31/06
	PCA 6	Incorporate OIG comments in the flow charts as appropriate and disposition.	3/31/06
	PCA 7	Identify and coordinate changes that must be made to existing policies Agency-wide.	4/3/06
		<p>Meet with HQ Mission Support Offices (Procurement, Office of Chief Engineer, Institutions &amp; Management, etc.).</p> <p>Develop a list of potential associated policy impacts</p> <p>Coordinate with HQ Mission Support Offices to obtain draft policy updates.</p> <p>Assign cross-functional teams to participate in Working Groups to re-engineer, as necessary, NASA's current processes and procedures.</p>	

PCA 8	<p>Engage working groups to:  Identify process and system(s) gaps between current processes and desired processes, as well as, identifying solutions. Specifically, teams will focus on the following areas of PP&amp;E Lifecycle management:  Planning  Acquisition  Management Control and Accountability  Disposition</p> <p>Ensure that OIG comments regarding specific corrective actions are incorporated in the flow charts as appropriate and dispositioned.  Review Compensating Control Team recommendations and other relevant material.</p> <p>Establish single points of accountability within the PP&amp;E Lifecycle.  Establish a certification requirement (Center Director for Real and Personal Property/Chief Engineer or Mission Director for Program Assets).  Establish format for new RSSI disclosure reporting requirements.  Develop Process Implementation Plan for Changes Agency-wide  Complete interim policy and process changes, as necessary, to include the following:  Program/Project Management policies  Procurement policies  Financial policies  Logistics policies  Facilities policies</p> <p>Conduct focused communication forums with accountable parties to discuss their roles and responsibilities within the PP&amp;E lifecycle.  Prepare analysis and record changes to reported fixed assets and expenses based upon revised policies.</p>	5/31/06
PCA 9 PCA 10		6/16/06 9/29/06

*4. Internal controls in estimating NASA's Environmental Liabilities require enhancement.*

“During our review of NASA’s environmental liability estimates totaling \$825 million as of September 30, 2005, and related disclosures to the financial statements, we continued to note weaknesses in NASA’s ability to generate an auditable estimate of its unfunded environmental liabilities (UEL) and to identify potential financial statement disclosure items because of a lack of sufficient, auditable evidence.” (Reference: NASA Fiscal Year 2005 Performance and Accountability Report (PAR), Part 3, page 207)

*Background*

Due to the highly complex scientific and technical nature of NASA’s work, the Agency’s scientific and engineering community develops the actual estimates for environmental liabilities. The OCFO provides accounting expertise in the form of policy and guidance to the Environmental Liabilities staff responsible for developing these estimates. Once estimates have been developed, they are then delivered to the OCFO accounting staff, who records them in NASA’s Core Financial system.

IG auditors specifically noted weaknesses in NASA’s ability to generate auditable unfunded environmental liability estimates and to identify disclosure items. (Fiscal Year 2005 PAR, page 211)

*Goal*

NASA’s goal for resolving this material weakness is to validate the tools and methodology used to prepare the unfunded environmental liability estimates.

*Objective*

Supporting that goal are the objectives to:

- 1. Develop standard agency-wide procedures to be applied by all Environmental Liability staff on the preparation, reviewing, validation, and processing of environmental liabilities, in agreement with guidance from statutory agencies (OMB, FASAB, Treasury, and State and local Governments).
- 2. Ensure that all staff involved in the development of the environmental liability estimates and in the review, analysis, and processing of those estimates in the financial system are properly trained.

*Strategy*

The strategy for achieving that objective is to improve existing environmental liability procedures and implement needed internal controls to assure the improved procedures are adhered to and followed. NASA will also provide proper training to all staff involved in the development of the environmental liability estimates and the review, analysis, and processing in the financial system.

*Accomplishments in Fiscal Year 2005*

The OCFO and the Environmental Management Division (EMD) developed a close working partnership to coordinate policies, processes and controls for estimating NASA’s environmental liabilities. Members from both offices met weekly to identify and resolve issues, and determine the most appropriate steps toward improved estimates.

NASA has developed and conducted training in conjunction with the EMD for staff that provides guidance and policy for estimating environmental liabilities. The training outlines the process for estimating environmental liabilities, explains Federal accounting standards and guidance, defines quality review processes, and addresses existing audit findings.

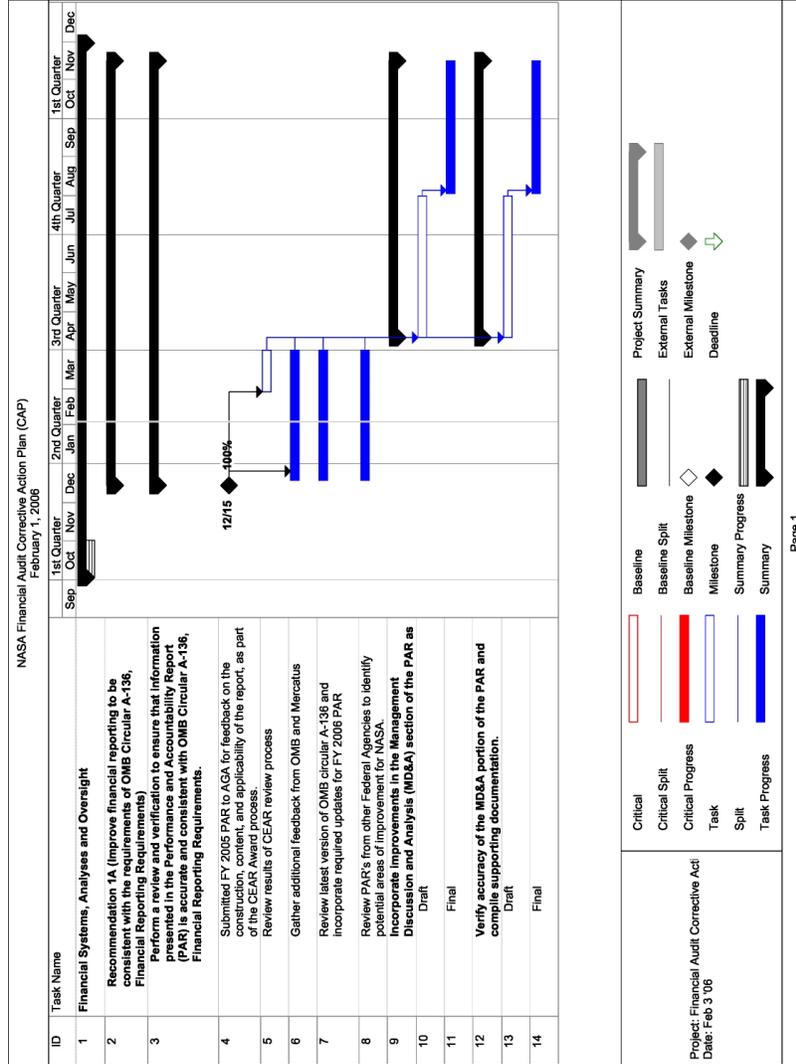
NASA has developed and published documented procedures for estimating environmental liabilities. These procedures have been distributed to all Centers.

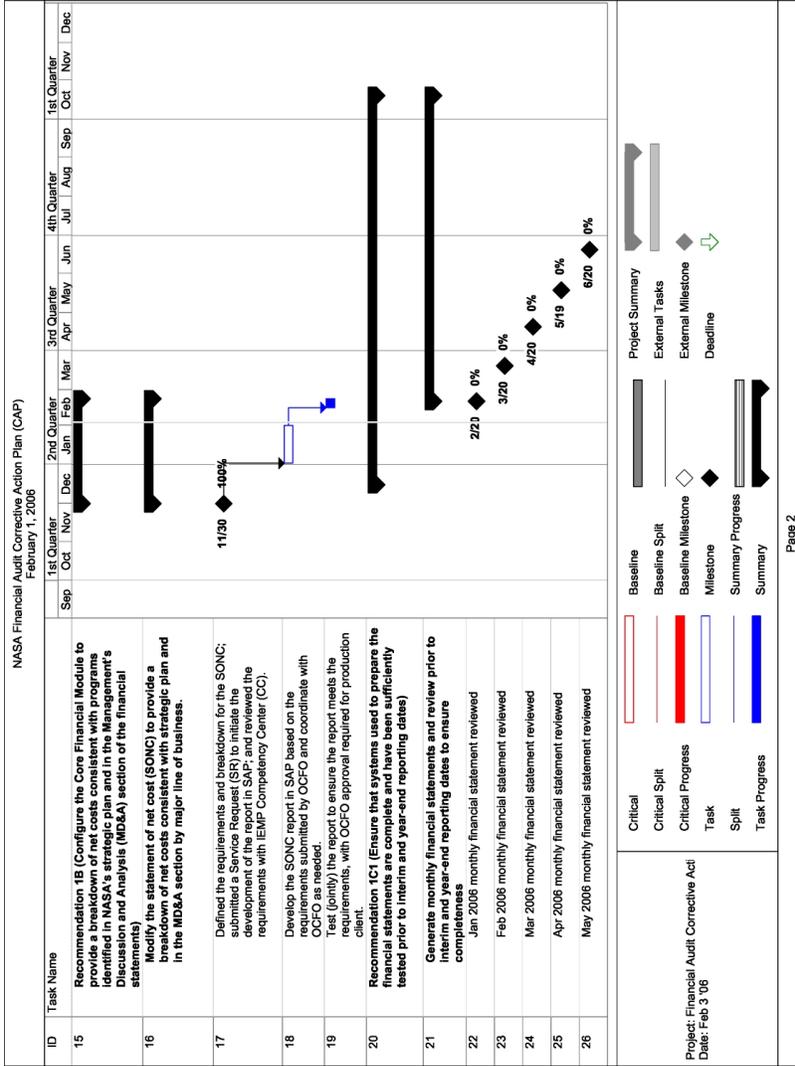
*Approach for Fiscal Year 2006*

NASA has developed a comprehensive set of planned corrective actions to address each of the financial audit recommendations. Following is a set of tables that track each planned corrective action to the recommendation from the financial audit report.

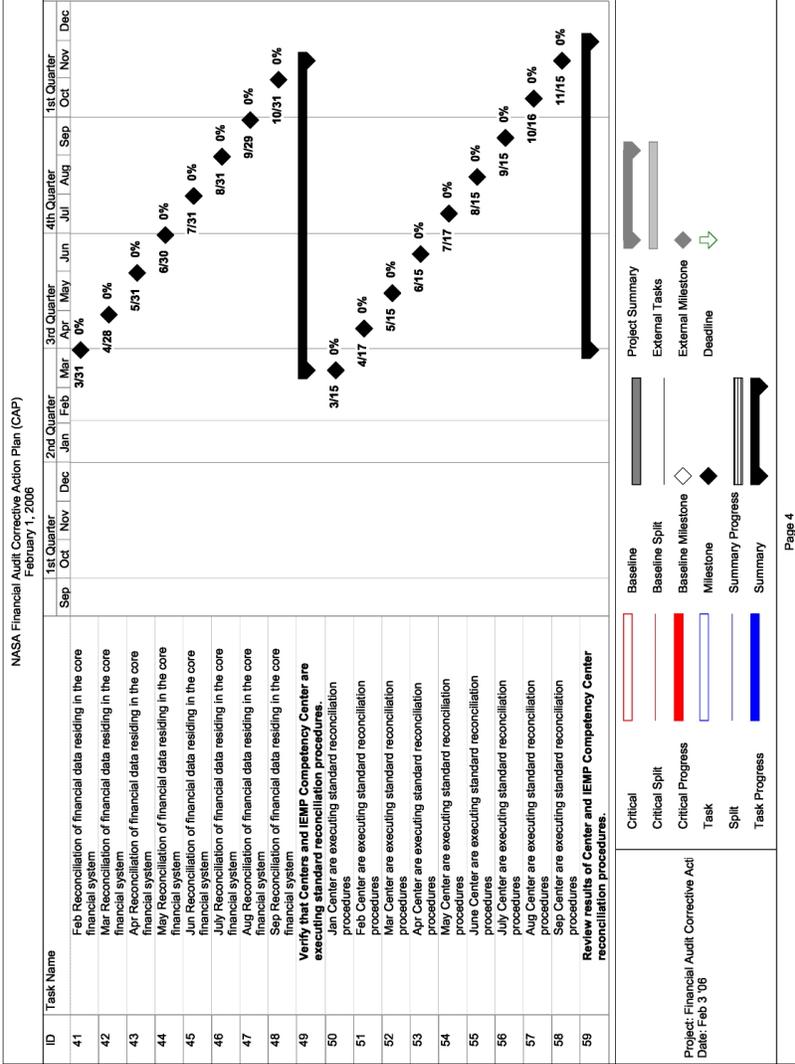


- Initiative Workplans
- Financial Systems, Analyses, and Oversight
- Fund Balance With Treasury
- Property, Plant & Equipment
- Environmental Liabilities

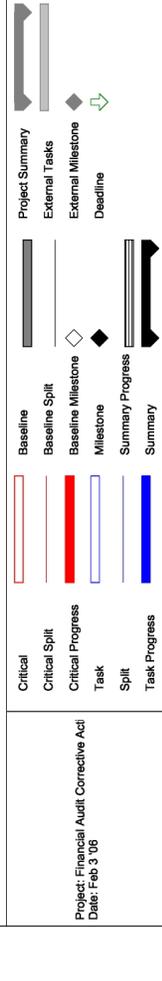








NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006																	
ID	Task Name	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter						
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
60	Jan 2006 monthly reconciliation procedures results reviewed																
61	Feb 2006 monthly reconciliation procedures results reviewed																
62	Mar 2006 monthly reconciliation procedures results reviewed																
63	Apr 2006 monthly reconciliation procedures results reviewed																
64	May 2006 monthly reconciliation procedures results reviewed																
65	June 2006 monthly reconciliation procedures results reviewed																
66	July 2006 monthly reconciliation procedures results reviewed																
67	Aug 2006 monthly reconciliation procedures results reviewed																
68	Sep 2006 monthly reconciliation procedures results reviewed																
69	<b>Recommendation 1c3: NASA should continue to validate its data within the Core Financial Module to resolve issues with data integrity that date back to the system conversion in FY 2003 to ensure that data is accurate and complete.</b>																
70	Establish and implement an error correction and prior period adjustment procedure consistent with the FASAB (SFFAS #7) standards that allows for the tracking of these items within SAP.																
71	<b>Recommendation 1D (Continue to devise short-term and long-term resolutions to IEMP systematic and integration issues. Lack of internal controls surrounding costs in excess of obligations and downward adjustments)</b>																
72	Establish safeguards to ensure that system does not pay cost in excess of obligation																
73	Develop compensating procedures to analyze Business Warehouse on a quarterly basis to ensure that liabilities are appropriately recorded.																



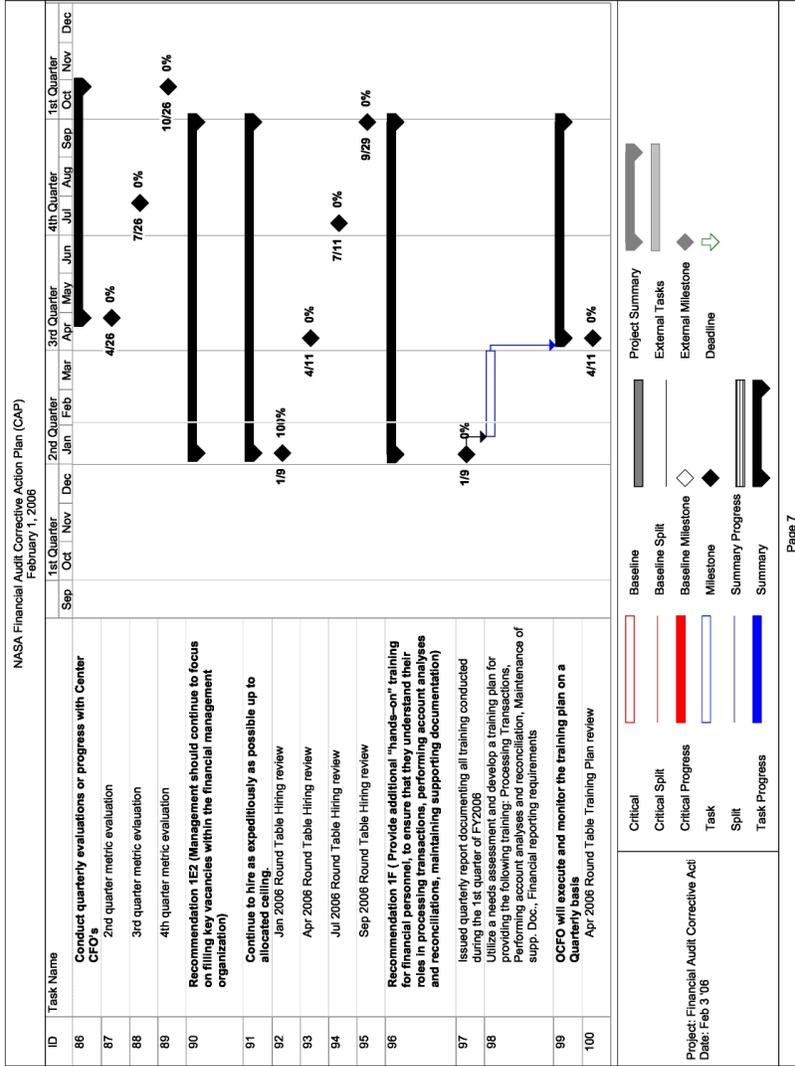
Page 5

Project: Financial Audit Corrective Acti  
Date: Feb 3 '06

	Critical		Baseline
	Critical Split		Baseline Split
	Critical Progress		Baseline Milestone
	Task		Milestone
	Split		Summary Progress
	Task Progress		Summary

NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006													
ID	Task Name	Sep	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
74	Formed cross-functional task team to review current process and identify opportunities for reengineering			12/16									
75	Conducted benchmarking sessions with Dept. of Education, Dept. of Health, and Dept. of Justice to identify best practices and lessons learned for funds control, cost collection, and accrual processing			12/16									
76	Drafted proposed process design and high level requirements			12/16									
77	Obtained OCO and Center CFO approval of SAP Version update Project Scope Document, incorporating requirements from task team efforts												
78	Incorporated process design into Core Financial System Update Version project												
79	Implement Core Financial System Version Update project, including improved process designs.												
80	<b>Recommendation 1E1 (Formally document roles and responsibilities of Headquarters, IEMP Competency Center, and center financial management personnel across all levels to ensure responsibilities are aligned, accountability is reached at all levels)</b>												
81	Developed an Operational Level Agreements (OLA) for the IEMP Competency Center and Agency CFO to operate under that prescribes their respective responsibilities pertaining to master data management and periodic closing processes.			12/16									
82	Finalized the OCO Governance Structure, which encompasses the customizing process with the financial management community and its communications with external systems suppliers.												
83	Develop performance metrics for Center CFOs to monitor compliance with OCO priorities, strategies, and objectives.												
84	Share performance metrics with Center CFO's												
85	Begin capturing metric information.												

Project: Financial Audit Corrective Act  
Date: Feb 3 '06



NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006																	
ID	Task Name	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter						
		Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
101	Jul 2006 Round Table Training Plan review																
102	Sep 2006 Round Table Training Plan review																
103	Recommendation 1G (Develop reports from the Core Financial Audit findings and open items, unliquidated obligations, grants, and other key areas are periodically assessed, researched, and resolved)																
104	Produce a series of management reports to facilitate financial management oversight and analysis; e.g., aging, delinquencies, prompt payment, etc. Suite of reports will be continually enhanced each quarter.																
105	Jan 2006 monthly management reports produced																
106	Feb 2006 monthly management reports produced																
107	Mar 2006 monthly management reports produced																
108	Apr 2006 monthly management reports produced																
109	May 2006 monthly management reports produced																
110	June 2006 monthly management reports produced																
111	July 2006 monthly management reports produced																
112	Aug 2006 monthly management reports produced																
113	Sep 2006 monthly management reports produced																

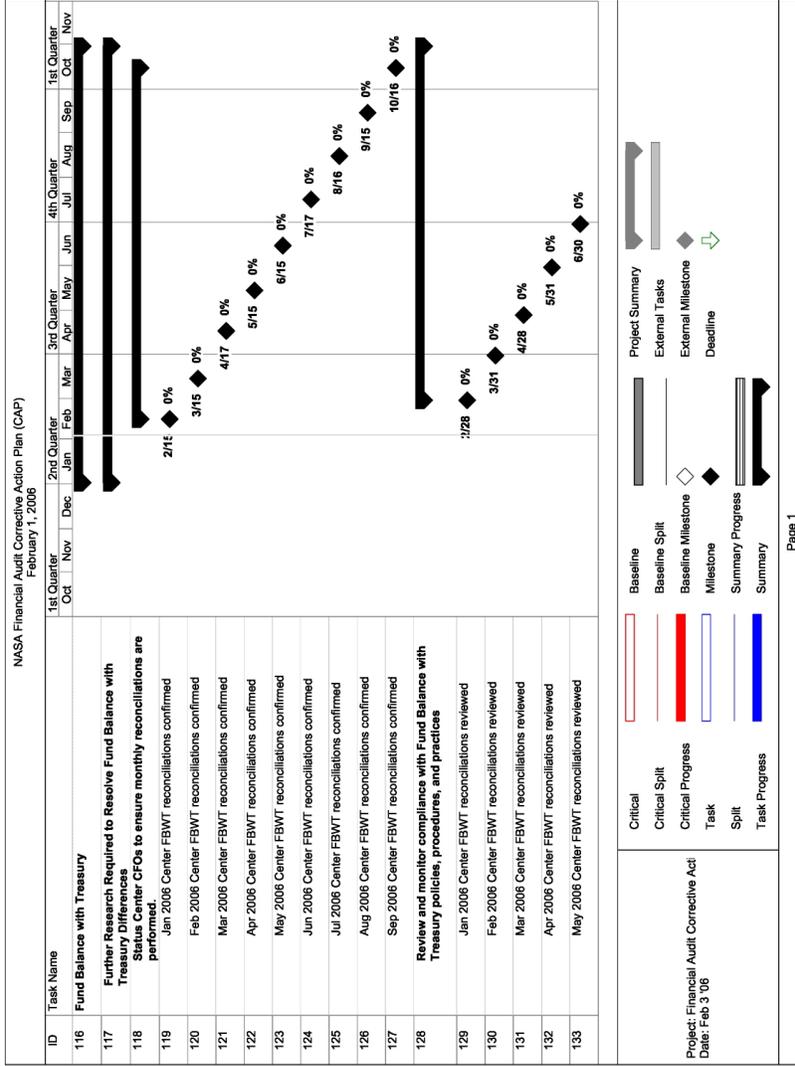
Project: Financial Audit Corrective Act  
Date: Feb 3 '06

Legend:

- Critical
- Critical Split
- Critical Progress
- Task
- Split
- Task Progress
- Baseline
- Baseline Split
- Baseline Milestone
- Milestone
- Summary Progress
- Summary

Project Summary

- External Tasks
- External Milestone
- Deadline



NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006													
ID	Task Name	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
134	Jun 2006 Center FBWT reconciliations reviewed												
135	Jul 2006 Center FBWT reconciliations reviewed												
136	Aug 2006 Center FBWT reconciliations reviewed												
137	Sep 2006 Center FBWT reconciliations reviewed												
138	Perform a CRCS to SAP reconciliation and resolve differences												
139	Establish Fund Balance with Treasury metrics												
140	Assess compliance with Fund Balance with Treasury policies, procedures, and practices												

<p>Project: Financial Audit Corrective Acti Date: Feb '06</p> <p>Critical Critical Split Critical Progress Task Split Task Progress</p>	<p>Baseline Baseline Split Baseline Milestone Milestone Summary Progress Summary</p>	<p>Project Summary External Tasks External Milestone Deadline</p>
---	--	---

NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006															
ID	Task Name	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
143	Property, Plant and Equipment and Materials														
144	Recommendation 3A1.2.3 (We recommend that NASA continue to focus on resolving prior year issues and completing its implementation of its recommendations and developing detailed corrective action plans)														
145	Defined Asset Categories based on published accounting guidance and NASA's business environment; Finalized how property will be classified (e.g., NASA Field and Contractor Field Program Related vs. Non-Program Related, etc.)														
146	Completed draft defining appropriate accounting treatment per Asset category (based on published accounting guidance and NASA's business environment)														
147	Draft														
148	Final														
149	Advise OMB, GAO, FASAB, and OIG of NASA's revised capitalization policy														
150	Adjust capitalization policy as necessary														
151	Flowchart and document desired business processes and procedures, and define roles and responsibilities for effective PP&E lifecycle management, to include valuation of Assets.														
152	Identify and coordinate changes that must be made to existing policies Agency-wide.														
153	Assign cross-functional teams to participate in Working Groups to re-engineer, as necessary, NASA's current processes and procedures (Planning, Acquisition, Management control and accountability and disposition)														
154	Engage working groups to determine process changes														

Project: Financial Audit Corrective Act  
Date: Feb 3 '06

Critical  
 Critical Split  
 Critical Progress  
 Task  
 Split  
 Task Progress

Baseline  
 Baseline Split  
 Baseline Milestone  
 Milestone  
 Summary Progress  
 Summary

Project Summary  
 External Tasks  
 External Milestone  
 Deadline

NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006															
ID	Task Name	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter				
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
155	Develop PP&E Process Implementation Plan for Changes Agency-wide.														
156	Implement PP&E Process Implementation Plan														
157	Complete interim policy and process changes														
158	Conduct focused communication forums														
159	Record changes to fixed assets and expenses per revised policy														

<p>Project: Financial Audit Corrective Act Date: Feb 3 '06</p>	<p>Critical</p> <p>Critical Split</p> <p>Critical Progress</p> <p>Task</p> <p>Split</p> <p>Task Progress</p>	<p>Baseline</p> <p>Baseline Split</p> <p>Baseline Milestone</p> <p>Milestone</p> <p>Summary Progress</p> <p>Summary</p>	<p>Project Summary</p> <p>External Tasks</p> <p>External Milestone</p> <p>Deadline</p>
--	--	---	--

NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			1st Quarter		
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
162	Task Name Environmental Liabilities															
163	Recommendation 4A1 (We recommend that NASA expedite the program the action plan it developed in response to our FY 2004 audit)															
164	Update the plan developed in response to the 2004 management letter comments															
165	Host the second Joint OCF and Environmental Management Division (JEMD) training course to expedite the overall resolution of the 2004 audit															
166	Develop and have available for auditor review, the Environmental Liability estimates based on 2nd quarter data															
167	Conduct review of Environmental Liability estimation process															
168	Complete final liability adjustments based on current information															
169	Recommendation 4A2 (NASA include in the action plan the center and facility specific findings that were identified during the 2004 audit)															
170	Update 2004 plan to include action and timeliness for addressing and resolving center and facility specific findings															
171	Recommendation 4A3 (NASA's OCF perform a self-assessment of the Unfunded Environmental Liability (UEL) estimation and aggregation process. This assessment should focus on identifying additional weaknesses in NASA's UEL system)															
172	Jointly assess the effectiveness of UEL internal controls, cost estimation process and data gathering procedures															
173	Develop review/internal control checklist															
174	Conduct site visits utilizing checklist															
175	Generate report for management review and disposition															

Project: Financial Audit Corrective Acti  
Date: Feb 3 '06

	Critical		Baseline
	Critical Split		External Tasks
	Critical Progress		Baseline Milestone
	Task		Milestone
	Split		Summary Progress
	Task Progress		Summary

Legend:

- Project Summary
- External Tasks
- External Milestone
- Deadline

NASA Financial Audit Corrective Action Plan (CAP) February 1, 2006															
ID	Task Name	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
176	Incorporate changes as necessary based on joint assessment														
177	Recommendation 4E (NASA should also continue to validate the tools (including IDEAL) and methodology used at the center and facility level to prepare the UEL estimates)														
178	Assess utilization of IDEAL parametric model														
179	Incorporate changes as necessary														

<p>Project: Financial Audit Corrective Act Date: Feb 3 '06</p>	<p>Critical Critical Split Critical Progress Task Split Task Progress</p>	<p>Baseline Baseline Split Baseline Milestone Milestone Summary Progress Summary</p>	<p>Project Summary External Tasks External Milestone Deadline</p>
--	---	--	---

## APPENDIX

## ACRONYMS

CAP—Corrective Action Plan  
 CC—Competency Center  
 CEAR—Certificate of Excellence in Accountability Reporting  
 CFO—Chief Financial Officer  
 COTS—Commercial off-the-shelf  
 CRCS—Central Resources Control System  
 DCFO—Deputy Chief Financial Officer  
 EMD—Environmental Management Division  
 E&Y—Ernst and Young  
 FASAB—Federal Accounting Standards Advisory Board  
 FBWT—Fund Balance With Treasury  
 GAO—General Accounting Office  
 HQs—NASA Headquarters  
 IDEAL—Integrated Data Evaluation and Analysis Library  
 IEMP—Integrated Enterprise Management Program  
 MD&A—Management Discussion and Analysis  
 NASA—National Aeronautics and Space Administration  
 OCFO—Office of the Chief Financial Officer  
 OIG—Office of the Inspector General  
 OLA—Operational Level Agreements  
 OMB—Office of Management and Budget  
 PAR—Performance and Accountability Report  
 PCA—Planned Corrective Action  
 PP&E—Plant, Property and Equipment  
 RSSI—Required Supplementary Stewardship Information  
 SAP—Systems, Applications, and Products  
 SFAS—Statement of Financial Accounting Standards  
 SFFAS—Statement of Federal Financial Accounting Standards  
 SONC—Statement of Net Cost  
 SR—Service Request  
 UEL—Unfunded Environmental Liability

*Question.* Given this state of affairs, how can the Agency oversee the expenditure of its appropriated resources and ensure that its programs and operations are efficient and effective?

*Answer.* NASA relies upon an integrated system of management controls to oversee the expenditure of its appropriated resources. These controls span multiple phases of resource management from the planning, programming and distribution of appropriations through to the application and use of those resources across the entire program and project lifecycle.

With respect to oversight of appropriated funds, as appropriations are received and distributed, the Agency tracks them from appropriation to apportionments to allotments to commitments and to obligations to help ensure that NASA is tracking resource allocation through the program lifecycle.

Efficient and effective programs and operations begin with planning and budgeting. NASA's Planning, Programming, Budgeting, and Execution (PPBE) is NASA's four-phased methodology for aligning resources in a comprehensive, disciplined approach that supports NASA's Mission and directs Agency resources toward the priorities set forth by Congress and the President. PPBE also enhances financial management quality and accountability by linking the Agency's financial, programmatic, and institutional communities for mission success. PPBE provides Agency leaders with timely, accurate, and useful information about where initiatives are and are not succeeding. This process helps to ensure a budget that supports the Agency's strategic priorities and that is traceable to outcomes.

As NASA's Mission Directorates use these funds to accomplish their goals, NASA's three-Council governance structure helps to ensure that they are doing so efficiently and effectively. The Strategic Management Council serves as NASA's senior decision-making body for strategic direction and planning by determining NASA's strategic direction and assessing Agency progress in achieving NASA's Mission and the Vision for Space Exploration. The Operations Management Council oversees Center, or institutional, operations and performance while the Program Management Council (PMC) serves as NASA's senior decision-making body for baselining and assessing program/project performance to ensure successful achievement of NASA Strategic Goals and outcomes.

Below the PMC-level, NASA enforces the Agency's governance principles of "Checks and Balances" and "Balance of Power" by balancing and integrating the activities and authorities of the Chief Engineer, the Independent Technical Authority, Program Managers, and the Office of Safety and Mission Assurance.

Funding requirements are set by law for government programs. The Independent Technical Authority not under program direction sets technical requirements. And, schedule requirements are set by a variety of factors, usually external and outside the Program Manager's control.

In NASA, the Chief Financial Officer ensures funding compliance. Appropriate third parties monitor funding and schedule compliance. The Office of Safety and Mission Assurance (OSMA) ensures compliance with the established critical technical requirements. Schedule compliance is assured by third parties depending on the source of the schedule requirements. For these reasons, the Chief Financial Officer, the IG, the Independent Technical Authority, and OSMA are not in the Program Manager's chain of command.

Three independent inputs give the NASA Administrator the confidence that the Agency has exercised appropriate checks and balances of Authorities, Responsibilities, and Accountabilities.

Below these governing structures, NASA employs financial management and programmatic staff at each of its centers. These individuals have a thorough knowledge of each of the Agency's programs and projects, including the resources budgeted and expended to support those programs and projects. The processes and procedures employed to monitor program and project spending and performance were in place before the implementation of NASA's new financial management system in fiscal year 2003. As the Agency continues to stabilize its centralized financial management system, our center financial management staff, as well as programmatic staff, continue to monitor and analyze the financial health of the Agency's programs and operations.

*Question.* What steps has NASA taken to prevent this type of ADA violation from occurring again?

Answer. NASA agrees with each of the OIG's specific recommendations:

—*OIG Recommendation #1.*—We recommend that the Administrator report the ADA violations for the funds carried over from fiscal year 2004 to fiscal year 2005 for each affected account and for the \$30,413,590 to the President of the United States through the OMB Director, the Speaker of the House of Representatives, the President of the Senate, and the Comptroller General of the Government Accountability Office, as required by the ADA and by OMB Circular A-11, section 145.7.

—*OIG Recommendation #2.*—We recommend that the Administrator request a comprehensive demonstration by the OCFO that the appropriations available to be spent in fiscal year 2006 can be traced from appropriation to apportionments to allotments to commitments and to obligations to help ensure that NASA is not violating the ADA for fiscal year 2006.

In addition to accepting and acting upon NASA's OIG two specific recommendations, NASA has implemented specific correction actions in the OCFO. These corrective actions include:

- Certification of reconciliations by responsible financial management personnel.
- Demonstrated effective system controls that prevent obligations from exceeding apportionment control totals.
- Conducted Appropriations Law training for 30 staff in January 2006 and 8 in March 2006.
- Conducted OMB Circular A-11 training for 24 staff in February 2006. An additional course is currently being scheduled.
- Increased the staff size in the Funds Distribution branch.
- Documenting enhanced internal controls, to include:
  - Logging and tracking of all OMB apportionment requests and approvals; and
  - Reconciliation of OMB apportionments to Congressionally approved Operating Plans to the funds loaded into the Agency's centralized financial system.

*Question.* What is NASA's current total estimated cost to develop, implement, and maintain the Integrated Enterprise Management Program, including those costs incurred to resolve data integrity issues resulting from the initial implementation of the Core Financial system?

Answer. The development and implementation costs for NASA's Integrated Enterprise Management Program, including all the hardware, software, civil service labor, contractor labor, travel, and overhead costs associated with re-engineering business processes and implementing business systems for human capital management, financial management, asset management, and procurement and contract

management are estimated at \$842 million for the development years 2000 through 2011, consistent with the fiscal year 2007 President's budget request.

Of this total development estimate, \$82.6 million is being expended to update NASA's financial system, which, among other benefits, helps resolve data integrity issues identified with the initial core financial system implementation. Approximately, \$50 million per year is expended operating and maintaining this business systems environment.

#### ADA VIOLATION

*Question.* The NASA Office of Inspector General reported that NASA, as a result of actions by officials in the Office of the Chief Financial Officer violated the Antideficiency Act (ADA). According to the IG report, the ADA violations occurred because of the lack of internal controls within the OCFO and OCFO personnel's misunderstanding of OMB apportionment requirements.

The NASA Administrator agreed to report the ADA violations to the President of the United States through the OMB Director, the Speaker of the House of Representatives, the President of the Senate, and the Comptroller General of the Government Accountability Office, as required by the ADA.

*Question.* When will NASA provide its report on the ADA violations?

*Answer.* By letter dated June 23, 2006, the Administrator informed the Committee of activities initiated regarding recommendations concerning two ADA violations identified by the NASA Office of Inspector General (OIG) in a report dated April 10, 2006. The Administrator outlined his commitment to ensuring that the root causes of the violations are addressed and that effective remedies are instituted for all of NASA's financial management processes and systems. As part of those efforts, and in conformance with the requirements of OMB Circular No. A-11 and NASA Policy Directive 9050.3E, Administrative Control of Appropriations and Funds, the Administrator received a determination from NASA's Office of the Chief Financial Officer regarding the identification of the alleged responsible party for the violations. That individual, no longer employed with the Agency, in response to notification and the opportunity to comment, has raised matters that the Administrator determined require further investigation.

Accordingly, the Administrator directed an intra-Agency team, to include representatives from the NASA Offices of Program Analysis and Evaluation, Human Resources, and General Counsel, to conduct a *de novo* review of the situation. That review is now expected to be completed by July 31, 2006, and is expected to provide the requisite information for the Administrator to accurately and comprehensively meet reporting obligations per OMB Circular No. A-11 and complete formal notifications.

*Question.* Who was responsible for the ADA violations?

*Answer.* As indicated above, the Administrator has directed an intra-Agency team to conduct a *de novo* review that is expected to provide the requisite information to enable him to accurately and comprehensively meet reporting obligations per OMB Circular No. A-11 and complete formal notification, including identification of responsible party/parties.

*Question.* Has disciplinary action been considered as required by OMB Circular No. A-11?

*Answer.* This determination will be an outcome of the review currently underway.

*Question.* The IG's report noted that the OCFO was unable to determine the exact amount of the ADA violations because of the unreliability of NASA's financial management system. Given this state of affairs, how can the Agency oversee the expenditure of its appropriated resources and ensure that its programs and operations are efficient and effective?

*Answer.* The ADA violations occurred because of NASA's failure to file timely reapportionment requests with the Office of Management and Budget and not as a result of NASA's financial management system.

NASA has implemented corrective actions to ensure that reapportionment requests are filed in a timely manner and that internal controls are in place. These actions include:

- Certification of reconciliations by responsible financial management personnel.
- Demonstrated effective system controls that prevent obligations from exceeding apportionment control totals.
- Conducted Appropriations Law training for 30 staff in January 2006 and 8 in March 2006.
- Conducted OMB Circular A-11 training for 24 staff in February 2006. An additional course is currently being scheduled.
- Increased the staff size in the Funds Distribution branch.

- Developing and documenting enhanced internal controls, to include:
- Logging and tracking of all OMB apportionment requests and approvals; and
- Reconciliation of OMB apportionments to Congressionally approved Operating Plans to the funds loaded into the Agency's financial system.

*Question.* In committing the ADA violations, did NASA expend any funds beyond those appropriated by Congress or, in a way that was inconsistent with Congressional direction?

*Answer.* NASA did not expend funds beyond those appropriated by Congress or in a way inconsistent with Congressional direction. NASA's violations were the result of its failure to file timely reapportionment requests with the Office of Management and Budget. The first violation occurred during fiscal year 2005 when NASA authorized and obligated in fiscal year 2005 the unobligated balance of congressionally appropriated two-year funds from fiscal year 2004 without requesting an fiscal year 2005 reapportionment as required by OMB Circular A-11. The second violation occurred when NASA failed to submit a timely reapportionment request to OMB in August 2004 to match congressionally approved Operating Plan changes.

*Question.* Were any NASA programs or operations adversely impacted financially or operationally as a result of the ADA violations?

*Answer.* No programs were impacted as a result of the first violation and no funding adjustments were necessary. To correct the second violation, NASA de-obligated \$30 million of fiscal year 2004 funds and used fiscal year 2005 funds to correct the overobligation. These de-obligated funds remain available to the impacted Mission Directorate to make any future upward adjustments to contracts awarded in fiscal year 2004.

*Question.* What has NASA done to assure itself that it has not committed any additional ADA violations?

*Answer.* NASA's Office of the Inspector General has recommended, and NASA has agreed, that NASA's Office of the Chief Financial Officer demonstrate to the NASA Administrator that the appropriations available to be spent in fiscal year 2006 can be traced from appropriation to apportionments to allotments to commitments and to obligations to help ensure that NASA is not violating the ADA for fiscal year 2006.

*Question.* What steps has NASA taken to prevent this type of ADA violation from occurring again? Will there be any independent analysis to affirm that the measures implemented by NASA will prevent future ADA violations, in any form?

*Answer.* NASA has implemented corrective actions to ensure that the weaknesses that led to the violations have been addressed. These actions include:

- Certification of reconciliations by responsible financial management personnel.
- Demonstrated effective system controls that prevent obligations from exceeding apportionment control totals.
- Conducted Appropriations Law training for 30 staff in January 2006 and 8 in March 2006.
- Conducted OMB Circular A-11 training for 24 staff in February 2006. An additional course is currently being scheduled.
- Increased the staff size in the Funds Distribution branch.
- Developing and documenting enhanced internal controls, to include:
  - Logging and tracking of all OMB apportionment requests and approvals; and
  - Reconciliation of OMB apportionments to Congressionally approved Operating Plans to the funds loaded into the Agency's financial system.

NASA's Office of the Inspector General has recommended, and NASA has agreed, that NASA's Office of the Chief Financial Officer demonstrate to the NASA Administrator that the appropriations available to be spent in fiscal year 2006 can be traced from appropriation to apportionments to allotments to commitments and to obligations to help ensure that NASA is not violating the ADA for fiscal year 2006.

#### NASA CENTERS

*Question.* One of the dilemmas that NASA faces is that some centers are better positioned to have future work on missions than others at NASA. It has been mentioned that an option NASA would entertain is to move the work to centers that will be having difficulty in the next few years in order to keep skilled workers at NASA. While NASA should do all it can to keep the skilled employees at NASA, I am concerned that this option could marginalize all of the centers.

How do we ensure this does not occur? Could you please provide this Committee with an update on how NASA has eliminated, or is eliminating, the uncovered capacity related to facilities? Could you please explain how moving research projects from a Center with low uncovered capacity to a Center with high uncovered capacity reduces NASA's total uncovered capacity?

Answer. As the NASA Administrator testified to both the House and Senate, “NASA is focusing its efforts to solve its uncovered capacity workforce problems through a number of other actions, including the assignment of new projects to research Centers that will strengthen their base of in-house work, the Shared Capability Assets Program that should stabilize the skills base necessary for a certain specialized workforce; the movement of certain research and technology development projects from certain centers not suffering from uncovered capacity problems to centers that are; retraining efforts at field centers so that the technical workforce can develop new skills; and the pursuit of reimbursable work for projects and research to support other government agencies and the private sector through Space Act Agreements.”

None of the above actions marginalizes any one Center. NASA’s goal is not to make all Centers equally unhealthy, nor to transfer work packages so that all Centers end up with equal or near-equal amounts of future work on NASA missions. Such an expectation is not realistic. Rather the goal is to increase the future work at Centers currently having difficulty sustaining workforce skills, while not damaging the ability of the other Centers to maintain their workforce skills that are critical to NASA’s future. NASA Centers cannot grow in size, but must effectively use other field Centers to get programs done. Work moving between Centers will be done with assurances that it does not aggravate an existing or potentially problematic situation. The decisions associated with work transfers, however, will not be based solely on numbers, but also on skills’ availability and mismatches. For example, NASA may seek to place additional scientific work at a Center with uncovered scientists, but may move a limited number of engineering tasks (where its engineering workforce is saturated with work) to another Center that has uncovered engineers with the necessary skills to complete those tasks. Such transfers allow the Agency, “to do all it can to keep skilled employees at NASA.”

Regarding facilities and related workforce, NASA continues to pare the infrastructure wherever we can do so without compromising our mission. This is an ongoing process. To date, the workforce has been reduced by over 900 people through buyouts. Eligible employees for buyouts included those associated with excess infrastructure.

#### PROCUREMENT

*Question.* This Committee has consistently noted their concern about NASA’s lack of transparency in contracting practices as well as significant cost overruns. These issues have also been recognized by the GAO and the NASA IG.

What is the Agency doing to improve its management of these programs in order to reduce its vulnerability to additional cost overruns?

Answer. Over the past three years since the GAO and IG reports were issued, NASA has implemented a number of initiatives aimed at improving its cost estimating performance. These include an overarching initiative called Continuous Cost Risk Management, which requires the NASA project management, and cost estimating community to identify elements in projects, which have the potential to induce high cost and/or schedule risk. CCRM goes on to include methods for tracking these risks throughout the life cycle and methods for applying cost risk dollars toward risk mitigation. The proper use of cost risk analysis itself has been greatly emphasized by the Agency as a new tool in its programmatic planning process. All major projects are now required to perform a cost risk analysis to identify the range of cost that is indicative of the risk of projects. Based on the cost risk analysis, the Administrator is requiring projects to budget to an independent cost estimate (ICE) that generally achieves a 70 percent level of cost confidence.

Other improvements in NASA cost estimating includes the institutionalization of a new cost data collection system, the Cost Analysis Data Requirement (CADRe) which takes “snapshots” of each project’s technical, programmatic and cost status at 5 key milestones across the project life cycle. The CADRe forms the basis of estimate for ICEs, which are being performed by the Independent Program Assessment Office within the Program Analysis and Evaluation organization at NASA Headquarters. All CADRe submissions are being maintained in a new NASA cost estimating data base, ONCE (One NASA Cost Engineering Data Base) for the use of the NASA cost estimating community.

All of the above efforts should lead to a vastly improved ability to estimate projects more accurately at their outset and at the time the Agency makes a formal commitment to OMB and Congress, which is at Preliminary Design Review (PDR). After PDR, Earned Value Management (EVM) systems are being set up and used by ongoing projects to manage cost throughout the balance of the life cycle.

It must be remembered that NASA projects often include cutting edge technology, which makes accurate cost estimation much more difficult. But better initial cost estimating and the use of EVM to manage the fiscal health of projects once underway, should significantly reduce the Agency's vulnerability to cost overruns.

#### NASA'S UNOBLIGATED BALANCE GROWTH

*Question.* The Committee recognizes that NASA is authorized to obligate funds over a 2-year period, and that a research and development agency like NASA is expected to carry over some unobligated funds at the end of each fiscal year. While the Committee recognizes that NASA can use unobligated funds to help transition from one fiscal to the next, there is no firm guidance on how much NASA should carry over from year to year. NASA's balance of unobligated funds has more than tripled from \$616 million at the end of fiscal year 2000 to \$2.1 billion at the end of fiscal year 2005.

Please explain to the Committee why these balances have built up at NASA?

*Answer.* First and foremost, let us assure you that all of these funds will be obligated within the assigned Mission Directorate or Office and all of these funds are needed to carry out NASA's missions. These are not "extra" funds that can be used to offset potential reductions to NASA's fiscal year 2007 budget request or to support unrequested activities. All of NASA's unobligated funds are needed to carry out the Agency's planned activities, and our multi-year resource planning strategy requires all of these funds. Unobligated funds are simply not yet committed under a binding agreement (e.g., grant or contract). Thus, the Agency has plans in place and needs all of its appropriated funds.

There are several reasons why the unobligated balances have been increasing over the last few years. There has been a tremendous amount of change at NASA over the last several years, and many factors associated with those changes have contributed to an increasing unobligated balance. Effective in fiscal year 2004, we began implementation of a new financial system, and also implemented full cost management, budgeting, and accounting. As a result of these changes, unobligated balances increased for several reasons. Labor dollars embedded in the programs initially caused the slowing of funding allocation and distribution throughout the Agency. Providing the Mission Directorates (MDs) with full cost funding resulted in increased funding being held at Headquarters. The new funds distribution process slowed down the release of funding to the Centers, which led the centers to seek more forward funding at the beginning of the fiscal year in order to cover labor and other expenses.

In addition, there were several programmatic changes that contributed to this instability. The Columbia accident required a major shift in resources, curtailing many planned activities. The Vision for U.S. Space Exploration announced January 2004, required redirection of about \$11 billion over five years. The Exploration Systems Architecture Study identified some major shifts in budgetary resources, curtailing many technology activities to provide more funding for major development projects. Increasing levels of earmarks for NASA have had the effect of slowing program definition and the release of funding. Overall, through all these major changes over the last few years, there has been less program definition at the start of the fiscal year for guidance to be distributed down to the NASA Centers, and Centers have been slower to obligate given the rate of change and the uncertainty surrounding all these changes, and maturing definition of major programs such as Constellation.

NASA recognizes this increasing trend over the last several years, and is working to reverse the trend. As of May 19, 2006, NASA had obligated 97 percent of our fiscal year 2005 appropriations (\$535 million is not yet obligated), and approximately 50 percent of our fiscal year 2006 appropriations (\$8.1 billion is not yet obligated). NASA has definite plans for all of these unobligated funds. The funds include a total of \$304 million for construction of facilities.

While NASA does not consider the levels of fiscal year 2005 and fiscal year 2006 unobligated funds to be unreasonable, we are working to expedite the obligation process where possible, and, as required in the fiscal year 2006 Science, State, Justice, Commerce and Related Agencies Appropriations Act (Public Law 109-108), have begun reporting prior year, unobligated balances to the Committees on Appropriations on a quarterly basis.

*Question.* What is the minimum amount of unobligated funds that NASA needs to transition from one fiscal year to the next? How much in unobligated funds does NASA believe it needs for other reasons?

*Answer.* There is no general minimum amount of unobligated funds that can be applied generically. Over the past 2 months, NASA has performed its standard mid-

year “phasing plan review” that has consisted of an in-depth review of its expenditures down to the project and Center levels at all NASA installations. Both the current status of obligations and forecasts for expenditures has been scrutinized and monthly spending plans throughout the remainder of fiscal year 2006 have been developed. Note that our 61 programs involve thousands of contractual actions for obligating funds across the Agency and at all Centers. In developing our spending plans, these procurements were viewed for each of the 555 projects within their respective program. The purpose of this standard in-house review was to ensure that we are allocating and spending our resources in the most efficient manner, and to ensure that we have the correct level of apportioned funding at the appropriate points in time for our programs. Projections for unobligated balances are about 9 percent at the Agency level, and range from a low of 2 percent for the Aeronautics Research Mission Directorate, to a high of 16 percent for the Science Mission Directorate. Program management at all levels at both NASA Headquarters and the Centers have participated in this expenditure review, and agree that these levels of unobligated balances are appropriate in order to ensure a smooth transition from one fiscal year to the next without a lapse in funding that could prompt potential work stoppages.

*Question.* Has NASA ever submitted a request for more new budget authority than it can realistically use?

*Answer.* No. NASA has never submitted a request for more new budget authority than it can realistically use.

#### BANKING FUNDS FOR CREW EXPLORATION VEHICLE (CEV)

*Question.* At a House Science Committee hearing in February, Dr. Griffin acknowledged that NASA is “banking” funds to smooth the funding profile for the CEV.

Is NASA using a portion of past unobligated balances to bank funding for CEV? For how many additional fiscal years will NASA continue this practice? Is NASA banking funds to smooth the funding profiles of other major development efforts?

*Answer:* The development profile for the Constellation program requires a funding curve that peaks in fiscal years 2008, 2009, and 2010.

This is the normal profile for hardware development efforts that maximizes the chances of Program success and provides the basis for any cost confidence evaluation.

Confronted with a flat Agency budget, Constellation’s management strategy is to carry unobligated fiscal year 2006 funds into fiscal year 2007 and use uncosted funds from fiscal year 2007 and fiscal year 2008 to cover the peak requirements in fiscal year 2009 and fiscal year 2010 (the years that the funds will be costed).

These carry-in funds will be used to smooth the overall constellation development funding curve for all the Constellation development projects, including Crew Exploration Vehicle (CEV), Crew Launch Vehicle (CLV), Launch and Mission Systems (LMS), and Exploration Communication and Navigation Systems (ECANS).

Current plans are to obligate money on the CEV contract that will be signed early this fall and on the CLV and LMS contracts that will be signed in 2007. As much as 90 percent of these funds will be obligated by the end of the fiscal year.

NASA’s strategy of using carry-in to smooth out the peak funding requirements is prudent use of multi-year funding to maintain schedule and reduce total costs.

#### LUNAR ROBOTIC ORBITER (LRO)

*Question.* NASA recently announced that a small secondary payload has been selected to accompany the Lunar Robotic Orbiter mission in 2008. NASA noted that the secondary mission should cost no more than \$80 million.

What is the current cost estimate for this secondary LRO mission?

*Answer.* NASA has decided on the Lunar Crater Observation and Sensing Satellite (LCROSS) as its secondary payload on the Lunar Reconnaissance Orbiter (LRO) mission. Per NASA’s original request for information requirements, the LCROSS vehicle should cost no more than \$80 million. Integration for flight will cost an estimated \$15 million. The total cost of LCROSS is therefore estimated to be \$95 million.

*Question.* Where is the funding coming from to pay for this secondary mission?

*Answer.* The Lunar Precursor and Robotic Program (LPRP, formerly Robotics Lunar Exploration Program) has an existing funding line for “Future Missions”, specifically designed to accommodate missions like LCROSS.

*Question.* Did NASA’s fiscal year 2006 budget or Initial Operating Plan specifically include the requirement or justification for this secondary mission?

Answer. The LRO mission is still in formulation, and as a result, did not have an established life-cycle cost and program content at the time of either the fiscal year 2006 or the fiscal year 2007 budget submission. Critical Design Review (CDR) is scheduled for this fall.

In NASA's fiscal year 2007 budget submission, NASA rebaselined LRO for launch on an EELV (from a Delta II). This change decreased risk to the LRO development by reducing pressure to retain large design contingencies and by eliminating a spacecraft spin stability issue related to its original Delta II launcher.

As a result of the rebaselining to an EELV, NASA issued a request for information, in January 2006, to industry to provide secondary payload concepts to take advantage of the additional capacity afforded by the launch vehicle. NASA's requirements for the secondary payload were that it benefit the robotic lander program, cost no more than \$80 million for development, and not exceed 2,205 pounds (1,000 kilograms). After a competition involving NASA centers and industry, LCROSS was selected as a secondary payload in April 2006.

The secondary payload is a cost-effective component of the overall LRO mission. It will provide an important capability to help determine whether water-ice is present in the Moon's polar cold traps. Total cost of the secondary payload is estimated at \$80 million, to be funded within LPRP through fiscal year 2009. The secondary payload supports LPRP LRO Level-1 Requirements (RLEP-LRO-M70), which state that, "The LRO shall identify putative deposits of water-ice in the Moon's polar cold traps at a spatial resolution of better than 500m on the surface and 10km subsurface (up to 2m deep)."

---

#### QUESTIONS SUBMITTED BY SENATOR BYRON L. DORGAN

##### UPPER MIDWEST AEROSPACE CONSORTIUM (UMAC)

*Question.* The Upper Midwest Aerospace Consortium (UMAC) is a collaboration of eight universities in a five state region that partners with the National Aeronautics and Space Administration (NASA) to take data gathered from NASA satellites and makes it available in everyday applications to educators, farmers, ranchers and residents in the Upper Great Plains.

The group is headquartered at the University of North Dakota in my state. I was proud to help connect the University to NASA in the 1990s and have worked with NASA and my colleagues in Congress to support funding to continue this important work.

Do you agree that UMAC and other groups like it play an important role in connecting more Americans to the work and breakthroughs at NASA?

Answer. Groups that connect Americans to NASA's research increase the return the public receives on its investment in NASA. Features common among such groups are: use of data provided by NASA satellites, ties to the NASA-sponsored research community in academia and industry, and direct connection to providers of goods and services to the public and the organizations that serve the public. To the extent that UMAC and other groups exhibit these features, they can perform a valuable function.

*Question.* What role do you see for groups like UMAC in the future, especially as it relates to new space and exploration missions?

Answer. NASA is dependent on the university community for the successful implementation of its new space and exploration missions. Opportunities to participate in NASA's missions will be openly competed, and peer review will be used to identify the most outstanding opportunities for participation by the university community. Opportunities to participate will span the entire array of mission activities including development of flight hardware (instruments and full missions), development of data processing and data archiving systems, participation in science teams including science operations, and analysis of data returned from NASA missions.

##### WINDOW OBSERVATIONAL RESEARCH FACILITY (WORF)

*Question.* NASA once intended to install a facility, Window Observational Research Facility (WORF), on the International Space Station (ISS) within which various earth-observing instruments could be operated. The University of North Dakota has been developing AgCam, a sensor intended to operate on the WORF.

Is the Window Observational Research Facility (WORF) scheduled to be installed on the International Space Station? If so, when?

Answer. NASA has assessed its plans for the utilization of the ISS, and focused its research and technology development goals toward those activities that most closely support the Vision for Space Exploration. In this environment of limited op-

portunities for the launch of facility-class payloads, it is critical that utilization planning align as closely as possible with the needs of the human exploration planning effort. The only missions for which specific payloads have been manifested on the Space Shuttle are the first two Return to Flight missions. Consistent with the Vision, the Space Shuttle will be retired by 2010. Prior to its retirement, it will be utilized primarily for the assembly of the ISS. Our top priority will be to make each flight safer than the last. As we noted in our November 2004, correspondence to you on this topic, in the event that an appropriate future flight opportunity does become available, the WORF facility will be considered for delivery to the ISS.

*Question.* If not, will it be possible to install small instruments, such as AgCam, on the ISS that make use of the optical quality window but do not use the WORF rack?

*Answer.* The AgCam hardware has been designed and built to be operated in the WORF. The WORF would provide resources such as power, thermal control, data and mounting positions for operations of the AgCam. The hardware as designed could not operate independently of the WORF. It might be possible to redesign the AgCam hardware and its operations concepts, but it would require additional funding, testing, and development time. Even with such a redesign, it is unclear whether the redesigned hardware could achieve the expected scientific value without the WORF.

## DC-8

*Question.* The University of North Dakota (UND) recently signed a 5-year agreement to operate the NASA DC-8 research flying lab. The transfer of the DC-8 from an in-house NASA operation to a UND operation has set a new precedent. To date, UND, on behalf of scientists everywhere has operated two missions, Stardust and INTEX-B with total success. I believe this approach has benefited education and public outreach.

Does NASA see benefit in transferring some of its activities from NASA centers to universities and other research organizations?

*Answer.* The success of the NASA program relies on partnerships with universities and other research organizations. It also relies on NASA maintaining core capabilities within the NASA Centers. In addition to the operations of the DC-8, NASA also relies on universities and other research organizations for activities such as the operation of the Hubble Space Telescope, operation of the Earth Science Distributed Active Archive Centers, and operation of the NASA Infrared Telescope Facility. NASA will consider proposals that offer benefits to both the science community and NASA.

The NASA Centers have unique capabilities that are critical to the nation's pre-eminence in space science as well as to the successfully carrying out the NASA mission. In order to maintain ten healthy Centers, and in order to maintain critical core capabilities at the NASA Centers, it is necessary that certain activities remain at NASA Centers.

## GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS (GEOSS)

*Question.* Global Earth Observation System of Systems (GEOSS) is an international program in earth-observing designed to inform decisions that benefit all humanity.

What will be NASA's role in providing societal benefits in the Global Earth Observation System of Systems (GEOSS)?

*Answer.* NASA's Earth science activity is closely coordinated through interagency and international activities such as the Climate Change Science Program, US Group on Earth Observations, and Joint Subcommittee on Ocean Science and Technology, as well as their international counterparts. The majority of NASA's space-based observations of Earth involve such international partnerships on the instruments and flight missions that comprise the space-based contribution to the Global Earth Observation System of Systems (GEOSS).

NASA Earth system science results in research and development of space-based observations and improved modeling capability are recognized as contributing nearly 46 instruments on 16 spacecraft for the international Global Earth Observation System of Systems (GEOSS). NASA Earth science applications are recognized for collaborating with partners to benchmark integrated system solutions to each of the nine societal benefit areas highlighted in the *Strategic Plan for a U.S. Integrated Earth Observation System (IEOS)* and the *10-Year Plan for a Global Earth Observation System of Systems*.

NASA develops and uses innovative remote sensing approaches to provide new views of the Earth to improve predictive capabilities for weather, climate and nat-

ural hazards and benchmarks the capacity to contribute to societal benefits through decision support. As an example, NASA collaborations with EPA, USDA, and the FAA have resulted in benchmarks for integrated solutions for air quality Nowcasting, global crop assessments, and de-icing assessments for aviation safety.

The observation and Earth system modeling techniques NASA develops and tests are a basis for future operational systems carried out by other organizations (most notably NOAA and USGS). Through collaborations, NASA observations are tested to determine their capacity to contribute to policy formulation and resource management through decision support systems.

*Question.* Will there be a role for universities to develop and deliver benefits to the residents of their regions?

*Answer.* In implementing its Earth science program, the NASA Applied Sciences Program conducts solicitations for “Decision support through Earth Science Research Results” to provide universities, private sector and others an opportunity to participate in extending the benefits of NASA sponsored observations and predictive capabilities through decision support tools. NASA involves the broad research community through solicitation of principal investigator-led satellite missions, technology and applications development, and a basic research program as well as focused research efforts tied more specifically to the results of our satellite programs. In particular, the university community is very strongly represented in these areas, and the research carried out at universities is critical to the education and training of the next generation of Earth and environmental scientists.

*Question.* How seriously do the reductions in Earth Science limit the U.S.’s role in the international program?

*Answer.* The International GEOSS and the U.S. IEOS include framework architectures that can accommodate and benefit from the observations and predictions/forecasts resulting from NASA research and development of space-based Earth observation systems; including the ground segments, data handling capacity, modeling, computing, knowledge, and applied sciences and system engineering.

NASA’s Earth Science budget contributes to GEOSS and fluctuations in NASA Earth Science funding have a corresponding effect on contributions to GEOSS. NASA’s plans for research and development of Earth observation systems include support for national and international priorities and goals, including the U.S. IEOS and international GEOSS. The GEOSS is architected to benefit from the full scope of the results of NASA research and development programs, flight missions and applied sciences partnerships on benchmarking enhancements to integrated system solutions for the nine societal benefit areas. Reductions in NASA’s Earth Science flight program budget in recent years directly impact the U.S. Earth Observing space-based capabilities and therefore the U.S. contributions to that aspect of GEOSS. An example is the delay of the Global Precipitation Measurement mission (GPM) that is based on an international collaboration and has been viewed as a prototype satellite constellation for GEOSS. Reductions in the R&A budget have an indirect and non-immediate impact on system contributions to GEOSS, by effectively delaying the utilization of Earth observations in research and, further on, the development of products and services.

---

#### QUESTIONS SUBMITTED BY SENATOR TOM HARKIN

*Question.* There has been significant publicity about the “muzzling of scientists” by the Administration when their conclusions do not match the policies of the Administration. Because science requires freedom of thought and discussion, we are concerned that this muzzling could have a chilling effect on the critical work that scientists pursue, as they will be afraid to undertake work that may lead to conclusions that clash with Administration policy. Since it is in the national interest to ensure that scientific discovery is free and unconstrained by political ideology, we would like you to explain the efforts you are making to ensure that NASA scientists are free to present their findings both publicly and to the media, without any fear of public affairs oversight that could limit their speech.

*Answer.* Earlier this year, NASA’s Administrator assembled a policy development team comprised of NASA employees with science, legal, and public affairs backgrounds to review existing policies, identify ways to improve them, and develop Agency practices to maintain our commitment for full and open discourse on scientific, technical and safety issues. The team recently concluded their review of the existing NASA policies and has produced a substantially revised document: [http://www.nasa.gov/pdf/145687main\\_information\\_policy.pdf](http://www.nasa.gov/pdf/145687main_information_policy.pdf)

In addition, the NASA Administrator issued an agency-wide statement on his views of Scientific Openness last February: [http://www.nasa.gov/about/highlights/griffin\\_science.html](http://www.nasa.gov/about/highlights/griffin_science.html)

The revised policy and the personal commitment by the NASA Administrator reaffirm the Agency's commitment to open scientific and technical inquiry and dialogue with the public.

*Question.* Around the world, governments are taking aim at our aeronautics industry—increasing their investment and making aeronautics R&D a top priority. Meanwhile the United States continues to deemphasize aeronautic research. For example, while NASA continues to downsize and internalize its aeronautics program, implementation of the European Union's Vision 2020 is accelerating. This trend will have a serious impact on the nation's competitiveness, national security, and our position as the world's leader in aeronautics research. How does the fiscal year 2007 budget request address this trend?

*Answer.* To address this question, one must first ask, what is NASA's role in helping to ensure that the United States maintains its "edge" in aeronautics? The answer is simply this: NASA's most important role in aeronautics is to provide technical leadership. And that is true regardless of budget.

Over the past several years, many independent reviews by the National Research Council (NRC), the Aerospace Commission, and the National Institute of Aerospace (NIA) have all raised the concern that NASA needs to get back to the pursuit of long-term, cutting-edge research. Historically, that is what NASA aeronautics has been known for and that is what the Nation has relied upon NASA to provide. These concerns were raised independent of the budget, and the concerns were valid.

The Aerospace Commission Report of 2002, commonly referred to as the "Walker Report," stated that Government investment in long-term research will be essential for the United States to maintain its global leadership in aerospace. The report concluded that long-term research enables breakthroughs in new capabilities and concepts and provides new knowledge and understanding, often resulting in unexpected applications, and the creation of new markets. It also noted that industry has the responsibility for leveraging Government research and for transforming it into new products and services.

NASA's Aeronautics program is currently undergoing a comprehensive restructuring to ensure that we have a strategic plan in place that enables us to pursue long-term, cutting-edge research for the benefit of the broad aeronautics community. A commitment to the pursuit of the cutting-edge, coupled with an unwavering commitment to technical excellence, will ensure a strong, positive impact on the U.S. aviation community.

*Question.* Though I am concerned with the level of NASA funding for aeronautic research and development, I am equally concerned that a national aeronautics policy be created that is consistent with the government's historic role, to promote continued United States' leadership of civil and military aeronautics research. How will these cuts influence the national aeronautic policy? What progress has NASA made on the policy? When will a draft be released for comment? What input has NASA received from industry, academics and/or user groups on the national aeronautics policy?

*Answer.* Work is currently underway on the creation of a National Aeronautics Science and Technology Policy. In anticipation of the call for a policy, the National Science and Technology Council (NSTC) Committee on Technology chartered an Aeronautics Science and Technology (AS&T) Subcommittee in September 2005. The AS&T Subcommittee is co-chaired by NASA's Associate Administrator for Aeronautics Research and OSTP's Transportation and Aeronautics Representative. The AS&T Subcommittee is comprised of members from NASA, DOD (OSD, Air Force, Navy, Army), DOT (FAA), JPDO, DOE, DHS, DOC, EPA, NSF, NSC, and the EOP (OSTP, OMB, OVP, DPC and CEA). The development, publication, and, to some extent, execution through governance of the policy called for by statute, have been tasked to the AS&T Subcommittee. Round-table outreach discussions with industry and academia occurred in April 2006 to ensure input from the stakeholder community. The policy is planned for completion by December 2006. A detailed implementation plan will follow completion of the National policy.

#### SUBCOMMITTEE RECESS

Senator SHELBY. For the information of the Senators and people in the audience on the subcommittee, we will review the fiscal year 2007 budget request for the Department of Commerce on Wednesday, May 3, in room S-146 of the Capitol. At that time, the Sec-

retary of Commerce will be with us to discuss the budget for the programs under his jurisdiction. Until then, the subcommittee stands in recess.

[Whereupon, at 3:20 p.m., Wednesday, April 26, the subcommittee was recessed, to reconvene at 2 p.m., Wednesday, May 3.]