THE AEROSPACE COMMISSION REPORT AND NASA WORKFORCE

HEARING

BEFORE THE

COMMITTEE ON SCIENCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED EIGHTH CONGRESS

FIRST SESSION

MARCH 12, 2003

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CONTENTS

March 12, 2003

THE AEROSPACE COMMISSION REPORT AND NASA WORKFORCE

WEDNESDAY, MARCH 12, 2003

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE,
Washington, DC.

The Committee met, pursuant to call, at 2 p.m., in Room 2318 of the Rayburn House Office Building, Hon. Sherwood L. Boehlert (Chairman of the Committee) presiding.

COMMITTEE ON SCIENCE
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC 20515

Hearing on

The Aerospace Commission Report & NASA Workforce
Wednesday, March 12, 2003
2:00 p.m. – 4:00 p.m.
2318 Rayburn House Office Building

WITNESS LIST

Panel One – Aerospace Commission

The Hon. Bob Walker, Chairman, Aerospace Commission
President, Wexler Walker Public Policy Associates

The Hon. John Douglass, Commissioner
President
Aerospace Industries Association

The Hon. John Hamre, Commissioner
President
Center for Strategic and International Studies

Panel Two – NASA Workforce

Mr. Max Stier, President
Partnership for Public Service

Mr. Bobby Harnage, President
American Federation of Government Employees

Mr. George Nesterczuk,
Nesterczuk and Associates

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HEARING CHARTER

COMMITTEE ON SCIENCE
U.S. HOUSE OF REPRESENTATIVES

The Aerospace Commission Report and NASA Workforce

WEDNESDAY, MARCH 12, 2003
2:00 P.M.–4:00 P.M.
2318 RAYBURN HOUSE OFFICE BUILDING

Purpose of Hearing

On Wednesday, March 12, 2003, at 2:00 p.m. in room 2318 of the Rayburn House Office Building, the House Science Committee will hold a Full Committee hearing to review *The Final Report of the Commission on the Future of the United States Aerospace Industry* and NASA Workforce legislation. This hearing will consist of two panels. The first panel will review the Aerospace Commission report issued last November to the President and Congress. The second panel will review proposed legislation, H.R. 1085, the *NASA Flexibility Act of 2003.* This bill provides additional authorities for the agency to recruit and retain a highly-skilled workforce which was one of the primary recommendations from the Aerospace Commission.

Major Issues for Congress Taken From Aerospace Commission Recommendations

- **Making U.S. leadership in aviation and space a national imperative.** The Commission urges Congress to call public attention to how the aerospace industrial base is in serious danger of decline, and to establish policies and programs to rebuild and sustain this nationally critical industry.
- **Increasing Federal Investment in Aerospace Research.** The Commission calls on the Federal Government to significantly increase its investment in basic aerospace research. One area of research the Commission cites is the development of a new, highly automated air traffic management system that is capable of handling more traffic than could be managed with the Federal Aviation Administration's current system.
- **Government-wide Management Structure Changes.** The Commission recommends a White House aerospace policy coordinating council, creation of an aerospace management office in OMB, and a joint committee in Congress to coordinate federal investment and policy decisions for aerospace.
- **Revitalize the U.S. Aerospace Workforce.** The Commission recommends several programs to recruit and revitalize the U.S. aerospace workforce for government and industry. One component, to be explored in the second panel, is providing additional legislative authority to enable NASA to recruit and retain skilled employees.

Need for the Aerospace Commission

The Aerospace Commission was established in the Defense Authorization Act of 2001 (P.L. 106–398). Backers of the amendment to create the Commission were concerned that U.S. aerospace industry was at serious risk even before the tragedy of September 11, 2001. The industry was already losing ground in the international marketplace for an array of aerospace products, including commercial aircraft, space launch vehicles and satellites, and military aircraft.

The aerospace industry is a powerful force in the U.S. economy, contributing over 15 percent to the Nation's Gross Domestic Product and supporting over 15 million high quality jobs. Last year, more than 600 million passengers relied on U.S. commercial air transportation, and over 40 percent of the value of all U.S. freight was transported by air. However, a convergence of negative trends in the commercial aerospace market and government spending, aerospace workforce cuts and industry consolidation, overseas competition, and a perceived lack of planning led to a growing alarm and calls to investigate these complex issues through a statutory Commission.

Charter of the Aerospace Commission

After enactment, the President, Senate, and House of Representative named twelve members to the Commission with a broad range of experience in government, industry, academia, Wall Street, trade associations and unions. The President named former Science Committee Chairman Bob Walker as Chair. The Commission was chartered to study the issues associated with the future of the U.S. aerospace industry in the global economy, particularly in relationship to national security, and to assess the future importance of the domestic aerospace industry to U.S. economic and national security. The scope included an examination of the budget and acquisition processes within the Federal Government, international trade and export controls, the impact of tax policies on international competitiveness, space launch infrastructure, and science and engineering education. Over the course of a year, the Commission held six public hearings, received testimony from over 60 witnesses, and met with over 50 government and industry organizations. The Commission presented a final report to the President and Congress last November. The details of the Commission's recommendations are listed in Appendix A, and the final report is posted on the Commission's website at *http://www.aerospacecommission.gov*.

NASA Workforce Challenges

One of the nine recommendations from the Aerospace Commission's report was that government, industry, labor, and academia work together to develop an aerospace workforce for the 21st century. Several studies show an approximately 20 percent decline in the number of undergraduate and doctoral degrees awarded in aerospace science and engineering over the last ten years. As 60 percent of NASA's 18,800 civil service employees are scientists and engineers (S&E), the agency's workforce is adversely impacted by these larger national trends and the shrinking talent pipeline of aerospace scientists and engineers. Within NASA's S&E workforce, the over-60 population outnumbers its under-30 population by nearly 3 to 1. While the average age today of NASA's S&E employees is 46 years old, the average age of NASA S&E employees during the Apollo era was 39 years old.

These workforce trends jeopardize NASA's ability to manage its highly complex missions. Since 2001, the General Accounting Office has ranked "strengthening human capital" as one of NASA's top management challenges. The GAO reported in January 2003 (before the *Columbia* accident): "NASA's shuttle workforce had declined significantly in recent years to the point of reducing NASA's ability to safely support the shuttle program. Many key areas were not sufficiently staffed by qualified workers, and the remaining workforce showed signs of overwork and fatigue. To the agency's credit, NASA has recognized the need to revitalize the shuttle's workforce. . .." Additionally, NASA's independent Aerospace Safety Advisory Panel report in 2001 made similar observations relating to deficiencies with the Space Shuttle workforce.

Need for NASA Workforce Reform Legislation

In May 2002, NASA submitted a set of legislative proposals to augment current civil service authorities to recruit, retain, and restructure its workforce along with justifications for how each proposal would help meet the agency's workforce challenges. The Space and Aeronautics Subcommittee held a hearing on NASA's management and workforce challenges on July 18, 2002 in order to review these legislative proposals and their justification. Since then, some of these legislative proposals were enacted government-wide in the *Homeland Security Act of 2002.* The *NASA Flexibility Act of 2003* (H.R. 1085) would provide the agency with additional civil service authorities. The individual provisions for this legislation are summarized in Appendix C along with comparisons to NASA's current civil service authority.

Witnesses

Panel One—Aerospace Commission

The Hon. Bob Walker, Chairman, Aerospace Commission
President, Wexler Walker Public Policy Associates

The Hon. John Douglass, Commissioner
President, Aerospace Industries Association

The Hon. John Hamre, Commissioner
President, Center for Strategic and International Studies

Panel Two—NASA Workforce

Mr. Max Stier, President
Partnership for Public Service

Mr. Bobby Harnage, President
American Federal of Government Employees

Mr. George Nesterczuk,
Nesterczuk and Associates

Appendix A

Aerospace Commission Recommendations

1. The integral role aerospace plays in our economy, our security, our mobility, and our values makes global leadership in aviation and space a national imperative. Given the real and evolving challenges that confront our nation, government must commit to increased and sustained investment and must facilitate private investment in our national aerospace sector. The Commission therefore recommends that the United States boldly pioneer new frontiers in aerospace technology, commerce and exploration.
2. The Commission recommends transformation of the U.S. air transportation system as a national priority. This transformation requires:
   - Rapid deployment of a new, highly automated air traffic management system, beyond the Federal Aviation Administration's Operational Evolution Plan, so robust that it will efficiently, safely, and securely accommodate an evolving variety and growing number of aerospace vehicles and civil and military operations;
   - Accelerated introduction of new aerospace systems by shifting from product to process certification and providing implementation support; and
   - Streamlined new airport and runway development.
3. The Commission recommends that the United States create a space imperative. The DOD, NASA, and industry must partner in innovative aerospace technologies, especially in the areas of propulsion and power. These innovations will enhance our national security, provide major spin-offs to our economy, accelerate the exploration of the near and distant universe with both human and robotic missions, and open up new opportunities for public space travel and commercial space endeavors in the 21st century.
4. The Commission recommends that the Nation adopt a policy that invigorates and sustains the aerospace industrial base. This policy must include:
   - Procurement policies which include prototyping, spiral development, and other techniques which allow the continuous exercise of design and production skills;
   - Removing barriers to defense procurement of commercial products and services;
   - Propagating defense technology into the commercial sector, particularly in communications, navigation and surveillance;
   - Removing barriers to international sales of defense products;
   - Sustaining critical technologies that are not likely to be sustained by the commercial sector, e.g., space launch, solid boosters, etc.; and
   - Stable funding for core capabilities, without which the best and brightest will not enter the defense industry.
5. The Commission recommends that the Federal Government establish a national aerospace policy and promote aerospace by creating a government-wide management structure. This would include a White House policy coordinating council, an aerospace management office in the OMB, and a joint committee in Congress. The Commission further recommends the use of an annual aerospace sectoral budget to establish presidential aerospace initiatives, assure coordinated funding for such initiatives, and replace vertical decision-making with horizontally determined decisions in both authorizations and appropriations.
6. The Commission recommends that U.S. and multilateral regulations and policies be reformed to enable the movement of products and capital across international borders on a fully-competitive basis, and establish a level playing field for U.S. industry in the global market place. U.S. export control regulations must be substantially overhauled, evolving from current restrictions on technologies through the review of transactions to controls on key capabilities enforced through process controls. The U.S. government should neutralize foreign government market intervention in areas such as subsidies, tax policy, export financing and standards, either through strengthening multilateral disciplines or providing similar support for U.S. industry as necessary.

7. The Commission recommends a new business model, designed to promote a healthy and growing U.S. aerospace industry. This model is driven by increased and sustained government investment and the adoption of innovative government and industry policies that stimulate the flow of capital into new and established public and private companies.

8. The Commission recommends the Nation immediately reverse the decline in, and promote the growth of, a scientifically and technologically trained U.S. aerospace workforce. In addition, the Nation must address the failure of the math, science and technology education of Americans. The breakdown of America's intellectual and industrial capacity is a threat to national security and our capability to continue as a world leader. The Administration and Congress must therefore:

   - Create an interagency task force that develops a national strategy on the aerospace workforce to attract public attention to the importance and opportunities within the aerospace industry;
   - Establish lifelong learning and individualized instruction as key elements of educational reform; and
   - Make long-term investments in education and training with major emphasis in math and science so that the aerospace industry has access to a scientifically and technologically trained workforce.

9. The Commission recommends that the Federal Government significantly increase its investment in basic aerospace research, which enhances U.S. national security, enables breakthrough capabilities, and fosters an efficient, secure and safe aerospace transportation system. The U.S. aerospace industry should take a leading role in applying research to product development.

Appendix B

Aerospace Commission Members

The Honorable Robert S. Walker, Commission Chairman; Chairman, Wexler & Walker Public Policy Associates

The Honorable F. Whitten Peters, Commission Vice Chairman; Partner, Williams and Connolly

Dr. Buzz Aldrin, President, Starcraft Enterprises, Sharespace, Starbooster and Starcycler

Mr. Edward M. Bolen, President, General Aviation Manufacturers Assn.

Mr. R. Thomas Buffenbarger, International President, International Association of Machinists and Aerospace Workers

The Honorable John W. Douglass, President and Chief Executive Officer, Aerospace Industries Association

The Honorable Tillie K. Fowler, Partner, Holland and Knight

The Honorable John J. Hamre, President and Chief Executive Officer, Center for Strategic and International Studies

The Honorable William Schneider, President, International Planning Services

Mr. Robert J. Stevens, President and Chief Operating Officer, Lockheed Martin Corporation

Dr. Neil deGrasse Tyson, Director, Hayden Planetarium

Ms. Heidi R. Wood, Executive Director, Morgan Stanley

Appendix C

Major Provisions of H.R. 1085, "NASA Flexibility Act of 2003"

Section 1: Title

Section 2: Compensation for Certain Excepted Personnel. This section provides a technical correction to update section 203(c) of the NASA Act of 1958 (the Space Act). The correction ties the pay scale for NASA Excepted (NEX) Employees to level III of the Executive Schedule ($142,500) rather than the obsolescent pay scale of grade 18 of the General Schedule.

Section 3: Workforce Authorities. This section amends the National Aeronautics and Space Act of 1958 (NASA organic act) to provide an additional title, "Title V—Workforce Authorities" and the following sections would be included under that title.

Section 501. Definitions. Several terms used throughout the Act are defined in this section. One key definition used throughout the Act is the term "critical need," which is a specific and important requirement of NASA's mission that the agency is unable to fulfill due to workforce limitations. Many of the authorities in the bill can be used only to address a "critical need."

Section 502: Planning, Notification, and Reporting Requirements. This section requires NASA to provide a Workforce Plan to Congress and NASA employees before using its new authorities. The Plan would specify the kinds of cases in which NASA would use its new personnel tools. In addition, six years following enactment, the Administrator is required to provide an evaluation of workforce actions and recommendations for addressing any remaining critical needs.

Section 503: Workforce Authorities. This section lists the specific workforce authorities provided until the time limit of October 1, 2009, subject to certain exceptions specified in Section 511.

Section 504: Recruitment, Redesignation, and Relocation Bonuses. This section authorizes the NASA Administrator to pay recruitment, redesignation, and relocation bonuses. The size of the recruitment and relocation bonuses is higher than what is allowed under current law. In addition, a new category of bonus, a redesignation bonus, is added, which could be paid to an employee who is newly appointed to a position in NASA from any other Federal Government position without relocating. The bonus allowed under the bill is up to 50 percent of an employee's annual salary multiplied by the agreed-upon service period (up to four years) if the position addresses a critical need, and 25 percent if the position does not address a critical need. Under current law, recruitment and relocation bonuses are authorized only up to 25 percent of annual salary without locality adjustments and without the multiplicative factor of service period.

Section 505: Retention Bonuses. This section authorizes the NASA Administrator to pay retention bonuses up to 50 percent of an employee's annual salary if the employee's position addresses a critical need and 25 percent if the position does not address a critical need. Current law authorizes retention bonuses only up to 25 percent of annual salary without locality adjustments.

Section 506: Voluntary Separation Incentives. This section allows the NASA Administrator to pay Voluntary Separation Incentive (VSI) payments up to 50 percent of an employee's annual salary (current law, under the *Homeland Security Act of 2002,* only allows up to $25,000) if the employee is in a position that fills a critical need. NASA employees could not receive a VSI payment if they had received any bonus or allowance in the previous 12 months.

Section 507: Term Appointments. This section authorizes the NASA Administrator to make term appointments for up to six years. Current law authorizes four year appointments. This section also allows term appointments to be converted to permanent civil service appointments, which is not allowed under current law. However, the section imposes certain conditions on the use of this term appointment conversion authority.

Section 508: Pay Authority for Critical Positions. This section authorizes the Administrator to fix pay up to the level of the Vice President's pay ($198,600 per year) for up to ten employees at any given time.

Section 509: Assignments under the Intergovernmental Personnel Act. This section allows the NASA Administrator to extend the term for Intergovernmental Personnel Act (IPA) employees up to four years (from current two years).

Section 510: Enhanced Demonstration Project. This section allows NASA to conduct a personnel demonstration project agency-wide by exempting NASA from the current limitation of 5,000 individuals.

Section 511: Termination. This section specifies that the workforce authorities listed under section 503 terminate on October 1, 2009, but grandfathers in bonuses and appointments made before the termination date.

Chairman BOEHLERT. I want to welcome everyone here this afternoon. I want especially to welcome Bob Walker, who I think everyone knows. He was the first Republican Chair of this committee, and he set a very high standard for all of us who follow. Every time I sit in this chair, Mr. Walker, I have to deal with Bob looking down at me from his portrait on the wall, and it will be a nice change today for me to be able to look down on you.

We are dealing today with two very important and related subjects we have dealt with before. First, we will hear from three members of the Commission on the Future of the United States Aerospace industry, which Mr. Walker chaired. All three have distinguished records of public service. John Hamre is a dear and old friend, and it is always good to see him back. And Mr. Douglass and Mr. Walker, we are so happy to have you here on this panel. You have all performed great public service through the Commission, which has emphasized the threat the U.S. aerospace industry faces and the need to counter that threat.

This is actually the third hearing we have had just this year that has featured this issue. Members on both sides of the aisle raised concerns about aeronautics research at our NASA budget hearings just two weeks ago. And last week, our Space Subcommittee, under the leadership of Mr. Rohrabacher, raised concerns at its hearing on Aerospace Research at NASA and the Federal Aviation Administration. So we are committed to doing all we can to focus attention on the aerospace industry and issues and to work to resolve them.

One of the issues the aerospace community faces is difficulty in attracting and attaining a top-notch workforce. And there is no place that problem is more obvious than at NASA. As I noted in testimony that I gave before the Senate last week, within five years, a quarter of the NASA workforce will be eligible to retire. As a matter of fact, 15 percent of the scientists and engineers are eligible for immediate retirement. The most recent accounting office report on NASA issued just this past January noted, "The agency still needs to deal with critical losses due to retirement in coming years." This conclusion built on numerous past GAO reports that concluded that NASA had to do more to address its workforce needs.

I have introduced H.R. 1085 to help NASA deal with this enormous challenge, and our second panel will comment on that bill specifically. I hope we can move the bill through the Committee swiftly. H.R. 1085 builds on existing law. It allows NASA, for example, to offer larger recruitment and retention bonuses than are permitted currently and to offer bonuses to employees shifting between federal jobs without relocating. But the language we use parallels existing law and Office of Personnel Management Regulations.

This is a targeted and limited approach. We didn't give NASA everything it asked for, and we have added accountability provisions NASA didn't request. What we are offering is a well thought out and effective approach that will help address critical needs at all levels of the agency. Will this solve all of NASA's problems? Of course not, but this is something we can do right away that will help NASA regain strength while we come up with additional steps

to help the agency. To those who criticize this as a Band-Aid approach, I would say that a Band-Aid is a pretty good alternative to continued bleeding and infection.

I look forward to hearing ideas today on how we can improve H.R. 1085, but we do need to move ahead with this legislation. All of the problems we will hear about today are pressing matters. It is incumbent upon us to act.

[The prepared statement of Mr. Boehlert follows:]

PREPARED STATEMENT OF CHAIRMAN SHERWOOD BOEHLERT

I want to welcome everyone here this afternoon, and I want especially to welcome Bob Walker, who, I think everyone knows, was the first Republican chair of this committee, and he set a high standard for those of us who have followed. Every time I sit in this chair, I have to deal with Bob looking down on me from his portrait on the wall, and it will be a nice change today to be able to reciprocate by looking down on him from the dais.

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As I noted in testimony I gave before the Senate last week, within five years, a quarter of the NASA workforce will be eligible to retire. The most recent General Accounting Office (GAO) report on NASA, issued just this past January, noted, (quote), "The agency still need[s] to deal with critical losses due to retirements in coming years." This conclusion built on numerous past GAO reports that concluded that NASA had to do more to address its workforce needs.

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I look forward to hearing ideas today on how we can improve H.R. 1085, but we do need to move ahead with this legislation. All the problems we will hear about today are pressing matters. It is incumbent upon us to act.

PREPARED STATEMENT OF REPRESENTATIVE JERRY F. COSTELLO

Good afternoon. I want to thank the witnesses for appearing before our committee to discuss the Aerospace Commission report issued last November to the President and Congress and Chairman Boehlert's proposed legislation, H.R. 1085, the NASA Flexibility Act of 2003.

A strong aerospace industry will enable the United States to defend itself, compete in the global marketplace, maintain a highly skilled workforce, and provide all Americans with the ability to travel safely and securely anywhere in the world. The Commission has done extensive work in studying these issues and has made nine recommendations to improve the aerospace industry. I look forward to hearing more from our witnesses on the implementation and feasibility of these recommendations.

Further, I support the Aerospace Commission's recommendation that government, industry, labor, and academia must work together to develop an aerospace workforce for the 21st century because the issue of a NASA workforce shortage is problematic. However, I am concerned about the effects the legislation would have on the NASA workforce. H.R. 1085 includes provisions relating to recruitment, redesignation and relocation bonuses, retention bonuses, voluntary separation incentives, special pay authority for critical positions, and unlimited enhanced demonstration project authority. The legislation essentially exempts NASA from several provisions governing the Federal Civil Service. Recruitment and retention are significant problems throughout the Federal Government and I believe that to address this effectively, it is important to examine a comprehensive government-wide approach.

I welcome our witnesses and look forward to their testimony.

Chairman BOEHLERT. Mr. Gordon.

Mr. GORDON. Thank you, Mr. Chairman. And Bob, let me add my welcome back to you. It is good to see you again. You certainly served with distinction. We may have disagreed on some areas, but it was never a matter of integrity. You were—you served with great distinction. And Mr. Wilson, thank you for coming by yesterday. It was a—Mr. Douglass rather. It was a very good conversation. I wish that we had more time, and hopefully we will have—can do that later.

And to the panel at large, let me thank you for your public service. This is a very important issue. I know that it is time-consuming, but we are glad that you spent the time to do this.

Mr. Hall should be coming in later. If he has some words of wisdom, I would hope, Mr. Chairman, that you would allow him to speak at that time, otherwise, I am going to yield the floor so we can get on and hear from the folks we need to.

Panel I

Chairman BOEHLERT. We always welcome the words of wisdom from Mr. Hall. Our first panel is a very distinguished panel consisting of the Honorable Bob Walker, Chairman, Aerospace Commission. Bob is President of Wexler Walker Public Policy Associates, and served with great distinction as the Chairman of this committee; the Honorable John Douglass, Commissioner, President, Aerospace Industries Association; and the Honorable John Hamre, Commissioner, President, Center for Strategic and International Studies.

Gentlemen, we would ask that you try to summarize your statement. We will not be arbitrary, but try to be guided by the five-minute rule, and then we will go right to the questions. You are up first, Mr. Walker.

STATEMENT OF HON. ROBERT S. WALKER, CHAIRMAN, COMMISSION ON THE FUTURE OF THE UNITED STATES AEROSPACE INDUSTRY; PRESIDENT, WEXLER WALKER PUBLIC POLICY ASSOCIATES

Mr. WALKER. Well, thank you very much, Mr. Chairman. And thank you and Mr. Gordon for your words of welcome. And I appre-

ciate the reference to a portrait staring down upon you. The portrait that stares down upon me in my office these days is Mario Andretti, that great Pennsylvania philosopher. And it does so because I think a statement of his characterizes the work of this committee that I try to carry with me into the private sector and that is he one time said, "If you are in control, you are not going fast enough." Well, I think that is the reality of the world in which we live, but anyhow, I am delighted to be here. And I thank you for the opportunity to testify and report to you on the work of the Commission on the Future of the United States Aerospace Industry.

Let me begin with a few thoughts about the Commission's final product. First, our recommendations were unanimous. Despite a very diverse group of commissioners whose diversity brought great strength to our deliberations, we were able to achieve unanimity in what we ultimately recommended. There remained some differences in detail about some of the narrative within the report, but we agreed on the nature of the problem faced by the aerospace sector and on a series of recommended paths for the Nation to pursue.

Second, our overall vision of the 21st century where aerospace allows anyone and anything to go anywhere at any time speak to the mobility that we believe international leadership will require. The ability to move people, goods, services, and munitions quickly to where they are needed and when they are needed to be there is a definition for both global security and global economic leadership.

From here, Mr. Chairman, I—my written testimony goes into detailing the specific recommendations that the Commission made. I will not go through those right now. If there are questions about them, I would certainly be happy to deal with it, but what I wanted to deal with in the rest of my testimony was the questions that were raised as part of the charter for this hearing.

First of all, you raised the issue about the Administration's budget proposals as they relate to the Commission's recommendations. My assessment is that the Administration is moving aggressively in several areas to meet our goals. NASA's request for funding for Project Prometheus is very much in line with our recommendation that they move toward technologies emphasizing power and propulsion. DOD and NASA are cooperating on the National Aerospace Initiative that was specifically endorsed by the Commission. NASA and FAA are beginning cooperative efforts in an advanced air traffic management system, a major focus of our report. And the Commission's—or—and the Administration's Hydrogen Program is very much in line with our recommendation for work on breakthrough energy capabilities.

On the issue of foreign competition, I would make two points. First, the global challenge comes from nations more focused than we are about the importance of aerospace technology and who are developing long-range plans to overcome the United States in an area where we have strategic and economic superiority. Second, our export control policies are preventing U.S. companies from selling products into world markets, meaning that we are undermining the strength of our own aerospace supplier base. Next, we have been very concerned, as this committee has been, about workforce

issues. The Commission said quite clearly the aerospace sector requires a scientifically and technologically competent society.

We recommended several things in the workforce arena, which were covered previously in my testimony, but I would point particularly to the suggestion that educational reform should emphasize individualized instructional programs and lifelong learning. Finally, if there is one overriding conclusion of the Commission it is that we must move toward horizontal decision-making as opposed to the vertical silo decision-making regime that characterizes government interaction with the aerospace industry.

The aerospace mission crosscuts many different departments, agencies, programs, Congressional Committees, and Subcommittees. Decisions made inside of vertical silos are wasteful of taxpayers' dollars and destructive of the coordination needed to utilize aerospace resources to the fullest capacity. For example, an advanced air traffic management system is absolutely vital to our continued leadership in aerospace.

To get the system we need, there will have to be significant cooperation and funding coordination between FAA, NASA, DOD, and NOAA. This is a very tall order, but also a very necessary process. No one of these agencies can do the multi-billion dollar expenditure necessary to get the new system in place. But a cooperative effort with each agency doing its own mission for its own reasons, coordinating research and technology so that individual mission assets can be used broadly is the way to go. DOD flew GPS for its own mission requirements, but the technology has become even more valuable as a broader mission. That is the kind of example that we think needs to be done on a much broader basis. It is the way in which the market has to go in the future.

I thank you for the opportunity to testify.

[The prepared statement of Mr. Walker follows:]

PREPARED STATEMENT OF ROBERT S. WALKER

Mr. Chairman, thank you for this opportunity to testify and report to you on the work of the Commission on the Future of the United States Aerospace Industry.

Let me begin with a few thoughts about the Commission's final product.

First, the recommendations made were unanimous. Despite a diverse group of Commissioners, whose diversity brought great strength to our deliberations, we were able to achieve unanimity in what we ultimately recommended. There remained some differences in detail about some of the narrative within the report, but we agreed on the nature of the problem faced by the aerospace sector and on the series of recommended paths for this nation to pursue.

Second, our overall vision of a 21" century where aerospace allows anyone and anything to go anywhere at anytime speaks to the mobility which we believe international leadership will require. The ability to move people, goods, services and munitions quickly to where they are needed when they are needed to be there is a definition for both global security and global economic leadership.

Let me if I can outline the recommendations made by the Commission and some of the reasoning behind those recommendations.

RECOMMENDATION 1: VISION: ANYONE, ANYTHING, ANYWHERE, ANYTIME

The integral role aerospace plays in our economy, our security, our mobility, and our values make global leadership in aviation and space a national imperative. Given the real and evolving challenges that confront our nation, government must commit to increased and sustained investment and must facilitate private investment in our national aerospace sector. The Commission therefore recommends that the United States boldly pioneer new frontiers in aerospace technology, commerce, and exploration.

Background

The 20th century was America's century. Our nation thrived on previously unimagined advances in ground, air and space transportation, rapidly becoming the world leader in nearly every economic sector driven by the progress of science and technology.

One hundred years ago, the slogan "Anyone, Anything, Anywhere, Anytime" would have meant leaving home with transportation permitted ,and then allowing a week or two to travel between widely separated American cities. Today, New York to London is a day trip. A package of any size shipped today arrives tomorrow morning anywhere in the country.

What could "Anyone, Anything, Anywhere, Anytime" mean a century from now? A suborbital day trip between Japan and the United States? A lunar vacation? A Martian hiking expedition? Whatever our future holds, the aerospace sector will take us there, providing our nation and the world with the ability to move people, goods, services, and ideas wherever they are needed and wherever they are wanted.

We need a bold vision for air transportation that creates a new, highly automated "Interstate Skyway System." The system needs to be safe, secure, and efficient and accommodate the large volume and variety of civil and military aerospace vehicles the Nation will require in coming years.

We also need an audacious vision of space exploration that recognizes the solar system as our backyard, the Milky Way galaxy as our neighborhood, and the universe as our hometown. We should do this not simply because it's fun or thrilling, or challenging, or enlightening. . .but because it represents a critical investment in our economic strength and ultimately in our capacity to defend ourselves.

It's America's choice.

RECOMMENDATION 2: AIR TRANSPORTATION: EXPLOIT AVIATION'S MOBILITY ADVANTAGE

The Commission recommends transformation of the U.S. air transportation system as a national priority. The transformation requires:

- Rapid deployment of a new, highly automated Air Traffic Management (ATM) system beyond FAA's Operational Evolution Plan so robust that it will efficiently, safely, and securely accommodate an evolving variety and growing number of aerospace vehicles and civil and military operations.
- Accelerated introduction of new aerospace systems by shifting from product to process certification and providing implementation support.
- Streamlined new airport and runway development.

Objective

Delivering people and goods quickly and affordably—when and where needed.

Background

Our air transportation system is severely limited in its ability to accommodate America's growing need for mobility. The basic system architecture, operational rules, and certification processes developed decades ago don't allow today's technologies to be fully utilized and don't allow needed innovations to be rapidly implemented. There are barriers to advancing our air mobility.

First, the U.S. air traffic management infrastructure is not scalable and is vulnerable. Air transportation's inherent speed advantage is being limited by air traffic infrastructure and operating concepts.

Second, revamped certification processes, procedural regulations, and airborne equipage innovation is needed. The bulk of certification and procedural regulations and processes were developed in an era whose time has passed and hasn't kept pace with new technologies. Furthermore, aircraft operators must equip with compatible hardware and systems in order for a modernized air traffic network to succeed.

Third, new runway and airport development takes too long. Meeting the Nation's demand for air transportation and fully exploiting its benefits will require a ground infrastructure that accommodates significant traffic increases. Many of the Nation's major airports are operating at capacity limits during large portions of the day.

In addition, the economic downturn and the substantial added security burden since 9/11 have seriously disrupted the economic health of the airline industry. Well-intentioned security policies have resulted in billions in post-9/11 costs and lost revenue and account for a large majority of the projected $9 billion in airline industry losses in 2002.

General aviation also has been acutely affected, manufacturers and suppliers are suffering significant losses in aircraft and equipment sales, and the overall impact is rippling through the rest of the U.S. economy.

And, as the forced contraction of the industry continues, small and mid-size communities are being disconnected from the national air transportation system that is vital to their economies.

The U.S. government must assume full cost and responsibility for assuring the protection of our aviation system against terrorist attack. At the same time it must adopt rational security measures that facilitate public access to the air transportation system, and thereby encourage air travel.

RECOMMENDATION 3: SPACE: ITS SPECIAL SIGNIFICANCE

The Commission recommends that the United States create a space imperative. The Department of Defense, NASA, and industry must partner in innovative aerospace technologies, especially in areas of propulsion and power. These innovations will enhance our national security, provide major spin-offs to our economy, accelerate the exploration of the near and distant universe with both human and robotic missions, and open up new opportunities for public space travel and commercial space endeavors in the 21st century.

Objective

The challenge we face on the space frontier is to build from dreams and concepts the political will to move forward to new technologies and destinations. For almost 20 years we have been satisfied to limit our dreams, rely upon proven technologies, and invest little in building public or political support for space initiatives. But the potential to do great things has never been nearer.

Background

The Commission believes the Nation would benefit from a joint effort by NASA and DOD to reduce significantly the cost and time required to access space. Such an effort would build on the capabilities of both organizations and provide the "critical mass" of funding needed to create the necessary breakthroughs in propulsion.

Investment in the development of more advanced propulsion systems will lead to faster transit times, improve operational flexibility, and reduce the radiation impact for long-duration, human exploration missions. Once the time to explore many parts of the solar system has been reduced to reasonable numbers, the political imperative to do what is now possible will be acted on.

A significant limiting factor in the performance of most spacecraft, including the International Space Station, is the amount of power that can be generated from solar energy, increasing available power could expand opportunities in military, civil, and commercial space applications. Once there is sufficient power in orbit to do real things, investment will be more likely.

New technologies open up opportunities for a next generation of satellites and launch systems for military operations, homeland defense, global protection, and air transportation management.

The Commission believes the Nation needs a joint civil and military initiative to develop a core space infrastructure that will address emerging national needs.

Our national space infrastructure is aging. For example, the Vehicle Assembly Building at Kennedy Space Center has a 35-year-old roof that requires frequent patching and other failures that have resulted from hurricanes and high winds. Replacement cost of infrastructure is $3.9 billion at the Kennedy Space Center and $3.0 billion at Cape Canaveral Air Force Station. Clearly a new operations and management structure is desirable for these facilities.

The civil and commercial aerospace sectors will look to space more in the future to develop new products and services and create new markets as they have for telecommunications and commercial remote sensing. The U.S. commercial space industry continues to lose access to markets as demand decreases and international competition increases. Government regulations and incentives are necessary to bolster this important market until there is a turn-around in demand.

The Commission believes that the search for knowledge will not only answer fundamental questions but also will inspire our children and provide a source of future products and services. This will require that the U.S. government sustain its long-standing commitment to science and space and continue to focus on international cooperative efforts.

RECOMMENDATION 4: NATIONAL SECURITY: DEFEND AMERICA AND PROJECT POWER

The Commission recommends that the Nation adopt a policy that invigorates and sustains the U.S. aerospace industrial base. This policy must include:

- Procurement policies that include prototyping, spiral development, and other techniques that allow the continuous exercise of design and productions skills.

- Stable funding for core capabilities without which the best and brightest won't enter the defense industry.
- Removing barriers to international sales of defense products.
- Removing barriers to defense procurement of commercial products and services.
- Propagating defense technology into the civil sector, particularly in communication, navigation, and surveillance.
- Sustaining critical technologies that aren't likely to be sustained by the commercial sector, e.g., space launch and solid rocket boosters.

Objective

A healthy aerospace industry is central to maintaining a safe and secure world. It provides the ability to:

- Rapidly, safely; and securely send and receive information;
- Move troops, equipment, and supplies to anywhere on the globe or into space at anytime, and
- Prosecute effects-based warfare.

Background

The effectiveness of American defense is a crucial determinant of world peace, prosperity, and stability. In the 21st century enabling technologies for vital military capabilities will come from the commercial sector as well as the defense sector. Today's military capabilities are at risk due to a threatened industrial base, workforce concerns, and the need to protect critical infrastructure.

The Defense Department should task the Defense Science Board to develop a national policy that will invigorate and sustain the U.S. aerospace industrial base. The policy should address issues such as mergers and acquisitions, procurement and budgeting policies, research and investment, technology transition, international sales, and workforce development.

The United States must continually develop new experimental systems in order to sustain the critical skills to conceive, develop, manufacture, and maintain advanced systems and provide expanded capabilities to warfighters.

The Federal Government and industry must partner to enhance the operational readiness and capability of new and legacy military aerospace systems. The government should fund research and technology development programs to reduce total ownership costs and environmental impacts and create a structured, timely, and adequately funded technology insertion process and reform procurement practices accordingly.

RECOMMENDATION 5: GOVERNMENT: PRIORITIZE AND PROMOTE AEROSPACE

The Commission recommends that the Federal Government establish a national aerospace policy and promote aerospace by creating a government-wide management structure. This would include a White House policy coordinating council, an aerospace management office in the Office of Management and Budget, and a joint committee in Congress. The Commission further recommends the use of an annual sectoral budget to establish presidential space initiatives, and replace vertical decision-making with horizontally determined decisions in both, authorizations and appropriations.

Objective

In the rapidly changing global economy, government leadership must be increasingly flexible, responsive, and oriented toward decision-making at macro levels. It must prioritize and promote aerospace within the government and in its interactions with the industry in order to realize the fullest potential of aerospace to the Nation.

Background

The development and implementation of federal aerospace policy is currently spread across multiple government agencies with oversight by numerous congressional committees. The government isn't organized to define national aerospace priorities, develop federal aerospace sector plans and budgets, manage programs that cross multiple departments and agencies, or foster a healthy aerospace sector in a global economy.

The Federal Government is organized vertically while national aerospace challenges are becoming more horizontal in nature. Without integration, national aerospace policy occurs either by default or piecemeal. The Commission believes that the U.S. government can only ensure U.S. aerospace leadership by leading itself. To do

this, the executive and legislative branches need to be reoriented to better address national aerospace issues.

Maintaining a national aerospace policy should be a function assigned jointly to the National Security Council and the National Economic Council. They should establish an Aerospace Policy Coordinating Council to develop and implement an integrated national aerospace policy. OMB should create a Bureau of Aerospace Management that would translate the national policy into annual planning and budget guidance.

Federal departments and many agencies should establish offices of aerospace development to promote aerospace activities and align aerospace with their missions. A prudent response from Congress would be to organize a Joint Committee on Aerospace.

Government processes tend to be complex, lengthy, and inefficient. As a result, aerospace products and services developed and used by the government are more costly for the taxpayers and take longer to acquire. Also, aerospace products and services developed by industry for sale in the commercial marketplace take longer and cost more because of extensive government barriers resulting in lost market share and diminished profitability.

Government, industry, labor, and academia must work together as partners to transform the way they do business, allowing the Nation to capitalize on the best ideas available and apply them rapidly to new aerospace products, processes, and services.

RECOMMENDATION 6: GLOBAL MARKETS: OPEN AND FAIR

The Commission recommends that U.S. and multilateral regulations and policies be reformed to enable the movement of products and capital across international borders on a fully competitive basis and establish a level playing field for U.S. industry in the global marketplace. The U.S. export control regulations must be substantially overhauled, evolving from current restrictions on technologies through the review of transactions to controls on key capabilities enforced through process controls. The U.S. government should neutralize foreign government market intervention in areas such as subsidies, tax policy, export financing, and standards either through strengthening multilateral disciplines or providing similar support for U.S. industry as necessary.

Objective

A globally competitive U.S. aerospace industry.

Background

Open global markets are critical to the continued economic health of U.S. aerospace companies and to U.S. national security. The 2001 U.S. aerospace trade surplus was nearly $32 billion, the largest surplus of any U.S. manufacturing sector. However, the U.S. industry share of the global market has declined in key sectors over the last 20 years. We are on the brink of ceding our position as the top producer of large commercial aircraft and are losing market share in civil helicopters and aircraft engines. Much of this decline is a direct result of foreign government intervention and protectionist policies.

In order to remain global leaders, U.S. companies must remain at the forefront of technology innovation. They also must have access to global customers, suppliers, and partners.

The defense industrial base is falling farther and farther behind the commercial marketplace because it has to cope with excessive regulation. The current export control regime provides too little security and is choking American companies and preventing effective technology collaboration with others. U.S. export controls must be completely overhauled, and defense procurement policies must more effectively balance international collaboration and maintain U.S. industrial capacity in critical technologies and capabilities.

Although we are ahead of other countries in investment in military technology and capability, we are on the edge of dropping out of the race in the civil sector. Instead of continuing to invest, our government has increasingly pulled back from the civil aerospace market and left it up to U.S. companies to compete against competitors subsidized by their governments.

RECOMMENDATION 7: A NEW MODEL FOR THE AEROSPACE SECTOR

The Commission recommends a new business model designed to promote a healthy and growing U.S. aerospace industry. This model is driven by increased and sustained government investment and the adoption of innovative government and industry policies that stimulate the flow of capital into new and established public and private companies.

Objective

A strong and healthy U.S. aerospace industry that is attractive to investors.

Background

The U.S. government budgeting and procurement system is extraordinarily complex and inefficient. Unpredictable and unstable government budgeting and funding creates a cycle that contributes to the diminished return on the government's investment in national security capabilities and serves as an impediment to long-term industry excellence.

A stable long-term investment budget is critical to the modernization and transformation goals of U.S. armed forces. The Commission advocates increasing the government's financial flexibility to make funding adjustments among and within programs.

In a call to revise program management policies, the Commission believes the use of multi-year contracting for both procurement and R&D programs will improve program stability and performance as well as produce needed cost savings.

The U.S. aerospace industry extends through a network of purchasers, subcontractors, suppliers, and partners—sometimes referred to as the supply chain. Each of the participants is intrinsically tied to the factors affecting the industry. Encouraging a climate that is attractive to new entrants, while stable enough for current players, will promote competition and innovation, add to efficiencies, and lower costs.

Certain U.S. tax and trade laws and regulations that affect a variety of industries weigh particularly heavily on defense and aerospace in competition with domestic commercial entities as well as in international markets.

Government and industry should work together to develop and implement training and exchange programs that would educate and expose their respective workforces to each other's challenges and responsibilities.

Government must develop and implement a policy regarding international cooperation in defense and aerospace that recognizes the global industrial base. The Commission urges a review of the policy regarding domestic and international business combinations.

RECOMMENDATION 8: LAUNCH THE FUTURE

The Commission recommends that the Nation immediately reverse the decline in and promote the growth of a scientifically and technologically trained U.S. aerospace workforce. In addition, the Nation must address the failure of math, science, and technology education of Americans. The breakdown of America's intellectual and industrial capacity is a threat to national security and our capability to continue as world leader. Congress and the Administration must therefore:

- Create an interagency task force that develops a national strategy on the aerospace workforce to attract public attention to the importance and opportunities within the aerospace industry.
- Establish lifelong learning and individualized instruction as key elements of educational reform.
- Make long-term investments in education and training with major emphasis in math and science so that the aerospace industry has access to a scientifically and technologically trained workforce.

Objective

A well educated, scientifically literate, and globally competitive aerospace workforce.

Background

There is a major workforce crisis in the aerospace industry. Our nation has lost more than 600,000 scientific and technical aerospace jobs in the past 13 years. Those losses began as a result of reduced defense spending following the end of the Cold War. But subsequent contraction of the industry through mergers and acquisitions and the events of 9/11 have made that situation worse.

Due to these actions and events, many of the workers who have lost their jobs are unlikely to ever return to the industry. These losses, coupled with pending retirements over the next 10 years, represent a devastating loss of skill, experience, and intellectual capital to the industry. Few new young employees are in the "pipeline" to replace the aging aerospace workforce.

The aerospace industry has historically been cyclical and strongly driven by defense spending. Global competition, especially in commercial aviation, has risen rapidly since 1989, most notably from Europe, and is likely to grow.

The aerospace industry must have access to a scientifically and technologically trained workforce. In the long-term, the Commission stresses that that action must be taken to improve mathematics and science education from K–12 through Ph.D.

It is likely that people entering the workforce now will hold five or more jobs in their lifetime, and the education system must be prepared to deliver training and education to meet these changing skill requirements and labor market needs.

RECOMMENDATION 9: ENABLE BREAKTHROUGH AEROSPACE CAPABILITIES

The Commission recommends that the Federal Government significantly increase its investment in basic aerospace research, which enhances U.S. national security, enables breakthrough capabilities, and fosters an efficient, secure, and safe aerospace transportation system. The U.S. aerospace industry should take a leading role in applying research to product development.

Objective

U.S. preeminence in aerospace research and innovation.

Background

In the past, aerospace led the technology revolution because of large public investment in research directed at national security imperatives and goals. Today, we have no integrated national aerospace consensus to guide policies and programs. This has resulted in unfocused government and industry investments spread over a range of research programs and aging infrastructure.

The lack of sufficient, sustained public funding for research, development, test, and evaluation infrastructure limits the Nation's ability to address critical national challenges and to foster breakthrough aerospace capabilities that could enable a new era in aerospace leadership for America.

To provide focus for aerospace investments on developing breakthrough capabilities, the Commission suggests the government achieve, as a national priority, the following goals by 2010:

Air Transportation

- Demonstrate an automated and integrated air transportation capability that would triple capacity by 2025.
- Reduce aviation noise and emissions by 90 percent.
- Reduce the aviation fatal accident rate by 90 percent.
- Reduce transit time between two points on Earth by half.

Space

- Reduce cost and time to access by half.
- Reduce transit time between two points in space by half.
- Demonstrate the capability to monitor and survey continuously Earth, its atmosphere, and space for a wide range of military, intelligence, civil, and commercial applications.

Time to Market

- Reduce the transition time from technology demonstration to operational capability from years and decades to weeks and months.

Now I would like to turn to the specific questions you raised in your charter for this hearing.

On the issue of the Administration's budget proposals for research and their relationship to Commission recommendations, my assessment is that the Administration is moving aggressively in several areas to meet our goals. NASA's request for funding of *Project Prometheus* is very much in line with our recommendation that they move technologies emphasizing power and propulsion. DOD and NASA are cooperating on the National Aerospace initiative that was specifically endorsed by the Commission. NASA and FAA are beginning cooperative efforts in an advanced air traffic management system, a major focus of our final report. The Administration's hydrogen program is in line with our recommendation for work on breakthrough energy capabilities.

On the issue of foreign competition, I would make two points. First, the global challenge comes from nations more focused than we are about the importance of aerospace technology and who are developing long-range plans to overcome the United States in an arena where we have had strategic and economic superiority. Second, our export control policies are preventing U.S. companies from selling prod-

uct in world markets meaning that we are undermining the strength of our own aerospace supplier base.

Next, we are very concerned about workforce issues. The Commission said quite clearly that the aerospace sector requires a scientifically and technologically competent society. We recommended several things in the workforce arena, which are covered previously in my testimony, but I would point particularly to he suggestions that educational reform should emphasize individualized instructional programs and lifelong learning.

Finally, if there is one overriding conclusion of the Commission, it is that we must move toward horizontal decision-making as opposed to the vertical silo decision-making regime that characterizes government interaction with the aerospace industry. The aerospace mission cross cuts many different departments, agencies, programs, Congressional committees, and subcommittees. Decisions made inside vertical silos are wasteful of taxpayers' dollars and destructive of the coordination needed to utilize aerospace resources to the fullest capacity.

For example, an advanced air traffic management system is absolutely vital to our continued leadership in aerospace. To get the system we need, there will have to be significant cooperation and funding coordination between FAA, NASA, NOAA, and DOD. That is a very tall order, but a very necessary process. No one of these agencies can do the multi-billion dollar expenditure necessary to get the new system in place, but a cooperative approach with each agency doing its own mission for its own reasons coordinating research and technology so that individual mission assets can be used broadly is the way we must go. DOD flew GPS for its own mission requirements, but the technology has become even more valuable as a broader mission. That is a market for the future.

Thank you for this opportunity to testify.

Chairman BOEHLERT. Boy, what a skilled master you are. You even left some time. Mr. Douglass.

STATEMENT OF HON. JOHN W. DOUGLASS, PRESIDENT AND CHIEF EXECUTIVE OFFICER, AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

Mr. DOUGLASS. Thank you, Mr. Chairman. I would like to begin by thanking you and Mr. Gordon for holding this hearing today, sir. This is a very crucial time for our industry, and your leadership in holding hearings like this is greatly appreciated. But I would also like to thank my two colleagues here for the work that they did on the Presidential Commission and for the continuing involvement of the time and energy that they both are putting into this work. And with your permission, sir, I would like to submit my written statement for the record and just briefly summarize it.

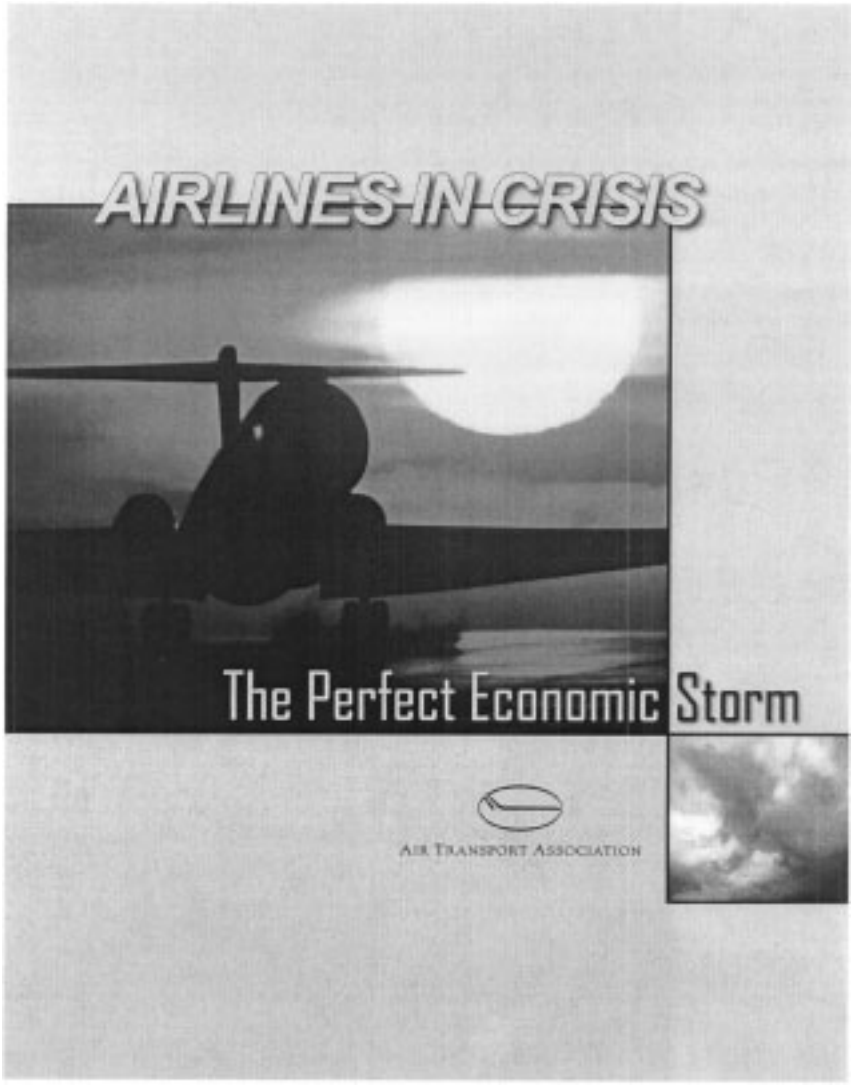
Chairman BOEHLERT. Without objection, all of the statements will appear in the record and in their entirety.

Mr. DOUGLASS. I—there are really three basic points that I would like to make in this summary. The first is that the aerospace industry, in its entirety, which is that its military work, its civil aviation work, its space work, and its homeland security work, is really the cornerstone and foundation of both our national economy and our national security. It represents about 11 million jobs, 15 percent of our gross domestic product. And it is the single biggest positive export trade balance in the American economy, approximately $30 billion in fiscal year 2002. So it is the cornerstone of two of the most important parts of American life: our economy and our national security.

The second point, sir, is that the industry is passing through a severe crisis. The American airline industry is nearly bankrupt. Just yesterday, my colleagues at the Air Transport Association, published a report called "The Perfect Storm," and with your permission, sir, I would like to also enter that into the record. That

outlines in detail the nature of the crisis that the airline community is facing.

[The information referred to follows:]


AIRLINES IN CRISIS
The Perfect Economic Storm
AIR TRANSPORT ASSOCIATION

Preface

The United States is engaged in a War on Terrorism that is soon likely to expand to hostilities in Iraq. The Air Transport Association (ATA) and its member airlines support this administration and our nation's efforts. We actively participate in the Civil Reserve Air Fleet (CRAF) program and many thousands of our employees, in particular our pilots, serve in the active reserve. We are also supportive because we have been the particular targets and unwilling instruments of terrorism, and because the deep economic morass in which we are mired is a direct result of the attacks of 9/11 and the resulting downturn in the economy.

Nevertheless, we are also mindful of the painful economic lessons of the first Gulf War and expect the economic consequences of a second Iraq experience will be even more dramatic in terms of the impact on our industry.

This report reviews our current economic crisis; outlines the impact of the first Gulf War; and forecasts the economic consequences on our industry of the expected Iraq invasion. The report highlights the need for decisive government action to counter a predictable crisis in the airline industry.

Table of Contents

Charts and Tables

Executive Summary

The U.S. airline industry is facing an economic crisis unlike any experienced before. In its simplest terms, the crisis is a result of an unprecedented decline in demand for air travel playing out against the backdrop of the industry's notoriously high fixed cost structure.

That decline in demand reflects both general conditions in the broader economy and a pronounced, post-9/11 public disinclination to travel by air. With the imminent prospect of a war with Iraq, market trends and experience with the first Gulf War indicate strongly that this economic crisis could deepen rapidly. Should that occur, there is a serious risk of chaotic industry bankruptcies and liquidations. Given the essential transportation links provided by the airlines and the significant role of aviation in the U.S. economy, this situation obviously warrants government attention and action to minimize the spread of economic damage.

It must be noted that the current set of circumstances is fundamentally not a result of "normal" market forces. As this report documents, while the general state of the economy (i.e., normal market forces) is a component of the crisis, other non-market pressures, including public mood, the threat of terrorism and the prospect of war appear to be far greater contributors.

The most likely war scenario estimates industry losses of $10.7 billion

The airline industry continues to undertake massive self-help measures to try to reduce losses and stabilize itself. These measures have seen 100,000 jobs cut, schedules modified, thousands of flights eliminated, offices and facilities closed, several hundred aircraft retired or placed in storage, more than $10 billion in reduced capital and operating budgets–and the cutting goes on. Negotiations are underway to reduce employment expenses throughout the industry by an additional $10 billion. No possible area for savings is being overlooked.

To encourage travelers back into the air, the airlines have been forced to reduce airfares aggressively. They have done so because, despite the major capacity cuts (fewer aircraft making fewer flights), the demand for air travel remains out of sync with supply. As a consequence, airlines have no ability to pass costs through to the traveler and no pricing power. The result is airfares today that are lower than they were in 1988 in nominal, not inflation-adjusted, dollars.

In a "normal" market, this type of cost-cutting could be expected to restore profitability. That has not occurred. Instead, what has happened is that new, additional costs (or reduced revenues) have grown to adversely impact the industry's bottom line. In general, these costs have arisen from government policy decisions in the post-9/11 environment. These decisions have unquestionably enhanced security, but not without economic consequences. The report calculates that these costs are on the order of $4 billion. Other government decisions relating to taxes and fees are playing out as well. The fact is that the industry is now carrying a tax burden that is 76 percent higher than it was in 1992, and 240 percent higher than in 1972–contributing substantially to the economic crisis.

Making matters worse, the cost of fuel has risen dramatically (from 57 cents in February 2002 to $1.20 last month) as a result of both the threat of war and other forces. Because fuel constitutes between 10 and 15 percent of the industry's cost structure, airlines do everything

in their power to manage this cost, including the use of hedging strategies. Nevertheless, with prices rising, and every one-penny increase in the cost of a gallon of fuel costing the industry $180 million annually, the picture is bleak.

To continue providing service, the airlines have been forced to assume a massive amount of debt, now in the range of $100 billion. (For comparison purposes, as of February 2003, all of the outstanding stock of the network airlines had a combined value of only $3.2 billion.) At this point, however, the industry's ability to borrow is virtually gone. A significant worsening of the economic picture will force carrier bankruptcies and possible liquidations. The prospect of a forced nationalization of the industry is not unrealistic.

To assist decision-makers in establishing policies to minimize economic harm, this report provides an assessment of the current economic state of the airline industry in the context of the expected opening of hostilities with Iraq. It does so utilizing four scenarios that incorporate current industry advance booking information, first-quarter 2003 operating data and actual experience with the first Gulf War.

A worse-case scenario estimates losses to reach $13 billion

These scenarios are conservative in their estimates but present cause for concern. Under the "most likely" scenario, industry losses would be $4 billion higher than under the base "no war" case, for total 2003 losses of $10.7 billion. This analysis projects a 15 percent traffic decline during one quarter of "active" war activity. Again, this is based on actual carrier advance booking information, which declined internationally by more than 20 percent following the recent Code Orange security alert. A worse-case scenario is also presented, applying the Gulf War experience combined with the effects of a terrorist incident of major significance. In this scenario, industry losses would hit $13 billion.

The airlines are not seeking government action that would interfere with normal forces in the marketplace. Rather, prudent measures are sought to mitigate the damage that is being done by the extraordinary "non-market" impact of terrorism and the prospect of war. Particularly given the pivotal role that the airline industry plays in the functioning of the entire national economy, the case for action is compelling. Conservatively estimated, absent decisive government action to mitigate the war's impact, airlines will be forced to cut at least 70,000 more jobs and eliminate 2,200 flights, hitting particularly small and mid-size communities. As the impact of those cuts plays out across the economy, hundreds of thousands of additional jobs will be lost.

The time for decisive government action to maintain this essential key to our economic success is now.

Section I

Background: Gulf War Repercussions

The U.S. airline industry always has been affected by changes in the national economy, more so since the industry's economic deregulation in 1978. This sensitivity exists because discretionary travel is one of the first expenses cut by businesses and individuals during a recession. Such declines in business hit airlines hard because they have high fixed costs that cannot be quickly or easily reduced. The two primary fixed costs are labor and aircraft. Labor costs only can be reduced through layoffs or agreements with unions, and equipment costs are fixed and expensive (a typical wide-body aircraft costs more than $100 million). Lease payments continue regardless of whether the aircraft is in service. Fuel prices can rise sharply during international crises. When crude oil prices increase, carriers cannot simply cut service to reduce this cost. Labor and fuel alone account for more than 50 percent of all airline costs.

Labor and fuel alone account for more than 50 percent of all airline costs

This economic sensitivity was apparent immediately prior to and during the 1991 Gulf War, after which the U.S. economy slipped into recession. The state of the economy already was adversely affecting the airline industry, but the addition of specific war-related factors dramatically exacerbated conditions. A drop in passenger traffic and a doubling of fuel costs led to four years of losses totaling $13.1 billion. While an argument can be made that, in the later years, some of these losses were the result of a weak economy, the losses of 1990 and 1991 are directly attributable to the Gulf War and its impact on commercial aviation.

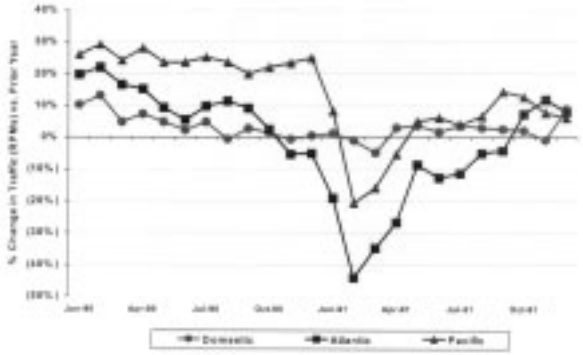
Industry operating losses were $1.9 billion in 1990, $1.8 billion in 1991 and $2.4 billion in 1992. Although these losses pale in comparison to those incurred by the industry after September 11, 2001, they were at that time record-breaking. The war itself lasted only 43 days, but its direct economic repercussions were felt for a full two years by the airline industry, with full recovery taking four years. The industry did not post a full-year operating profit until 1993 and a full-year net profit until 1995.

Prior to the Gulf War, most carriers were comparatively strong, both structurally and financially. Most were recording modest profits. Overall, in 1989, the U.S. airline industry recorded $1.8 billion in operating profits. Between 1984 and 1989, the industry had net profits of $3.9 billion on $12.6 billion in operating earnings. Airlines also had adequate cash reserves and access to capital markets, which today they do not enjoy.

Traffic over the Pacific grew significantly at annual rates in excess of 20 percent in the months preceding the Gulf War. Over the Atlantic, traffic increased steadily throughout the first three quarters of 1990. But in the months leading up to the Gulf War, passenger loads declined dramatically over these and other routes. Traffic over the Pacific plummeted from a growth rate of more than 20 percent to a rate of minus 21 percent. Over the Atlantic, traffic went from growing 20 percent to minus 44 percent. The impact on domestic traffic was significant but less severe, falling off 8 percent. Clearly, the American public was concerned about possible threats abroad but felt more secure domestically. The events of 9/11 have drastically altered this sense of security, leaving domestic travel more vulnerable than ever.

Chart 1

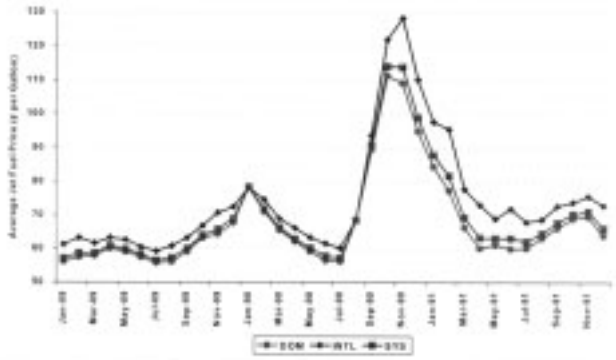
Passenger Traffic: 1990-91



Prior to Iraq's invasion of Kuwait on August 2, 1990, jet fuel prices throughout 1989 and 1990 were stable. In 1989, jet fuel cost an average of 60 cents per gallon and in July 1990 it was at 57 cents. In September 1990 prices soared to 91 cents and by October they reached $1.14 per gallon. At that time, each one-cent rise in jet fuel prices cost the U.S. airline industry $160 million annually.

Chart 2

Jet Fuel Price: 1989-91



Overall, the impact of the Gulf War on U.S. commercial aviation was as follows:

Traffic	-	Down 8 percent systemwide, 15 percent internationally
Daily flights	-	Cut by 350, reducing service to hundreds of communities
Employment	-	25,000 total lost jobs
Fuel costs	-	Up 45 percent for increased costs of $1.5 billion
Net losses	-	$13.1 billion over four years
Bankruptcies	-	Seven carriers filed for bankruptcy, four liquidated

After the Gulf War, the industry shrank significantly, tens of thousands of employees lost their jobs, communities lost service and the overall U.S. economy suffered

After the Gulf War, the industry shrank significantly, tens of thousands of employees lost their jobs, communities lost service and the overall U.S. economy suffered. Although the majority of carriers were financially healthy prior to the Gulf War, several were in a weakened state. Pan Am was struggling from declining passenger traffic following the 1988 terrorist attack on Flight 103, and Eastern Airlines was experiencing protracted labor troubles. For these carriers, the rising costs and declining traffic were insurmountable obstacles, ultimately leading to the demise of these long-established corporations.

Table A

Significant Gulf War Airline Bankruptcies

	Date	Action	Outcome
Continental	12/3/90	Chapter 11	Emerged 4/27/93
Pan Am	1/8/91	Chapter 11	Liquidation
Eastern	1/18/91	Last Flight	Liquidation
Midway	3/25/91	Chapter 11	Liquidation
America West	6/27/91	Chapter 11	Emerged 8/25/94
TWA	1/31/92	Chapter 11	Emerged 11/3/93
Markair	6/8/92	Chapter 11	Liquidation

In fact, by 1993, the state of the industry was so threatened that President Clinton established the *National Commission to Ensure a Strong and Competitive Airline Industry* to explore ways in which the industry could be restored.

Section II

U.S. Airline Industry: 1995 to Present

The effects of the 9/11 attacks continue to harm the industry significantly to this day

By the spring of 2001, the U.S. airline industry was clearly entering a period of economic turbulence. The slowing economy and the bursting dot-com bubble suggested substantially slowed economic growth. Passenger traffic was expected to increase only 1 percent in 2001 from the 2000 record level of 1.8 million passengers per day (1.6 domestic; 0.2 international). Aircraft operations, which totaled 25,200 departures per day in 2000, were expected to increase only slightly in 2001. Net losses for the industry were forecast at $3.5 billion.

Despite this daunting challenge, the airlines were positioned to weather the storm. The profitable period from 1995 to 2000 had enabled the carriers to rebuild their balance sheets from the Gulf War years. Industry cash reserves totaled some $11 billion at the end of the first quarter of 2001 and, despite the preceding period of record demand, industry expansion had been moderate, with operating revenues growing at an annual rate of 6.6 percent from 1995 to 2000.

Table B

State of the U.S. Airline Industry on September 11, 2001

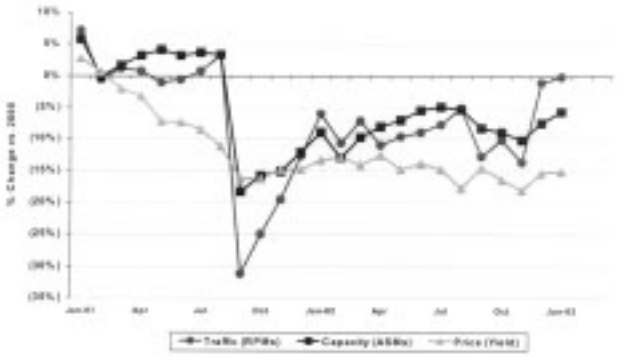
Cash Reserves	$11 billion
Cash Burn Rate (assuming $3.5 billion loss)	$10 million per day
Net Debt-to-Capital	70-75%
Fleet	4,950 aircraft
Employment	686,000 FTEs
Projected 2001 Net Loss	$3-3.5 billion
Major carriers in bankruptcy	0
Major carriers with investment-grade credit ratings	3

This situation changed dramatically after the September 11, 2001, terrorist attacks. The manageable economic challenge that had been confronting the airlines suddenly ran well beyond the normal range of business control and natural market forces. The effects of the 9/11 attacks continue to harm the industry significantly to this day.

The immediate shutdown of our nation's aviation system produced a cash "burn rate" for the industry in excess of $330 million per day for the duration of the stoppage. Once air service was restored, the combined effects of public apprehension and avoidance of air travel, for a variety of reasons, were reflected in an unprecedented drop in demand. As the following chart demonstrates, the precipitous drop in traffic following the 9/11 attacks was mirrored by the industry's sharp reduction in capacity.

Chart 3

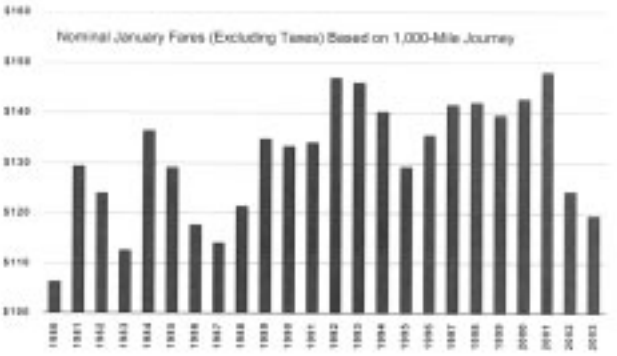
Passenger Traffic, Capacity and Yield Trends



Despite these capacity reductions, continuing soft demand over the past 18 months has compelled airlines to price their services at record low levels to induce travelers back into the air. The results are projected industry losses of roughly $25 billion from 2001 through 2003.

Chart 4

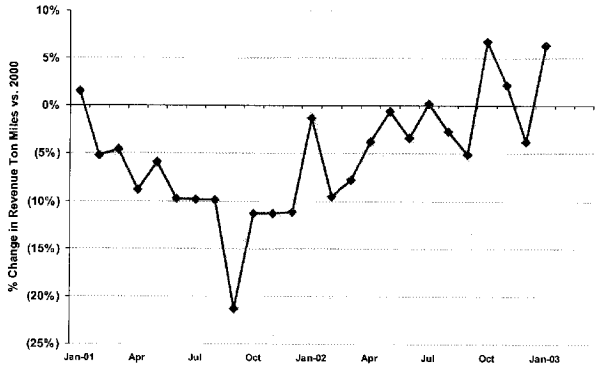
Nominal Airfares at Lowest Level Since 1987



The question is often asked: How can any distinction be drawn between the "normal" economic downturn in the economy that was impacting the airlines prior to 9/11, and the direct effects of the attacks? It is instructive to look at the air cargo experience for some answers.

Chart 5

Air Freight Volume Trends

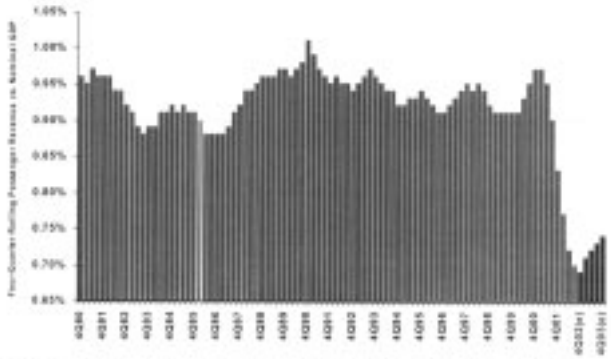


The initial 9/11 cargo declines were steep but have not persisted, as has faltering passenger demand. A case can be made that the cargo market generally reflects the impact of the broader economic slowdown and recovery cycle on the aviation market. On the other hand, passenger apprehension and avoidance factors have persisted, and it is the difference between the performance of these markets that is an area of concern–the area beyond normal business fluctuation and normal market conditions.

Another indicator of the abnormal change that is impacting the airlines is the growing disparity between passenger revenues and gross domestic product (GDP). Historically a consistent 0.90 to 0.95 percent of GDP, passenger revenue since 9/11 has fallen below 0.75 percent of the nation's output, suggesting that much more than conventional economic factors are at play. Again, the point is that we are confronted by economic forces that appear well beyond those of the normal business cycle.

Chart 6

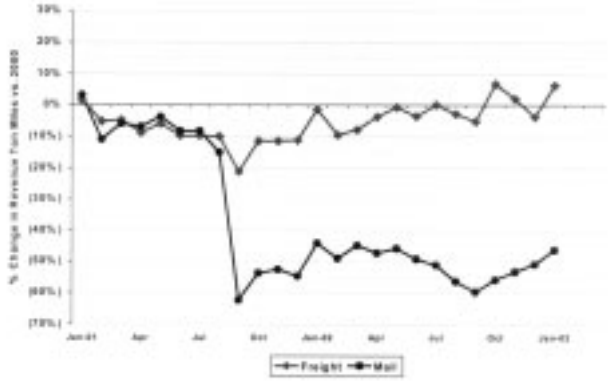
Passenger Revenue vs. Nominal GDP



The chart below highlights the post-9/11 difference between freight and mail volumes. Because of security issues associated with both freight and mail, the decline of mail and modest growth of freight have been problematic for the combination carriers. Freight and mail losses are estimated at about $400 million because of heightened security measures.

Chart 7

Air Freight and Mail Volume Trends



The Industry Responds

The airline industry has responded to the crisis by taking aggressive self-help actions necessary to stem the effect of deepening losses. As noted above, the primary tool the industry has used is to match capacity more closely with customer demand by decreasing operations, cutting staff and reducing service. While measured clinically in terms of available seat miles (ASMs) or numbers of aircraft, these cutbacks also have a sharply personal component. Nearly 100,000 employees have lost their jobs as a result of this forced contraction of the airline industry, along with nearly 400,000 others in the U.S. travel and tourism sector.

The table below provides a detailed breakdown of the Air Transport Association member airlines[1] fleet between December 31, 2000, and December 31, 2002. Moving into the period, the increase of the fleet by 69 units, as of June 30, 2001, reflects the last wave of modest capacity growth the industry experienced during the robust 1990s.

Nearly 100,000 employees have lost their jobs as a result of this forced contraction of the airline industry, along with nearly 400,000 others in the U.S. travel and tourism sector

Table C

Net Change in Mainline Operating Fleet – ATA U.S. Members [1]

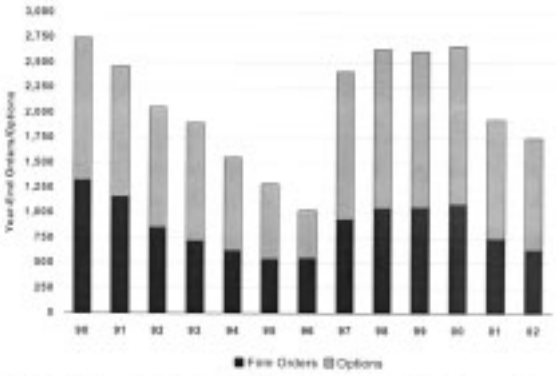
Fleet	6/30/01	12/31/01	6/30/02	12/31/02	Change
B727	480	333	259	224	(256)
MD80	631	573	561	554	(77)
DC10	133	111	96	72	(61)
DC9	311	274	272	268	(43)
DC8	118	80	78	77	(41)
F100	114	96	74	74	(40)
B717	28	43	13	13	(15)
L1011	20	15	13	13	(7)
B747	174	174	170	168	(6)
B737	1,296	1,277	1,303	1,294	(2)
A330	9	9	9	9	—
MD90	16	16	16	16	—
A310	41	43	46	45	4
A321	19	23	28	28	9
MD10	12	12	16	22	10
MD11	51	53	56	62	11
A300	89	94	101	104	15
B777	110	119	129	129	19
B767	333	344	359	363	30
B757	579	600	615	623	44
A319	158	177	196	210	52
A320	228	251	267	284	56
TOTAL	**4,950**	**4,717**	**4,677**	**4,652**	**(298)**

Sizeable reductions began with the September 11, 2001, attacks and continue to the present, prompting the fleet to shrink by 298 aircraft, with a strong emphasis on the least efficient aircraft. While several hundred new aircraft have been delivered (reflecting primarily firm, non-cancelable aircraft orders in place prior to September 11, 2001), the rate of new orders has plummeted, creating still more uncertainty for the aviation sector.

[1] ATA members are Airborne Express, Alaska Airlines, Aloha Airlines, America West Airlines, American Airlines, American Trans Air, Atlas Air, Continental Airlines, Delta Air Lines, DHL Airways, Emery Worldwide, Evergreen International, FedEx, Hawaiian Airlines, JetBlue Airways, Midwest Airlines, Northwest Airlines, Polar Air Cargo, Southwest Airlines, United Airlines, UPS Airlines and US Airways.

Chart 8

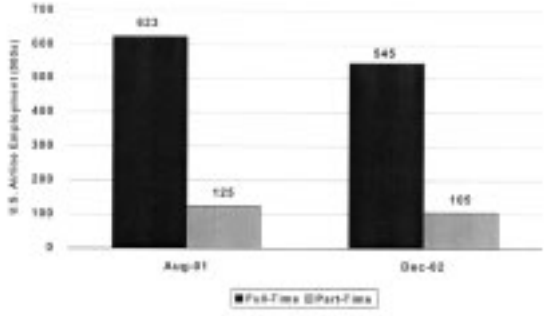
Aircraft Orders and Options Backlog – ATA U.S. Members



Aircraft utilization also has fallen. Many aircraft now operate four flights per day instead of five. As a result of aircraft retirements and reduced utilization, operations dropped from the expected 25,200 per day in 2000 to 24,400 per day in 2001, and an estimated 23,100 per day in 2002. The following chart documents the 13 percent decline in industry employment from August 2001 through December 2002, as reflected in Department of Transportation data for the entire airline industry. A total of 78,000 permanent full-time employees and 20,000 part-time workers have been cut to help save these companies and their remaining employees.

Chart 9

U.S. Airline Employment



Many other self-help measures also are being taken. The table below reflects the actions taken by the six global network airlines to reduce capital and operating budgets by more than $10 billion. Despite the cuts, however, the financial hemorrhaging continues. Airlines have reduced inflight food service, installed automated check-in kiosks, depeaked hub operations, hedged fuel costs, closed reservation centers, eliminated stations and generally reviewed all of their costs for every potential savings–and that effort continues.

Table D

Self-Help Measures Taken by the Six U.S. Global Network Airlines*
(Year Ended September 2002 vs. 2000)

Category	Reduction	Change
Operating Expenses	$4.5 billion	(5%)
Capital Spending	$5.6 billion	(47%)
Capacity	100.1 billion ASMs	(13%)
Mainline Fleet	240 aircraft	(7%)
Headcount	70,112 employees	(16%)
Other	Closure of numerous city ticket offices, maintenance facilities, and reservations centers; reduction in inflight services, fuel consumption, commission rates; etc.	

* SEC filings of American, Continental, Delta, Northwest, United, and US Airways

The Government Responds

ATSSSA provided an infusion of $5 billion in recognition of the effects of the system shutdown and its longer-term impact

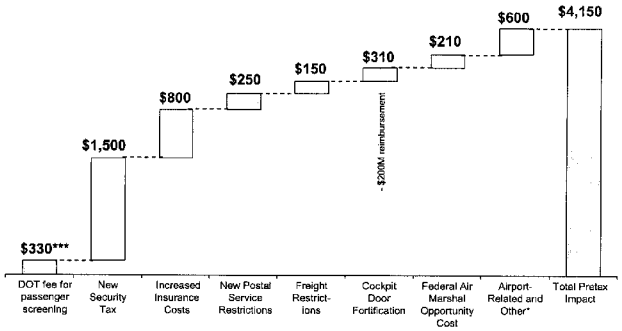
The federal government moved rapidly, post-9/11, to respond to the threat of attacks on the United States by aviation terrorists and the risk of immediate airline industry bankruptcy. The Air Transportation Safety and System Stabilization Act (ATSSSA) of September 22, 2001, provided an industry "life-saving" infusion of $5 billion in recognition of the effects of the system shutdown and its longer-term impact. In addition, $10 billion in possible loan guarantees were made available to qualified applicants. Notwithstanding the beneficial effect of the stabilization payments, which were subject to taxation, the resulting 2001 net loss to the industry exceeded $7.7 billion. (Originally, pre-9/11, this loss was projected at $3.5 billion; without the stabilization offset it likely would have topped $12 billion.)

Subsequently, with the enactment of the Aviation and Transportation Security Act (November 16, 2001), the Transportation Security Administration (TSA) was established and, with it, a new era of aviation security. Working with the industry, TSA has established vastly different and improved security processes and procedures. With well-intentioned and very valuable government action, of course, other results have followed. The following chart demonstrates the estimated incremental pre-tax costs to the airlines of post-9/11 government policy decisions. These costs include both the direct, out-of-pocket costs for new unfunded security mandates imposed on the airlines or billed to the airlines through the airports, lost revenues resulting from security policies, and payments made directly to the federal government by the airlines and their customers. As a result of competitive forces at work in the industry, the absence of industry pricing power results in government imposed taxes and fees directly reducing industry revenue on virtually a dollar-for-dollar basis.

Chart 10

Financial Impact of Post-9/11 Policies
Estimated Incremental Industry Pretax Costs ($ Millions), 2002 **

Post-9/11 taxes, fees and unfunded mandates have added more than $4 billion to the industry's annual burden



* Includes ramp security, aircraft inspections, checkpoint document verification, queue management, exit lane monitors, screening of catering supplies and materials, airport space occupied by TSA, security equipment, training, fingerprinting, background checks, employee ID badge program, increased airport rents and landing fees, and airport capital modifications.

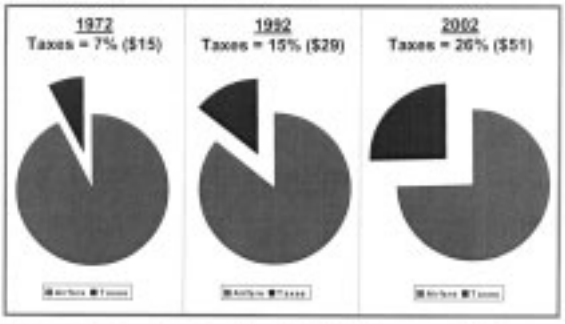
** All numbers extrapolated from estimates developed by Alaska, America West, American, American Eagle, American Trans Air, Atlantic Southeast, Comair, Continental, Delta, Express Jet, Horizon, JetBlue, Midwest, Northwest, Southwest, United, United Express, US Airways.

*** Approximated according to TSA reports.

Chart 10 is also helpful in understanding the magnitude of the problem confronting the airline industry. Despite the airlines' massive self-help measures undertaken in response to the 9/11 crisis, the inexorable growth of other expenses–beyond the control of the industry to manage and resulting in substantial measure from government action–has significantly contributed to the deepening economic meltdown of the industry. Post-9/11 taxes, fees and unfunded mandates have added more than $4 billion to the industry's annual burden.

Chart 11

Taxes and Fees on a $200 Roundtrip Ticket
(Single-Connection With Maximum PFC)



The 76 percent increase in industry taxation between 1992 and 2002 must be a cause for alarm

On the related point of tax policy, Charts 11 and 12 demonstrate both the impact of government tax policies on the airlines, and draw attention to the implications of high rates of taxation on a fragile industry. The 76 percent increase in industry taxation between 1992 and 2002 must be a cause for alarm. The risk that these tax rates, combined with the impact of security policies, have overwhelmed the fragile economic balance that has been maintained by the airline industry in the past is very real.

Table E

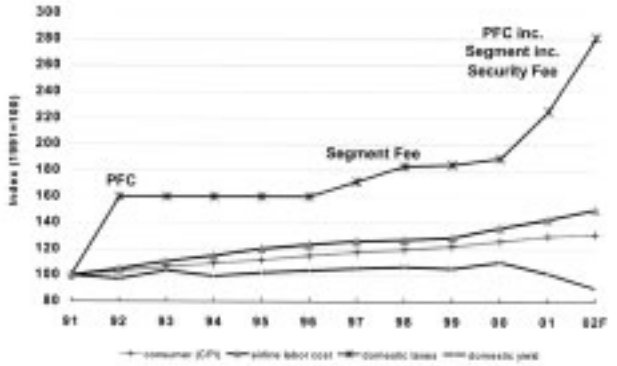
Federal Aviation Taxes and Fees

Tax/Fee	1972	1992	2003	R/T***
Passenger Ticket Tax*	8.0%	10.0%	7.5%	ead
Passenger Flight Segment Tax*	-	-	$3.00	$12.00
Passenger Security Surcharge	-	-	$2.50	$10.00**
Passenger Facility Charge	-	$3.00**	$4.50**	$18.00**
International Departure Tax	$3.00	$6.00	$13.40	ead
International Arrival Tax	-	-	$13.40	ead
INS User Fee	-	$5.00	$7.00	ead
Customs User Fee	-	$5.00	$5.00	ead
APHIS Passenger Fee	-	$2.00	$3.10	ead
Cargo Waybill Tax*	5.00%	6.25%	6.25%	ead
Frequent Flyer Tax	-	-	7.5%	ead
APHIS Aircraft Fee	-	$76.75	$85.25	ead
Jet Fuel Tax*	-	-	4.3¢/gal	ead
LUST Fuel Tax*	-	0.1¢/gal	0.1¢/gal	ead
Air Carrier Security Fee	-	-	TBD	ead

* Tax applies only to domestic transportation; prorated on flights between mainland U.S. and Alaska/Hawaii
**Legislative maximum
***Single-connection roundtrip with $4.50 PFC

Chart 12

Aviation Taxes Have Outpaced Inflation and Airfares



The Role of Insurance

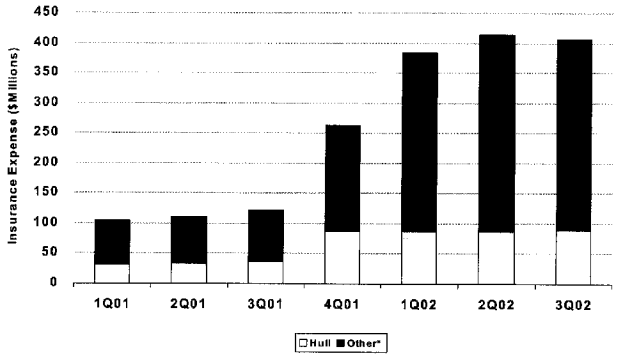
Following the 9/11 terrorist attack, overall liability insurance costs for U.S. airlines more than tripled. War-risk insurance, which had been provided at no cost or for only one or two cents per passenger, became prohibitively expensive. After 9/11, insurers, not sure of the actual risks, priced war-risk insurance at rates that airlines could not afford. (For example, one insurer offered war-risk insurance for $2.25 per passenger, which would have cost the U.S. airline industry nearly $1.4 billion annually.)

The FAA in late September 2001 responded to the turmoil in the insurance markets by providing third-party war-risk insurance to U.S. airlines. Recognizing that the markets still were not offering war-risk insurance on reasonable terms, Congress last fall in the Homeland Security Act instructed the FAA to expand, at least through August 31, 2003, its war-risk policies to include coverage for passengers, crew and hulls (aircraft). This coverage is costly–roughly $140 million annually for the U.S. airline industry–but it is far more economical than obtaining coverage commercially.

As a further recognition of the adverse circumstances and the terrorist threat against the industry, the Act reinstated the $100 million act-of-terrorism liability cap that first had been enacted in the Air Transportation Safety and System Stabilization Act of 2001.

Chart 13

Airline Insurance Costs: 2001-02



* Passenger, cargo and corporate liability

The Role of Fuel

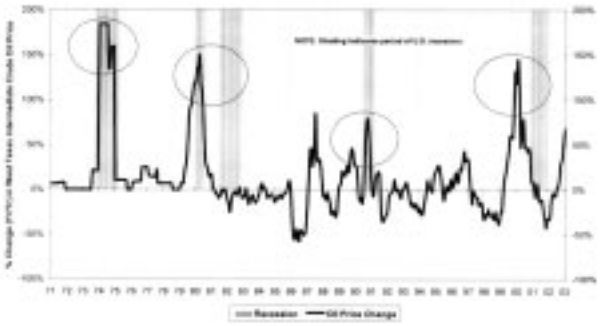
Every one-cent increase in the cost of a gallon of jet fuel costs the industry $180 million per year

Fuel constitutes the industry's second-largest operating expense. During times of relatively moderate fuel prices, these costs average 10 to 12 percent of industry expenses. Currently, these costs are pushing 15 percent–and with every one-cent increase in the cost of a gallon of jet fuel costing the industry $180 million per year, the exposure of the industry to price escalation is severe.

Beyond its direct impact, another aspect of an energy price increase is the relationship between energy, the economy and air travel. The link between energy prices and the health of the economy is clear. The major recessions of the past 30 years can, in large measure, be attributed to the steep increase in energy prices. The airline industry is inextricably tied to the overall economy–even minor recessions result in reduced demand and increased sensitivity to prices for leisure as well as business travelers.

Chart 14

Oil Shocks Trigger Recessions



Past fuel spikes and attendant recessions have brought about widespread hardship in the airline industry. Airline profitability suffers as a direct consequence of a weakening economy.

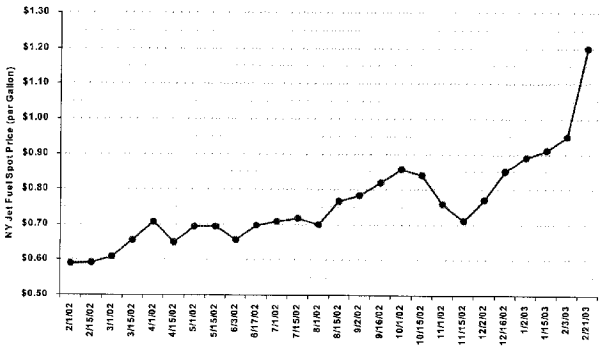
The airlines are doing everything they can to conserve fuel. Throughout the history of commercial aviation, airlines have insisted upon the most fuel-efficient aircraft possible and have worked with airframe and engine manufacturers to reduce fuel consumption. Today's fleet is nearly three times more fuel-efficient than the fleet we were operating at the time of the first OPEC fuel crisis. In fact, our conservation efforts have resulted in a fuel consumption rate of almost 40 passenger miles per gallon in today's aircraft--a rate that compares favorably with the most fuel-efficient automobiles.

Unfortunately, once again, the bottom-line is a massive increase in industry losses. During the first 11 months of 2002, spot prices for jet fuel rose 27 percent. Just since last December, spot prices have risen an additional 55 percent.

By the end of February 2003, spot prices had reached $1.20 per gallon, a 108 percent jump from February 2002.

Chart 15

Market Price of Jet Fuel



While carriers have employed various hedging strategies to deal with the situation, the additional impact on the industry of Jet A prices remaining at current levels for just two quarters would be on the order of $3.6 billion.

The Perfect Storm

Between customer avoidance of air travel, government tax and security policies, insurance, escalating fuel prices and the general state of the United States and world economies–and despite massive and ongoing industry self-help efforts eliminating billions in expenses–industry losses continue to accumulate. The 2001 loss of $7.7 billion (which reflected the stabilization payments) was exceeded by the 2002 reported loss of more than $10 billion.

Table F

Changes Since 9/11 for Airlines With More Than $100M Revenue

	2000	2001	2002 prelim	2002 Changes vs. 2000
Net Profits/(Losses)	$2.6B	$(7.7)B	$(9.5)B	$(12.1)B
Traffic (RPM)	690.9B	649.0B	634.3B	-8.2%
Passengers	663.3M	618.8M	601.4M	-9.3%
Daily Flights	25,200	24,400	23,100	-8.3%
Employment	659,600	655,400	584,700	-74,900
Fuel Cost (per gallon)	78.9¢	78.6¢	71.5¢	-9.4%
Airfares	$135.60	$124.60	$114.70	-15.4%
Load Factor	72.4%	70.0%	72.1%	-0.3 pts
Breakeven Load Factor	70.4%	76.7%	81.4%	+11.0 pts

Notes:

1. This data is for the Major and National airlines. This DOT category includes all airlines with more than $100 million in operating revenues.

2. Self-help measures are clearly visible in the reduction in the number of flights, and the reduction in employment. These two categories afford the greatest possibility for management to lower expenses. Of course, many other steps have been taken as well.

Despite massive and ongoing industry self-help efforts eliminating billions in expenses, industry losses continue to accumulate

3. Airlines have sharply lowered prices in order to attract as many travelers and shippers as possible. Demand for travel is elastic. That is, by lowering prices, volume will be stimulated and revenue will rise. However, demand for business travel is less price elastic than leisure travel. That is, when business travel prices are reduced, volume may not increase commensurately. With the slumping economy, business travelers have benefited from lower price levels, but business travel volume is still well below 2000 levels.

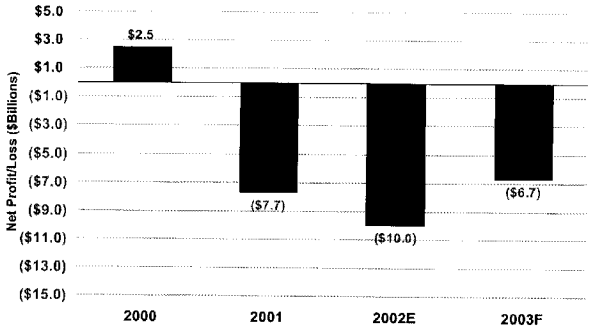
4. The employment reductions reflect average annual values. When calculated from peak employment to trough, the reductions are even greater.

5. The sharp rise in the breakeven load factor is driven by two factors -- lower prices and higher costs. When prices go down, more seats must be filled to generate breakeven revenues. When costs rise, more seats must be filled to cover those higher costs.

For 2003, "base case" estimated losses (premised upon first-quarter performance and projected fuel costs) will exceed $6.7 billion. Should current estimates prove valid (which as noted below is unlikely in the event of an active war in Iraq) the industry will stand to have lost, at a minimum, almost $25 billion from 2001 through 2003. Depending upon the course of a war, these losses could worsen significantly.

Chart 16

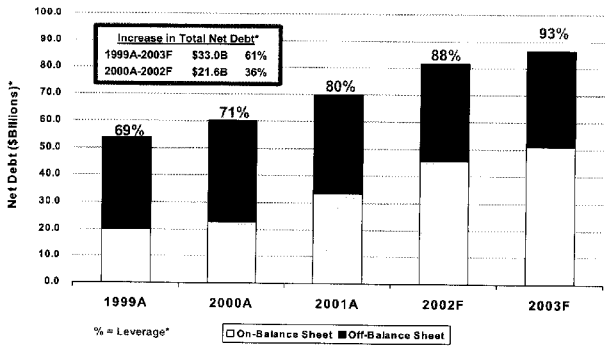
Airline Industry Net Income/(Losses)



In order to remain in business and continue to provide essential transportation, the airlines have assumed massive debt burdens to cover their losses. The industry is now carrying over $100 billion in debt. The 11 largest passenger carriers alone are 90 percent leveraged, with debt approaching $90 billion. At the same time their credit ratings have declined–with debt of nine of the nation's 10 major airlines rated "junk."

Chart 17

Airline Industry Leverage*



* Net Debt = LTD + STD + Capitalized Operating Leases – Cash and Short-Term Equivalents as of December 31; Leverage = Net Debt / Total Capital

Source: Salomon Smith Barney estimates for AirTran, Alaska, American, America West, ATA, Continental, Delta, Northwest, Southwest, United, US Airways

Table G

Airline Credit Ratings – Standard & Poor's

	9/10/01	3/5/03	Change
Southwest	A	A	—
Alaska	BB +	BB	(1)
Delta	BBB-	BB	(2)
Northwest	BB	BB-	(1)
Continental	BB	B+	(2)
AirTran	B	B-	(1)
America West	B+	B-	(2)
American Trans Air	B+	B-	(2)
American	BBB-	B-	(6)
US Airways	B	D	(8)
United	BB+	D	(9)

Stock prices have plummeted as well. By the end of February 2003, the outstanding stock value of the entire network-carrier industry had plummeted to only $3.2 billion. The industry is financially depleted and "going down for the last count." It does so at grave risk to our broad, national, transportation-dependent economy.

Section III

Aviation's Critical Role in the U.S. Economy

The importance of civil aviation to the economy, to the nation, and to the quality of life of Americans was made readily apparent by the terrible events of September 11, 2001. Layoffs and financial losses in civil aviation, its supplier industries, the tourism industry and the broader economy rose sharply.

For every job in the airline industry, 15 jobs are produced in the broader economy

According to the authoritative 2002 *National Economic Impact of Civil Aviation* study conducted by DRI–WEFA, Inc. and the Campbell-Hill Aviation Group, Inc., the total 2000 impact of the commercial aviation sector in the United States exceeded $800 billion (8 percent) in GDP and 10 million jobs.

More fundamentally, air transportation powers our national economy–it links our communities together; it delivers vital, high-value goods; it produces jobs across the spectrum including our largest sector of employment, travel and tourism; and it drives just-in-time delivery vital to our productivity. There is quite literally no aspect of life in the United States that does not benefit from aviation.

When aviation experiences economic difficulties, those difficulties reverberate across the economy. For every job in the airline industry, an estimated 15 jobs are produced in the broader economy. It is not surprising, therefore, to learn that in the travel and tourism sector of the economy alone, more than 460,000 jobs have ceased to exist in our post-9/11 economy. With nearly 100,000 of those jobs coming directly from the airlines, the ripples grow. Job losses for aerospace workers are obvious–less so are the jobs lost in every other sector that depend upon those nearly half-million lost jobs.

Table H

Employment Impact of Civil Aviation by Sector, 2000
(000s of Jobs)

	Direct	Indirect	Induced	Total	Percent
Retail Employment	1,022	586	669	2,277	20%
Transportation	1,381	610	131	2,122	19%
Other Manufacturing	0	310	926	1,235	11%
Mining and Construction	393	117	218	728	6%
Wholesale Employment	0	490	182	672	6%
Transportation Equipment	380	65	122	567	5%
Finance, Insurance and Real Estate	0	184	213	397	4%
Public Utilities and Communications	0	61	167	228	2%
Other	1,059	787	1,175	3,022	27%
Total	4,234	3,212	3,802	11,248	100%
Percent of Total	38%	29%	34%	100%	

Source: DRI-WEFA, Inc.

As discussed later, the prospect for the loss of an additional 100,000 airline jobs is very real. With such a loss, some 3,800 daily flights would be eliminated. With that action, mid- and small-size communities would suffer significant service reductions, including the likely elimination of air service to many smaller communities.

Civil aviation touches nearly every aspect of our lives, and its success will, to a great degree, shape American society and the U.S. economy in the coming decades

Civil aviation has become an integral part of the U.S. economy. It is a key catalyst for economic growth and has a profound influence on the quality of life around the globe. It integrates the world economy and promotes the international exchange of people, products, investments and ideas. Indeed, to a very large extent, civil aviation has enabled small community and rural populations to enter the mainstream of global commerce by linking such communities with worldwide population, manufacturing and cultural centers. Fundamentally, civil aviation touches nearly every aspect of our lives, and its success will, to a great degree, shape American society and the U.S. economy in the coming decades.

The United States possesses the largest, most extensive aviation system in the world with more than 18,000 landing facilities, ranging from large commercial airports serving millions of passengers annually to small grass strips accommodating only a few aircraft each year. Of the nation's more than 500 commercial service airports, over 400 enplane more than 10,000 passengers annually and are classified as primary airports. Of these, 50 are responsible for 70 percent of commercial traffic. The FAA records some 7,000 aircraft owned by commercial air carriers, of which over 6,000 are large aircraft, defined as having a seating capacity of more than 30 seats or a maximum payload capacity of more than 7,500 pounds carrying passengers or cargo for hire or compensation.

In 2000, U.S. airlines carried 666 million passengers and registered 24 billion ton miles of cargo on nine million scheduled departures. U.S. airlines also carried 11 million passengers and over six billion ton miles of cargo on 400,000 non-scheduled departures.

Economic deregulation of airlines in the late 1970s stimulated competition from both existing firms and new entrants. Intensified competition spurred innovations in marketing, operations, technology, and governance that enabled firms to become more efficient, improve service quality, introduce new services, and become more responsive to consumers' preferences. Air travelers enjoyed a 38 percent decline in real average fares through 2000 and 79 percent greater service (as measured by departures), concurrent with an increase in revenue passenger miles of 200 percent. Fares fell rapidly and personal travel by air became the norm after deregulation. Airlines accelerated development of network route structures to increase flight frequency and to broaden the scope of services to include many previously unserved or underserved small and medium markets, while taking advantage of the efficiencies of the hub-and-spoke system.

With deregulation, air cargo networks were able to facilitate just-in-time shipping, providing expanded services at lower costs. Optimization of just-in-time shipping allows short production and development cycle times and eliminates excessive inventory in the logistics chain regardless of facility location. Without the availability of ubiquitous, reliable, efficient air express service, U.S. businesses would be unable to realize the competitive economies of just-in-time production. Air transportation offers many cost advantages–lower lead times, quicker customer response times, improved flexibility, and reduced inventory. Many high-tech, high-value industries have embraced air transport for its time and cost advantages in manufacturing and distribution, and because it improves delivery reliability by providing time-definite guarantees.

Section IV

War With Iraq

The anticipated impacts on the airline industry of a war with Iraq raise the risk of an economic catastrophe to crisis levels. Nationalization of the industry as a result of wholesale airline bankruptcies is conceivable.

The grave condition of the industry entering into the war, as outlined in Section II, is already being worsened by reductions in travel brought on by public concerns–avoiding international travel, not wanting to be away from home in the event of hostilities, fear from terrorist reprisal attacks–all are combining to dampen demand below its already weak levels.

In an effort to quantify the likely impact of war on the airline industry, the following scenarios put forward four "case studies" of the prospects. The studies, which range from the Base Case/No War scenario through the full first Gulf War experience combined with a major terrorist incident (with an impact similar to the 9/11 attack), provide what is believed to be a conservative and reasonable picture of likely outcomes. Each case is based upon all fighting occurring during the second quarter of 2003. To the degree possible, actual advance booking data were incorporated into this analysis. In each scenario, carrier loss mitigation actions (further drastic cuts in capacity and staff) are factored into the calculation.

Bankruptcy is certain for multiple airlines at the loss levels estimated in the most likely war scenario

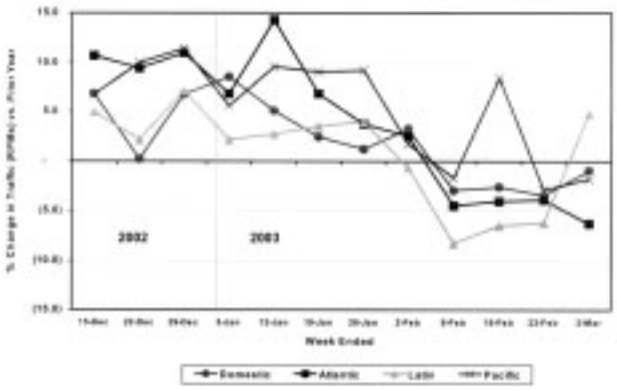
The data, which follow, along with the operative assumptions, set forth a bleak picture with best-case 2003 losses to the industry in the $6.7 billion range without any Iraq War. This estimate is based upon actual first-quarter 2003 operating data. Earlier estimates, projecting a $5 billion to $6 billion loss, have already been proven overly optimistic.

Moving up the scale, and primarily for comparison purposes, a scenario equivalent to the first Gulf War–which is believed highly unlikely since fares actually rose in that period–would result in a $7.6 billion loss.

The most likely war scenario produces industry losses $4 billion higher than the base case, for total losses of $10.7 billion. This analysis projects a 15 percent traffic decline during one quarter of "active" war activity. This is based upon actual carrier advance booking information, which declined internationally by more than 20 percent following the recent Code Orange security alert. Advance booking data are corroborated by weekly traffic data collected by ATA. Since mid-December, year-over-year traffic growth rates have fallen sharply in every geographic entity served by U.S. airlines, with the biggest declines in the Atlantic. Based upon historic patterns from traffic declines and the slow rate of returning traffic under this scenario, the last quarter of 2003 could see traffic levels no higher than those experienced in 1997. At these loss levels, sequential airline bankruptcies are inevitable.

Chart 18

Industry Traffic Growth Rates Plummeting as Anticipated War Approaches



Source: America West, American, Continental, Delta, Northwest, United, US Airways

Finally, a conservative worse-case scenario projects losses of $15 billion based upon a Gulf War-type experience combined with a terrorist attack of 9/11 magnitude. While current conditions mean airlines must fill 80 percent of seats to break even–an unprecedented annual requirement–such an eventuality would raise the bar to 92 percent. Under this $15 billion loss case, a total industry collapse is virtually certain.

Iraq War Scenarios

Table I

Anticipated War Losses
(2003 scenarios compared with 2002 base)

2003 Scenarios	Base Case - No War	Gulf War Equivalent	Most Likely	Gulf War Equivalent Plus Terrorism
Net Profits/(Losses)	$(6.7)B	$(7.6)B	$(10.7)B	$(13.0)B
Traffic	+5%	-3%	-8%	-12%
Passengers	+28M	-18M	-52M	-75M
Daily Flights	+500	-700	-2,200	-3,800
Employment	+11,000	-31,000	-70,000	-98,000
Fuel Cost (per gallon)	83¢	78¢	93¢	110¢
Airfares	+0.2%	--	-4%	-9%
Load Factor	73%	72%	73%	75%
Breakeven Load Factor	80%	80%	85%	92%

Assumptions:

1. In all cases, the war is expected to last for one quarter (90 days). Obviously, the impacts would be magnified if the war were to last longer.

2. The Base Case assumes there is no war and shows how the airline recovery might continue after two years of losses following the 9/11 terrorist attacks. It assumes a growing economy, which would be the principal driver for increased traffic levels.

3. The Gulf War Equivalent scenario is based on domestic traffic falling 5 percent while international traffic falls 15 percent. The overall traffic decline would be 7.8 percent and recovery to pre-war levels would take about six months. Fuel prices would fall sharply following a quarter in which they have spiked higher. Airfares are assumed to rise by 3 percent during the war but fall slightly during the recovery.

4. The Most Likely scenario is based on information from airlines on advance bookings for March and April compiled specifically for this report. These advanced bookings suggest that traffic will fall more sharply than during the Gulf War I. Further, the Most Likely scenario assumes that an Iraqi war on top of the already depleted crude oil inventories will continue to see high but modestly declining crude prices. As after the 9/11 terrorist attacks, airlines are expected to try to attract travelers with lower prices.

5. The Gulf War Equivalent scenario coupled with a terrorist attack within the U.S. is expected to bring even more difficult circumstances. During the 1991 Gulf War, airline traffic across the Atlantic initially declined by 43 percent. In this case international traffic is assumed to decline by that amount for a full quarter and domestic traffic is assumed to fall by 25 percent. Crude prices are projected to increase sharply in this case.

BASE CASE ASSUMPTIONS

Net Losses	After recording losses totaling nearly $10 billion in 2002, the industry is able to make some progress in reducing losses in 2003 to $6.7 billion.
Traffic	With a growing economy, airline traffic shows continued improvement with a 5 percent growth rate but still does not return to 2000 levels.
Passengers	The number of passengers grows by 28 million or about 76,000 per day.
Daily Flights	To accommodate the growing number of passengers, airlines add about 500 daily flights.
Employment	To handle the increased flow of passengers and freight, airlines add about 11,000 employees–about 2 percent. The increase in employment is less than the increase in the number of passengers because of increasing productivity of the workforce.
Fuel Cost	Current fuel prices are running at over 100 cents per gallon. With the Venezuelan strike behind us, energy costs are expected to moderate.
Prices	Fares are currently running at 1988 levels, without adjustment for inflation. Prices have been very weak because of the slack demand for air travel. With increasing demand in 2003, airlines may be able to put in place a modest 3 percent fare increase.
Load Factor	The percentage of seats filled is expected to reach a record high of 73 percent as carriers add capacity more slowly than the increase in passenger and cargo demand.
Breakeven Load Factor	Although the industry is expected to reach a record load factor in 2003, prices remain very low and costs very high, so that the breakeven load factor remains seven points above the actual load factor. A price increase would reduce the number of seats needed to be filled to break even, and decreases in costs–especially labor and fuel–would reduce the breakeven load factor.

GULF WAR EQUIVALENT SCENARIO

Net Losses Losses would grow to $7.6 billion principally because of the decline in the number of passengers.

Traffic When fighting began in the Gulf in 1991, traffic declined by 8 percent and took about a half-year to recover to pre-war levels. For the full year, 1991 traffic declined by 2 percent. This scenario assumes the same quarterly 8 percent decline in traffic and assumes that by the fourth quarter, traffic will be back to fourth quarter 2002 levels. It should be noted that fourth quarter 2002 traffic was still 8 percent below the fourth quarter of 2000.

Passengers An eight percent decline in passenger traffic equates to 13 million fewer passengers in the quarter. For the full year, a 3 percent decline in the number of passengers equates to 18 million less than in 2002.

Daily Flights During the Gulf War, flights were not reduced in proportion with the decline in passengers, and load factors fell. This scenario assumes a slightly greater reduction in flights, with a proportionately greater reduction in fuel and labor costs.

Employment Net employment for the year will average 31,000 fewer than in 2002.

Fuel Cost During the Gulf War, fuel prices declined from the highs established in the preceding quarter when Iraq had invaded Kuwait. This scenario also assumes a sharp decline in jet fuel prices from the preceding quarter. With the cut in the number of flights, fuel consumption is expected to be reduced by over 500 million gallons. At the assumed price of 78 cents per gallon, airlines would save nearly $400 million.

Prices During the Gulf War, airfares increased. We have assumed that same increase in this scenario. *However*, it seems unlikely that airlines (who were unable to raise prices in 2002 because of weak demand) would be able to raise prices in the face of weaker demand. Nonetheless, to closely replicate the experiences of the Gulf War, a 3 percent increase is assumed for the period of the war followed by a 1.4 percent quarterly (year-over-year) decline and a 0.4 percent increase. These price moves are identical to the price changes of the Gulf War. A more likely outcome is that airlines would continue to lower prices and losses would widen.

Load Factor With flights and capacity cut, load factor is assumed to remain close to the near record levels of 2002. If flights and capacity were cut less aggressively (as in the Gulf War) load factors would be lower and losses would widen.

Breakeven Load Factor The breakeven load factor is driven higher principally by higher unit costs. Although airlines will cut employment and fuel consumption, average compensation per employee is expected to rise slightly. Laid off employees come from the low end of the seniority lists. The remaining employees tend to be more highly compensated because they are more senior. Unit fuel costs (price per gallon) are assumed to be seven cents per gallon higher than in 2002. Over the last 10 years the average price per gallon of jet fuel has been 63 cents. The last three years have seen jet fuel prices of 79, 79 and 72 cents. These fuel costs that have been far above the long-term average price are a big part of the losses experienced by the airlines.

MOST LIKELY IRAQI WAR SCENARIO

Net Losses Net losses would be expected to increase by $4 billion over the base case (no war) scenario. These losses would be principally driven by the decline in traffic coupled with a decline in price and an increase in the price of fuel.

Traffic Based on advanced booking information supplied by ATA member airlines, traffic is expected to decline more sharply than in Gulf War I. Carriers have indicated that following the move to Code Orange security level, international advance bookings declined by more than 20 percent. In this case, we have assumed a 15 percent decline in the quarter in which fighting occurs followed by quarterly declines of 10 and 7 percent. By the fourth quarter of 2003, traffic levels would be expected to be at levels that are similar to 1997. These low traffic levels would be the combined result of having not yet recovered from the 9/11 terrorist attacks and the added impact of a second Gulf War. It would then take several years of steady growth to return to 2000 traffic levels.

Passengers These lower traffic levels equate to 52 million fewer passengers carried in 2003–an 8.6 percent reduction compared to 2002 and 17 percent below record 2000 levels.

Daily Flights Carriers are expected to react aggressively to the decline in traffic by cutting service equally sharply. Flights are expected to be reduced by 2,200 per day–a 9.5 percent cut for the full year.

Employment Unfortunately, employees bear the brunt of self-help measures undertaken by airlines. The workforce is expected to be reduced by 70,000 in this case.

Fuel Cost Fuel costs are expected to rise. Crude oil inventories have been reduced to very low levels by the Venezuelan strike, making the nation more vulnerable to supply disruptions from the Middle East. Even though the Venezuelan situation seems to be resolving, crude prices and jet fuel prices are continuing to rise.

Prices Airlines will struggle to regain their lost customers by further lowering prices. This was the pattern followed after the 9/11 terrorist attacks. ATA expects that airlines will continue to cut prices in order to stimulate demand. In this most likely scenario, we expect prices to fall about four percent compared to the eight percent declines in 2001 and 2002 triggered by the 9/11 attacks.

Load Factor With aggressive capacity cuts and their attendant cost reductions, airline load factors are expected to reach record levels.

Breakeven Load Factor Even with many cost cutting measures in place, the breakeven load factor is expected to increase to an extremely high 85 percent.

GULF WAR EQUIVALENT PLUS TERRORISM SCENARIO

Net Losses Although many people are working hard to avoid this scenario, it must be assigned a relatively high probability. If a terrorist attack occurs in the U.S., passenger volumes would be sharply reduced and losses would be unbearable. ATA believes that losses could amount to $13 billion and would threaten the continued viability of the industry.

Traffic Another terrorist attack would send traffic plummeting. During Gulf War I *and* following the 9/11 terrorist attacks, Atlantic traffic initially declined by 43 percent. In this scenario all international traffic is assumed to decline by that amount for a full quarter and domestic traffic is assumed to fall by 25 percent. For the full year, traffic could fall by 12 percent, bringing the industry back to 1995-1996 traffic levels. It would take years to recover.

Passengers Passenger enplanements would drop by 75 million. Considering the No War scenario, this represents a passenger decline of more than 100 million from those expected levels.

Daily Flights Airlines would react aggressively to cut their costs. Airline flights would be reduced by some 3,800 daily flights. Service to many small- and medium-sized communities would be eliminated.

Employment Employment levels would be cut by nearly 100,000 employees, bringing the total reduction in force from 2000 to 2003 to nearly 175,000 or more than 25 percent of the workforce.

Fuel Cost Fuel costs are currently as high as the spike that preceded Gulf War I. In this scenario we have assumed that they remain at those very high levels through the war and decline slowly during the following quarters.

Prices Lower prices are expected to recoup lost traffic. In this scenario price reductions are assumed to be about the same as those that followed the 9/11 terrorist attacks.

Load Factor With even more aggressive capacity cuts, load factors are assumed to increase to record levels–reaching 75 percent.

Breakeven Load Factor Although airlines will aggressively cut costs, breakeven load factors are expected to rise to impossibly high levels–reaching 92 percent for the year.

Section V

Conclusion

A key pillar of our nation's economy–our airline system–is suffering from extraordinary adversity brought about by the 9/11 terrorist attacks on America. The forces at work are well beyond "normal" market fluctuations and reflect the stated goal of the terrorists to bring down the United States by attacking its key institutions.

Over the past eighteen months, both the United States government and the airline industry have taken decisive steps to defend and stabilize this critical economic engine. While the steps have been difficult, painful and expensive, they have been essential. For the airlines, massive job losses, massive new costs, and radical airline capacity cuts, among the other measures outlined in this report, have been undertaken to try to keep the airlines flying. The government has been equally aggressive in establishing new security processes and procedures.

As our long national fight against terrorism continues, however, still greater "non-market" adversity is on the horizon for the airline industry. The mere prospect of war with Iraq has already further weakened this industry, which is literally struggling to survive. As the prospects for war mount, and its likely scenarios are projected, it becomes starkly clear that wholesale bankruptcies in the airline industry, major airline liquidations and even the forced nationalization of our airline system are the risks we confront.

There remains a short window of opportunity if we are to avoid this likely outcome. The government can and should act with dispatch to reduce the burdens currently imposed on the airline industry. While the airlines must be expected to deal with normal forces in a free market, the government must recognize and respond to the extraordinary, non-market forces that have produced the crisis in the industry.

The time for decisive government action to maintain this essential key to our economic success is now.

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Washington, DC 20004-1707
USA
202-626-4000

www.airlines.org


Aerospace Industry Sales
Billions of Current Dollars
175
150
125
100
75
50
25
0
$153.7
$144.7
$153.1
$148.2
$138.444.4
$52.9
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$25.5
$24.7
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1999
2000
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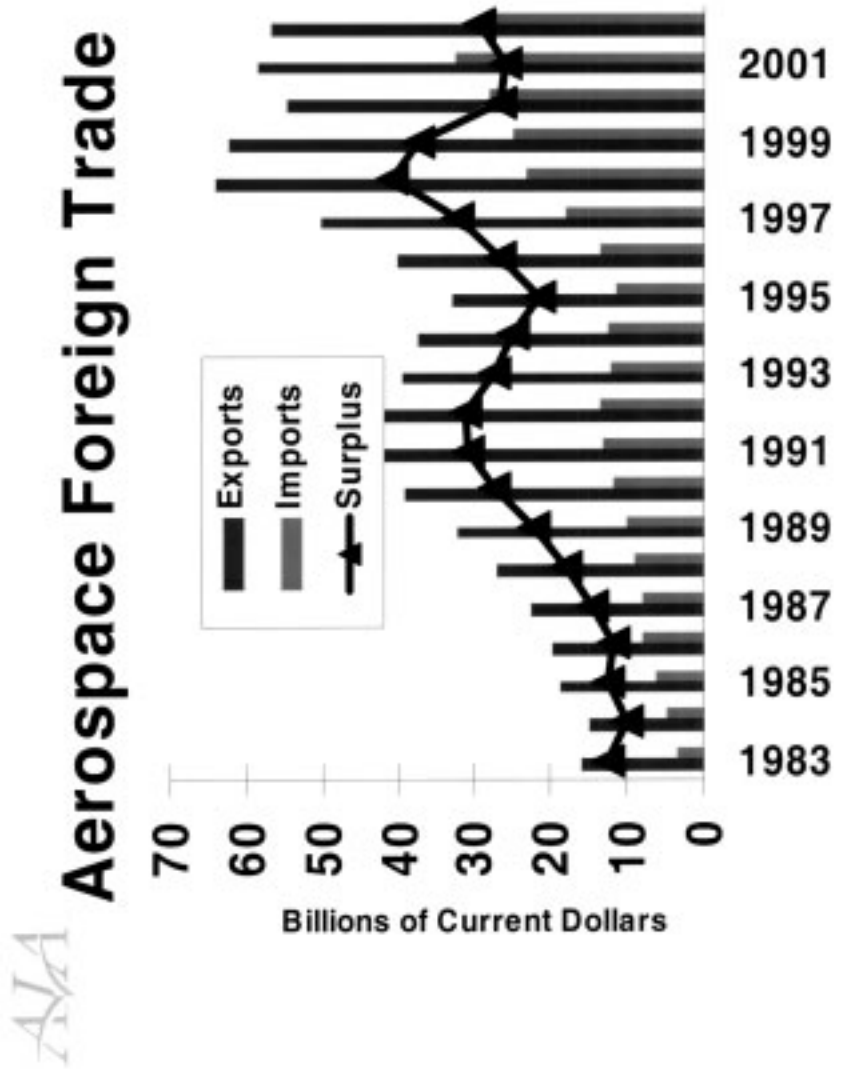
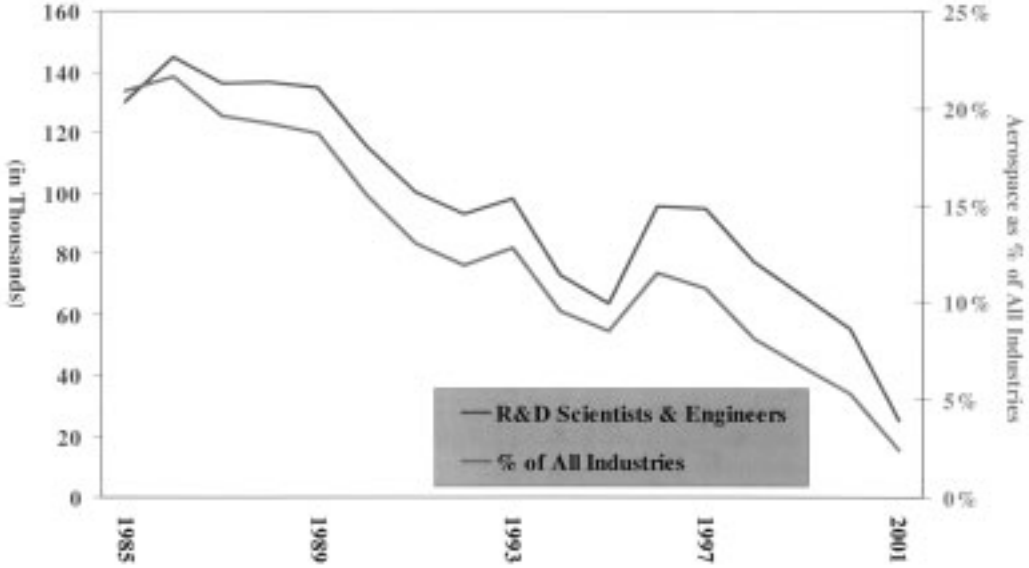
2002p
2003e
Civil Aircraft
Related Products
Military Aircraft
Space
Missiles


Aerospace Foreign Trade
Exports
Imports
Surplus
2001
1999
1997
1995
1993
1991
1989
1987
1985
1983
70
60
50
40
30
20
10
0
Billions of Current Dollars

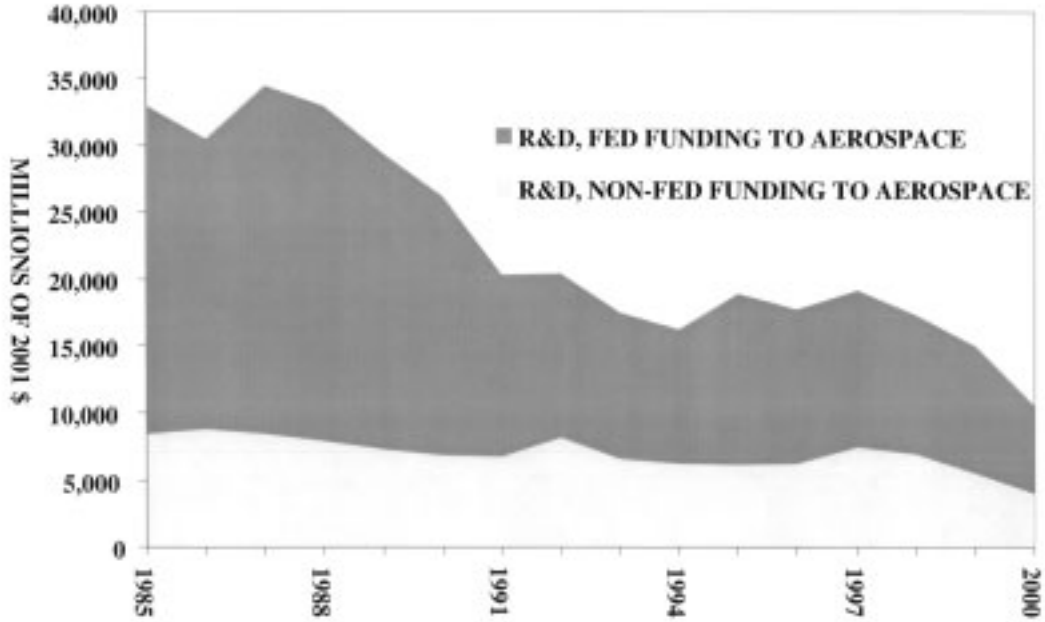
R&D Scientists & Engineers Employment in Space and as % of All Industries

The aerospace industry has gone from a peak of 144,800 aerospace scientists and engineers in 1986 to fewer than 25,100 in 2001.



U.S. Aerospace R&D Funding

Federal research and development investment in the aerospace industry dropped 75% from 1987 to 2000 after adjusting for inflation.



Mr. DOUGLASS. The second part of this second point is that the commercial space market has almost ceased to exist. Several years ago, a panel not unlike the Commission that the three of us are on, looked forward to the first decade of this century and estimated that we would see about 70 commercial launches a year. Last year, there were two, sir. And so that part of the market has almost collapsed, meaning that the military market for space is taking up the whole load of our national commitment to space.

Next, the manufacturing base is contracting at an alarming rate because of these events in commercial aviation and civil space. Despite the increases that we have seen in our defense program, we have lost 115,000 jobs since September the 11th, 2001. That is approximately 15 percent of our workforce. And today, the workforce, which underpins this vital part of our economy and our national security, is at the lowest level that we have ever kept records for. Our records go back to 1953. And just by extrapolating from '53 back and discounting the war years, we think we are at a level approximately of where we were just before World War II broke out, which is the lowest level in well over 50 years in terms of employment.

While all of this is going on, our international competition has made it—this—I am primarily now talking about the European aerospace industry, has set their national goals to supplant us as the world's leader in aerospace.

Now my third point is, I think, the major point that was made by the Commission in its entirety, and that is that we can turn this situation around with a relatively modest investment if we act now. Some of the key parts of the Commission report that I would like to bring to your attention are first that we must act to create an environment where air transportation system is profitable. And we must be mindful of the long-term needs of this sector of our economy. The second one is the one that you introduced in your opening statement, sir, and that is that we have got to renew our aerospace infrastructure. And here, I am talking about our human capital in our facilities. You outlined very eloquently some of the problems in the human capital part of the industry.

Our facilities at NASA today are aging to the point where no one wants to use them anymore. I just happened to be over with the Navy the day before yesterday looking at some of their advanced programs, and they, like industry, are thinking of going to Europe for future wind tunnel testing because of the old nature of NASA facilities.

Sir, we have got to also maintain our ability to use and exploit our position as the world's leader in space technology. If you think about where we are today and you think about the dreams and vision of our leadership a generation ago, we pretty much achieved all of those dreams and visions of a generation ago in regards to what our nation can do in space. The issue for us today is can we maintain that vision and where do we go from here? And as we all know, the recent tragedy with the space shuttle has made this even more complicated and more difficult.

Finally, sir, we must not lose sight of our long-term needs as we solve these current crises. There are huge, long-term structural

needs in modernizing our air traffic control system here in the United States, and we have got to look to those needs.

So I will just close with the good news. And the good news is what my colleague pointed out in his testimony, and that is that much of the technology that we need to solve these problems exists today in our Department of Defense. And hopefully, if we look at using this technology in a crosscutting way in our economy, we can resolve some of these problems without too much of a massive investment in new research.

Thank you for the opportunity to talk, sir.

[The prepared statement of Mr. Douglass follows:]

PREPARED STATEMENT OF JOHN W. DOUGLASS

Introduction

On behalf of the member companies of the Aerospace Industries Association of America, or AIA, I wish to thank Chairman Boehlert, Congressman Hall and the Members of the House Science Committee for the opportunity to testify this afternoon regarding legislative implementation alternatives proposed by the report of *The Commission on the Future of the U.S. Aerospace Industry.* The House Science Committee has worked diligently on issues affecting the vitality of our industry, and AIA is grateful for your efforts. We also appreciate, Mr. Chairman, your early and vocal support for the mandate and the recommendations of the Aerospace Commission.

AIA operates as the Nation's largest trade association representing small, medium and large manufacturers of aerospace products. We currently have approximately 80 regular and 150 associate member companies involved in the design and manufacture of aircraft and spacecraft as well as related systems and subsystems. After discussing some of the key economic and technological indicators of the industry's position today, I will address the Commission's Research and Development (R&D), civil aviation and space recommendations of particular interest to the Committee and then highlight several military programs of importance to the long-term defense of our homeland as well as our allies and interests overseas.

A Snapshot of the Aerospace Industry

A Record of Industrial Innovation

The aerospace sector of our economy, Mr. Chairman, generates economic activity equal to nearly 15 percent of the Nation's Gross Domestic Product and supports approximately 11 million American jobs. Our industry leads the Nation in net exports, posting a $30 billion surplus in 2002. Aerospace workers furthermore represent 4.5 percent of all manufacturing employment, and their productivity generated $148 billion in sales last year. Of this amount, civil aircraft revenue totaled $43.3 billion while military and space-related sales accounted for $80 billion.

Aerospace enterprises contribute directly to the economic and national security of the United States. Civil aviation, for example, enables the movement of people, resources and ideas that anchor jobs at home while expanding our trade and investment opportunities abroad. Cable and wireless technologies pioneered by the military planted the seeds for the Internet and mobile telecommunications. Materials and optical transmission research done by NASA and its contractors have advanced life-saving diagnostic procedures, land management techniques and our understanding of climate change. And in the realm of national defense, Mr. Chairman, precision-guided weapons and real-time reconnaissance systems prepare our dedicated forces to protect the United States from new adversaries who blur the boundaries—and the standards of conduct—between nations.

The Challenges Ahead

Economic, political and demographic developments of the last several years, however, pose immediate challenges to the aerospace industry. Since the end of the Cold War, two recessions, business re-structuring and subsidized foreign competition have caused the U.S. share of the global aerospace market to fall from 72 percent in 1985 to less than 52 percent today. ASIA forecasts that sales of civil aircraft alone will decline by nearly $20 billion between 2001 and the end of this year. Commercial space sales peaked in 1997 at six billion dollars but had fallen to $3.4 billion by the end of 2002. Most dramatically, the aerospace manufacturing segment, with 689,000 employees as of last December, stands at its lowest level since World War

II. Just since the attacks of September 11th, this work force has declined by 13 percent. In answer to the second question of your invitation letter, Mr. Chairman, the near-term decline in aerospace sales and employment have harmed the overseas competitiveness of U.S. producers. The superiority of American satellite, space-based communications, military and civil airframe products, paired with ongoing improvements in worker productivity and manufacturing automation, will aid our companies in the search for stable international markets. But as the Aerospace Commission made clear, prudent investment, regulatory strategic policies on the part of government, which I will discuss beginning in a few minutes, are equally vital to the long-term health of the industry.

I would like to address another question of interest to the Committee concerning the relative impact of economic conditions and evolving business models on aerospace profitability. Market- and merger-driven business model reforms, compounded by changing government funding cycles, have pressured the revenue streams of the industry. DOD's FY04 procurement request, for example, recovers barely more than one-half of the FY85 high point of $142 billion. Corporate mergers and the rise of European state-subsidized consortia have intensified the development of low-cost, highly-automated production lines in the civil transportation segment just during the last seven years. Industry business models, by emphasizing higher productivity per employee, should have a stabilizing effect on cash flow. But long-term profitability depends on the recovery of the civil aviation market and substantial increases in defense procurement. Unfortunately, the pending crisis in Iraq is eroding investment in each of these markets as civil flights continue to decline and the operational needs of our forces shift investment from modernization.

Next to revenue and job losses, the industry faces a significant shortage of younger, technically-skilled professionals. The average age of the aerospace manufacturing employee is now 51; the same number,for engineers rises to 54. In 2008, 27 percent of aerospace workers will become eligible for retirement. Government agencies confront similar demographic trends. NASA's personnel under the age of 30, for instance, are one-third the number over the age of 60. As the workforce ages, technical professionals also migrate to other disciplines. Twenty-four years ago, aerospace companies employed 20 percent of the Nation's R&D scientists and engineers; by 2001, the level had tumbled to 2.4 percent. At the same time, foreign nationals represent 40 percent of the students now earning engineering and science doctoral degrees in the United States. These young people often return to their native countries or cannot qualify for sensitive domestic defense and space jobs.

By acting now, we have the opportunity, Mr. Chairman, to revitalize the markets and human capital of an industry so critical to our freedom, mobility and prosperity. As you and the Committee know, the Aerospace Commission report contains nine overall recommendations for civil aviation, space, military, acquisition, research and workforce reforms. In the following sections of my testimony, I will offer some legislative and policy proposals on aspects of the report that fall under the jurisdiction of the Science Committee. I will then detail a few items from the defense budget to complete the picture of how the aerospace industry makes an integrated contribution to our national security and socio-economic quality of life.

Aerospace Research and Development

The first question of your invitation letter, Mr. Chairman, accurately noted that the Federal Government spends more on aerospace research than any other country. But as your question further anticipated, the Aerospace Commission found that the government should create a systematic framework to support pre-competitive basic aerospace research. This process would embrace the policy of fostering capabilities for industry to apply in advanced air transportation; navigation, surveillance and telecommunications products. Our foreign competitors not only appreciate the value of pre-competitive research, but also focus investment on product development. In a bold 2001 document entitled *A Vision for 2020,* the European Commission (EC) established a multilateral goal for obtaining "global leadership" in civil aviation during the next 17 years. More importantly, the EC has committed $93 billion to its vision, making government entities responsible for the funding of 30 percent of the continent's civil aeronautics R&D. And as you wrote to the Secretary of Transportation on October 1, 2002, Mr. Chairman, the European *Air Traffic Alliance* has started to work on a next-generation Air Traffic Management system scheduled for activation by 2018.

In the United States, however, the tide has moved in the opposite direction. Since 1998, the combined NASA and DOD investment in aeronautics research and technology programs has fallen by one-third. Federal R&D and research infrastructure investments in aerospace dropped 75 percent from 1987 to the year 2000 (after adjusting for inflation). Taking these factors into account, the Aerospace Commission

warned that the Nation could miss several opportunities to incubate "breakthrough capabilities" in high-performance computers; propulsion and energy systems; noise and emissions mitigation; and hydrogen-fueled engines.

The President's FY04 NASA and FAA budget proposals represent a modest start in addressing our federal R&D resource gaps. I respectfully urge the Committee to support NASA's $959 million Aeronautics Technology and the FAA's $100 million Research, Development and Engineering requests. These two programs devote the majority of their funding to civil aircraft safety and structural improvements: As a complement to the President's budget, I also recommend that the Committee pass the Aeronautics Research and Development Revitalization Act of 2003 (H.R. 586), introduced on a bicameral, bipartisan basis by Senators George Allen, Christopher Dodd and Representative John Larson of this distinguished Committee. H.R. 586 gradually increases the NASA and FAA research budgets between now and FY08, with more than 50 percent of the authorized funding reserved for low-noise, low-emissions aircraft and aviation safety programs. The passage of H.R. 586 would signal domestic air travelers and our competitors in Europe that the United States has a vision of reliability for the civil aviation realm to match our global superiority in the military realm. It would also give the FAA more flexibility to adapt military surveillance and communications technologies in upgrading the air traffic control network.

Moreover, the Committee has an opportunity, in cooperation with the Ways & Means panel, to re-visit the issue of the federal R&D tax credit. The current 20 percent credit expires next year. Based on outdated defense spending trends from the 1980s, however, the aerospace industry qualifies only for an "alternative credit" of less than four percent. This inequity has a disproportionate impact on companies that invest in high-risk R&D to validate many of the aeronautics capabilities that I mentioned a few moments ago. Furthermore, a recent study by the General Accounting Office found that the R&D tax credit generated one-third of real economic growth in the U.S. during the late 1990s. Congress should act this year on the conclusions of the GAO by making the credit permanent and gradually increasing the "alternative" percentage to a level comparable with the standard rate.

Finally, I recommend that the Committee consider legislation to streamline the research information transfer process between the government and the private sector. As the Aerospace Commission noted, technology deployment often outpaces the completion of cooperative agreements among federal agencies and private sector research organizations. The manufacturing sector, in turn, has missed opportunities to capitalize on government-sponsored basic research to develop higher-performing aerospace systems. To address these problems, the FY04 NASA Reauthorization bill could serve as a vehicle for mandating an assessment of interagency research programs and new guidelines to streamline proposal evaluation and contractual oversight procedures.

Products and services that transform or prolong our lives always begin with bold ideas, as proven, among others, by the Wright brothers, Dr. Jonas Salk, and the information entrepreneurs who power the World Wide Web. I therefore ask the Committee to support basic aerospace R&D programs that will enable Americans to travel, trade and communicate with greater efficiency in the future.

Civil Aviation

The decline in air travel and system delays following the attacks of September 11th is temporary. Forecasters agree that growth in demand for air transportation ultimately will return to much higher historic levels and will outpace available and currently planned capacity. Aging infrastructure and often insufficient capacity, coupled with high passenger volume, should make the cause of airport and air traffic management modernization an urgent national priority. U.S. airlines and general aviation carriers serve more than 750 million passengers per year, carry 27 percent of the Nation's exports and imports and pump nearly one billion dollars into the domestic economy. But a duplicative infrastructure review process delays many airport facility and runway projects by between 10 and 15 years. At the same time, the Aerospace Commission found that FAA policies and oversight practices fail to take advantage of new communication, navigation, surveillance and air traffic management (CNS/ATM) products to modernize our aging and cumbersome air traffic control system.

NASA's Strategic Plan estimates that as domestic and international airports reach full capacity without adequate expansion, the airline industry could lose $20 billion in output and forfeit up to 200 billion passenger miles by 2015. Your October 2002 letter to the Transportation Secretary, Mr. Chairman, also noted that while the U.S. is "the world's preeminent provider of safe and efficient air navigation serv-

ices. . .at the federal level, no department or agency has taken on the task of planning for a follow-on Air Traffic Management system."

As a result of this crisis of economies and mobility, AIA and the Aerospace Commission urge the Committee to consider the following legislative initiatives to create an integrated federal strategy for air transport modernization:

- Full funding of the FAA's FY04 $3.9 billion request for National Airspace System (NAS) safety, homeland security, and air traffic automation programs to advance the Agency's Operational Evolution Plan (OEP). The OEP anticipates the expansion of national air transportation capacity by 30 percent over the next nine years.
- Passage of an amendment to the FY04 NASA and/or FAA Reauthorization Bills establishing a joint program office among DOD, NASA, FAA and NOAA. The amendment would mandate a multi-year blueprint and timeline for a revitalized air traffic management network that leverages capabilities and resources from across the Federal Government. The integration and timely dissemination of information using advanced networks will enable the broad situational awareness and collaborative decision-making essential to civil and military users. Beyond the scope of OEP, this provision would also set general policy guidelines for establishing system-level performance requirements to meet long-term safety, security, capacity, efficiency and environmental needs.
- Industry could make a vital contribution to the mission of this proposed joint program office. Many AIA member companies, for example, have invested years of work with a broad group of stakeholders to develop system performance requirements as well as modeling and simulation capabilities to evaluate advanced concepts.
- Amending the Aviation Investment and Reform Act for the 21st Century (AIR–21) to require a streamlined FAA regime for airport improvements. Congress should request a detailed plan for concurrent or deadline-driven permitting, licensing and project approval milestones. A priority projects list should also be prepared for the approval of the FAA's authorizing and appropriating committees.

AIA believes, Mr. Chairman, that legislation of this nature would begin to align the resources of government with the well-documented capacity and technology shortfalls in the civil aviation sector.

Space Exploration

Transcending their pain and grief, the families of the Columbia Seven Shuttle astronauts told the world that "the bold exploration of space must go on" because our lost heroes had accepted "risk in the pursuit of knowledge." This declaration, Mr. Chairman, defines our resilience as a people. And resilience, combined with curiosity about the galaxy beyond our skies, has propelled America into space. Drawing on the courage of the Columbia families and the determination of the Administration and this committee, the U.S. space program can emerge from tragedy in a stronger scientific and exploratory position.

AIA and its member space companies will work tirelessly with NASA, the White House and the Gehman Board to uncover the causes of the Columbia tragedy and to implement the needed reforms in our space transportation programs. Towards this end, we commend you and the Committee, Mr. Chairman, for obtaining the cooperation of NASA last month in allowing the Board to retain independent professional analysts and to set its own investigative timetable.

The Colombia disaster also requires us to sharpen our focus on the cost, reliability, propulsion and safety hurdles posed by the exploration of space over the last three decades. In the assessment of the Aerospace Commission, government and industry must scrutinize the "significant expense to get to orbit and a hostile and highly limited environment once on-orbit." To tackle this issue, Mr. Chairman, I respectfully urge the Committee to assess NASA's strategy for a long-term Shuttle replacement vehicle. Before the Colombia tragedy, NASA had determined that the space program would rely on the existing fleet for at least another 15 years. This timeframe may still apply, but it requires the agency to design a post-Shuttle architecture as rapidly as possible so that human observation and experimentation can continue to enrich our understanding of the universe.

Similar to the crisis in civil aviation, the challenges to the U.S. space program center on the need for interagency coordination guided by coherent policy objectives. In recognition of this fact, the FY04 NASA Strategic Plan, which AIA urges the Committee to support, charts an ambitious course for the country's space research and flight programs. Six Enterprises (Space Science, Earth Science, Biological and

Physical Research, Aerospace Technology, Education and Space Flight) will undertake a joint effort to breach what the Agency candidly defines as "technological barriers" in four areas: power, transportation, on-orbit human capabilities and solar system communications.

To amplify the impact of the Strategic Plan, AIA and the Aerospace Commission recommend the following amendments, summarized by program categories, to the FY04 NASA Authorization Bill. These proposals will also establish guidelines for reform in the relationship between NASA and Congress.

Next-Generation Launch Vehicles

The Committee, in evaluating the budget justifications for the Expendable Launch Vehicle, Space Shuttle upgrades and the Orbital Space Plane concept, should consider a requirement for a separate, early 2004 report from the Administrator, to be followed by an oversight hearing, on the state of research and experimentation to:

- reduce the cost to orbit;
- develop and test enabling technologies for a Reusable Launch Vehicle in cooperation with DOD, a mission endorsed by the Director of the National Reconnaissance Office;
- improve control center operations and security; and mitigate launch, flight and recovery constraints.

These areas, identified by the Aerospace Commission, represent the key financial, navigational and safety issues for the post-Shuttle generation of space transportation vehicles.

Power and Propulsion Systems

A second authorization amendment should formalize NASA–DOD joint efforts, possibly by creating a program office or task force under the auspices of the National Aerospace Initiative, on propulsion research and power systems. NASA and the Aerospace Commission have both targeted propulsion and power advances as the critical ingredients for the sustainability of spacecraft.

Space Launch Infrastructure Upgrades

As a result of a presentation by NASA Kennedy Space Center (KSC) officials, the Aerospace Commission revealed that the Current Replacement Value of the KSC infrastructure amounts to $3.9 billion. The main deficiencies include corrosion in the cable plant and the Vehicle Assembly Building as well as aging and under-performing Shuttle launch pad transporters. The Committee therefore should consider an amendment mandating a launch infrastructure improvement plan from NASA with out-year budget allocations based on the $3.9 billion estimate by KSC management.

As J.F. Creedon, Associate NASA Administrator for Aerospace Technology, testified on February 27th before the Senate Commerce Subcommittee on Science, "access to space will require interagency partnerships to meet common needs." AIA strongly believes that the Committee can clarify our strategic roadmap for space exploration by creating and directing a new series of federal partnerships.

Human Capital

I noted at the beginning of my testimony, Mr. Chairman, the difficulties faced by the aerospace industry in recruiting and retaining skilled professionals. As the Aerospace Commission pointed out, the United States has lost more than 600,000 aerospace jobs in the last 13 years. Previewing future generations of workers, we find that the math and science testing performance of students in the U.S. relative to their European and Japanese counterparts gradually erodes to the 10th percentile or below by the end of high school. Yet in the awesome mix of platforms and technologies that characterize our industry, no resource is more valuable than human and intellectual capital.

AIA joins the Aerospace Commission, therefore, in urging Congress to empanel an interagency task force, with a formally designated lead agency or department, to build a strategy by mid-2004 for improving and expanding the math, science, engineering, and technical/vocational education of Americans. Congress should then subdivide and revise the various elements of the strategy to incorporate them as mandatory mission planning objectives in the appropriate budget authorization bills.

NASA's strategic human capital program, the subject of the second panel of today's hearing, could serve as a model for an integrated federal workforce plan. AIA strongly supports this comprehensive initiative. The Education Enterprise of NASA will unite the Human Resources division with other critical units, such as the Technical Programs office, to design new scholarship and recruitment programs to nar-

row gaps in professional skills across the organization. This approach, by assigning responsibilities to all functional and program activities, makes the improvement of human capital a continuous agency mission.

National Security Programs

I want to draw the Committee's attention to a few key programs from the FY04 defense budget that demonstrate the Pentagon's evolving Total Force framework to deter or defeat the unpredictable adversaries of our age.

Naval Force Modernization

The oceans cover 70 percent of Earth's surface, and the majority of the world's population and industrial facilities reside within 250 miles of a coastline. If only for these reasons, the Navy's surface and submarine fleets provide the United States with the forward military presence, free of dependence on foreign bases, to prevent or prevail in conflicts and to safeguard the global sea lanes of commerce. The Navy's FY04 shipbuilding request of $12 billion deserves strong congressional support as the Service continues to execute a full-scale modernization and recapitalization program. The aircraft carriers, destroyers, cruisers, submarines and combat support ships of the future will magnify the power of ground forces with deep land attack, special operations, theater missile defense and reconnaissance capabilities. As a result of this strategy, Mr. Chairman, the Navy will assume an increasingly important role in meeting many of our national security objectives from the sea and along the shore.

Armored Programs

In their 2003 Posture Statement, Army Secretary White and Chief of Staff Shinseki describe their vision of an Objective Force that by 2010, will complete training for ground dominance, cyber-warfare and space exploitation operations. In addition, the current Stryker Brigade Combat Teams and the planned Future Combat System (FCS) provide soldiers with mobile air-ground units to project power and subdue adversaries in the most austere or heavily urban environments. Armored forces will therefore remain vital to our unchanging need for enemy territorial control as the end-state of victory, and the FY04 Army budget contains focused R&D and acquisition proposals to keep the Objective Force plan on schedule. Aerospace technologies will also provide a number of critical networked solutions to the fully-deployed FCS. The current heavy armored deployments to the Persian Gulf theater only underscore the requirement to keep the FCS program on schedule since our soldiers will need state-of-the-art battle space management and force protection equipment over the course of several years.

Today's Stryker industrial base reflects the successful shift from a single product line to a flexible manufacturing process capable of building multiple combat vehicles in a variety of weight classes. What once functioned as a Cold War tank line now supports the production of the Stryker family of 10 different vehicles. This armored transformation would not have occurred without the resources, skills, vendors and investment by both government and contractors. During Operation Desert Storm, for example, a warm production line made it possible to supply over 22,000 spare components and major assemblies on short notice. As current and future ground threats arise, the existence of a modernized armored industrial base will prove critical in supporting the Nation's military response and deterrent objectives.

Tactical and Mobility Aircraft

Our combat experiences in Afghanistan, Southwest Asia and the Balkans illustrated the dramatic utility of air power as a wartime force multiplier. During the opening phases of conflict, precision air power destroyed or crippled enemy air defense, fighter-bomber and command-and-control networks, thereby depriving hostile forces of territorial defense and combat attack assets. At the same time, personnel and cargo transport aircraft enable the United States to introduce troops and firepower into a zone of conflict during a time when we lack fewer basing facilities overseas.

I subsequently urge Committee Members and Congress to support FY04 Air Force and Navy budget requests that dedicate a combined $21.3 billion to seven tactical and mobility aircraft (the F/A–22 tactical fighter; the F/A–18E/F carrier-based strike fighter; Joint Strike Fighter development; C–17 Airlifter procurement; C–5 avionics upgrades; C–130 Transporter modernization; and V–22 Tiltroter procurement), supplemented by more than 45,000 precision-guided munitions, to expand the Nation's global force projection capabilities.

In addition to promoting the modernization of U.S. air-breathing military forces, Congress should ensure that the appropriate DOD components and Services sustain, as the Aerospace Commission advised, critical, high-risk defense-related tech-

nologies such as combat system design capabilities, solid rocket boosters and radiation hardening.

Conclusion

In closing, Mr. Chairman, I commend you, Congressman Hall, and the entire Committee for serving as the trustees of scientific innovation and programmatic accountability among your colleagues. Through this testimony on implementation alternatives regarding the report of the Aerospace Commission, I have tried to concentrate on legislative policy reforms to improve interagency cooperation, direct the development and fielding of new technologies for the civil aviation and space arenas, and begin the vital effort of workforce revitalization. These three assets—knowledge-sharing, modernization and people—will open new frontiers for the aerospace industry to serve our commercial and war fighting customers of tomorrow.

BIOGRAPHY FOR JOHN W. DOUGLASS

John W. Douglass is President and Chief Executive Officer of the Aerospace Industries Association, which represents the Nation's manufacturers of commercial, military, and business aircraft, helicopters, aircraft engines, missiles, spacecraft, materiel, and related components and equipment. Mr. Douglass became the seventh full-time Chief Executive of the Association in 1998. Before that he served for nearly three years as Assistant Secretary of the Navy for research, development and acquisition of defense systems for the U.S. Navy and U.S. Marine Corps.

A nationally recognized expert in systems acquisition, Mr. Douglass has extensive acquisition experience in Congress, the Defense Department, and the executive branch as a policy authority, contracting officer, engineering officer, test and evaluation officer, program control officer, and research director.

Before being named a civilian Navy executive, Mr. Douglass was with the Senate Armed Services Committee where he was foreign policy and science and technology advisor to Senator Sam Nunn and served as lead minority staff member for defense conversion and technology reinvestment programs.

Earlier Mr. Douglass completed 28 years of U.S. Air Force service and retired as a brigadier general in 1992. His numerous Air Force assignments included service as the deputy U.S. military representative to NATO as well as Director of plans and policy and Director of science and technology in the Office of the Secretary of the Air Force. He also served as Special Assistant to the Under Secretary of Defense for Acquisition.

Within the Executive Branch, Mr. Douglass was Director of national security programs for the White House, responsible for formulating policy on a broad range of national security issues. He served as President Reagan's personal representative to the Blue Ribbon Commission on Defense Management chaired by David Packard.

A native of Miami, Florida, he earned a Bachelor of Science degree in industrial engineering from the University of Florida, a Master of Science degree in industrial

engineering from Texas Tech University and a Master of Science degree in management science from Fairleigh Dickinson University. Mr. Douglass has done postgraduate work at the Cornell University Center for International Studies where he was an Air Force Research Fellow with the Peace Studies Program.

Mr. Douglass is a member of the Board of Governors of the Aerospace Industries Association, a member of the Commission on the Future of the U.S. Aerospace Industry, and Chairman of the Aerospace Technology Policy Forum. In addition, he is Chairman of the Board of Trustees of the National Center for Advanced Technologies and Past Chairman of the International Coordinating Council of Aerospace Industries Associations.

AIA Positions:

Chairman, Aerospace Technology Policy Forum
Chairman, Board of Trustees, National Center for Advanced Technologies

Member:

Commission on the Future of the U.S. Aerospace Industry
National Contract Management Association
Space Day Foundation Council of Advisors

Chairman BOEHLERT. Thank you very much. Dr. Hamre, before we go to you, we have been joined by the Ranking Minority Member, the distinguished gentleman from Texas, and it is a pleasure to recognize him for any remarks he might care to make.

Mr. HALL. Mr. Chairman, thank you. And I subscribe to the remarks you have made. I will be very brief. Of course, I want to welcome all of the witnesses today. I know you have to prepare, and you have to get here, and you have to testify when you get here, and you have to get home, so you have gone to a lot of trouble, and we appreciate it. And you are here because it is obvious that we think you know a lot more than this panel knows, and we kind of pick your brains, especially our old friend, Bob Walker. Bob is a class guy, was a class guy, will always be a class guy. He wrote a lot of bills that made this a better Congress, and he improved a lot of bills that others had written from time to time. Sometimes when we didn't want him to improve them, he improved them. But Mr. Chairman, thank you for that time. And I will ask unanimous consent to put a very extraordinary speech in the—I haven't read it yet, but I know it is a good one.

Chairman BOEHLERT. Without objection, so ordered.

[The prepared statement of Mr. Hall follows:]

PREPARED STATEMENT OF REPRESENTATIVE RALPH M. HALL

Good afternoon. I would like to welcome all of our witnesses to today's hearing. We look forward to hearing your testimony. I'd like to extend a particular welcome to former Chairman Bob Walker, who once was an active Member and leader of the Science Committee.

We have a great deal to cover this afternoon. Each of the topics to be discussed could easily merit a separate hearing. As a result, I will be brief in my opening comments so that we can spend as much time as possible hearing from our witnesses.

Let me say just a few words about the topic to be addressed by the first panel, namely the report of the Aerospace Commission. The Commission was chartered at a time of uncertainty for the Nation's aerospace industry. However, the reality is that the future of the industry is now even more uncertain than when the Aerospace Commission started its work. More than 20 percent of the Nation's air carriers are in bankruptcy. The Nation's space program is just coming to grips with the loss of the Space Shuttle *Columbia* and its impact on a range of programs, including the International Space Station. We are in the midst of a sustained downturn in both the commercial launch market and the commercial satellite market. The inherent conflicts between export control policies and the globalization of the aerospace industry have been growing. This committee is looking for some wisdom from the Commission—not just regarding your long-term vision for aerospace, but also your

advice on how best to deal with the multiple challenges facing the aerospace industry today.

That brings me to the second topic to be addressed in this hearing: NASA workforce issues and Chairman Boehlert's proposed NASA workforce flexibility legislation. I will say up front that I welcome the Chairman's efforts to focus attention on the issue of how best to attract and retain the skilled personnel NASA will need to retain its vitality in the 21st century. I hope that the Committee will treat this issue with the seriousness that it deserves and devote the time needed to do thoughtful oversight. It can be tempting to some to try to "short circuit" the legislative process in their zeal to achieve quick results, but I hope that we will resist that temptation.

The question before this committee is not whether we want to have a skilled, diverse, and effective NASA workforce. I believe we would all say that we do. The real question is what approaches are best suited to deliver the desired result. That's not a simple question to answer.

For example, when the Nation's aerospace sector has lost almost 50 percent of its jobs since 1989, we should not be surprised to find that many talented students are looking elsewhere for careers. Will NASA recruitment bonuses or related measures have more than a marginal impact on reversing that broad national trend? Are there other measures that could be more effective?

If NASA wants to attract and retain talent in critical skills areas through various incentives, does it send a mixed message to prospective employees when it also advertises its intent to make 50 percent of its remaining civil service jobs vulnerable to being contracted out within the next few years?

To what extent is the aging of NASA's workforce the result of the protracted hiring freeze that the agency faced during the 1990s—and thus correctable under existing hiring rules now that the freeze has been lifted?

And what are the implications of giving NASA management and OPM the authority to change the workplace rules of the entire agency without the prior approval of Congress? What changes is NASA management proposing to make if they are given this authority?

The NASA workforce has been compared to a family. We need to remember that the NASA family has been profoundly shaken by recent events. Let us tread carefully and take the time to ensure that whatever we do is in the best interests of all of the NASA employees.

Thank you, and I yield back the balance of my time.

Chairman BOEHLERT. And now, Dr. Hamre.

STATEMENT OF HON. JOHN J. HAMRE, PRESIDENT AND CEO, CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES

Dr. HAMRE. Mr. Chairman, distinguished Members, thank you for inviting me. I am so pleased to come up here knowing that I am not going to get a whipping today. This is—usually I would come up here and Mr. Boehlert would just thrash me something fierce, because I give him something dumb, but thank you for the chance to come up anyway.

I was asked to come up here I think largely because people feel I have a disagreement with my Commission and my Chairman. And I don't. And I would like to say for the record how pleased I am that Bob Walker was our Chairman. He did a splendid job. He brought very diverse people and perspectives to a consensus. I think we are all very grateful for the time and the energy he put into it, and I am always glad to be with my friend and colleague John Douglass and I learn a lot from John all of the time.

Both of them have said what, in essence, I had planned to say, so I can be very short. I did feel at the time, and I feel even more strongly now, that frankly we are facing a very serious crisis with our aerospace industry. I mean, if you were to use medical analogies, we are in the ICU unit. I mean, we are on life support. And I depend, just as you do, every day on being able to get on an airplane and fly safely across this country in an industry that is mak-

ing money, profitable industry that is making money. And they are not. And we have got to face up to that. We have got a real problem on our hands for the long-term viability of this industry. It is not just the airline industry; it is the people that make airplanes. We can not live in this country with an industry that can't manufacture state-of-the-art, modern airplanes. And that is at risk.

The satellite industry, I am—I hate to say it, government regulation is undermining the vitality of our satellite industry and our launch capacity. I mean, we have excess capacity, and it is imploding. And so we have got a genuine crisis on our hands, and frankly it sits squarely with our government, and we have got to do something about it.

Now I would like to focus on one specific set of issues, and I would ask you all to take a look at how we regulate this industry in terms of exports. We have got a set of policies in place, which have not been updated since the end of the Cold War. And we are creating protected markets for our foreign competition by our export controls. Now I frankly want strong export controls, but I think they are being trivialized by their misapplication on—and being spent all of our energy on trivia. We are regulating five-ton trucks and rearview mirrors on F-16s. And God only knows what we are doing. With 40,000 licenses a year, and 99.6 percent of them get approved. And we just go through agonizing months to get an approval, and we are wasting lots of time and talent and resources looking at things that are not important. And we are not spending the time and the resources to look at the stuff that really is important. And we have got to change our focus. Let us focus on things that are really important.

Thirty percent of our exports are going to the United Kingdom, and yet we treat them just like they are Pakistan in terms of the—of having to get a license. Now there has got to be some differentiation in the way we approach our best friends and our skeptical partners. There has got to be some difference between leading edge technology and dull edge technology. That is not at all recognized in the way we approach this industry, and we are choking and really hurting an industry.

Let me just take the satellite industry, and I—we have done some work on this in my little think-tank, and I would commend it to you, Chairman. I will give copies to your staff. I don't expect Members to read it, but it outlines some alternative approaches that give you stronger security and more sensible regulation of an industry that we have to have and we can not live without. And it starts with the premise that these people do not want to violate American laws. They do not want to hurt American security. They want to be our partners to protect America. And we need to treat them like that and enter into a new relationship with this industry so that we honor that commitment that they have. And there are ways to do that, and it has been worked on a lot of detail and a consensus across the wide perspective of the community that knows a lot about this.

Satellite industry, right now, we let a company develop an export of technology only when they can prove a foreign competitor can do it as well as they can. What does that tell you? We are in essence providing a protected market for foreign competition through

American producers. This can't be the way that we want to run this industry. Now there are other approaches, but we have got to start thinking with an up-to-date, modern export control system that is tailored to the kind of business environment we live in today. And we do not have that. We have an export control system that is tailored to the 1960's, and we need to change it.

Thank you very much for the chance to be with you, sir.

[The prepared statement of Dr. Hamre follows:]

PREPARED STATEMENT OF JOHN J. HAMRE

Mr. Chairman, distinguished Members of the Committee on Science, thank you for inviting me to join Aerospace Commission Chairman Robert Walker, and my colleague and friend John Douglass, to testify before you today on the work of the Commission on the Future of the Untied States Aerospace Industry.

Mr. Chairman, let me note that I signed the report, and I stand by the recommendations of the report. I would like to take this opportunity to thank Chairman Walker for the enormous energy he gave to this effort, and for the patience he had in bringing together the thinking of such a diverse and talented panel. I believe that it is best to let Chairman Walker speak on behalf of all of us to the recommendations of the Commission. I will deal briefly only with the questions you asked of me in your letter of invitation. Naturally, I would be delighted to answer any question you pose, and provide any additional information for the record that you and the Committee may desire from me.

First, you asked what fundamental issues did the Final Report fail to appropriately examine. The Commission was chartered to examine fundamental factors that needed to be addressed to ensure the long-term viability of the aerospace industry. I believe the Final Report did this. My concern then—and this concern has only grown with time since we concluded our work—is with the deteriorating financial health of the aerospace industry. To use a medical analogy, the aerospace industry is in the intensive care unit on life supports.

I personally depend on this industry every week. I cannot live without a reliable, safe, efficient and *profitable* commercial airline industry, yet since we finished our report several major carriers have declared bankruptcy and more are likely to follow. We cannot rely only on the current fleets of aircraft. Right now, the flying inventory is quite new because the recession in the industry has caused the airlines to mothball their oldest aircraft. But the replacement rate is uncertain, and the viability of U.S. producers is challenged. We must have new production aircraft on an indefinite basis.

Mr. Chairman, I personally consider this situation to be a crisis. This industry is essential to America's vitality and productivity. Our future national economic health and security depends on a healthy and viable aerospace industry. And in all honesty, this industry is in enormous trouble. Along with commercial aviation, our satellite industry is imploding, with far too much capacity for the limited market we forecast for the next decade. The launch industry is similarly confounded by surplus capacity.

Solving this problem requires immediate action. The focus of our Commission was on a longer-term perspective, and it is because of this that I don't believe we have a crisp checklist of actions that the Committee should take. So at this stage, I can only offer my personal observations.

First, the airline industry itself has to get its own house in order. Unfortunately this means tackling the unbearable cost structures of the current business, and probably developing modified business models for the future. I have to defer to others to develop those strategies. I do believe that it has to be led by the industry itself, in the context of the market place.

Second, the Federal Government has got to put more energy and resources into the modernization of the air traffic control system. The FAA's modernization plan is essential, but it is not by itself sufficient for the long run. While the recession currently has eased the pressure on the system, the modernization program will only carry us another decade or so. New approaches are essential. Here I think the Commission report provides useful direction, and I commend these approaches to the Committee for consideration. I especially recommend that the Committee devote time this year, as you prepare your legislative agenda, to the need for a long-term solution to air traffic control.

Third, the industry is burdened by an uneven patchwork of costs and restrictions that have been imposed since September 11. Admiral Loy has done a splendid job

standing up the Transportation Security Administration, but the overall architecture of security, and the burdens that are placed on the industry, need to be dispassionately examined. Most importantly, how should we finance the security we want in aviation? Do we put it on the back of the airlines? Do we provide it as a government service? In a post September 11 environment, how do we strike a balance between security and efficiency? We don't have a clear philosophy here, and the uneven patchwork of regulations and obligations needs to be rationalized, in my view.

Fourth, we desperately need to modernize Government regulation of this industry. Here let me refer to the second question you posed. You asked for my views on export control and technology regulation. Frankly, our approach to export control and technology regulation is obsolete, stuck in a cold war mentality that fails to comprehend the threats of our day.

I want stronger export controls on things that matter, not a rigid adherence to bureaucratic rules that buy very little security and merely satisfy the imperatives of a bureaucracy. The failings in this area are profound. We make virtually no distinction between cutting edge technology and old, prosaic technology. We make our best allies go through the same process as we do the worrisome countries. We spend an enormous amount of time and energy regulating trivia, which soaks up the talent and resources of our government regulators. They should be spending their time on truly important matters, and not waste their time on five ton trucks and portable generators. The Commission has outlined solid and constructive recommendations in this area, and I would commend them to you and to the Committee staff.

Mr. Chairman, let me address the last question you raised in your letter of invitation, and that is how do we encourage greater exports without compromising critical technologies. Here we need reasoned judgment, not the blind paranoia of mid-grade government examiners. We have the naive idea that it is a simple matter to reverse engineer any product to extract critical technology. Frankly, that is just not correct. Reverse engineering is enormously difficult. If you ask any high technology producer of virtually any product, they will tell you it is nearly impossible to build a product, even if you give them the complete drawings. The manufacturing art is essential, and that is not compromised routinely. Indeed, our companies have an intrinsic and reliable incentive not to compromise that art. If the government approached the industry as partners, rather than as wayward mischievous children needing discipline, we would get stronger security.

There are ways to do that. I would commend to the Committee work that we have done at my research institute, the Center for Strategic and International Studies (CSIS). With your permission, I would like to submit two CSIS reports to complement your hearing record: "Preserving America's Strength in Satellite Technology," and "Technology and Security in the Twenty-First Century: U.S. Military Export Control Reform." These reports outline a comprehensive new approach that would provide stronger security and impose less burdensome regulation on a troubled industry. Under existing regulation, we are burdening an industry with choking regulation that buys very little security and is isolating our industry from market opportunities and competitive forces that are critical for its long-term health. This is especially true in the area of satellite technology. Our current regulations are creating a protected market for foreign competitors, and constraining American producers to a market that is too small to maintain their profitability. Under our current approach, we have in place all the incentives to create the satellite manufacturing equivalent of Airbus.

We need well-designed and sensible controls on technology. I do want a strong export control system. But it needs to be well designed and it needs to comprehend the changes that are taking place in our economy. Our current system is neither well-designed nor flexible to change.

Mr. Chairman, distinguished Members of the Committee, thank you for inviting me to participate in this important hearing. I would be pleased to answer any questions you might have when the time for questioning begins.

DISCUSSION

Chairman BOEHLERT. I thank all of you very much. And Chairman Walker, you and I have served for a long time in this institution from our days in the '60's as staff members. And we have seen very distinguished Commissions, and this one is not an exception, very dedicated and able and committed Americans make very clear policy recommendations. And then the reports are put on the shelf

and they gather dust. And so let us hope that this one will be an exception and not fall under the category of being the rule.

ROLE OF PROPULSION & POWER

Let me ask you this, what areas of research do you think are most essential for the future of the aerospace industry? Mr. Walker, you are first up on that.

Mr. WALKER. Well, we identified several in the report, but in both air and space, propulsion is a major area where research could produce some dramatic changes. We—if you want additional speed to be able to go point to point, it is one of the ways in which you get a commercial industry which is different from the direction in which the Europeans are going. That is propulsion in large part. If you want to do more exploration of the solar system, you do propulsion research at NASA and give yourself new options there.

Along with propulsion in space, power also becomes an issue. It means that you can do far more in the way of scientific missions if you have additional power aboard the spacecraft. That also is a matter where you can put money. We identified, for example, a need to do the National Aerospace Initiative. One of the reasons why you do that is because it will increase speed, largely for defense missions initially, but also give you a platform off which you can do fully reusable space vehicles in the future. That will be a materials issue. It will also be a propulsion issue for the future.

So my guess is that those are the places where you would get the biggest payoff for your research dollars at the present time.

USING DEFENSE TECHNOLOGIES FOR CIVIL APPLICATIONS

Chairman BOEHLERT. Mr. Douglass.

Mr. DOUGLASS. Sir, Chairman Walker has mentioned almost everything that I would have on my list, in terms of categories, I think the insight that I could add to you is the following thoughtful comment. If you look at our military today, we are two to five generations ahead of anybody else in the world. We are the only people with stealth fighters, stealth bombers, big tankers, J-stars, transport airplanes that can do marvelous things, precision guided munitions of all types, information technology, data fusion. And then you go over to the commercial side, and you say, "Hey, wait a minute. Why is a brand new airplane approximately the same as a brand new Airbus?" And part of the answer is we, as a Nation, are not effectively taking the technology we have already developed and paid for, American citizens have paid for, and moving it from our military side to our commercial side the way we used to do years ago. Part of that lies in the globalization of the industry, but part of it lies in the stovepipe nature of the way our government is structured here. And so there is a huge opportunity for us to help civil space and civil aviation by linking up what we have already paid for on the Department of Defense side to the commercial side.

I think Chairman Walker mentioned that one of the good news is that NASA and the FAA are cooperating to share research on a new air traffic control system. DOD should be a part of that program, because much of the technology the DOD uses is in informa-

tion warfare. For example when I was the Assistant Secretary of the Navy, we developed—and when John was a Deputy Secretary at DOD, we developed a thing called a cooperative engagement capability where every single ship in the fleet can see what every other ship's sensors see. That is a perfect application for air traffic control. It is developed. It is there. The Navy is using it. It ought to be brought over to the commercial side.

Chairman BOEHLERT. Mr. Hamre, you have been in and out of the government in responsible positions. Some would say you have a better vantage point from which to view how things need to be changed within the government. What can we do?

PEER REVIEW OF R&D INVESTMENT

Dr. HAMRE. Well, sir, I forgot I couldn't pass high school physics. I am not going to tell you how to spend R&D money. I am personally very skeptical that the government can pick winners and losers in R&D. I think that—and I think that we really should try, and I think you honor this by trying to have a peer review process that provides expertise that comes in from the outside and say that is a winner, that is a loser. I think that that becomes very important. The government does need to provide the infrastructure for the scientific community that it can't afford to buy or won't because it is just out of scale to what an individual project can undertake. That is what the Genome Project is. I mean, we spent a lot of money mapping the genome, and now you are going to see an incredible explosion of the exploitation of that knowledge. That is what I think the Committee should be doing is focusing on the—what are the technologies we know that could be developed but the infrastructure impediments are standing in the way. That would be the greatest contribution we could make, and frankly, I think we are lagging on infrastructure investment in R&D these days.

Chairman BOEHLERT. I see my time is expired. The gentleman from Texas, Mr. Hall.

Mr. HALL. Mr. Chairman, thank you. And Mr. Douglass, good to see you again. I remember the day you and Tom Tate came in. I had the pleasure of recommending you. Dr. Hamre, thank you for your very good presentation. You didn't know too much about physics. I was a Navy cadet at TCU, Texas Christian University, and took celestial navigation. That gave me six hours of physics with an A. And it sure helped me later, and I can't spell physics to this good day. I asked Dan Quayle to help me, and he said "F-i,".

FINANCIAL HEALTH OF COMMERCIAL AVIATION

Dr. Hamre, the U.S. aviation industry is going through a lot of tough times now. Of course, you broke into that, and thank you for doing that. Over 20 percent of our airlines, I am told, are in bankruptcy, and passenger carriers have lost around 18 billion over the last two years or so, it has been reported. How really worried are you about the potential collapse of our U.S. airline industry? We just can't allow that to happen, and I am going to ask you for some advice on that. What do you think ought to be done? And who should pay for it and how it should be paid for, a grant, loan, or what?

Dr. HAMRE. Well, I am sure going to need the wisdom of my colleagues to answer that question, but sir, I think we can not live with a collapsed industry. I mean, it is—the heartbeat of the—of our economy depends on this being a viable, safe, continuing, functioning airline industry. It is very sick. Some of it is self-imposed, some self-induced through decisions that were made by the companies, and they are going to have to sort their way through it. So far, the people that have been paying the price for whatever the mistakes are has, frankly, been stockholders. I mean, we have seen as the collapse of the values of these companies. We have not seen the fundamental restructuring of the costs of these companies. And there is going to have to be a restructuring of the costs, and that is frankly what bankruptcy is about. But right now, the bulk of the costs have been carried by stockholders, to be perfectly candid. Now we are going to need a more balanced view, and it has to be sorted out by the industry.

Now one comment, and then I will turn to my colleagues. I think the government needs to figure out what is the right relationship it should have with the industry as for security and safety of operations. Right now, we tend to just put all of the burden on them and let them pass it through as a cost to the customer. That didn't work with safety. We didn't like what we got out of that, and I think we need to be asking ourselves do we have the right mix. I don't have a good formula for you, but that needs to be evaluated in a very dispassionate way.

Mr. DOUGLASS. Sir, I would tell you I think on September the 11th, 2001, we entered into a new era. And I think the key comment that John made is that we have got to determine what is inherently a governmental responsibility and what is inherently the responsibility of private industry. And some of the losses that the airlines have talked about today could be conservative if some of the worst case scenarios happen. For example, there have already been, I think, around the world about 20 or 30 attempts by various terrorists to shoot down airliners with hand-held anti-airplane missiles. And fortunately, they have missed in the last few tries. We don't—we think they have got some hits in Africa and a few other places where we don't have a lot of information about what happened.

But if this begins to take on a wider global perspective, just think of cost that it would be for equipping all of the airline fleets all around the world for a defense against that kind of an attack. Now who would pay for that? We couldn't turn to this industry that is near bankruptcy today. Is that an inherently governmental thing that we have to do? How do we regulate foreign airplanes coming into our airspace or our airplanes going into theirs? There are some very fundamental questions like this that we need to resolve in the light of this new and very, very difficult era that our country has now come into after September the 11th.

Mr. HALL. Mr. Chairman, I am going to have a few minutes left. Would you like to——

Mr. WALKER. Sure. Let me just hit a couple of points. I agree with the points that my two colleagues have made. But one thing that the airline industry did identify for us in the Commission was the fact that they are tremendously overtaxed at the present time.

The fact is that if you get a bargain $100 ticket, about $46 of that goes for one tax or another. And it is a burden that the industry is bearing at the present time. It is having an impact on their ability to compete.

AIR TRAFFIC MANAGEMENT

Let me give you one technology side of this, though, that provides some hope and that is that we do have emerging technologies that will give us the opportunity to redefine the airline industry in some remarkable ways. The reason why air traffic management has come up in both John's and my testimony is the fact that in order to do some of these new concepts, you have to have a far more robust way of managing air traffic than we now have. But if you get there, you can do point to point travel, and you can use point to point travel with relatively small airplanes that allow businessmen, for instance, to fly from one small town to another small town and do it on an air taxi. That is a very different kind of concept. It is a very different kind of airline structure for the future, but it is entirely possible if we develop the technologies needed to get there. That doesn't replace the need for the kind of airline industry that we have at the present time, but we do need to think about how you provide consumers with what they want. Why are businessmen going out and spending a lot of time and money getting into partial leases of airplanes at the present time? Because they don't want to fly hub to hub. They want to go where they want to go when they want to get there. And we need to think about how you do the technology that allows a restructuring of the industry around that model.

Mr. HALL. Thank you. My time is up.

Mr. ROHRABACHER [presiding]. Thank you very much, Mr. Hall. As you can see, we have a new person holding the gavel, and I will be, I guess, conducting this hearing for another hour until the Chairman returns, and I will take the prerogative of having my time now.

FUTURE OF CIVIL AVIATION

I think that the points Mr. Walker was just making are very astute and people need to focus on. When we say that we have a sick aerospace industry and we—and the airlines are in trouble, and we have this trouble and things aren't working, we tend to think that what we want to do is make something that is configured the way it has been configured for the last 30 years work. Well, that is obviously not the case, is it, Mr. Walker? What you were just outlining for us is a totally different vision of an aerospace industry.

Mr. WALKER. Well, there is no doubt that there are opportunities ahead of us to reconfigure the industry. And if you look at the desirability of point to point travel, it is a very different model than what we have pursued in the industry up until now. And but it does demand probably new kinds of aircraft, because you can not fly very large aircraft point to point.

Mr. ROHRABACHER. Right. And also—well, there is some research going on now in San Diego. I know it may or may not be successful with the development of the DP–2, which is a plane that carries

45 people, will go up and down like a Harrier jet, and be able to use very small runways and be able to go from very secondary runways. And from what you are describing and also with the change in the air traffic control system where we take greater advantage of GPS rather than the system we had in the past, what would you say the odds are that we are going to have a totally new type of aviation industry 20 years from now?

Mr. WALKER. Well, I think you are going to see a very different kind of technology mix inside the industry that will give you a much different structure and probably a much different economic structure. But understand, it also complicates some of the problems that John Douglass mentioned. It allows you to use more and more airports across the country, but that means that in this present environment, the security issues that arise in utilizing vastly more airports complicate and add cost into the system.

Mr. ROHRABACHER. Right. And Mr. Douglass actually mentioned a specific technology that would have helped us develop exactly what I am talking about in his testimony. You mentioned, Mr. Walker, propulsion. Mr. Douglass mentioned a radar system, a shared radar system. Do we have—now Mr. Douglass, however, suggested in his testimony that we have the technology we need to have an overhaul of our aerospace industry. You suggested, perhaps, we need some more technology work before that is possible. And you focused on propulsion.

Mr. WALKER. I agree absolutely with what John Douglass said about air traffic management. I think that we are developing and have a lot of control navigation surveillance systems that the Defense Department has developed that would give us the ability to do an air traffic management system in an automated way that would be very important. What I am suggesting is that one of the things that characterizes a new technological approach is more speed inside the system, and there you are going to have to have some new propulsion. We haven't developed much in the way of new engines in recent years.

Mr. ROHRABACHER. The—I was just going to get to that. Now who do you represent, Mr. Walker?

Mr. WALKER. Who do I represent?

Mr. ROHRABACHER. Yeah, what—do you represent big companies?

Mr. WALKER. Sure.

Mr. ROHRABACHER. And do you represent big companies, Mr. Douglass?

Mr. DOUGLASS. Generally speaking, sir, I represent all of the aerospace companies.

Mr. ROHRABACHER. Okay.

Mr. DOUGLASS. We have about 250 members.

Mr. ROHRABACHER. Okay. And Mr. Hamre, do you represent big companies?

Dr. HAMRE. No, I run a think tank.

Mr. ROHRABACHER. Okay. So they listen to you?

Dr. HAMRE. Yeah, I hope so.

INDUSTRY R&D SPENDING PRACTICES

Mr. ROHRABACHER. Well, let me put it this way. I know a fellow with a—incredible credentials who has come up with a revolutionary new engine concept. But everybody seems to be waiting for the government to put the money into developing the new engine. Is there a problem here with the industry being willing to invest?

Mr. WALKER. Yeah, one of the real problems with the industry is the fact that they haven't been making any money. It doesn't matter whether you are building aircraft or flying aircraft and so on. The profit margins inside the industry have been very, very poor. One of the things that our report looked at is what kind of investment climate can you create that will allow more investment money to come in so that some of these industries would have the money to do some R&D on their own and develop new products. But at the present time, they haven't been able to do that.

Mr. ROHRABACHER. Mr. Douglass, do you want to jump in there?

Mr. DOUGLASS. Generally speaking, the manufacturing part of the industry makes about $6 or $7 billion a year in profit on sales of around $150 billion. That is everything combined. So it is profitable. In other words, the manufacturing part is not losing money like the airlines are, but the level of profitability, as Chairman Walker said, is not the same level that you see in other parts of manufacturing.

Mr. ROHRABACHER. But will you be depending on the government to come up with—let us just say, hypothetically there is someone with great credentials who has a new engine, all right, which is—obviously I haven't been in contact with somebody like that, but who is going to develop—who is going to build the first prototype of that engine? Would it be private industry? Would they put money in? Or will you just be totally relying on the government to build the first prototype to these type of engines?

Dr. HAMRE. In engine technology, at the large engine end of the spectrum, the new development of new technology is generally shared between the government and industry. There is a program called HPTET. It is a long series of letters. I apologize for not being able to tell you exactly what it is, something like High Performance Engine something something, and that is a shared program where the Department of Defense and industry share in the development of new engine technologies. As you go down further, sir, into smaller and smaller engines, generally you find that industry pays for the development of those engines.

Mr. ROHRABACHER. All right. Well, I see my time is up. And Mr. Gordon from Tennessee.

AIRLINE TICKET TAXES

Mr. GORDON. Thank you, Mr. Chairman. Bob, you mentioned that, like, some $46 or whatever amount of a $100 ticket went to taxes. I assume most of that was for the trust fund or for the local infrastructure and things of that nature. Do you think we have adequate infrastructure so that we need those funds, or would you recommend that those dollars come out of public—or not public, but general funds rather than user fees?

Mr. WALKER. Well, I think we need to sort that out. I mean, I think that there are some things that it is entirely reasonable for people who utilize the system to pay for it. But the problem is that an awful lot of that money in recent months has gone into security, for example. And there really is a question as to whether or not the airlines and the ticket tax ought to be the prime vehicle for providing the security options for the country. And so there is a sorting out process that needs to be done here about which are the real obligations of government to fund through general revenues and which are the things that ought to be a part of a user fee structure? I think if you did that sorting out process, you might be able to relieve some of the burden that has been placed on the airlines and ultimately on their competitive position inside the transportation system.

NASA INFRASTRUCTURE INVESTMENT

Mr. GORDON. And also you mentioned some interesting new programs for NASA and how they are being funded in this current budget. My concern is do we have an adequate infrastructure to support these programs. I mean, I have a real concern that we have an aging infrastructure at NASA that we have got equipment facilities that need to be upgraded. And so I guess two questions: one, you know, how concerned are you about that and are—do we have adequate funding, and if not, do we need to have more funding there; and secondly, do you think that it would be a good idea for NASA to conduct a comprehensive review of its current and future infrastructure needs along with the pragmatic assumptions that would guide these requirements?

Mr. WALKER. Let me point you to the Commission report on that, because I think we did feel strongly that the infrastructure that the—inside NASA is deteriorating, is a major problem. We suggested a new approach to that. We suggested municipalization and/or privatization of a lot of facilities so that you could, in fact, go out and use bonding authority in order to put new infrastructure in place. If you take a look at what has happened down at Kennedy, the newest structures at Kennedy Space Center are, in fact, built with bonded money, that—the two platforms for the EELVs down there were actually developed by the Florida Space Authority and then turned over to the contractors for their use.

It seems to me that there may be a model there for upgrading and building new facilities at a lot of——

Mr. GORDON. Well, with virtually every state, except for, I think, Montana, on the ropes now, you know, who is going to be able to afford that? And I guess secondly, even if it is bonded, somebody has to pay the premium, so——

Mr. WALKER. Sure. But the issue is that the reason why we have not been able to get the money that is needed for infrastructure improvement is as these things have gone through the appropriations cycle every year, that is tended to be downgraded. It is not the absolute necessity right now, and so it is not done. This would allow——

Mr. GORDON. But you think we need additional funding for infrastructure?

Mr. WALKER. Yeah. This is a way in which what you could do is assure that you get the infrastructure now but pay it off over a period of 30 years or so. And yes, that would take some additional money for the appropriation so that NASA could, in fact, afford to do the bonding. But the fact is that much of this, if we depend upon the actual appropriation structure to get all of the infrastructure we need, it is simply not going to happen, and we are going to continue to have a very serious problem.

Mr. GORDON. But we need—you know, whether it is—we need more money budgeted for the infrastructure regardless of whether it is paying off a bond or doing it ourselves——

Mr. WALKER. Right.

Mr. GORDON [continuing]. But one way or the other, we have got to have additional funds, is that correct?

Mr. WALKER. Well, again, I would suggest to you that the—that there are many states who are prepared, because it is a good business opportunity for them, to go out and do some of this bonding that will not require huge amounts of new NASA money to be put in. The states will develop this because——

Mr. GORDON. Are they going to pay off the bonds?

Mr. WALKER. No, the authorities have the ability to go out and bring private industry into those areas that are municipalized, and therefore they make the money that can be used to pay off the bonds. And so——

Mr. GORDON. I thought we had a surplus in infrastructure—I mean, not infrastructure, but in terms of assets of depressed launch.

Mr. WALKER. Well, for example, if you are going to do an orbital space plane, as NASA has proposed, if that is going to be the new generation of technology, you are going to have to have facilities that allow you to integrate that aboard the EELVs or integrate it in whatever other way that you would utilize it. Who is going to build those facilities? Is NASA going to build them out of the appropriations stream or should you look for a more unique way of providing the facilities? We already have the example now that the Air Force utilized that—a bonding authority through a federal—the Florida Space Authority in order to put the facilities in place which are now being used for EELV. We are simply suggesting that that may be a model that gives you the capacity to get what you need for the future.

Mr. GORDON. Well, I think—I hope that would be worthwhile. Most states that I have been hearing say that we are passing too much down to them now. But let us see if the other panelists think that the states and private sector can afford to take this on or whether or not we need to have additional funding at the federal level and also whether or not we need to have that strategic resource review to determine what we have got and what is the situation? And what are you going to do with it? Mr. Douglass.

Mr. DOUGLASS. My input would be we probably do need some kind of a strategic review of NASA's infrastructure and a plan to modernize it. There are a number of structural problems that exist today with NASA that are huge bills to be paid in the future. One of them is the revitalization of this infrastructure to meet the long-term needs of the Nation. Another one is some substantial amount

of research to help the FAA with its long-term air traffic control needs. And then in the not too distant future, we have got to figure out a way to replace the shuttle, and——

Mr. GORDON. Mr. Douglass, I am sorry. I don't want to be imposing on these other people's time, so I guess the question is do you expect the private sector and the states to assume this or are we going to have to have additional federal dollars to accommodate this?

Mr. DOUGLASS. My guess is you will need additional federal dollars, sir.

Mr. GORDON. Substantial or——

Mr. DOUGLASS. Substantial.

Mr. GORDON. Mr. Hamre.

Dr. HAMRE. I can only speak very narrowly. I mean, if—there are only three ways that you fund things when it is a public good that you want that the marketplace won't provide. It is you mandate the cost and you just impose it on the private sector, you have a user fee, or you do a direct appropriation. Each of these has a different impact on efficiency and on incentives. I will give you an example of what I don't—I think you do not want to use user fees, and you do not want to have a mandate, and that is air traffic control. I mean, I think—I remember when we were talking about having user fees for air traffic control. You know, all you are going to get is a bunch of people that won't file flight plans, because they are trying to avoid cost. I mean, I think you—there are certain things that you have got to structure in your mind what are the incentives that come from it. I think we are going to have to spend more money on air traffic control.

Clearly the OEP Program is under-funded, and it needs to be funded at a higher level. And we need to invest in a modern air traffic control beyond the OEP.

Mr. GORDON. And do you think that NASA should have a strategic resource review?

Dr. HAMRE. Well, I certainly—it is always helpful. We certainly need it at DOD. I would recommend it, sure.

Mr. GORDON. If I could just conclude, Mr. Chairman, by saying that the OMB requested that, the appropriators required it, NASA started it but wouldn't finish it. And so I think if within your spheres of influence you would suggest to NASA that they move forward with this strategic resource review, as was required by OMB and by the center appropriators, then I think it would be beneficial for all of us. Thank you. And thank you for your time.

Mr. ROHRABACHER. Mr. Gordon, we probably will have time for a second round, and you will be able to follow-up even more. Now Mr. Calvert.

WIND TUNNELS

Mr. CALVERT. Thank you, Mr. Chairman. We—some number of years ago, Bob, you probably remember this, we were talking about wind tunnels 10 years ago. And as far as I know, we haven't done a lot since then. And I guess the state-of-the-art wind tunnel that we have in the United States, I guess, is Ames, and I don't know if we have really improved it substantially. Did you look into wind

tunnel technology here in the United States versus what others are using throughout the world?

Mr. WALKER. Yeah. We did not spend a lot of time on it, but clearly, the United States has not invested in wind tunnel technology. Most of the wind tunnels we have built have been fairly small wind tunnels where you test models. A full-scale wind tunnel, I don't believe we have built one in, what, 40 years or something like that. And much of the rest of the world is migrating to other places to have wind tunnel testing done, because they have far more modern facilities than we do and far more up-to-date use of information technologies within those wind tunnel facilities.

Mr. CALVERT. And I remember from our discussions years ago that you couldn't expect, say, Boeing or any particular aerospace industry to front the cost of a wind tunnel, because it just doesn't get a pay back on it. But there was some discussion about having a joint type of facility where the military, obviously who has a function, and the industry themselves coming together to maybe finance this type of thing. Is there—is that a good idea or do you think it should be a direct appropriation to build a state-of-the-art wind tunnel in the United States?

Mr. WALKER. Well, again, I would say to you that the clearer message that you should take out of the final report of the Aerospace Commission is that we need a lot more in the way of cooperative efforts among agencies. Now all of them, in fact, depend upon appropriation streams, but the fact is that time and time again we came up against issues where there was a need for civilian, commercial, and military uses of the same kind of resource. And our feeling is that Congress and the Administration needs to figure out ways to crosscut horizontally through the vertical silos that now exist so that we get a really maximum use of the resource we put into these. But yes, I mean, everybody in the country that is concerned with aeronautics and aerospace requires up-to-date wind tunnel technology. It should not be laid off on only NASA to provide that for the Nation. There ought to be a cooperative approach among a variety of agencies that have that need in order to see to it that it gets done.

ENGINE TECHNOLOGY

Mr. CALVERT. Another question on—we have—the Chairman brought up engine technology and can—and maybe, Mr. Douglass, you are the best person to answer this question. Can—do you think of any time a major engine design in the United States that has been put forward has not had government participation in some way?

Mr. DOUGLASS. Not in recent years, sir. We are at a level of technology in engines today where the primary performance parameters are all set by the government. And the most recent series of parameters that we have imposed on the industry have been noise parameters. We have made our commercial aviation engines substantially less noisy than they were 10 years ago. We are at what is called stage three noise reduction. We are looking to go towards—in a year or so, toward stage four, but the new thing we are also looking at are how do we reduce the emissions that come out of an engine. And when you talk noise and emissions and

thrust together, you pretty much tied down the design of the engine.

FUTURE AIR TRAFFIC MANAGEMENT & OEP

Mr. CALVERT. And one last question on regards to air traffic control. All of us fly a lot, and we are all frustrated. The industry is frustrated, as the public is frustrated. And we have been talking about fixing our air traffic control system here in the United States for a long, long time. And do you think we are going to get any closer to actually taking this from the idea stage to actual implementation of a plan that can take us to the 21st century with the technology that is available today?

Mr. DOUGLASS. First of all, Mr. Calvert, I want to—just by way of a disclosure, I was asked if I represent anybody, I am on the Board of Directors for a not-for-profit R&D corporation. And it is the FFRDC that supports FAA. So just by way of disclosure, I just delineate that I have a relationship with them. It is a—you know, it is a not-for-profit government corporation.

The OEP is a good program. And it—and this is the program that is in place now. It has been designed by the FAA to improve the efficiency of what is there now. And it definitely is a crucial thing to do. It—but I will have to tell you, the OEP program is a treading water program. If you put in place a $15 billion investment, and we need to make it, 10 years from now, we are going to have all of the same problems with air traffic control that we have today. If you don't put in that investment, it is going to become a nightmare over the next several years. So you have got to make this investment in order to avoid a dramatically deteriorating situation once we get out of this recession.

But it is not the long-term. The long-term we need to move to a new technology. And I think that we all have the vision of this new system, but it hasn't been engineered in any concrete way. This really does need to be—I would commend it to you, sir, as a focus for this committee, there needs to be some effort put on this. And it is going to be crucial, but it is a 10-year out, 15-year out solution. You have to stay with the OEP program if you are going to see—if we are going to avoid terrible problems with air traffic control once the economy pumps up.

Mr. CALVERT. So in closing, you would say we need to do a two-track type of a process here. One is to attempt to fix the system that we have now to get through the short-term, and in the long-term, scrap what we have and start over again with a state-of-the-art system that will take us forward in the future?

Mr. WALKER. Well, what you are talking about is a change in the fundamental underpinnings of the system. I mean, the system that we have had for 50 years depends upon voice communication between controllers and pilots. If you are going to have substantial increases in the amount of air traffic and then you are going to put unmanned aircraft into the same environment as human-controlled aircraft, if you are going to put space aircraft into the same environment as air vehicles, you simply can not rely upon a voice communication system. You have to go to a far more automated system. And as we have suggested here earlier, the military has assets that are—that could be utilized for such a system.

And so what we are suggesting is that as you develop OEP to enhance the voice communication derived system, you also begin to move to this automated system that gives you the opportunity then to do the complete switch at some point in the future.

Mr. CALVERT. Thank you.

Mr. ROHRABACHER. Mr. Lampson.

TRUSTED TRAVELER PROGRAM

Mr. LAMPSON. Thank you, Mr. Chairman. Somewhat the same line that Mr. Calvert was just talking about, our travels through airports certainly has been one of the significant bottlenecks for the airline industry to—that has added to their difficulties. And we have talked from the last year or so about a trusted traveler program that might help significantly move people through those airports more quickly. What are your thoughts about what impact it would have, any of you, on the airline industry and their finances if we implemented a trusted traveler program? And how quickly can we do this?

Mr. WALKER. Well, it is not an issue where the Commission spent a good——

Mr. LAMPSON. I understand.

Mr. WALKER [continuing]. Deal of time looking at it. I will tell you, as one of the people that travels a lot, and I think all of us here and so on do, I would love to see it come into place, because it would certainly make it more convenient for people who fly a lot to be able to get on and off airplanes easier. And I think that has economic implications for the airlines.

Clearly people who have to spend long hours waiting in lines are not people who are going to be happy consumers. If you are flying in this country less than 500 miles, the average speed of travel is 35 miles an hour by air. So the fact is that that is not a system that ultimately gets you to what you want to do. Is that—isn't it 35 or is it 85? It may be 85, but anyhow, it is a very, very low speed compared to the speed of the aircraft, because the time is being spent in other pursuits. And so insofar as you can move away from those kinds of numbers, you will have a more profitable industry.

Mr. LAMPSON. I just wanted to raise that, because I feel very strongly about it. And I am on the other Committee that hopefully can push to do something. But we have—we are holding this up. The technology is there, and we are not moving it. And somehow or other, we must.

Mr. WALKER. I want to get it in the record just right. It says for air travel—this is out of our Commission report. For air trips less than 500 miles, doorstep to destination travel time is now between 35 and 80 miles per hour.

Mr. GORDON. Well, I think I will get Mario Andretti to give us a lift.

Mr. DOUGLASS. Sir, I would like to add one thought to that. And it also stems from what Mr. Calvert said before. Where some of these issues intersect is that the government can develop the technologies needed to do these kinds of things, and indeed, in many areas, the technology has already been developed. The issue is de-

ploying it. And if we have an airline industry that is absolutely bankrupt, how are we going to deploy it?

Mr. LAMPSON. Do you think they are waiting on us, then, to say, "Do it," or for us to do it?

Mr. DOUGLASS. I believe the issue for us, all of us as Americans, is in the light of this new security environment that we are in, is where does inherently governmental responsibilities to protect our people end and where does private enterprise responsibilities begin to pick up? And I think we all have to think our way through that, because the passenger part of airline security is only the tip of the iceberg. I mean, I—my own personal view is given what happened out there in Pennsylvania, those brave Americans that rose up in that airplane and killed those damn hijackers, you are not going to see a lot of them try that any more. So what you are going to see are terrorist events which have to do with sneaking it in through the baggage or hiding out at the end of the runway with a missile or some other kind of thing.

So the security environment is really now almost anywhere below 10,000 feet the airplane operates where, you know, somebody can get at them.

Dr. HAMRE. Sir, could I just ask you, the problem isn't with the industry. It is with our government that has old, obsolete, paper-based rules that it keeps wanting to impose on us, because that is the way they have always done it. How many times have you traveled internationally and filled out that I–9 form, you know, before you land at Dulles? You know. Well, I don't know what they do with all of those pieces of paper. I can not get on an airplane without the company swiping my passport. They could compare that today to say that is John Hamre. I am just filling out that form so I can stand in an hour-long line out there to hand it to an inspector.

Mr. LAMPSON. You could carry a smart card that has all——

Dr. HAMRE. That is exactly right.

Mr. LAMPSON [continuing]. Of that data on it, and you could put your airline ticket and everything that happened in your past——

Dr. HAMRE. But you have got to change. This is not an industry problem. This is a government problem.

SPACE IMPERATIVE

Mr. LAMPSON. I thank you very much, and I am totally running out of time to do what I really wanted to do. Tell me a little bit about the comment that was made in the report, Mr. Walker, about the recommendation to create a space imperative. It sounds like a positive step. I am a little unclear about it. What did the Commission mean by that phrase, "create a space imperative," and what specifically are you recommending to be done to create a national space imperative?

Mr. WALKER. Most of that is based upon our belief that if you could cut the time of travel, for instance, to places like Mars and some of the places that we have dreamed about going in space, that you are more likely to be able to have the imperative to fund them, that one of the problems inside the political system is that when you say that it takes months or years to go to places, it is very hard to get people excited about them in a sense of actually getting

them paid for inside the system. And so a large portion of that was our belief that if, in fact, you come up with new propulsion systems that cuts the travel from Earth to Mars to weeks rather than months, that it becomes far more politically viable to fund a program that has that kind of potential.

Mr. LAMPSON. Have we funded any of the research recently, and we cut some of the funding that was leading toward the engine that would help us to——

Mr. WALKER. Yeah, well—but you—but the proposal that you have before you right now coming out of NASA is for Project Prometheus, which would fund nuclear plasma rockets that would, in fact, give you the ability to cut the time of travel to Mars to a matter of weeks.

Mr. LAMPSON. My time is up. Thank you, Mr. Chairman. Thank you, panel.

Mr. ROHRABACHER. Thank you very much, Mr. Lampson. Mr. Lucas.

SPACE TOURISM

Mr. LUCAS. Thank you, Mr. Chairman. Chairman Walker, there has been a lot of discussion in the past couple of years about the commercialization of space ventures and the part that entrepreneurial companies can play in that. Would you assess the role of suborbitals as we look at our national space policy for the next couple of years?

Mr. WALKER. Well, the problem right now in the entire commercial marketplace in space is the fact that it is flat on its back, that there is very little investor interest in putting money in, because in large part, the great hope of generations of satellite constellations that—where the profitability was going to be simply has never materialized. And so you have excess launch capacity at the present time and not very many people who are willing to put investment dollars in. Where I believe that there may be some hope for the future and where some small commercial companies are beginning to at least try to make a go of it is in space tourism and particularly in suborbital flight. And you have about 24 companies that are out there right now worldwide competing for the X-prize. Success on the X-prize may, in fact, give you a generation of vehicles that would be used almost exclusively for commercial space tourism. And that is one of the places where we see, and where the report says that there is a potential for perhaps a profitable enterprise in the future.

HIGH SPEED PROPULSION RESEARCH

Mr. LUCAS. Thank you. You mentioned, and your colleagues on the panel also mentioned the importance of engine propulsion work being a major initiative for NASA and the Federal Government. And I know over the recent decades, literally we and the Europeans have spent hundreds of millions of dollars on efforts to develop supersonic transportation propulsion systems. And there has been discussion even amongst those of us in Congress about the potential to restart some of those programs. Did the Commission—did you on the Commission make any recommendations about restart-

ing such research? Or maybe the better question is what do you think of the whole concept?

Mr. WALKER. Well, if—in the report, we make a recommendation that endorses the National Aerospace Initiative that is largely being run out of the offices of DDR&E and Defense but is being done in cooperation with NASA. And the whole idea behind that is to begin with our capabilities right now to do about mach II, mach III, and move ahead by one mach a year over the next 10 years, so that at the end of that time you have a capacity to do something in the area of mach XII or mach XV. The reason why that is an important initiative is because it will take advantage of some new propulsion concepts that we have as well as take advantage of some new materials technology that is emerging.

And we believe that that cooperative effort between NASA and DOD is in fact a very important program for this nation to do for two reasons. First of all, it gives the military some capability—some speed capabilities that it vitally needs for the future, but secondly, the vehicle that you develop could become the basis for the first stage of a two-stage, fully reusable, orbital vehicle in the future. And that is a potential that we need to recognize as we begin the—to do the work of developing the orbital space plane, for example.

Mr. LUCAS. Thank you. Thank you, Mr. Chairman.

Mr. ROHRABACHER. Mr. Smith.

[The prepared statement of Mr. Smith follows:]

PREPARED STATEMENT OF REPRESENTATIVE NICK SMITH

I want to thank Chairman Boehlert and Ranking Minority Member Hall for holding this hearing today to review the state of the United States Aerospace Industry and NASA Workforce legislation.

The aerospace industry has impacted our nation beyond simply contributing to the technology of flight. It contributes to the efficiency and security of our air transportation system. Discoveries made through aerospace research and development have led to significant improvements in our transportation, communications, and defense capabilities. And perhaps most importantly, aerospace employs millions of Americans all across the country.

In order to maintain our technological and competitive position in the world, our country needs to produce young people with the best science and math training. The second half of this hearing will focus on the difficulties that NASA is having recruiting and retaining quality employees. Clearly there is a great need to improve math and science education in this country.

Last year, we were able to pass legislation that improved research and education efforts at the National Science Foundation. One section of this bill—known as tech talent—established a competitive grant program to increase the number of students pursuing and receiving degrees in science, math, engineering, and technology. I am pleased to see that the Commission's report recognizes the importance of continued improvement in math and science education.

Still, it is one thing to ensure that quality educational programs are available to Americans, but it is another to actually motivate and see American students entering and completing degrees in these fields. Forty percent of the graduate students in engineering, mathematics, and computer science in this country are foreign nationals. We should be very concerned that we are simply educating the S&T workforces of other nations while more and more of our own students are ill-prepared to succeed in these careers.

Personally, I think that NASA and the space program could be a fantastic motivator for getting kids excited about science.

I will be interested to learn how the Commission would recommend how we can encourage more American students to enter into these fields that are so important to maintaining our economic and national security in the future.

Mr. SMITH. Thank you, Mr. Chairman. Gentlemen, thank you. Bob, good to see you again. I was trying to think of the issues we were talking about when you were Chairman of this committee, one, two, three, four, five, six, seven, eight——

Mr. WALKER. The issue was balancing the budget back then. That was the issue.

SCIENCE & MATH EDUCATION

Mr. SMITH. We won't even talk about that. I guess—I Chair the Research Subcommittee now, and we were pretty aggressive in the NSF reauthorization bill to push an effort to try to encourage more of our American students in the science and math. And of course with some place between 60 and 70 percent of NASA's employees being engineers or scientists, what—did the Commission talk about this? Is there a concern that almost half of our graduate students in aerospace science engineering are now foreign students? What was the Commission's recommendations?

Mr. WALKER. We are very concerned about it. You will find in our report that one chapter of the report and one full recommendation is related to workforce issues. And a substantial portion of that relates to education. There are a couple of issues here. First of all, if, in fact, you are going to do the kinds of things we need to do in aerospace in the future, you have to have a scientifically and technologically competent society. It isn't just the people who have——

Mr. SMITH. Yeah, that is what I tried to say, but how do we do it?

Mr. WALKER. Well, we recommend, among other things, we recommended some coordinated activities between the Department of Labor, the Department of Education, NASA, and other agencies and so on to begin to define what the needs are so that the—we can speak, again, across agencies to meeting the need. Secondly, we recommended implementation of educational reforms that would include both individualized and structural curriculums and lifelong learning. We believe that there was a—that there is a real need in our society to refocus education away from the idea of the teacher as an imparter of information but rather a teacher as the manager of information. Utilize all of the information now inside the system, use technology so that you can tailor instructional programs to the needs and the interests of the individual student.

That is entirely possible. The aerospace industry is doing it now. They have programs that they use to train their own workers that do those kinds of things. We think that it—there is a need to merge that into the public education system, into the university systems, in a way that you get a far better competency level.

Mr. SMITH. Yeah, I think NASA will—in 1957, after Sputnik, NASA was developed, and there was sort of a momentary bubble that excited a lot of youth. Two of my four kids went into physics and engineering, I think, partially because of that little stimulus out there and excitement. Somehow, I am not sure NASA still fulfills that excitement role for youth, but——

Mr. WALKER. One of our commissioners, Neil Tyson, said that it is very important to have some exciting projects that you are doing, because that is what does stimulate students. He said you won't

get very many aerospace engineers who will come on board in order to make the next generation of engines 10 percent quieter. The fact is that you need some real programs out there that really stimulate people to do exciting things. And that is one of the things that our Commission——

Mr. SMITH. Do you other gentleman have——

Mr. DOUGLASS. Yes, sir. I would like to add a couple of things to that. First of all, when you look at this problem, you immediately come to the issue that the American educational system is not all run by the Federal Government as primarily, as we know, in our states and local communities. And so one of the things that industry is doing, the aerospace industry is doing, is we are going to take the Commission recommendations and over the summer and fall of this year, try to create a national plan, which is a cooperative plan between the Federal Government, the states, local communities, and industry and academia to get at this problem, because it is not just a NASA problem. It is an industry problem. It is an Air Force problem. It is a Navy problem. It is a NOAA problem. Anywhere where aerospace touches our government, we are finding that our workforce is aging and we aren't getting the human capital we need to sustain the industry or the oversight part of the government that regulates the industry.

Mr. SMITH. Let me ask one last question, I think, and then maybe, if the Chairman lets me—because I think education—I mean, it certainly is the seed corn to our future, whether we are talking about aerospace or whether we are talking about innovations to be competitive in a world market. Give me the Commission's position or recommendation or evaluation on the current NASA, FAA trying to bring in DOD and Homeland Security in an effort to design how we are going to better structure new management and organization for the air traffic program.

Mr. WALKER. Well, from my perspective, they are just in the process of getting it off the ground. That in and of itself is a good sign. I mean, for a long time, there has been resistance of the agencies to work together. There has been resistance inside of FAA to step out on programs that would change the system in revolutionary ways. I think that attitude is changing. I have been over and briefed a number of people inside of Department of Transportation and FAA. They are very much on board with the idea of moving toward new systems. NASA has some very exciting things that they bring to the table on this. You—the question will be whether or not you can utilize some of these DOD assets. I mean, there—if you can't do that, it becomes a system, which is probably too expensive for us to do.

If you can utilize some of those assets, then I think it is entirely possible that you could develop a system here that would be in the range of affordability. But that is a cooperative effort that——

Mr. SMITH. So you say—pretty much, is that an agreement? You say yes, it is a good thing.

Mr. WALKER. Yeah, it is a good thing.

Mr. SMITH. And Mr.—is it Hamre? I am sorry. I don't know how to pronounce your name. Any last words on education or——

Dr. HAMRE. The only thing is that you really can't have the educated workforce if you don't buy anything. You know, we have got

to buy stuff. And either you can educate them, you can crank them out the door, but if they don't have real things to do when they get out, that is going to be the problem. So it is creating a vision and actually choosing to extend what it is we set as a goal for our society, what we want to do. But just educating the next generation of engineers without having things for them to work on is probably going to be counterproductive.

Mr. SMITH. Thank you.

Mr. WALKER. The fact is, we are graduating aerospace engineers. They end up working in the computer industry.

Mr. SMITH. Right. And they are being offered 40,000 right out of—with a bachelor's degree, and so a larger and larger percentage of our researchers getting our federal grants are foreign nationals. Thank you, Mr. Chairman.

Mr. ROHRABACHER. Thank you very much. I think that, of course, we all have to recognize you will be able to attract young people, bright young people, into engineering and scientific jobs if you pay them more money. Surprise, surprise. I mean, if you are paying—I mean, I drive down in my community, and I—a lot of aerospace people live in my area, but the people who live in the best houses are all lawyers. So we won't go into that. Mr. Larson, I don't know if he is a lawyer or not.

NASA AERONAUTICS R&D INVESTMENT

Mr. LARSON. Thankfully not. And with all due respect to the legal profession, I am a teacher, so I thank the Chairman, and I thank him for this—for the hearing. And I want to thank these gentlemen on the panel today, Mr. Walker, Mr. Douglass, and Mr. Hamre, who have been instrumental in putting together the Aerospace Commission's recommendations.

My concern, and I will cut right to the chase, you know, we face European Vision 2020, global competition. And when we look to the NASA budget, and as we reminded NASA when they were in here the other day that part of NASA, as the second—the first A in NASA stands for Aeronautics, and yet we see, again, a cut of five percent. And actually, it is probably deeper than that when you take into consideration inflation and costs.

If that cut is allowed to stand, and especially in lieu of your recommendations before—to the President before Congress, what impact will that have on research and development and our ability to compete into the future? We will start with Mr. Walker and——

Mr. WALKER. Well, I think you do have to look at the budget in terms of the totality of it. And that is that a large portion of what NASA intends to do in the aeronautical area does involve the National Aerospace Initiative. And there, you need to look at the fact that that is a program that the Administration is standing up for over at DOD and where they are cooperating with NASA. NASA will be the beneficiary of being able to utilize the DOD resources. And the fact is that some of the NASA input to this will be very important to the long-term of the program. So I think that it is important that, as a Nation, we are investing in aeronautics and in propulsion and in a number of things of that type. I would want to look at the entire resource base, however, of what is going into it and not just single out particular agency budgets.

Mr. LARSON. Mr. Douglass.

Mr. DOUGLASS. I think we have got to do a lot more in aeronautics. I think one of the manifestations of a lack of investment in this area can be seen in situations like Boeing when they were thinking of developing the sonic cruiser, having to go to Toulouse to do it in a wind tunnel, to their arch rival. I think there are other areas where the cutbacks in aeronautics have caused us to be less competitive in a very competitive global economy.

If we accept the model that NASA is supposed to be the engine for basic research for the civil side and the DOD is supposed to supplement that or we glean what we can, and Bob pointed out the structural problem we sometimes have that DOD technology is very expensive because it is, in many cases, absolutely life or death and so on. But there are only two places to get the technology we need for the commercial side: one is from NASA, and the other is from the Department of Defense as far as basic research is concerned. And if we don't invest as a Nation, we are gradually going to lose this part of our economy, as sure as God made little green apples. And there is a cause and effect here. It is very hard to draw, you know, micro connections. But when you go back to the macro view and you see that the EU, as you mentioned, in 2020 has pledged to spend $95 billion over the next 10 or 15 years to displace us, and you look at our—what is going on in the civil aviation side of our economy, you see we have these huge structural problems that we have got to deal with.

Mr. LARSON. Mr. Hamre.

Dr. HAMRE. I—my gut instinct says that we probably need to be spending more, but we do need to—an awful lot of work for aviation in the future is really on things like materials technology, nanotechnology. So it may not be showing up in the kind of ways that in the past you would think about going into a NASA budget into a wind tunnel. You would have to get people that are more expert that are really looking into the details of it to know where we need to be. But you know, I think this is an industry right now that most people have decided it is an old, mature industry, and it is not very exciting. And people are walking away from it. And I think that is going to be a mistake.

Mr. LARSON. Well, it is a very alarming mistake inasmuch as we are shedding workforce, we are shedding expertise and technology. And as Mr. Douglass said, here is Europe staring us directly in the face and saying, "Oh, by the way, we are coming after you. We are going to subsidize our industry, because ultimately we are going to take it away, because your government is no longer wed to supporting this kind of research and development, and ours is." And ultimately, without governmental intervention and support here in dramatic fashion, it is just going to be the slow attrition and the constant outsourcing to other nations and other industry as we lose our core base of aerospace industry here in the country. I mean, it is incredibly alarming that we would let this take place.

AEROSPACE SECTORAL BUDGET

Mr. WALKER. Mr. Larson, I agree with you. The one thing I would suggest, though, that may be worth you looking at is the fact that one of the things that the Commission did as a part of our

work was developed an aerospace sectoral budget. We went through and figured out where all of the spending was taking place in aerospace inside the government. What you come to a conclusion is—now that did not include the military, because the military was off, but if you take a look at all of the resources, you will find a tremendous amount of money that is being spent in aerospace. The question is whether or not it is being spent correctly, and whether or not it is being spent with any kind of rational plan behind it.

And one of the things that really needs to be done in order to address the issues that you are talking about is to assure that we are spending that money for the things that really need to be done. And what the Commission tried to do was prioritize how that money should be spent. And we would agree with you that it is extremely important that we spend some money in these areas that are going to determine the future of the industry.

Mr. LARSON. Thank you very much.

Mr. ROHRABACHER. Thank you, Mr. Walker.

Mr. LARSON. Thank you, Mr. Chairman.

Mr. ROHRABACHER. And there is a difference between subsidies that our foreign competitors might have the advantage of and perhaps incentives that we could provide. And there are two different approaches to trying to make people competitive. We could—I will recognize Mr. Bart Gordon for a 1-minute summary. And I will give a 1-minute summary, and we will move on to the next panel.

IMPROVING NASA'S INFRASTRUCTURE

Mr. GORDON. Thank you, Mr. Chairman. And I hope that the Committee will follow this same brevity.

Is it fair to say that it is the consensus of this panel that there needs to be infrastructure, and I would say even significant infrastructure improvements within NASA, that some portion of that may very well need to come from already financially strapped aviation industry and states, but also that there needs to be additional resources, and what I mean bluntly, is spending on infrastructure by the Federal Government within NASA? Is that a fair consensus? Does anybody not agree with that?

Mr. WALKER. Well, the only caveat I would put on it is that I would also put a part—as a part of that better utilization of the resources that are already being spent.

Mr. GORDON. Okay. Well, good. That is—but the first part, we do need to—we are going to have to spend some more, is that fair? Okay. Then the second part is going to what you have suggested. Is it also a fair consensus that this committee would recommend that NASA have an inventory or strategic resource review of its assets and facilities, what improvements need to be made, what consolidations need to be made, if any, and any—and what expenses need to be made? Would it be fair to say that there should be that type of review of NASA? Does anybody—for the record, I think all of the——

Mr. WALKER. I don't disagree with that.

Mr. GORDON. Okay. So we have got horizontal—or rather, vertical heads.

Mr. WALKER. Again, that was not included in the Commission report, so we can't say that that is what—where the Commission came from——

Mr. GORDON. But the panelists.

Mr. WALKER [continuing]. But I am speaking for myself, personally——

Mr. GORDON. Thank you.

Mr. WALKER [continuing]. I don't have a problem with that.

Mr. GORDON. Thank you.

Mr. ROHRABACHER. Thank you, Mr. Gordon. And thank you to all of the panelists today. Let me just note a couple of things. We heard several times about the possibility that there is a lack of cooperation in terms of utilizing technology that is available. I—this—as Subcommittee Chairman, Mr. Gordon is—just walked out, but as Ranking Member, I am sure he would agree, we have—we will be having a hearing of the Subcommittee that is focused on that issue of whether or not there are technologies and how to free them up from the—especially from DOD over to the civilian sector. Also, part of that hearing will be whether or not labeling this of secrecy in our government, whether or not that has something to do with an obstacle to competitiveness where there might be some technologies that aren't permitted to be utilized by the civilian sector by, perhaps, an overaggressive use of secrecy now that the Cold War is over with. So we will address that in this Subcommittee.

I am noting that Mr. Walker repeated numerous times the lack of propulsion and how we should focus on propulsion. Let me note that if the airline industry is losing money, if we had engines that would be—cost less, meaning they wouldn't have to be replaced after every 20,000 hours or so, or they would be a better use of fuel and were, perhaps, lighter, the airline industry may well be able to be competitive again. And I know there are some engines around that have not been followed up on, that are not—that there have been no prototypes, but there are engineers, who are very respected engineers, who have got some good ideas. And I would hope that we have an industry that is open to these ideas as well as having our government open to these ideas.

Now with that said, thank you all very much, and Mr. Ehlers came in late, but because he has the Ph.D., and the guy who really knows all of the answers, we are going to give him a chance to ask whatever questions he wants. Go right ahead, Mr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I will be very brief. Actually, I was here very early, but I have made a McArthur-ist return. Just—and I was in an Aviation Committee hearing, and I heard the same thing I heard here, that the industry is in trouble. If we can get rid of government regulation, we can save 10 percent. So I find it interesting that both ends, the production end and the consumer end, are in the same problem.

Just a quick question, Mr. Walker, and if you have already covered this and it is in the record, you don't have to answer, but I was intrigued with your comments earlier about the propulsion issue. Now were you referring to space propulsion or to commercial aircraft propulsion?

Mr. WALKER. In the case of the space propulsion, it is in space propulsion largely that we are looking at and to cut the times for

particularly exploration of the solar system. In terms of aircraft propulsion, we have mentioned a couple of times here that the National Aerospace Initiative is aimed at increasing the speed substantially over the next 10 years.

Mr. EHLERS. And what do you mean by "substantially"?

NATIONAL AEROSPACE INITIATIVE

Mr. WALKER. The National Aerospace Initiative is aimed at taking the present speed capacity we have of mach II to mach III and moving it up at one mach a year over the next 10 years, so that after a decade, you would have the capacity to do a XII to XV mach.

Mr. EHLERS. And you are talking about this for passenger service or——

Mr. WALKER. Well, we are talking about having the capability for a number of uses. One of the uses for it would be to provide the air portion of a two-stage to orbit vehicle for space travel. Some of it would be to deliver goods. Some of it would be to deliver munitions. You know, there are a variety of uses. And you might not use all of that speed for commercial aviation immediately, but it does give you the capacity once you have developed the materials and propulsion to look at much higher speed aircraft for commercial passenger use.

Mr. EHLERS. Okay. You are probably not going to use Middle East oil for that, either.

Mr. WALKER. We are going to use hydrogen.

Mr. EHLERS. Somehow I am not surprised at that answer. I yield back, Mr. Chairman. Thank you.

Mr. ROHRABACHER. And because the Chairman gave himself an extra minute, we are going to give Mr. Lampson a minute.

Mr. LAMPSON. Such a magnanimous individual. Thank you, Mr. Chairman. I just wanted to really make more of a comment than ask a question at—Bob, your comment about the—being a space imperative, and I was—I guess my thought was perhaps that we ought to give more credence to trying to get the cost of getting into lower orbit down more so that we could do more in space and then ultimately set bigger goals that would take us further on out into space with the better engines or faster engines that would let us move to Mars more quickly.

Mr. WALKER. Well, that is a part of our recommendation as well. I mean, we—if you look at the Commission report, we also recommended trying to come up with systems that would give us lower cost of transportation to orbit in the first place, and then particularly looked at reusable spacecraft on that. And that is the one reason why the National Aerospace Initiative, in conjunction with the orbital space plane that could provide both pieces of an ultimately viable, reusable vehicle are important here. So we would agree that reducing the cost to orbit is also important, but we thought that the imperative comes from the ability to do more things in a time frame which is more practical.

Mr. ROHRABACHER. All right. And let us remember that Mr. Hamre suggested that there are a lot of things that we are doing regulatory-wise that are obsolete and are causing great costs to our industry, and we can change that without spending any money.

And we should. There is no excuse for us in Congress not doing our job and getting at those and trying to have those reforms. Thank you very much, panelists.

Panel II

NASA WORKFORCE

Mr. ROHRABACHER. We have a second panel with us. And are you going to invite the second panel? All right. Thank you all very much.

The witnesses from the previous panel certainly hit certain problems right on the head, and one of the major problems that the Aerospace Commission identified was its workforce in terms of aerospace workforce of the United States both in industry and government. Chairman Boehlert has been working with NASA trying to address this problem, and in fact, I have just today cosponsored Chairman Boehlert's legislation aimed at trying to deal with this problem, which is H.R. 1085, the *NASA Flexibility Act of 2003.* And hopefully, once we pass that, it will begin to address the agency's critical needs in terms of workforce.

So NASA has a workforce that is aging. NASA scientists and engineers, many of them are over 60 years old, and they outnumber those under 30 by a ratio of 3:1. This committee will be considering this legislation and the problems facing NASA and the challenge of a workforce for the next century. And this panel is here to give us some insights into this major issue.

Our first witness is Max Stier, President and CEO of the Partnership for Public Service. The partnership works to make the United States Government an employer of choice for talented, dedicated Americans through educational outreach, through legislative advocacy and hands-on partnership with agencies like NASA. And Mr. Stier, you may proceed. And if would ask again, if you could summarize down to about five minutes, we could get to the questions and have a little dialogue.

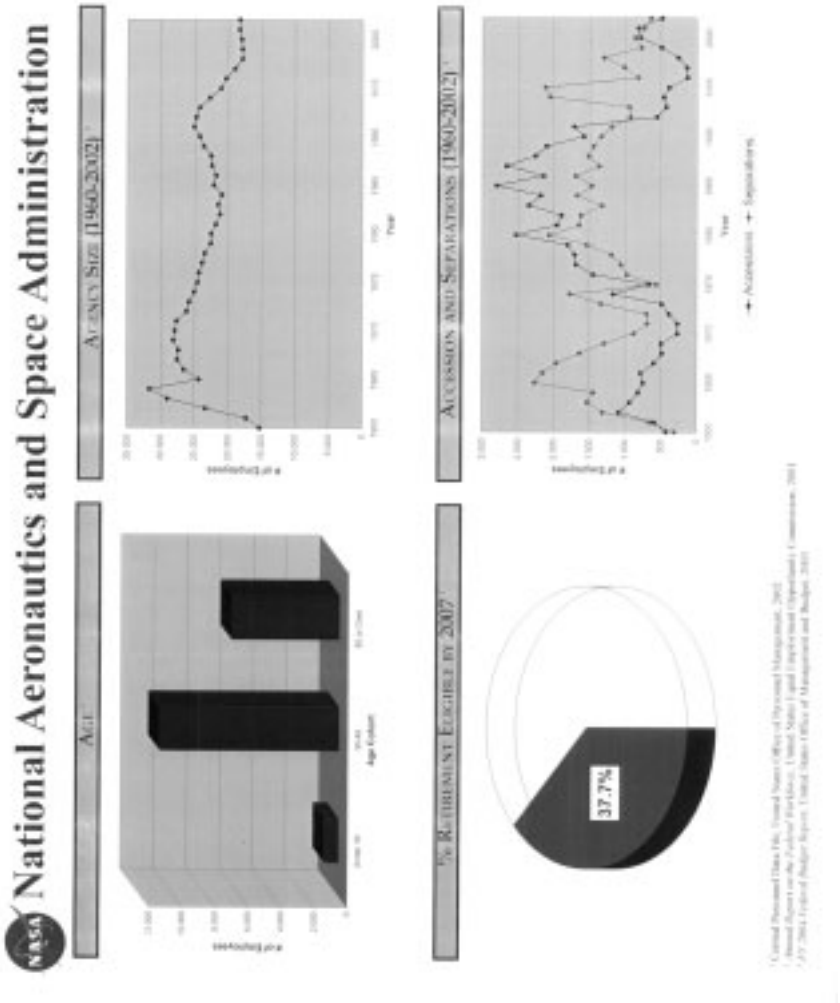
STATEMENT OF MR. MAX STIER, PRESIDENT, PARTNERSHIP FOR PUBLIC SERVICE

Mr. STIER. Thank you, Mr. Chairman, Members of the Science Committee. And it is a great pleasure to be here, particularly with this panel, with President Harnage, and Mr. Nesterczuk.

I am going to focus my oral remarks, the initial remarks here, on three key questions: the first of which is why this matters; the second, why NASA now; and third, and finally, is what is needed.

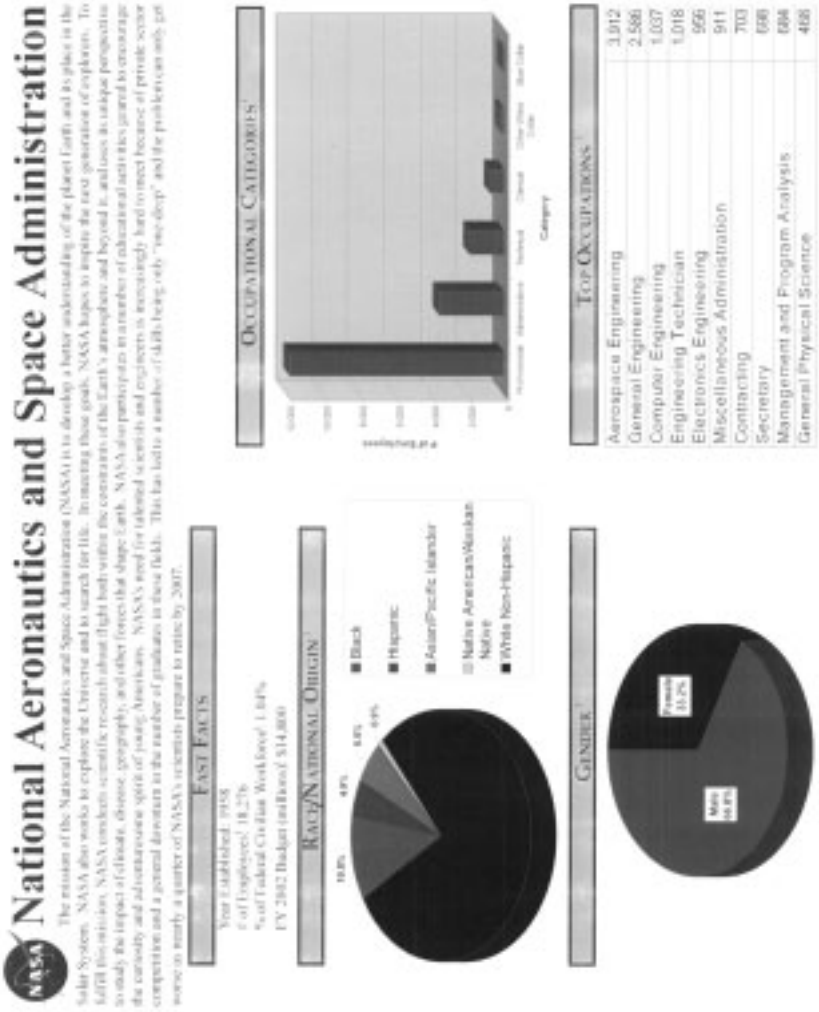
NASA WORKFORCE DEMOGRAPHICS

On the why this matters, the demographic chart that I have up there, and I think may even be on some of these screens, really tells the full story.



What you see there is very much a workforce that is absolutely out of balance. When you look at the under 30 at NASA, the percentage is close to five percent of the workforce. Industry average on engineering, in the private sector, is closer to 14 percent. That is a real problem. What the—NASA needs to do and what it needs to do here and now is make sure that it keeps the cohort in the 30- to 49-year-old range. It has to retain the talent there, and it needs to recruit the under 30 to bring it up. And it is a real challenge. And why is it a real challenge? Because there is a war for talent, and the war is very difficult.

NASA'S COMPETITION FOR TALENT



So in the next chart here, you will see what NASA is up against. This is the competition. The competition is extraordinary. And obviously, you had the last panel here, which represented many of the industry actors here. And the fact of the matter is they are doing what they are supposed to be doing. They are going out there and getting the very best talent for their companies. And we need to make sure NASA can do the very same thing.

I would note that these logos all come from a website, spacejobs.com. The web is an unbelievable place to get information about jobs. That is where young people, in particular, are looking. And we need to be able to compete in the government in the same

way. There are no academic institutions on there. If you put them there, we wouldn't have any room on the chart, so we had to exclude them, but they are real competitors, too.

So the question is well what are they doing and how is it that NASA can compete. Well, let me tell you an anecdote that comes from a report that was done for the Air Force about Ames, actually a NASA facility. And I will quote from that report in a discussion about how private companies are targeting—actually targeting government engineers and scientists. And they describe one incident, "A case in point is a Silicon Valley company that rented a small airplane, attached a recruiting banner to the tail of the aircraft, and then made repeated low passes over a government research facility." That was the NASA Ames facility. "The major"—extraordinary, but it goes on. "The major commuting roads into the government research facility are also lined with billboards placed there by local companies with recruiting messages directed at the government researchers who work there."

Now the bottom line is NASA doesn't need to do exactly this, but that is the marketplace out there. And NASA has to have the tools to be able to compete in that marketplace. Now why are the competitors doing that? The bottom line is because human capital counts. When you look again at private sector data, and that is because that is where all of the data is today in these issues, the fact of the matter is that is replete with examples of why human capital counts. When you look at the data, you see upwards of 40 percent plus returns on capital over and above the normal when you see effective human capital management.

That is what the government needs to do. It needs to be able to effectively manage its human capital in order to see the returns that all of us need as a country.

ROLE OF NASA WORKFORCE LEGISLATIION

Now the legislation that you are talking about here is a good start. I would add two things, though. First, it is just legislation. That is the starting point. The key question is going to be in implementation, and I think that the provisions you have in here in terms of oversight to looking at what happens with these different authorities is very important. I also think it is very important for the Committee to support NASA in the resources that it needs, and Congress needs to support it and the resources it needs in order to implement these flexibilities and ones that are already on the table. The legislation is the beginning part of the stage, but again, you can change that playbook as much as you want, but if you don't have players that have the resources and the know-how to execute those plays, it is not going to change.

ROLE OF EMPLOYEE COMMITMENT

The second component, and we have President Harnage here, which I think is quite important, is you absolutely have to have employee involvement and employee commitment to the process. And that is something that again the private sector data is replete with examples that it is essential to success and that in and of itself, employee engagement will create better returns.

NEED FOR NASA-SPECIFIC WORKFORCE LEGISLATION

So now a question that rises is why NASA. This is clearly a problem in NASA, as we have heard from the prior panel, you have got this problem certainly in the science and technology fields across government. It is also a problem government-wide in many other occupations.

And I would argue that is why NASA rather than a government-wide piece here and now is first and foremost because NASA is ready. When you look at NASA, it has a strategic human capital plan. It is being scored in the OMB scorecard with a green on progress and it is one of only six agencies to receive a yellow. And it is ready. It has a plan to attack the problem, and it needs to be given the tools, too, in order to succeed.

It is also true that NASA has specialized needs. It has a workforce that is 60 percent science and technology, science and engineering, and those are the most difficult professions here and now to recruit. Again, if you look at a recent private sector survey, engineering was the second hardest category to recruit just following the IT area.

I notice my time is over. I would love to talk about what is needed. Clearly, I think this bill is a step in the right direction, but it is not the full story, and other things, for example, Scholarship for Service Program, would benefit NASA and, frankly, this country enormously. Thank you very much.

[The prepared statement of Mr. Stier follows:]

PREPARED STATEMENT OF MAX STIER

I want to thank the House Committee on Science and Chairman Sherwood Boehlert for the invitation to testify before you today on an issue that is of great interest to me and the Partnership for Public Service. The National Aeronautics and Space Administration (NASA) is confronted with a number of urgent workforce challenges and I am pleased to discuss our views regarding the potential for a proposed bill, the "NASA Workforce Flexibility Act of 2003," to assist in meeting those challenges. The Partnership for Public Service strongly supports giving federal agencies meaningful workforce management tools to better enable them to become the high-performing organizations that the public justifiably demands. At the same time, we also believe those tools must be carefully crafted to ensure that they do not conflict with the public's interest in a merit-based civil service system. For the reasons outlined in this testimony, we support the provisions of the "NASA Flexibility Act of 2003" as a good step in the right direction. We also offer suggestions for additional proposals that the Committee may wish to consider.

Basic Principles

The views expressed in this testimony are based on three fundamental principles which must be preserved in the design and implementation of any new federal workforce management flexibilities.

First, as noted in the Partnership's July 31, 2002, report, "Homeland Security: Winning the War for Talent to Win the War on Terror," whether in the private sector or public sector, active employee involvement in the design and implementation of management improvement activities is a proven method for achieving positive results. Every federal demonstration project or alternative personnel system that has successfully tested or implemented a human resources management policy outside the requirements of Title 5 has first engaged in consultation or negotiation with employee unions or, in the absence of a union, direct consultation with affected employees.

Second, effective use of any HR flexibility presupposes that sufficient resources are available and allocated for their use. We strongly encourage congressional appropriators and the Office of Management and Budget to take this into account during budget development and deliberations. We appreciate the fact that there are many demands placed upon the limited funds that are available for federal oper-

ations. However, good human resources management is an investment in the long range health and vitality of the federal workforce and the health and vitality of the government itself. We've seen the negative results associated with attempts to exact "savings" by short-changing constructive human resource initiatives. Workforce management done "on the cheap" will fail.

Third, agency leadership committed to effective mission accomplishment and the long-term health of the public service is an essential ingredient for successful workforce management. Commitment and accountability for positive results and adherence to public service values must exist at all levels of agency management.

Why Are New Flexibilities Needed?

By now, of course, it is well documented that the entire Federal Government is facing severe workforce challenges. Further, those challenges are approaching crisis proportions in at least some federal organizations. For example, the General Accounting Office has designated strategic human capital management as a government wide high-risk area. The President's Management Agenda contains five government-wide management initiatives, the first of which focuses on the strategic management of human capital. The challenge today is not one of finding additional evidence of federal workforce problems, for the evidence abounds. The real challenge is to develop and implement a viable response to those problems. In that regard, I commend the House Committee on Science for its initiative to seek answers and to propose solutions.

Background

Before I summarize what I see as the unique workforce challenges confronting NASA and some of the more promising responses to those challenges, it might be instructive to briefly share a little background on the Partnership for Public Service. The very existence of this non-partisan, non-profit organization that I have the privilege to lead is itself testimony to the seriousness of the problems confronting NASA and the rest of government.

The Partnership for Public Service is dedicated to helping recruit and retain excellence in the federal civil service. Through an aggressive campaign of hands-on agency partnerships, legislative advocacy, focused research and educational efforts, the Partnership encourages talented people to choose federal service for some or all of their careers and works with the government to help retain high-achieving federal employees. We exist because of the vision and concern of our founder, Samuel J. Heyman, who was himself a federal employee in the 1960's. Although Mr. Heyman left government in 1968 to run the family business after the death of his father, he never lost his appreciation for the fact that the quality of life in this country is a direct reflection of its government and that the quality of the government is a direct reflection of its workforce.

Concern over a potential decline in the quality of the federal workforce has been fueled in part by the knowledge that over the next five years well over half of the federal workforce may qualify for retirement, including over 70 percent of its senior executives. Moreover, this turnover will occur after a decade of downsizing which resulted in skills imbalances in a number of agencies and left some staffs stretched perilously thin. Additionally, interest in federal employment remains low among some of the most highly talented, and marketable, members of the national labor force. This was, and is, a scenario for disaster. Out of a determination to do something about this situation, the Partnership was established and a public launch was planned for September 12, 2001.

On September 11, 2001, we were in the midst of a congressional breakfast being held to introduce the Partnership when word of the terrorist attacks reached us and the building was evacuated. If anything, however, the events of September 11, 2001, reminded the American public of the need and value of a strong and vital public service. Unfortunately, the renewed appreciation for the public service has not resulted in increased interest in federal employment. To that end, the Partnership has been actively engaged since its establishment in working with Congress, the Administration, federal employees and their representatives, corporate leaders, academic institutions, and other individuals and organizations interested in ensuring that the Federal Government has a high-performing workforce within a high-performing workplace.

While the Federal Government competes in the same arena as the private sector, it operates with a significant handicap in terms of a compensation system that is relatively inflexible and which does not respond to "market-pressures" when competing for the "best and brightest," particularly in occupations where the demand exceeds the supply. Nor is the federal recruiting disadvantage simply a matter of pay. Even well-qualified individuals who are actively interested in federal employ-

ment must face what has been described as a "civil service hiring labyrinth" that in comparison to private sector hiring is viewed as slower, more confusing, and less fair. Finally, the current system also offers limited opportunities for high performing employees to receive monetary awards based on their performance or contributions.

Implications for NASA

The problems and challenges described above apply to all agencies, but not equally. The predominance of positions in NASA that require high levels of technical and scientific expertise magnifies its recruitment and retention difficulties in a unique way. As noted in the NASA profile attached to this testimony, over 60 percent of NASA employees are in professional positions (positions with positive educational requirements at the college level). NASA's top three occupations in terms of the number of employees in that occupation are aerospace engineers, general engineers, and computer engineers—all skills that are in great demand in the private and academic sectors. NASA also faces acute short-term recruiting needs with three times as many employees over the age of 60 as there are under the age of 30. Further adding to its workforce management challenges, NASA went through a sustained downsizing effort starting in 1993 that lasted through 2000 with negative consequences for the depth of its technical capacity. As noted in the President's Management Agenda for FY 2002:

> Downsizing at NASA over the last decade through attrition and buyouts has resulted in an imbalance in NASA's skills mix.

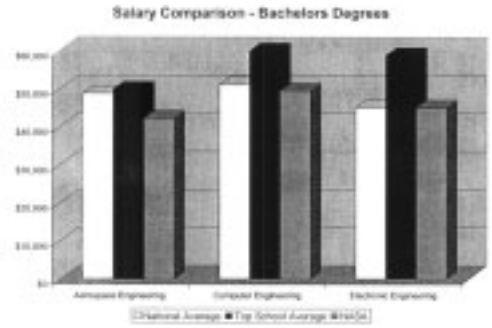
Having identified a problem and having the ability to do something about it, however, are two different issues. Many of the positions that NASA will need to fill are among those for which competition with the private sector is particularly acute. Plus, as the overall talent pool shrinks, NASA will increasingly be at a disadvantage in comparison to private sector employers who are better able to adapt their personnel policies and practices to the changing labor market. As noted by the General Accounting Office in its January 2003 report, "Major Management Challenges and Program Risks: National Aeronautics and Space Administration":

> NASA is facing shortages in its workforce, which could likely worsen as the workforce continues to age and the pipeline of talent shrinks. This dilemma is more pronounced among areas crucial to NASA's ability to perform its mission, such as engineering, science, and information technology.

Finally, we agree with the NASA Administrator, Sean O'Keefe, who noted in his written statement to the Senate Subcommittee on Oversight of Government Management, the Federal Workforce and the District of Columbia, Committee on Governmental Affairs, that:

> NASA's ability to fulfill its ambitious mission is dependent on the quality of its workforce. An agency is only as strong as its people.. . . Being "good enough," will not suffice: NASA needs the best and the brightest to build a world-class workforce.

Unfortunately, it's difficult to attract and retain a world-class workforce when the hiring system is not only convoluted and off-putting, but the starting salaries offered are below national averages and, as the chart below shows, significantly below the salaries paid to graduates from some of the Nation's top schools. Although average engineering salaries in the public and private sector tend to be comparable, the private sector pays higher entry level rates to attract top candidates. This provides a significant advantage over the relatively inflexible federal pay system.



Sources: *National Average* from National Association of Colleges and Employers, 2001-2002. *Top School Average* indicates average entry-level salaries for graduates from schools ranked 1-5 for engineering in "America's Best Colleges 2003," *US News and World Report*, 2003.

Why NASA and Not All of Government?

I know there is some concern regarding the "Balkanization" of the federal civil service system by allowing individual agencies relief from the requirements of Title 5 of the U.S. Code and not others. An alternative to the flexibilities being considered in the proposed "NASA Flexibility Act of 2003," might be to wait for government-wide civil service changes that would benefit all federal agencies. As attractive as that proposition sounds on the surface, the realities of the situation argue against it for three reasons. First, NASA's needs are too acute to await a broader legislative package. Second, we believe NASA has demonstrated that it is presently ready to manage the proposed flexibilities in a responsible and effective manner. Third, while we support the broader goal of comprehensive government-wide reforms, we see no reason to delay action on the current proposals until that more ambitious agenda is realized.

Any proposed change to a provision in Title 5 should be evaluated within the context of the need of the agency or organization involved and the capacity of that agency to handle the change in a responsible, merit-based fashion. On the first point, and based on the information provided in the first part of this testimony, we must agree with Committee Chairman Boehlert who, in his testimony before the Senate Subcommittee on March 6, 2003, stated:

> Now, NASA is not the only agency facing workforce issues, in general, or issues involving its scientific and engineering workforce in particular. But NASA's needs are especially critical. I don't believe we have to wait for massive, wholesale reform of civil service law to take care of NASA's immediate problems.

NASA does not have the luxury of waiting if it is to successfully meet the substantial workforce and mission challenges it faces.

On the issue of whether NASA is ready to handle in a responsible, merit-based fashion the flexibilities being proposed, I would note the findings of the General Accounting Office in its January 2003 report on NASA which, while finding that NASA's human capital was still at risk, also found that:

> Since our last Performance and Accountability Series report issued in January 2001, NASA has been taking actions to address each of its challenges. For example, NASA has hired new staff, who helped address imbalances in some critical skill areas in the shuttle program, and it has developed a strategic human capital plan to enhance its entire workforce.

We also note that based on the Office of Personnel Management's and the Office of Management and Budget's assessments of the progress being made in its human capital management, NASA received a "green" in human capital management progress and was one of only six agencies that received a "yellow" rather than a "red" in that area in the executive management scorecard.

Finally, calling for government-wide reforms in lieu of agency-specific relief ignores the fact that there are already more federal employees who work in federal organizations that are exempt from some or all of Title 5 than there are employees in organizations that are fully covered by Title 5. A 1998 report by the U.S. Office of Personnel Management, "HRM Policies and Practices in Title 5—Exempt Organizations," found that:

> In the Federal Government, the trend toward flexibility has manifested itself in a number of ways, including the attempt by a number of agencies to move away from the specific requirements of Title 5. Full or partial exemption from Title 5 is of course nothing new. Agencies such as the Tennessee Valley Authority, and the Federal Reserve Board have been outside Title 5 for decades. But the movement in that direction has gained momentum, to the extent that nearly half of federal civilian employees are now outside of some aspect of Title 5 coverage.. . ."

Note that this report was written before the Internal Revenue Service was granted substantial flexibilities and before the Department of Homeland Security and its 180,000 employees were exempted from portions of Title 5 that still cover many of the remaining federal agencies. So an argument that all federal organizations should remain under Title 5 and that any changes should apply government-wide seems to have been lost some time ago. Given this background, the present legislative proposal is a welcome continuation of a long time trend toward limited grants of flexibilities on an agency-by-agency basis.

Why Now?

NASA's workforce problems have also been exacerbated by significant changes in the aerospace industry itself. The "Final Report of the Commission on the Future of the United States Aerospace Industry," which was the subject of the first panel at this hearing, found that:

> Clearly, there is a major workforce crisis in the aerospace industry. Our nation has lost over 600,000 scientific and technical aerospace jobs in the past 13 years.. . .most of the workers who have lost their jobs are unlikely to return to the industry. These losses, coupled with pending retirements, represent a devastating loss of skill, experience, and intellectual capital to the industry.

That finding, along with the well documented decline in the number of U.S. students pursuing degrees in science, mathematics, and engineering, strongly suggests that any increase in interest in federal employment, especially among science and engineering students, is likely to be temporary at best. I would also note, as has been reported by the National Science Foundation, that 40 percent of the graduate students in America's engineering, mathematics, and computer science programs are foreign nationals. Since the Federal Government restricts its hiring to U.S. citizens only, this further shrinks the pipelines.

Finally, as I previously noted, the goal for NASA should not be the hiring of simply qualified employees, but the development of a world-class workforce with a world-class work environment. That talent may still not be readily available to NASA even now, and it seems even more certain that it will not be available a few years from now.

Will the "NASA Flexibility Act of 2003" Give NASA What It Needs?

As I stated at the opening of this testimony, this bill is definitely a step in the right direction. It may not give NASA all the tools that it needs—there is still the question of funding along with the need for sustained leadership and commitment,

among a few other necessities—but these provisions and flexibilities will be helpful. It is also noted that there are a number of safeguards built in, including development of a public "workforce plan," and notification and periodic report requirements that also significantly diminish the possibility that the authorities will be abused. As detailed below, these proposed flexibilities promise to be of substantial assistance to NASA in meeting its workforce challenges:

- The ability to provide recruitment, redesignation, and relocations bonuses (Sec. 504) that are substantially greater than those currently authorized and that are combined with a service agreement should help offset the ability of other employers to substantially out-bid NASA up-front. Since federal compensation comes closer to private industry averages several years after initial hire, retention should also not be a problem even though the bonuses are not part of base pay. These flexibilities also track "best practices" in the private sector. In a recent WorldatWork survey of private sector employers, engineering was the second most-difficult occupation in terms of attracting and retaining qualified applicants. Further, more than three of every five employers in this category (61 percent) used sign-on or hiring bonuses in response to that difficulty.
- Retention bonuses (Sec. 505) at a level higher than currently available will be particularly useful not only in retaining crucial talent, but also for ensuring that new employees have experienced staff members to train and develop them.
- Voluntary separation incentive payments (Sec. 506) have also proven to be useful when used conscientiously as part of a workforce reshaping effort as opposed to simply promoting workforce reductions. Under a reshaping effort, the employees separated are typically in positions no longer essential to the mission of the agency and their departure frees resources that can be used to bring new employees on board who fill new positions that are essential. While this provision, especially at the monetary levels provided, could be quite useful, that fact that it is restricted to only 10 positions a year may limit its effectiveness.
- The use of Term appointments (Sec. 507) for up to six years and, if the need appears to be continuing, allowing conversion to a permanent appointment (under the conditions specified in the bill), can provide needed flexibility in dealing with the normal uncertainties of a highly scientific or technical environment and shifting congressional or Administration priorities.
- The authority (Sec. 508) to pay up to ten individuals in critical positions at a level above the current pay caps is another authority, that while subject to some debate, has been used in the Internal Revenue Service and found by an independent evaluator (Hal Rainey, a distinguished professor in the School of Public and International Affairs, the University of Georgia) to be an effective tool. It should be noted that the higher rates of pay, which are certainly attractive compared to the current federal pay cap, can still be relatively modest compared to private sector salaries for similar levels of responsibility.
- The expansion of assignments under the Intergovernmental Personnel Act (Sec. 509) from a maximum of two years to four years, is again a flexibility that used judiciously can be quite useful, especially given the fact that the nature and duration of a scientific endeavor can be difficult to accurately predict in advance.
- Enhanced demonstration project authority (Sec. 510) takes the existing authority in Section 4703 of Title 5 and removes the 5,000 person limit. In essence, this would allow NASA to propose a project that could cover all 18,000 plus employees in the agency. Given that there has been 25 years worth of experience under this authority without any major problems, this provision breaks little new ground and seems amply supported by the long history of relatively successful demonstration projects.

Additional Suggestions

As we noted at the outset, we believe the proposed flexibilities in the "NASA Flexibility Act of 2003, are a step in the right direction. We also believe that there is one additional flexibility and one modification to a provision already contained in the proposed bill, that would also be useful. They are:

- Among a number of recommendations by NASA for additional human capital legislation that have merit, a proposal for a "scholarship for service" program stands out. As the number of students in the engineering and science educational pipeline shrinks, particularly students who are U.S. citizens, NASA's

ability to attract its fair share of the "best and brightest," is likely to become increasingly difficult. This will be especially true when students with student loans to repay are lured by higher starting salaries in the private sector. A NASA supported scholarship program could serve two worthy purposes: (i) encouraging students to consider a course of study leading to a career in science or engineering; and (ii) provide another entry point for talented students to join the NASA workforce by coupling the scholarship to a requirement for service.

- Section 510 of the "NASA Flexibility Act of 2003," provides one valuable enhancement to the current demonstration project authority in Section 4703 of Title 5 by allowing more than 5,000 employees to be covered. However, it would still require NASA to go through the rather daunting and time consuming process contained in Section 4703. Those original provisions, however, were part of the 1978 Civil Service Reform Act and were appropriate safeguards for an untried process. Today, however, we have over 25 years experience with demonstration projects and a long history of successful projects and lessons learned. We would recommend that serious consideration be given to a more streamlined process similar to that given to the Internal Revenue Service in 1998 and codified in Section 9507 of Title 5. There remains a requirement for union negotiation and congressional notification of proposed projects, but IRS has been able to move more rapidly than other agencies. It's noteworthy that many of the successful demonstration projects that have been undertaken, including the very first demonstration project in 1981 at the Naval Weapons Center, China Lake, California have involved employees in scientific and engineering environments, since the agencies involved were experiencing some of the same difficulties as NASA in recruiting and retaining top talent. By providing the same process flexibilities to NASA that have been given to the IRS, NASA could more easily adapt some of the successful practices and lessons learned in other environments.

Mr. Chairman and Members of the Committee, I want to again thank you for allowing me to share with you the perspectives of the Partnership for Public Service on these important issues regarding the future of the NASA workforce. We would be happy to assist the Committee in any way we can as you seek to ensure that NASA has the world-class, highly motivated workforce that it needs for the challenges that lie ahead. I would be happy to answer any questions you may have.

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NASA Faces Triple Workforce Threat; Evidence Described in New Congressional Testimony by Partnership President

Agency Needs New Tools to Address Graying Workforce, Shrinking Labor Pool of Scientists and Engineers, and Fierce Competition with Private Sector for Talent

Washington – At today's House Science Committee hearing on NASA workforce reform, the Partnership for Public Service urged that the National Aeronautics and Space Administration be given new authority to implement workforce tools to help it address a critical deficit of skilled engineers and scientists.

"NASA's labor shortage may ground its ability to keep America at the forefront of space exploration," said Max Stier, president and CEO of the Partnership. "The last time we saw a recruitment challenge of this magnitude was during the era of Sputnik. Now more than ever, our government must retain, recruit, and train skilled scientists and engineers if America is to remain a leader in innovation and discovery."

Stier testified before the committee today in support of the "NASA Flexibility Act of 2003," legislation introduced by House Science Committee Chairman Sherwood Boehlert (R-NY). He described NASA's staffing challenges as a three-part problem:

1. Almost half of the entire federal workforce will be eligible to retire within the next five years, and NASA's demographic challenges are even more acute. The agency currently has three times as many employees over the age of 60 as it does under the age of 30.

2. NASA is also unique among federal agencies in its occupational distribution: over 60 percent of the agency's employees are in professional positions (positions typically requiring a college or graduate school degree). The top three occupations within this group include aerospace engineers, computer engineers, and general engineers. The talent pool for engineering and science positions is decreasing across the U.S. labor market:

    - According to the National Science Foundation, 40% of the graduate students in America's engineering, mathematics, and computer science programs are foreign nationals. This exacerbates the crisis because the federal government restricts its hiring to U.S. citizens only.

3. The agency's need for engineers to fill these looming skills gaps is shared by the private sector. The declining number of U.S. students pursuing degrees in science, engineering and mathematics is shrinking these crucial talent pools for all sectors, causing intensifying competition. As the talent pool shrinks, Stier said, NASA will increasingly be at a disadvantage in comparison to employers who are better able to adapt their recruitment packages to the demands of a changing labor market.

Chairman Boehlert's legislation would give NASA the authority to enact incentives such as increased pay for hard-to-fill positions, and increased recruitment and relocation bonuses to help NASA compete with private sector employers.

Stier suggested that the legislation should be taken further, proposing a NASA-supported "scholarship for service" program for students who enter a course of study leading to a science or engineering job and pledge to serve in government for part of their career.

Stier also noted that employee unions must be consulted and engaged at the development stages of any workforce management improvements that would be enacted through the Boehlert legislation.

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BIOGRAPHY FOR MAX STIER

Max Stier is the President and CEO of the Partnership for Public Service. He has worked previously in all three branches of the Federal Government. In 1982, he served on the personal staff of Congressman Jim Leach. Mr. Stier clerked for Chief Judge James Oakes of the United States Court of Appeals for the Second Circuit in 1992 and clerked for Justice David Souter of the United States Supreme Court in 1994. Between these two positions, Mr. Stier served as Special Litigation Counsel to Assistant Attorney General Anne Bingaman at the Department of Justice. In 1995, Mr. Stier joined the law firm of Williams & Connolly where he practiced primarily in the area of white collar defense. Mr. Stier comes most recently from the Department of Housing and Urban Development, having served as the Deputy General Counsel for Litigation. Mr. Stier is also an adjunct professor of law at Georgetown University and is a graduate of Yale College and Stanford Law School.

Mr. ROHRABACHER. I am sure we will touch on some of those creative ideas during the question and answers.

Mr. STIER. Thank you.

Mr. ROHRABACHER. Mr. Harnage, you may proceed.

Mr. HARNAGE. Thank you, Mr. Chairman.

Mr. ROHRABACHER. You need to touch your microphone button.

Mr. HARNAGE. Here we go.

Mr. ROHRABACHER. There you go.

STATEMENT OF MR. BOBBY L. HARNAGE, SR., PRESIDENT, AMERICAN FEDERATION OF GOVERNMENT EMPLOYEES, AFL–CIO

NASA WORKFORCE DOWNSIZING

Mr. HARNAGE. On behalf of more than 600,000 federal and DC Government employees that I represent, I want to thank you for the opportunity to testify here today on the Committee's draft proposal for sweeping civil service changes at NASA. Like the rest of the government, NASA will experience a wave of retirements over the next several years. Unfortunately, NASA has, for more than a decade, pursued a vigorous and ill-conceived program of downsizing and outsourcing, which has made its problem even more acute than other agencies. Instead of careful consideration of whether its mission could be most effectively and economically carried out by hiring in-house employees, it has engaged in wholesale privatization, not competitive sourcing, and made reliance on contractors rule.

Indeed, the President's fiscal year 2004 budget includes an evaluation of NASA's compliance with the so-called competitive sourcing initiative and knows that NASA has made its entire privatization quota without ever even having a single competition.

CORRECTION TO WRITTEN STATEMENT

Mr. Chairman, at this point, I want to point out in my written statement that I had indicated on that the investigation in the shuttle disaster was looking into NASA's relationship with the contractors making a contribution to that disaster. And I want to correct that. What we should have said is the investigating committee is looking at the potential of that, and we don't want to appear to have made any foregone conclusion, and I apologize for that. And my written statement has been corrected to reflect that.

NASA OUTSOURCING

Reliance on contractors are proven to be a costly mistake for NASA, both in terms of taxpayer dollars and in terms of the agency's internal human resource infrastructure, eliminating federal positions and rushing to contract out as much government work as possible rather than building and planning for a transition to the next generation of NASA employees who are dedicated to career service with the agency has made the coming retirement wave challenges for NASA. NASA needs a stable workforce able to hold its massive and far-flung army of contractors honest and accountable to the government's own procurement rules. It also needs an adequate in-house technical, scientific, and engineering workforce able to bring contractor work back into the government and evaluate the quality of work that is permitted to remain in the hands of contractors.

COMMENTS ON H.R. 1085

The authorities proposed for NASA can fairly be described as constituting a "white knight" strategy for rescuing the agency from its contracting failures. They addressed the symptoms of those failures, not their cause, and only offered temporary solutions. The fact is that too much contracting out and privatization caused NASA's workforce deficits and only a reversal of contracting out and privatization will resolve them.

Before implementing a bonus for some and super-sized salaries for a few others instead of an adequate salaries for all approach, NASA should ask itself, "Should employees who are loyal and have made a decision to dedicate their careers to public service be penalized financially relative to those who are in and out within six years? Should the federal pay system reward only those willing to extort a bonus from an agency by continually threatening to leave in the middle of an important project? Or should the Federal Government pay adequate, competitive salaries to all of its employees?" No federal agency, including NASA, should have a human resource plan that explicitly encourages constant turnover and puts no values on continuity, dedication, or career development for the incumbent workforce, yet that is exactly the direction this draft legislation would take the agency.

I ask you to strongly vote in favor of a focus on improving pay as a means of improving recruitment and retention of federal employees. However the approach contained in this legislation is, at best, incomplete, at worst, misplaced. Federal salaries are too low, not just for prospective employees or for employees the agency expects to employ if for only a short period; they are too low for everyone.

Mr. Chairman, we are willing to work with this committee in developing this legislation, fine tuning this legislation, but we don't believe that shortchanging the federal employee is going to attract future employees for any long period of time. And that concludes my testimony. I would be glad to answer any questions you might have.

[The prepared statement of Mr. Harnage follows:]

PREPARED STATEMENT OF BOBBY L. HARNAGE, SR.

Mr. Chairman and Members of the Committee: My name is Bobby L. Harnage, and I am the National President of the American Federation of Government Employees, AFL–CIO (AFGE). On behalf of the more than 600,000 federal employees our union represents, I thank you for the opportunity to testify here today on the Committee's draft proposals for sweeping civil service changes at NASA.

My testimony will address not only the Committee's specific legislative proposals, but also AFGE's assessment of NASA's most important workforce-related challenges over the next ten years, our views of the most effective strategies for recruitment and retention of federal employees, and whether the Committee's proposals would further those goals, and finally, AFGE's own recommendations, and our opinion of the wisdom of seeking civil service changes on an agency-by-agency basis rather than government-wide.

Many of the proposals contemplated in this legislation have been presented elsewhere as government-wide changes or earlier in the form of legislation prepared by NASA's political leadership, and have been rejected largely on the grounds that they undermine merit system principles, that they would exacerbate the Federal Government's "human capital" crisis, and that they would create serious conflicts of interests between private sector interests and the public good. In addition, they fail to address the root causes of NASA's (and the other executive branch agencies') workforce problems: inadequate salaries, and mindless contracting out, privatization, and downsizing.

For these reasons and others, AFGE opposes most of the human resources proposals contained in this legislation. Further, it must be noted that the Committee on Government Reform has primary jurisdiction and expertise in matters involving Title 5. With all due respect, these proposals do not belong in the Committee on Science where the jurisdiction and expertise is in areas other than federal personnel. AFGE strongly opposes the implied policy of seeking changes to civil service laws on an agency-by-agency basis.

Like the rest of the Federal Government, NASA will experience a wave of retirements over the next several years, as workers with between 25 and 35 years of federal experience reach retirement eligibility. Unfortunately, the policies both NASA and other federal agencies have been pursuing for the past decade will exacerbate the problems and challenges the retirement wave presents. Prior to the retirement wave, NASA has for more than a decade pursued a vigorous and ill-conceived program of downsizing and outsourcing. Instead of careful consideration of whether NASA's mission could be most effectively and economically carried out by hiring in-house employees, it has engaged in wholesale privatization (NOT "competitive sourcing"), and made reliance on contractors the rule. Indeed, the President's FY 2004 Budget includes an evaluation of NASA's compliance with the so-called "competitive sourcing" initiative and notes that NASA had met its entire privatization quota without ever having held a single competition!

This has proven to be a costly mistake for NASA, both in terms of taxpayer dollars and in terms of the agency's internal human resource infrastructure, not to mention the victims of the recent shuttle disaster. Eliminating federal positions and rushing to contract out as much government work as possible, rather than building and planning for a transition to the next generation of NASA employees who are dedicated to career service with the agency has made the coming retirement-wave challenges truly daunting for NASA. Indeed, *The New York Times* reported on March 6, 2003 that NASA's inability and disinclination to oversee its contractors is being examined by the independent panel investigating the loss of Columbia, i.e., excessive contracting out without regard to the public interest has already been identified as a contributing factor to the disaster.

In this context, the proposals the Committee is considering seem rather paradoxical. The proposals would encourage the elimination of even more federal positions through Voluntary Separation Incentive Payments (VSIPs), and thereby further undermine the agency's ability to assemble a new generation of career civil servants dedicated to carrying out NASA's mission in the most efficient and reliable way for taxpayers. The proposals would establish NASA as a place where people might take a short turn through the revolving door between the agency and its contractors, but not a place to build a career, not a place that expects loyalty from its employees or that will exhibit any in return.

Almost all the new authorities the Committee is contemplating in its legislative proposals turn on the concept of "critical need." The legislation proposes to define critical need as "a specific and important requirement of the Administration's mission that the Administration is unable to fulfill because the Administration lacks the appropriate employees either because of the inability to fill positions or because

employees do not possess the requisite skills." It is unfortunate that virtually none of the proposals that follow would help NASA with a long-term strategy of acquiring a regular, reliable workforce with "requisite skills."

Even the Administrator implicitly acknowledges that the agency finds itself in a helpless state, admitting that "it doesn't have a very deep bench," and is apparently entirely at the mercy of its contractors. Yet his metaphor is telling; he needs to learn that staffing a federal agency is not like staffing a football or basketball team where short service on the bench or elsewhere is all that is needed or expected. NASA in particular needs a stable workforce able to hold its massive and far-flung army of contractors honest and accountable to the government's own procurement rules and cost accounting standards. It also needs an adequate in-house technical, scientific, and engineering workforce able to bring contracted work back into the government and evaluate the quality of work that is permitted to remain in the hands of contractors.

Unfortunately, the "workforce authorities" the Committee has proposed for NASA can fairly be described as constituting a "White Knight" or "Band-Aid" strategy for rescuing the agency from its contracting failures. The proposals only address the symptoms of those failures, not their cause. To make matters worse, all the proposed new authorities are aimed at temporary solutions to be followed by subsequent temporary solutions. The fact is that too much contracting out and privatization caused NASA's workforce deficits, and only a reversal of contracting out and privatization will solve them.

The "workforce authorities" provided to NASA in the Committee's draft include authority to pay recruitment, "redesignation," relocation, and retention bonuses; authority to eliminate jobs through voluntary separation incentive payments; authority to expand the definition of temporary employment at NASA to as long as six years; authority to fix basic rates of pay for "critical" jobs; and authority to lengthen intergovernmental personnel act assignments, and increases the number of people covered by NASA demonstration projects to 5,000. All but the last of these would be triggered by a NASA-determined but Congressionally-approved identification of "critical needs."

The proposals for enhanced authority to offer recruitment, relocation, "redesignation" and retention bonuses of up to 100 percent of salary (50 percent for retention of those who are "critical" and 25 percent for those who are not) over four years are similar to those proposed last year by NASA, and those being considered in the context of government-wide civil service reform legislation. AFGE is strongly in favor of Congressional willingness to focus on the importance of improving pay as a means of improving recruitment and retention of federal employees.

However, we believe that the approach to financial incentives for recruitment and retention contained in this legislation is at best incomplete, at worst, misplaced. Federal salaries are too low not just for prospective employees, or for employees the agencies expect to employ only for a short period. Salaries are too low for all employees. There are market-driven reasons why the Federal Government should pay competitive salaries, and there are values-driven reasons why the Federal Government should pay competitive salaries. While market-driven reasons such as recruitment and retention may on the surface only appear to apply to prospective employees and "flight risks," they in fact apply to all employees.

AFGE does support the use of bonuses and other financial incentives to reward federal employees. Yet they should never be used as substitutes for a fully funded regular pay system. The "human capital" crisis these bonuses are ostensibly meant to alleviate is in part a result of the repeated failure to implement and fund the Federal Employees Pay Comparability Act (FEPCA), passed in 1990. FEPCA already provides broad authority for the payment of recruitment and retention bonuses. According to a comprehensive study published by OPM in 1999, less than one percent of eligible federal employees had received bonuses under FEPCA's authority. The main reason for the failure to use existing authority cited repeatedly by agency managers was an absence of funding.

It is also important to note that the legislative proposals do not provide a separate, supplemental funding mechanism for either the payment of bonuses, or the payment of salaries equivalent to that paid to the Vice President of the United States for ten lucky individuals. Implicitly, the assumption is that the bonuses and super-salaries would be financed from existing salary accounts. That is, the agency would only be able to use the broadened authority in the draft legislation if it paid for them through the elimination of jobs or the denial of other salary adjustments for those not selected for a bonus. Again, that is not a good long-term strategy for rebuilding in-house capacities.

It is foolish to pretend that, if enacted, these provisions would improve NASA's ability to recruit and/or retain federal employees. Bonus payments do not count as

basic pay for purposes of retirement or other salary adjustments. They are a poor substitute for the provision of competitive salaries and regular salary increases that allow employees to maintain decent living standards.

Before implementing a bonuses-for-some and super-sized salaries for a few others, instead of an adequate-salaries-for-all approach, NASA should ask itself the following: Should employees who are loyal and have made a decision to dedicate their careers to public service be penalized financially relative to those whose only loyalty is to their individual paycheck? Should the federal pay system reward only those willing to extort a bonus from an agency by continually threatening to leave in the middle of an important project? Or should the Federal Government pay adequate, competitive salaries to *all* its employees?

The legislative proposals make the following scenario possible: a recent graduate is hired "directly" for a "temporary" position at a job fair, effectively beating out three other candidates who had applied for the position through normal competitive procedures (among the three were a veteran with relevant experience and the same degree from the same university, a disabled veteran with 10 years of federal employment and a similar degree, and a recent graduate from another university with the same type of degree but a higher GPA who mistakenly thought the best route to federal employment was to follow procedures and fill out a Standard Application Form 171). To encourage the direct hire person to accept the position, he is promised bonuses worth 25 percent of salary each year for four years (indeed, he must also accept a service agreement wherein he agrees to work for NASA for a period "not to exceed four years"). During that four-year period, the agency would repay the employee's student loans. At the end of the four-year service agreement, the employee threatens to leave in the middle of a project. NASA wants to keep him on for at least two more years. A retention bonus of 50 percent of salary, for two years, is authorized because a "critical need" is identified. One year later, he is converted to permanent status. At the end of this period, a new Administration/political appointee at NASA decides it would rather do without him, and offers him a Voluntary Separation Incentive Payment (VSIP), determined not on the basis of the regular severance formula in Title 5, but rather equal to 50 percent of his salary, since the Administrator has determined that to eliminate this position is critical to his restructuring efforts. Over six years, the lucky employee has received more than eight and a half years of salary. And the expertise and experience he has built up over that period is lost to the agency. But the authorities remain, so NASA can go through this song and dance all over again.

That's quite a windfall for the hypothetical employee, quite an expensive experiment for taxpayers, and quite an insult to the thousands of rank and file federal employees who are taken for granted and denied competitive salaries, benefits, or any form of job security. The question is: Is it a reasonable response to the "human capital" crisis? Will it allow the government to replace the more than 50 percent of federal employees who will be eligible to retire within the next five years with a new generation of employees who exhibit the same level of skill, dedication, and reliability as our nation has relied upon in the past? What chance is there that employees in the existing workforce who have as good or better skills than those hired under the authorities being contemplated will share in the kind of "critical need" bounty to be lavished on temporary workers?

Federal agencies, particularly science-dominated agencies like NASA are not fly-by-night operations or flashes-in-the pan. They are not here today and gone tomorrow, nor do they produce technological fads with only passing relevance or utility. As such, no federal agency, including NASA, should have a human resources plan that explicitly encourages constant turnover and puts no value on continuity, dedication, or career development for the incumbent workforce. Yet that is exactly the direction this draft legislation would take the agency.

We urge NASA and other executive branch agencies to stop looking for short-term fixes. NASA's need for a high quality workforce and comprehensive in-house capacity are neither temporary nor short-term, and the government as well as the employees deserve to have the security and continuity that a workforce with regular civil service appointments conveys. With regular permanent appointments, the government obtains the expertise it needs, as well as the authority to supervise, manage, and control the substance and direction of that work. Taxpayers' interests are best served by knowing that federal employees, sworn to uphold the public good and work in the public interest, perform government work.

The idea of treating ongoing government programs as temporary, even when the particular work project is estimated to last for less than six years, is wrong. It is just an extreme case of "managerial flexibility" that is contrary to the agency and the public interest. Just in order to be able to get rid of a worker without notice, or any due process, the agency seems willing to be staffed by a group of contingent

workers to whom absolutely no loyalty, commitment, training, or career development is offered. If NASA expects to be around longer than six years, why does it want to treat its work and its workers, even those who work for the agency up to six years, as temporary?

The authority to offer Voluntary Separation Incentive Payments (VSIP) described in the legislation fails to address an important question. In earlier drafts, the VSIP proposals for NASA required a one-to-one elimination of full-time-equivalent positions as the only means of using them. We believe that using VSIPs only for position elimination is ridiculous. At a minimum, there should be no connection between efforts to restructure and delayer and authorized agency FTE levels. At a time when NASA and other federal agencies are asking for expanded authority to pay bonuses and repay student loans in their efforts to hire more federal workers, why should they simultaneously be required to eliminate FTE's and pay employees to leave federal service? Couldn't the money be better spent on retraining? On improving salaries? On improving the Federal Employees Health Benefits Program (FEHBP) which this year pays only 70 percent of the premium of the plan that covers over half of all enrollees?

I have saved the worst, and most damaging proposal for last. The Committee's draft would eliminate the 5,000 person limit on the number of employees covered by a demonstration project and allow NASA's Administrator to decide what number of employees to be included. If enacted, this provision would allow NASA to put every single one of its employees under a demonstration project of management's unilateral design. Only those covered by a collective bargaining agreement would have the opportunity to vote to decide whether to give up their rights under Title 5 and join the project.

Granting this authority to the NASA administrator would be highly destructive of civil service standards, and in fact destroys the entire notion of a demonstration project as an experiment or pilot plan. If no substantial number of NASA employees remain in the regular Title 5 system as a baseline or constant, then against what standard is the demonstration project being tested? That is the reason Congress required numerical limits on those covered by a particular demonstration project in the first place. I fear the removal of limits on the number of people covered by a NASA demo may just be an easy to impose on NASA a new personnel system that would not otherwise pass muster if it were proposed as a legislative change to Title 5. AFGE strongly opposes this section of the legislative proposal, and urges the Committee to reject it.

Finally, the legislation would require annual reporting to Congress on the exercise of the workforce authorities it establishes, and prior approval of all the details of any "Workforce Plan" NASA might concoct for the exercise of the authorities in the bill. Later, NASA would have to come back to Congress for any reauthorization or enactment of legislation to make the authorities permanent. While this approach is far superior to other approaches that usurp the role of Congress altogether with respect to large scale and permanent changes to Title 5, it is still a unilateralist approach that is inappropriate for a unionized agency. Why is there no allowance for federal employees to have their views of any proposed "Workforce Plan" heard through the process of collective bargaining? Why exclude the wisdom, expertise, and experience of the front-line in-house NASA workforce from the formulation of proposals to improve recruitment and retention of the next generation of NASA scientists and engineers? NASA's management has certainly shown itself capable of grave miscalculation, and extremely poor judgment. AFGE urges the Committee to require collective bargaining over the terms of any recommended "Workforce Plan" that will affect bargaining unit positions.

This concludes my testimony. I will be happy to answer any questions Members of the Committee may have.

Chairman BOEHLERT. Well, and let me say I firmly agree with that statement. I don't want to shortchange the union employees of the Federal Government. As a matter of fact, you should know that one of my sons-in-law is a former president of one of your affiliates.

Mr. HARNAGE. Oh, very good.

Chairman BOEHLERT. And——

Mr. HARNAGE. I will stand in one. I should know.

Chairman BOEHLERT. Let me tell you, I have been blessed. All of my sons-in-law are outstanding. They darn well had to be to get my okay.

The third witness is Mr. George Nesterczuk, a private consultant for human resources management and legislative analysis, who has worked on both Capital Hill and the Executive Branch for many years. And he also had the good judgment to go to school at Cornell in upstate New York, which is near and dear to my heart. And I understand his first choice was working for NASA as he completed his studies. Mr. Nesterczuk, we look forward to your testimony.

STATEMENT OF MR. GEORGE NESTERCZUK, NESTERCZUK AND ASSOCIATES

Mr. NESTERCZUK. Thank you, Mr. Chairman. Thank you, Members of the Committee, for giving me the opportunity to testify on H.R. 1085 today.

NASA RECRUITING

As you noted, Mr. Chairman, I did work for NASA early on in my career, and I was one of those people on the bubble in the late '50's and the early '60's who was attracted to the space program and aerospace research. Back in those days, NASA was a very young agency, a start-up agency, on the cutting edge of technology, and that is what was drawing a lot of the young talent across the country—the notion of being involved in cutting edge issues. I would like to say that was true today. I don't think it is, and that is part of the difficulty NASA is facing as it looks into the future—to re-establish a mission and the direction to become that kind of cutting edge agency that it once was.

NASA'S WORKFORCE COMPARED TO OTHER GOVERNMENT AGENCIES

The problems that NASA faces today are no different than those many other federal agencies face. In light of the cutbacks and the workforce reductions, budget reductions of the past 20 years, a lot of HR issues were swept under the table. Insufficient strategic planning in dealing with workforce issues basically has led a lot of federal agencies to the dilemma that they are facing today. NASA, as a high-tech agency and one requiring a specialized workforce, is akin to NIH in the health field, Department of Energy, Defense Department. A number of agencies need to gain relief from current civil service rules in order to attract and retain some of the people with specialized skills that they need in order to fulfill their missions.

REVIEW OF H.R. 1085

I don't want to dwell too much on what has happened in the past and how the agencies got there since we need to be looking to the future to resolve these problems. And H.R. 1085, in that respect, I think is a very fine bill. It addresses a lot of short-term issues in proposing the retention bonuses, recruitment bonuses, the special provisions for high pay for people with specialized skills. I think those will address some of the short-term problems that NASA faces with the liabilities of a lot of people possibly headed into retirement.

However, compensation alone is not going to solve NASA's problems. There are a lot of inherent systemic management systems inherent to Federal Government that make it a difficult place to work and a difficult place to manage.

Demonstration Project Provision

Therefore, I believe that section 510, the provision in 1085 that allows NASA to engage in an agency-wide demonstration project in personnel is probably the most important feature of the bill. So let me address some comments on that specifically. The key point in that provision is to lift the statutory limit of 5,000 employees on demonstration project. That would permit NASA to run an agency-wide HR program and examine changes in areas such as broad pay reform, reform with the classification system, performance management, dealing with problem employees and the whole question of recruitment in the intake stream.

Civil Service Classification System

The classification system in particular is very problematic. It is a system that was implemented in the civil service 60 to 70 years ago. And I, frankly, welcome the Committee's willingness to get into some of the arcane aspects of personnel by proposing this bill, because that is where you are going to get to the root cause of some of the morale problems faced by NASA and its workforce. The classification system is a stovepipe system. It basically brings people in one occupational line, and they are expected to pursue a career in that line for the next 20, 30, 40 years. You know, that worked back in the '30's and '40's. Today's workforce is much more mobile. The skills mixes have to be much broader, and no allowances are made for that. So people who would like to cross over, perhaps having picked up additional experiences in 10 or 15 years of government work, can't make those cross overs into other occupations because of the classification system. In many instances, that would be allowed. They would have to take a pay cut, a grade reduction of two or three grades, to make that kind of a cross over. That is just not logical. The private sector doesn't work that way. It is not giving proper respect to the human capital element of your organization. If you are going to rely on it, you have got to work with them, permit for career enhancement, and for cross training, and allow people more mobility in the agency.

Demonstration Projects Is a Core Provision

Section 510 of 1085 basically will provide that. Although I think some of the language is a little restrictive, it will need to be broadened to permit NASA to establish a demo authority of its own without tight supervision from OPM. So I would recommend rewriting some of that language, but that is basically a core provision in there.

I see my time has run out, and I will leave the rest for questions.

[The prepared statement of Mr. Nesterczuk follows:]

PREPARED STATEMENT OF GEORGE NESTERCZUK

Mr. Chairman and Members of the Committee, thank you for the opportunity to testify today on H.R. 1085, the *NASA Flexibility Act of 2003,* a bill to make certain personnel authorities and enhanced flexibilities available to the National Aeronautics and Space Administration. My name is George Nesterczuk and I am President of Nesterczuk and Associates, a management-consulting firm located in Vienna, VA.

Introduction

As a long time participant in public sector management initiatives I welcome the Committee's willingness to delve into some of the arcane aspects of civil service personnel rules. I come to these issues with a perspective of someone trained in the sciences that, through no fault of his own, became immersed in the realm of human resource management. I began my professional work experience as a graduate research assistant at the Goddard Space Flight Center. During subsequent years I spent a decade as a government contractor supporting NASA satellite tracking operations, and performing research in geodesy, atmospheric physics, and remote sensing.

Later, during the Reagan years I went on to hold senior positions at the U.S. Office of Personnel Management, the Department of Defense, and the Department of Transportation. While at OPM I managed a variety of programs including government-wide pay and performance management systems and the Senior Executive Service. At the Department of Transportation I served as Science and Technology Advisor to the Secretary and was DOT's liaison with the White House Office of Science and Technology Policy. In 1995, I returned to federal human resource management issues as Staff Director of the Subcommittee on the Civil Service in the House of Representatives. I have now dealt with federal HR issues continuously for over 20 years.

Background

The problems that confront NASA are not new nor is NASA alone in its predicament. Over the past twenty years a continuous stream of budget reduction and downsizing initiatives have taken their toll on a workforce previously accustomed to lifetime employment with careers spanning 30 to 40 years. Managers could expect to recruit a steady stream of young entry-level college graduates every year to replace a fairly predictable cohort of retirees. In recent years, however, reduced budgets and lower staff ceilings have resulted in hiring freezes and occasional reductions in force to complement the steady outflow of retirement eligible federal employees. In the mid-1990s a new tool came along—the Voluntary Separation Incentive, also known as the buy-out—to further accelerate retirements.

Now federal agencies must deal with the aftermath: an aging workforce and a significantly reduced pool of young talent from which to grow the next generation of senior managers and executives. In addition to this aging workforce syndrome, NASA faces the challenge of recruiting and retaining highly skilled technical professionals against a highly competitive private sector. Further, NASA must also deal with a potential crisis in depleted expertise as an increasing proportion of its aging workforce achieves retirement eligibility. The agency is aware of these problems and has provided demographic data to the Committee to illustrate and quantify these problems.

General Support for H.R. 1085

H.R. 1085 contains measures to deal with at least some of these issues in the short-term using financial incentives to attract and retain quality staff in critical functions. However, in the long-term, more basic systemic reforms will be needed to reestablish some balance in NASA's workforce and promote and maintain a high performance environment. Though very important, compensation alone is not sufficient. The quality of the work environment is an important factor that can attract or drive away talent.

To that end, the enhanced demonstration authority proposed in the bill is perhaps the most important part of H.R. 1085. It will permit NASA to experiment with agency-wide reforms that can streamline recruitment, revamp the pay and classification systems, and reform the administrative appeals procedures by which the agency deals with problem employees.

Broadly speaking, I support the intent of H.R. 1085 and believe its provisions will indeed provide NASA much needed flexibility in dealing with some vexing human resource issues. At the same time I have serious reservations about the provision extending increased voluntary separation incentives.

Views on Specific Provisions

At this point in my testimony, I will provide more detailed provisions of H.R. 1085.

Using NASA's organic act

The Committee has chosen to amend NASA's organic act instead of the civil service statutes contained in Title 5 of the U.S. Code. This is a sound strategy which permits you to tailor agency specific remedies for provide immediate relief without bearing the burden of justifying government-wide changes and bearing the cost and attendant implementation issues.

There is ample precedent of Congress providing other federal agencies with flexible personnel provisions to deal with agency specific problems. The annual authorizing legislation for the Department of Defense invariably carries a handful of civil service provisions to deal with DOD specific matters. Federal banking regulators and financial institutions received broad pay exemptions back in the 1980s to the exclusion of all other federal agencies. In 1995, the FAA was removed from coverage by Title 5 USC and permitted to establish an entirely separate system of personnel rules. More recently, the IRS, the Transportation Security Administration, and the Department of Homeland Security were all provided extensive flexibilities by Congress to modify existing personnel rules in order to function more effectively.

Limitations on authorities granted

Sections 501 and 503 impose important limitations on the authorities granted. First, the financial recruitment and retention incentives are limited to situations of critical need. In addition the workforce authorities themselves expire after a period of approximately six years. These are important controls that place the agency on notice that abuses would not be tolerated. Unchecked or unlimited reliance on recruitment and retention bonuses would ultimately create new morale problems in the workforce and give rise to questions of equitable treatment and raised expectations.

Placing a limit on the duration of these flexibilities will also put the agency on a notice of "use it or lose it." It will speed up the implementation of needed reforms and provide Congress with a specific opportunity to revisit these issues after a reasonable time period has elapsed. Based on prior demonstration projects five years is sufficient time to gather data to evaluate the efficacy of the demonstration. This depends however on the depth and breadth of proposed reforms. More complicated HR changes may require a longer evaluation period.

To answer the specific question posed by the Committee as to the adequacy of the six year time limit placed on these authorities I would answer yes on the critical pay, on bonuses, buy-outs, term conversions, and IPA assignments. As to the demonstration authority a more qualified response is called for. Broad and/or complex changes may require a longer period. Much will depend on NASA's ability to propose specific reforms in the first few months of this authority and what it can reasonably proceed to implement during the first year of the demonstration authority.

Congress and the Agency will have the sixth year to decide which authorities to extend, which to make permanent, and which to terminate. At that point the demonstration authority itself could be extended if NASA needs additional time to tackle remaining agency-wide HR problems. The important thing is for all parties—NASA, its employees and Congress—to know that oversight over the process and its results will be maintained in order to promote an environment of accountability.

Notification requirements

The planning and reporting requirements set out in Section 502 give the agency 90 days in which to submit to Congress a Workforce Plan stipulating how it will implement the workforce authorities granted under H.R. 1085. Employees are to be provided the Workforce Plan at least 60 days before any authorities are exercised. Subsequent changes require similar Congressional and employee notification. Both notifications to Congress and employees are reasonable requirements and should not pose an undue burden on the agency. The disclosures will permit the Committee to track the implementation of authorities and provide insight into NASA's implementation rationale.

Demonstration project authority

Since the demonstration project authority granted in Section 510 is perhaps the most important authority extended to NASA I will address it first. The enhancement over existing demonstration project authority consists of lifting the limit on the size of the demonstration from 5,000 employees to as many as the Administrator determines necessary. This would permit NASA to implement much needed agency-wide personnel rule changes in areas such recruitment and selection procedures,

pay and classification systems, and administration procedures to deal with performance and conduct cases.

It is not clear, however, that the current statutory language in H.R. 1085 will suffice since all other language governing demonstration projects remains in place in Chapter 47 of Title 5 USC. Thus, if 10 other projects are already under way according to 4703(d)(2) NASA could not proceed with its own demonstration. OPM could also find grounds to keep NASA from implementing since it remains the controlling authority over demonstration projects.

I believe more directive language will be required in the bill to give NASA the lead in establishing a demonstration project. OPM should be designated a consulting agency to NASA during the term of the demonstration authority, and the project could follow the remaining rules in 5 USC 4703. The notification requirements contained in 4703(b)(1) however should be overridden and streamlined by language in H.R. 1085 since the existing notifications are extremely cumbersome and arguably not appropriate to the Committee's intent. The notification rules in section 502 of H.R. 1085 are more appropriate than those currently in 4703(b)(1).

Targeted financial incentives

The provisions in Sections 504 and 505 permitting bonuses for recruitment and retention, and for transferring or relocating employees will allow NASA greater leeway in attracting and keeping certain employees with highly specialized skills. The critical pay authority in Section 508 will serve the same purpose.

These bonuses could address the difficulty faced by many federal agencies in attracting mid-career employees either from other federal agencies or the private sector. The use of service periods to make sure an employee "buys in" to the agency for several years is a particularly good idea. The size of the bonuses makes them noteworthy. Currently they are limited to 25 percent of pay, payable in a lump sum. The bill proposes to increase this to 50 percent for critical jobs for each of two years and up to 25 percent for up to four years for non-critical jobs. The payout can be spread out over time but in no instance can it exceed 100 percent of basic pay.

Buyouts

Since the mid-1990s voluntary separation incentives have been quite the rage in federal HR circles. Reported data from the initial implementation of buyouts indicated that out of 132,000 buyouts between 1994 and 1998, 92 percent went to retirement eligible employees. In other words nearly $4 billion was spent in extending a "golden handshake" to freely departing federal employees. The justification for the high cost was that this was a more effective means of downsizing than running reductions in force. While this point can be argued, Members of Congress were sufficiently persuaded that they extended buyout authority permanently and government-wide in legislation establishing the Department of Homeland Security.

Existing law pegs the buyouts at $25,000 per handshake and requires no offsetting payment into the retirement system. The earlier buyout authority recognized that moving people prematurely into retirement shifted the cost burden from the Treasury payroll account to the Treasury retirement account and required that an appropriate payment be made into the already underfunded Civil Service Retirement and Disability Fund.

Section 506 proposes to raise the "golden handshake" in value from $25,000 to 50 percent of salary—over $70,000 for a Senior Executive, and it too has no offsetting provision for cost to the retirement system. This is a highly problematic provision that sends a mixed message at best. How can an agency express concern about losing senior talent, make a special effort to pay retention bonuses and then turn around and spend money on separation bonuses which is all a buyout really is.

H.R. 1085 proposes to limit these huge "golden handshakes" to individuals in "critical need" positions. How is one to understand this? The "critical need" designation makes the incumbent eligible for a retention bonus of up to 100 percent of salary. If instead he is offered $50,000 or $60,000 or maybe $70,000 to leave what does that tell us about his value to the agency or his performance on the job? And is he a better or worse performer than the one in the non-critical job to whom you only offer $25,000 to leave? Are you willing to pay more money because the incumbent in the critical job does more damage? Non-performing or non-productive employees should be removed or reassigned into jobs they are better suited for. They should not be rewarded with cash to get them to move on. That simply short changes the good performers who aren't getting performance awards for lack of money.

Buyouts raise a lot of questions as to intent of purpose, especially if the function is not being abolished following the incumbent's departure. Their use sends a mixed message at best particularly in an organization arguing for relief because it is losing

talent. I strongly urge the Committee to delete this provision entirely and leave NASA to tip toe around the existing government-wide authorities for buyouts at the $25,000 level. The agency will have its hands full making buyouts credible at the lower level without the extra public scrutiny of $70,000 "golden handshakes."

Other provisions

Section 507 provides for the conversion to career status of employees serving in term appointments. This is a useful flexibility for the Administrator to exercise as long as the provisions are not abused, for the abuses would seriously undermine merit system staffing principles. Temporary hires are usually brought in to deal with peak or surge workloads. Since they are temporary the rules by which such positions are filled tend to be relaxed and don't necessarily comply with full and open competition requirements for career status in the civil service. If a pool of temporary employees serves as an agency "farm team" entry into permanent civil service positions will over time become compromised.

The flexibility in extending IPA assignments by four years as proposed under Section 509 is likewise a very useful provision for the Administrator to have. Since it is exercised after the initial two-year appointment expires there would have been ample opportunity to evaluate the individual's performance hence the provision poses no risk to the agency. One must nevertheless guard against the abuse of sending non-performers out of the agency for extended periods of time. IPA assignments for federal employees to State and local governments have been known to be examples of "turkey farms." The Administrator should implement controls to make sure this does not occur—it is a very costly practice.

Summary and Conclusion

In conclusion let me express general support for H.R. 1085 and its intent to provide NASA with much needed HR flexibility. The bill provides the immediate remedy of additional compensation for specific purposes of retaining and attracting talented individuals for critical agency needs. The pay differentials paid in bonuses and the higher pay authorized are substantially above current authorities and therefore meaningful. These provisions will provide the agency with better access to professionals at mid career rather than at entry level. Most important is the enhanced demonstration project authority that will permit NASA to experiment with agency-wide reforms to potentially streamline recruitment; revamp the pay and classification systems, and reform the administrative appeals procedures by which the agency deals with problem employees.

This concludes my testimony. I will be happy to respond to any questions you may have.

DISCUSSION

EMPLOYEE INPUT TO WORKFORCE PLAN

Chairman BOEHLERT. Well, thank you very much. I don't think it is going to surprise anyone to learn that I am going to have the majority of my questions for Mr. Harnage, because you have raised some concerns about the bill, and we want to address concerns.

Let me ask you, what kind of mechanisms would you suggest we use to give employees more input into the workforce plan, which is required in 1058—1085 I mean?

Mr. HARNAGE. We had a very good system that was working. It was slow in getting off of the ground, because it didn't have the full support of all of the agencies. But it was called partnership where we were showing that the input of the people doing the work did create efficiencies, and increase in productivity, and a lowering of cost. But for some reason, when this Administration came in, it desired to eliminate the partnership program, and it has taken us two years to begin to get it started back. It is beginning to come back in some agencies, working very well, for example right now in the Air Force, probably the most outstanding one we have got left there.

So, I think the more involvement of the workforce in making these changes and what they see is working the—a better way of doing it, more involvement of their representative——

Chairman BOEHLERT. Well, this is agency specific, and I think arguably, you could say, crisis driven. Do you have any reason to conclude that you couldn't have a good working relationship with NASA?

Mr. HARNAGE. If there was a desire to do so.

Chairman BOEHLERT. Do you sense that there is a lack of desire or you haven't addressed the question yet?

Mr. HARNAGE. Well, I am not going to say there is a lack of desire. Let us say there is a lack of taking the opportunity. For example, on this very legislation, we weren't contacted until the latter part of last week. And supposedly, you know, for us to meet and talk about this legislation. The problem was the material that was supposed to be with that letter wasn't with that letter, and it wasn't until yesterday that my staff was able to meet with NASA. My calendar didn't allow that on that short of notice, so something as important as this, you would think that we would have been talking about it months ago.

Chairman BOEHLERT. You would think that. I can acknowledge the merit of that statement. Well, we—maybe we can serve as an intermediary to——

Mr. HARNAGE. I am sure you can.

Chairman BOEHLERT [continuing]. Facilitate a closer working partnership, because I think it is essential that you be at the table——

Mr. HARNAGE. It is essential.

Chairman BOEHLERT [continuing]. And work well with the officials.

Mr. HARNAGE. And I would like to point out, if I might, that——

Chairman BOEHLERT. Sure.

Mr. HARNAGE [continuing]. We are not resisting change. In fact, we are—we consider ourselves a change agent. There are a lot of things in the human resource area that we recognize are antiquated and need changes. It is that a lot of what is being pushed is being pushed on buzzwords and things that tend to work in the private sector but does not necessarily work in the federal sector.

Chairman BOEHLERT. I think our task is going to be a little bit easier, because it is agency specific.

Mr. HARNAGE. Right.

Chairman BOEHLERT. And they all differ, so we will work with you and with NASA, because you want to identify with a solution to the problem. I think you can agree that the problem is very real. It is not——

Mr. HARNAGE. Yes.

BUYOUT PROVISIONS

Chairman BOEHLERT [continuing]. Imagined. We didn't make it up. Why do you think it is going to result in the reduction of jobs? It—you know, our—from our point, we think it is going to create new opportunities for people.

Mr. HARNAGE. Well, we were looking for, where you are offering—early out, in previous legislation, that required a quid pro quo

for every position you had a buyout, you couldn't replace it. I don't know that that allows that in this legislation, so——

Chairman BOEHLERT. That was from guys downtown, not from here.

Mr. HARNAGE. Right.

Chairman BOEHLERT. All right.

Mr. HARNAGE. And so that is one of our concerns where we are offering a buyout. We are not necessarily indicating that that position then can be filled by another civil service employee either whether it is out of college or off the street, whatever the needs of the agency is, so that is one of our concerns.

OUTSOURCING

The other concern is, like I said, in the outsourcing. This agency has—we recognize that it is always going to be contractor heavy. That is the nature, you know, of the mission, but we believe they have gone too far, and there is no indication of slowing down. And it is going to be very hard to recruit employees when you say, "Come on and go to work for the government, but while you are thinking about that, we are studying your job for privatization."

BONUSES

Chairman BOEHLERT. Do you have any problem with the existing bonus system? And address that somewhat, if you will, you know, because we have provided even larger bonuses. We are trying to give some incentives to the agency to get the people they need to fill the vacancies that are going to come just like that. And we don't want that.

Mr. HARNAGE. I don't have any problem with bonuses, per se. The bonuses that have been applied in the past, we do have a problem with, and some of these that are indicated. For example, when we looked in at the current FEPCA, the Federal Employee Pay Comparability Act, allows for bonuses, yet they—only something like two percent of bonuses are being utilized, and we tried to find out why. The reason is they weren't funded. So when a manager made a decision to give somebody a bonus, he had to either not fill a position or use some salary in some other place in order to make that up, so there is no incentive for the manager to give those bonuses. So they have to be funded if they are going to really work. They have to be funded. So that would be the number one problem.

The number two problem is offering bonuses to recruit someone to come on board where you pay 25 percent of their salary for four years. And they come on board working side-by-side with somebody equally qualified, maybe be even better qualified, that has been, say, working for 10 years drawing less money than the new person is. There has to be some way of addressing the morale of the current workforce while you are trying to also address the need for bringing in more employees.

Chairman BOEHLERT. Well, we want to work with you and with NASA to address a real problem that the agency is facing. And when the agency faces a problem, that concerns us, and it should concern all Americans, so we will work with you, Mr. Harnage.

Mr. HARNAGE. I appreciate that. And one of the biggest things that I saw missing out of all of this is it doesn't involve the—you know, the workers at all. And it doesn't involve any collective bargaining. It seems to, you know, just give total flexibility without the checks and balances that the employees themselves can pay a real value to this process. And so I would like to see that that is protected.

Chairman BOEHLERT. Thank you for your willingness to work with us. Mr. Gordon.

Mr. GORDON. Thank you, Mr. Chairman. Let me first point out to Mr. Harnage, my father was a groundskeeper at the VA and—in my hometown of Murfreesboro, and was a member of AFGE for a long time. And I know firsthand how it has improved our lives. And let me also say that this legislation is much improved from what we saw last year. And I think that Chairman Boehlert very much wants to move forward with a good bill. And when he says he wants to talk to you, he means that sincerely. And so we do need to develop this dialogue, because I think something is going to happen, and let us make it happen the best that it can.

I do have a concern as to what really are our problems. And let me go through that just quickly. The proposed NASA Workforce Legislation includes recruitment, retention, and relocation bonuses that would be higher than under existing law. And I would assume the justification is that the existing incentive levels are insufficient. Yet NASA's own national recruitment initiative report published in January of 2002 states, "NASA centers are increasing the use of hiring incentives to attract candidates and retain employees. These flexibilities, commonly referred to as the three Rs, are recruitment, retention, and relocation incentives, were offered by OPM beginning in 1991. It is important to note that the payment of these bonuses comes from the center's budget. There is no extra money for the payment of these bonuses. Most center managers say the budget constraints keep them from making greater use of these flexibilities." So we have got to determine what really is problems within the existing law and what—or problems with just not adequate funding.

NASA RECRUITING

Also NASA, as we know, has had a hiring freeze until recently. And I think that we need to find out better, in terms of the need to recruit new candidates what information we have since this hiring freeze has been taken off. And I would like to know whether any of the witnesses can provide any specific data on how successful NASA has been in hiring new employees after the hiring freeze has been removed and any data that you might have on what problems NASA is having in attracting and retaining employees.

BONUS PAY

Mr. HARNAGE. Well, I can't answer that question, because I don't know how hard they have tried to hire new employees. That would have to be the first test, how often and how many people have they tried to hire, and then what was their success rate. But you talk about the bonuses. As I stated earlier, the problem with the past

bonuses is they have not been funded, and therefore, that was a disincentive to a lot of managers to use those. So——

Mr. GORDON. Well, that is what I am trying to find—you know, we know we have a problem, but what I am trying to determine is the problem not adequate funding of existing flexibility——

Mr. HARNAGE. Right.

Mr. GORDON [continuing]. Versus a problem of needing additional flexibility. So——

Mr. HARNAGE. Well, in addition to that, though, it—and I heard one of the Congressmen state earlier, it is pay. One of our problems with the bonuses is they are being utilized, or seem to be utilized, to make up for a deficiency in the pay. And that is not a purpose of a bonus. To give a bonus, you are giving somebody what they are really worth instead of rewarding them. They should get what they are worth, and a bonus should be a reward for excellence in service.

Mr. GORDON. This goes back to whether we have a structural problem or a financial problem.

FUNDING SALARIES AND BONUSES

Mr. STIER. Congressman, I think that the problem is that there is not a problem. There are several problems, and there are a lot of different things that need to be done here. And I think you are 100 percent right. This is an issue of resourcing for sure. It is that a lot of these flexibilities exist. They can't be adequately used, because the dollars aren't there to actually fund them. But it is also true that NASA needs additional flexibilities. I think, again, if you look at that chart, that is what NASA is up against. NASA needs to be able to compete in a very, very difficult marketplace. They are plenty of——

Mr. GORDON. Okay. So do you have some data that shows since the NASA freeze has come off that this chart you have demonstrates that it has—there has been a problem?

Mr. STIER. What I have for you is data that is in my testimony, and I should have asked for that to be entered into the record. But the data shows that on, for example, entry-level salaries, NASA is not able to compete against the private sector. And what I have is data that shows when you——

Mr. GORDON. So that is not a structural problem, then that is a financial problem.

Mr. STIER. That is a financial problem. What I have is data that shows that private sector companies, those companies, 60-plus percent of them use consistently recruitment and retention bonuses in order to keep the talent that they have. What I have is data from—anecdotal data from NASA of the number of top-tier scientists, engineers, etcetera, that they have wanted to keep that they can't keep. And I can give you specific examples, if you would like them. They are anecdotal rather than data, but it demonstrates that there is a real problem there.

NEED TO COMPARE FLEXIBILITY AND FINANCIAL PROBLEMS

Mr. GORDON. Yeah, but again, we know we have a problem. We are trying to find out what solution and whether or not there is al-

ready that flexibility. And what I would—just if I could real quickly close, Mr. Chairman, by saying I think we need more data to—in an effort to try to determine structural versus lack of funding. And for the record, last year's Subcommittee hearing on NASA workforce issues, the Comptroller General of GAO stated that without a detailed review of NASA's plans, GAO was "not in a position to assess NASA's use of existing authorities, the sufficiency of those authorities, and their relationship to this agency-wide human capital goal". So again, I would hope that as we go through this process, we can get more data to really determine what is structural that needs to be changed and——

Chairman BOEHLERT. And what is financial.

Mr. GORDON. Financial that needs to be improved.

Chairman BOEHLERT. Thank you very much, Mr. Gordon. Mr. Rohrabacher.

PAY FOR SCIENTISTS AND ENGINEERS

Mr. ROHRABACHER. Thank you very much. Mr. Stier, you stated earlier that 60 percent of NASA's workforce are engineers or scientists. What are the other 40 percent?

Mr. STIER. Other 40 percent are, you know, a variety of different activities from clerical work to all of the activities that NASA is engaged in. It is a virtually unique among agencies with respect to the percentage of professional engineering and science staff.

Mr. ROHRABACHER. Okay. Now the 60 percent that are engineering and scientists——

Mr. STIER. Yes.

Mr. ROHRABACHER [continuing]. Are they the higher-paid 50 percent?

Mr. STIER. By and large, they are going to be higher-paid, absolutely. They have positive educational requirements. They start out, generally speaking, at a higher level, and they will be higher paid.

Mr. ROHRABACHER. Okay. There is a Space News report there that suggests that the—NASA's workforce—that the engineers in NASA's workforce make around an average of $74,000 a year as compared to $68,000 a year in the private sector. First of all, do you think that that is accurate?

Mr. STIER. It is accurate. It comes from the Bureau of Labor Statistics data. It reminds me of an anecdote where Bill Gates walks into a bar with 38 people. And everyone immediately, on average, becomes a billionaire. The point here is that that it is a median. That tells you something, but it doesn't give you the full story.

Mr. ROHRABACHER. I got it. Now the—but by and large, the employees at NASA who are not the engineers and scientists are making much less than this then?

Mr. STIER. Some are, and some are going to be making similar. I mean, again, there are different professionals, in addition to scientists and engineers there, that will clearly be in equivalent grades.

Mr. ROHRABACHER. All right. So making—you know, when Mr. Gordon was mentioning about trying to differentiate between a structural versus pay differentiation, if indeed you could have

fewer people being paid more money to do a job, then you could actually say that is structural, couldn't you?

Mr. STIER. Well, I think that is—that I would——

Mr. ROHRABACHER. Please feel—the other panelists can feel free to jump in.

Mr. NESTERCZUK. Let me comment on that. The pay issue is a structural issue. The pay system is established in statute. It is rigid. You are pegged to a pay scale depending on your years of service and experience. On the intake stream, you don't have a lot of flexibility as an agency to reset the entry-level salary. So that is a structural issue. The financial aspect of it comes in the way of the bonuses. If on this pay system, you can overlay some flexibility with a recruitment bonus to attract someone to get them started into the agency, but you don't have the money for those bonuses, yes, that is a financial issue.

Mr. STIER. If I might add——

Mr. NESTERCZUK. So the pay structure——

Mr. ROHRABACHER. So we can give the—I guess what I am saying is we are not necessarily talking about spending a huge chunk of more federal dollars——

Mr. NESTERCZUK. No.

Mr. ROHRABACHER [continuing]. In the sense that you can use those dollars to pay some people more money who we really need there as compared to some other people whose skills may not be as up-to-date. I mean, let me just note, I am a former journalist. I don't think I could go back into the field of journalism right now, because I have been technologically left behind. Journalists now have to have an incredible number of technical skills that I don't have. And then when you—that is when you see that NASA's workforce or engineers that are aging engineers as compared to the younger people who are 25- to 30-year-olds. I would note that the 25- to 30-year-olds maybe have up-to-date skills where some of the older fellows and older ladies don't have those same skills. And——

Mr. STIER. I would say first that NASA does have a structural issue with respect to a starting pay salary, which is lower than the private sector. Some of the older people you are talking about, I think one of the real challenges NASA actually has is in keeping them, because they need to be in NASA to train the new people that are coming through.

Mr. ROHRABACHER. Right.

IMPORTANCE OF CONTINUOUS LEARNING

Mr. STIER. You heard from the prior panel about the importance of continuous learning. In the case of the workforce that NASA has, there is quite a bit of that that goes on, and so just because—as a young guy, I have to say this, just because you are old doesn't mean that you are not up to speed.

Mr. ROHRABACHER. Well, let me take that as a—let me suggest that that is a very wise answer to the question, because those of us who are here and go into politics, we don't always continue learning. And maybe that is not a good comparison then.

Mr. HARNAGE. Well, if I might add, one of the reasons you don't continue learning, you talk about in the journalism area, is because that is no longer, you know, required of the job that you are now

doing. But when we make these comparisons, I often like to use—I am a very proud American. I am a veteran, and I am proud that we have got the best-trained military in the world. We are now facing, with the probability of war, and there is no doubt in any United States citizens' mind who is going to come out on top on that. The only question is how many casualties will there be, but they are well trained, the best trained military in the world. And every one of them came to work at the entrance level. We trained them continually through their career, so that they kept pace, and that is what we ought to be doing with our civilian workforce.

Chairman BOEHLERT. The gentleman's time has expired.

Mr. ROHRABACHER. If the Chairman would indulge me 30 seconds just to say——

Chairman BOEHLERT. A nanosecond.

Mr. ROHRABACHER. The Japanese have known that if you pay your engineers more than your lawyers, it is a very—it is something good for society. And perhaps we can structure it so in our society that the people who go to work for NASA would be making more money if they—especially if they have the skills that we need. And I thank the Chairman for his leadership in trying to give us a little experiment here with trying to make things better.

Chairman BOEHLERT. Thank you. And we give some flexibility to NASA, and I think it is very important that there be constant communication with you and representing your membership, and you have input. But we lift the arbitrary 5,000 cap, and it is agency-specific. Goodness knows we need a lot of reform in government overall, but if we wait to do it for everybody, we will never get it done. And this is an agency we have to address the urgent need right now. I don't think there is any disagreement on the need. The question is how best to address the need. And we are trying, to the best of our ability, to come up with a proposed solution. But we should not exclude anyone in the development of that demonstration activity and the solution. So you have got my pledge that we will be facilitators to make certain your voices are heard, your input is given the consideration it deserves.

With that, let me turn to Mr. Hall.

Mr. HALL. Mr. Chairman, I have not been here. I have been in another hearing, and I don't know what has been asked, and I don't want to abuse their time. I will submit questions for later.

Chairman BOEHLERT. Okay. Thank you very much. Unless there is someone who has—Mr. Lampson, I'm sorry.

Mr. LAMPSON. Thank you, Mr. Chairman. I don't want to be left out.

Chairman BOEHLERT. The other gentleman from Texas.

DESTINATION AND VISION FOR NASA

Mr. LAMPSON. Thank you very much. I have to agree with every word that you said about there is a problem. We have known that problem existed in NASA for a while, and there was concern from years back, because I have visited with people, particularly at the Johnson Space Center, about the loss of continuity form project to project. And as people were not being replaced and brought in to work with the older heads and gaining the experience of actually

doing those tasks before they move to the next project, then it becomes lost.

And I am one who firmly believes after—I think we had a hearing on this subject some time last year. I don't remember exactly when it was. But I remember during the course of the hearing, I got up and went and sat with a group of about 20 college students in the back. And I asked them. I said, "You are the potential employees for NASA. What do you want? Are you most interested in the dollars that can be put into your pocket or is there something else?" And almost to a person, it was, "Where are we going? What can I do to build on my dream? What can I do to make me feel like I have accomplished something significant?" And I think that is a huge factor that has to be put into this equation and make sure that we have got a destination for NASA and a vision, something that is going to challenge the people who want to come in and live a dream and take a shot at making a huge difference in the world, like so many people who have come into NASA so long ago have done, and hopefully will continue to do.

DEMONSTRATION PROJECT

But with that, let me ask a couple of questions so that we might get down to where we might make improvements in the bill. I wish there were someone from NASA here, but the bill seems that it would allow the NASA Administrator to carry out agency-wide personnel demonstration projects. Could the Administrator—and any of you answer. Could the Administrator use that authority to eliminate the federal pay classification system at NASA?

Mr. NESTERCZUK. Yeah, I will take that. Yes, the Administrator would be allowed to change the classification system at NASA.

Mr. LAMPSON. Could they then establish their own pay classification system?

Mr. NESTERCZUK. Yes, they could.

Mr. LAMPSON. Could the Administrator arbitrarily eliminate the current Administrative appeals procedure available to NASA employees and replace it with something else?

Mr. NESTERCZUK. To a limited extent. The administrative aspect of it, which is up to the level of the Administrator inside the agency, that appeals process could be changed, but subsequent external reviews to the Merit Systems Protection Board and elsewhere, no.

OUTSOURCING

Mr. LAMPSON. What would be the effect of that authority on the establishment of a diverse workforce? And would it effect—would it increase the NASA Administrator's power to expand outsourcing?

Mr. NESTERCZUK. It is not related. It is not really related. The question of dealing with the appeals processes in cases of problem employees who may be subject to removal or some such action, how you deal with that, basically, is that appeals process. The question of outsourcing is something that OMB handles. It is beyond the scope of the demonstration authority.

Mr. LAMPSON. Anybody want to make any comments about any of that before I move——

Chairman BOEHLERT. Yeah, I do. I want you to know that we are going to be monitoring this very, very carefully. And they have to come to us with their plan. And so we will be working, and you have my pledge, as does Mr. Harnage, that we are going to be examining this very carefully. And we are going to consider all aspects. We better solve some problems, not create new ones.

Mr. LAMPSON. Good. Thank you, Mr. Chairman, for that statement.

DEMONSTRATION PROJECTS

Mr. STIER. Mr. Chairman, if I might add one comment on that, and that is that the demo project authority includes, as it ought to and needs to, consultation and work with employee groups, union groups, where they exist. There is a long history here. The demo project authority actually goes back 25 years. One of the points that I think is quite important for the Committee to look at is that this has been a way for government to experiment. It has been experimenting for 25 years primarily in this arena around scientists and engineers. We have learned a lot. Why are we waiting 25 years to take what we have learned to make the government a better place? And I would say that we ought to be making sure that we find out what has worked and try to use that in places where it is really needed, like NASA. I think that is one of the advantages of demo projects and clearly something that obviously has to include employee involvement.

NEED FOR OVERSIGHT

Mr. NESTERCZUK. Yeah, let me clarify the point. The Administrator can't unilaterally make changes. The Administrator can propose a change to the system. It then has to be debated, reviewed through the normal clearance processes in the demonstration authority and then subsequently accepted and implemented. But he can't unilaterally just go ahead and make a change.

Mr. HARNAGE. Well, one thing that I would say is that I have asked Congress to be very cautious about giving up its oversight over any agency where you give them the authority. This wouldn't be a demonstration project, because it would be agency-wide. And it would be the agency's rules and regulations. And I am a little confused on what the appeals process would be when you have circumvented the classification process with this demonstration project. But I also want the Committee to understand when I was—a while ago when I said we are a change agent, I tried for four years to get the Clinton Administration to sit down with us and talk about pay reform. And I have tried now for two years to get the Bush Administration to sit down and let us talk about pay reform. We recognize there is a need. We recognize that it has got to be addressed if you are going to do anything about the recruitment and retention problem. But so far, neither Administration has been willing to sit down and start working on it. It is time we started working on it.

Chairman BOEHLERT. The gentleman's time has expired.

Mr. LAMPSON. Can I just make one ending comment?

Chairman BOEHLERT. One ending comment.

Mr. LAMPSON. It follows—and it is just a few words. And it follows sort of what your comments are. They will have to come back to the Committee to make a report under this bill, but they wouldn't have to get Congress's approval. And I would like to at least for us to have a dialogue on that some how or other.

Chairman BOEHLERT. I can assure you and everyone that we are going to continue to have a dialogue in this. As a matter of fact, first of all, Congress never, never gives up its oversight authority and responsibility. I can guarantee you that. Secondly, and not surprisingly, NASA is not like—unlike—is like any other agency; they wanted authority to do what they wanted to do permanently, and without any consultation. And we said, in essence, "Like Hell. We are not going to give you that open-ended opportunity to do whatever you darn well please," although we do think they would act responsibly, but we are going to make sure they act responsibly. Until they—as Mr. Stier pointed out, consult, this is not a unilateral action by a select group of people over in a corner addressing a problem. This is a select group of people over in a corner identifying the problem, opening up to everyone saying, "This is a real problem. We have got to get at it, and we are determined to get at it in a responsible way." But we are not going to yield on oversight. We are not going to let them do whatever they darn well please. And I don't want to prejudge what they might come up with their demonstration project. It might be just wonderful. You and I might be standing up applauding. But I doubt if that will be the case. I think it will need a little massaging, but we are here. We are masseurs. Thank you very much.

Mr. GORDON. Can I close, also, please, sir?

Chairman BOEHLERT. All right. You have an opportunity to close, Mr. Gordon.

PLANS FOR THE WORKFORCE AUTHORITIES

Mr. GORDON. Thank you. Just a couple quick points. As Mr. Lampson pointed out, really the only responsibility or obligation of NASA is to come back and report what they are going to do, which brings us, to some extent, into this chicken and the egg situation, in that they have continued to say, "We want this additional authority," but they haven't told us what they want the authority for. And you know, if they would maybe come forth and tell us what they want to do with this and what they plan to do with it, I think that would be beneficial.

The other—and the other point is this: there has been a lot of discussion about salary. And part of the way to enhance the recruitment and retention of NASA employees is to increase salary. And I mean, this bill doesn't talk about salary. But—and as a practical matter, I know we are really talking about compensation in general. This—but this bill is more about compensation in general, which is bonuses and these sort of things. And once again, you know, under OPM, NASA has the ability to a lot of flexibility in terms of additional bonuses. But the centers' managers are afraid—not afraid, they are not using it, because they don't have adequate funds. So we really do need to know more about could they get the job done with adequate funding without additional legislation?

And the final point is, I just want to once again emphasize that I think that we have a fair forum here with Mr. Boehlert in trying to—I have no doubt that he wants to do the right thing. And we need to get the best information before this committee to do that.

Chairman BOEHLERT. That is closing in a really positive note. Thank you very much for being resources for this committee. We really appreciate your input, all of you. And the dialogue will continue.

Mr. NESTERCZUK. Thank you.

Chairman BOEHLERT. Thank you so much.

Mr. NESTERCZUK. Thank you, Mr. Chairman.

Chairman BOEHLERT. This hearing is adjourned.

[Whereupon, at 4:30 p.m., the Committee was adjourned.]

Appendix 1:

Answers to Post-Hearing Questions

ANSWERS TO POST-HEARING QUESTIONS

Responses by Robert S. Walker, Chairman, Commission on the Future of the United States Aerospace Industry; President, Wexler Walker Public Policy Associates

Questions submitted by Representative Ralph M. Hall

Q1. The Aerospace Commission has made an extensive set of recommendations to improve the civil space and aviation sectors in the United States.

- *How much do you estimate it would cost to implement all of those recommendations?*
- *In light of the current state of the aerospace industry, will the private sector be able to contribute much of the needed funds, or will the Federal Government have to pay for the major share of the cost?*

A1. The Commission on the Future of the United States Aerospace Industry did not specifically cost out our programmatic recommendations. You will note that most of our recommendations would encompass a variety of potential programs and therefore costing out any one of those would not be particularly useful.

That said, however, it is clear that tens of billions of dollars of new investment is needed in the aerospace sector. Our approach to finding the resources for that needed investment was to look at the aerospace expenditures now being made or contemplated, combine that spending into a sectoral budget, prioritize what are the real needs inside that budget and then suggest better horizontal management of the resources so that real priorities get addressed.

Certainly additional money beyond that already committed is needed to return U.S. aerospace leadership, but a considerable amount can be achieved by Congress and the Administration organizing activities within the sector in such a way that programs are complimentary rather than competing. Our most vivid suggestion in that regard is to assure that space based control, navigation and surveillance assets being designed for military missions also include capability to be utilized as an integral part of a modernized air traffic management system.

A substantial part of the investments needed for a robust aerospace future will have to come through government actions. The Commission suggested a series of business related reforms, which we believed would make the aerospace industry more attractive to the private investment community. The present situation of cyclical business and relatively meager profits even in the best of times does not attract much capital into the industry. Our belief was that policy change which results in making aerospace a more attractive investment arena will assure the finance base for additional research and development, more new products and a stronger ability to compete in the global economy.

Questions submitted by Representative Bart Gordon

Q1. In the Commission report, you stated [page 3-3]:

> *"The use of revolutionary reusable launch vehicles (RLV) is within our grasp in this decade. Developing the next generation of RLVs (in low, medium, and heavy lift configurations) could dramatically improve both the affordability and reliability of access to space."*
>
> *However, NASA's latest integrated space transportation plan slows down the development of a next generation RLV and assumes the continued operation of the Shuttle fleet for another fifteen years or so. It also seems to back away from earlier cost reduction goals.*
>
> - *Why does the Commission believe that next generation RLVs are achievable in this decade?*
> - *What would it take to develop a next generation RLV on that timetable?*
> - *Did NASA discuss your RLV recommendations with you before they issued their new integrated space transportation plan?*

A1. Your question made me realize that our specific wording could lead to misinterpretation and therefore was not as artful as it should have been.

The advent of RLVs within the decade is not likely as a NASA program. We would hope that the Orbital Space Phase could be completed within the decade. Our discussions with NASA led us to believe that they plan to design the OSP in a way that it could ultimately be used as the second stage of a two-stage RLV. But, since the first stage of such a vehicle is most likely to emerge from the National Aero-

space Initiative, the timeframe for such integration is probably toward the middle of the century's second decade. Prior to that, of course, the OSP would be on an EELV, a concept attractive to the Commission as a way of better utilizing our EELV investment.

What our Commission statement refers to is the possibility of privately financed RLVs being launched within the decade. Several competitors for the x-prize are likely to fly such vehicles, which while not orbital, will be fully reusable technologies going to the edge of space. In addition, efforts such as those underway at Kistler also have the potential of creating reusable vehicles for, at least, small payloads.

The Commission's hope was that the development of reusable technologies would lead to vehicle configurations addressing a multitude of space needs. Our intent was to push for the earliest possible timetable for such development because we believe that the result would be a dramatic reduction of cost to orbit.

ANSWERS TO POST-HEARING QUESTIONS

Responses by John W. Douglass, President and Chief Executive Officer, Aerospace Industries Association of America, Inc.

Questions submitted by Representative Ralph M. Hall

Q1. The Aerospace Commission recommended that the Federal Government significantly increase its investment in basic aerospace research. However, NASA's budget request calls for an almost 5 percent cut (excluding the effects of inflation) in aeronautics R&D funding over the next five years. This runs counter to the Commission's recommendations.

- *What will be the impact of continued cuts to aeronautics R&D?*
- *Will it be possible to achieve the future air traffic management system recommended by the Commission if NASA and FAA's R&D budgets follow the trend laid out in the Administration's budget request?*
- *What would you recommend be done?*

A1. Long-term reductions to the aeronautics Research & Development (R&D) budgets of the FAA and NASA would postpone the deployment of leading-edge technologies to improve the speed, range, safety and environmental efficiency of American air and space travel. As the report of the *Aerospace Commission* warned, patterns of declining federal aeronautics R&D spending could result in missed opportunities for the Nation to take advantage of "breakthrough capabilities" in high performance computers; propulsion and energy systems; noise and emissions mitigation; and hydrogen-fueled engines.

These patterns could also jeopardize the critical need for integrating the resources of federal aviation agencies to modernize the Nation's aging Air Traffic Management (ATM) system, as required by Title VI, Sec. 622 of *The Century of Aviation Reauthorization Act of 2003.* This initiative will require sustainable multi-year funding to reduce the reliance of the National Airspace System (NAS) on vulnerable ground stations and to foster the development of advanced satellite-based networks for both civil and military aviation communications, navigation and surveillance.

Insufficient Federal Government investments in aeronautics R&D would also increase the challenge of recruiting sufficient numbers of scientists and engineers into the Nation's aerospace industrial workforce during a decade when nearly 30 percent of the sector's employees will reach retirement eligibility.

Finally, a contraction of our commitment to aeronautics R&D at home will only yield aviation market leadership to our competitors abroad. European Union (EU) governments underwrite approximately 30 percent of the continent's civil aeronautics R&D, and in the realm of space, the EU, as well as Japan, China and Russia, have aggressively pursued new payload launch capabilities for at least the last five years. Our competitors overseas have calculated that the United States lacks either the will or the means to leverage its military superiority into world-class civil aviation and commercial space transportation systems. Robust programs of aeronautics R&D, however, would represent the first step in proving them wrong.

To place American aeronautics R&D programs on a stable glide path for economic growth and innovation, the Aerospace Industries Association recommends the following changes in the mission planning cycles of NASA and the FAA.

NASA

- Restoration of the balance between the Space and Aeronautics Enterprise budgets by increasing the latter to 30 percent of the Space Science account ($1.672B) over a five-year period.
- Increased funding of Space Flight Capabilities, Shuttle life extension, the Orbital Space Plane and Propulsion and power technologies with the objective of deploying a new manned launch vehicle by 2010.
- An aggressive recapitalization of NASA's infrastructure to facilitate aeronautics and space research.

FAA

- A reversal of budgetary trends through an increase in the FAA's Research, Engineering & Development top line by 30 percent (above the FY03 $100M level) as well as the Facilities & Engineering NAS modernization program by 45 percent (above the $3B FY03 level).

- The establishment of public/private partnerships to accelerate the development of advanced ATM technologies, propulsion and fuel capabilities, environmental efficiency and rotorcraft platforms.

These additional resources would significantly enhance NAS safety and capacity.

ANSWERS TO POST-HEARING QUESTIONS

Responses by Max Stier, President, Partnership for Public Service

Questions submitted by Chairman Sherwood Boehlert

Q1. How do recruitment, relocation, and retention bonuses for industry and academia compare to the current legal limits for Federal Government employees?

A1. While there is considerable variance among different industries and academia with regard to their use of recruitment, relocation, and retention bonuses, overall both sectors provide larger bonuses to proportionately more recruits or employees compared to the Federal Government. The December 1999 report by the Office of Personnel Management, "The 3Rs: Lessons Learned from Recruitment, Relocation, and Retention Incentives," does a good job of outlining some of the major differences between the federal and non-federal environment regarding use of these tools. In that report, for example, OPM notes that ". . .use of recruitment bonuses in the private sector is increasing. In a recent survey of 41 companies offering recruitment bonuses, over half offered bonus amounts of more than $3,500. The majority of all bonuses range from 6 to 15 percent of base pay." Private sector employers also frequently use finder's fees as part of their recruitment techniques and there is more managerial discretion regarding when and how recruitment incentives are used.

Similarly, OPM found that 50 percent of non-federal public sector and private sector contacts said they provide relocation incentives as either lump sum bonuses or salary differentials. OPM also found that non-federal employers typically provide a variety of additional relocation incentives typically not available in the federal sector, including housing allowances and reimbursement for cost of evaluating school systems. Finally, OPM found that retention or "stay for pay" incentives are administered differently outside the Federal Government, particularly in the private sector where there are the options of using deferred compensation, cash on a lump sum basis, stock options and profit sharing.

Q2. How do recruitment, relocation, and retention bonuses for industry and academia compare to the new limits for NASA employees in H.R. 1085?

A2. The new and higher limits for recruitment, relocation, and retention bonuses proposed in H.R. 1085 for NASA employees would bring NASA closer to what industry and academia can provide when competing to attract or retain talented applicants or employees. Overall, the proposed higher limits in H.R. 1085 seem quite reasonable, particularly since they are contingent upon the employee entering into a service agreement with NASA. Of course, the ultimate utility of these incentives will depend to a large degree on whether NASA has sufficient resources to use them effectively. If they do, the incentives should be quite useful and, ultimately, very cost effective.

Questions submitted by Representative Ralph M. Hall

Q1. It is reasonable to presume that NASA and its contractors are competing for many of the same employees due to the specialized skills involved. Given that, would increased recruitment and retention bonuses as envisioned in H.R. 1085 have any net positive effect—or would it just result in higher costs for both NASA and its contractors as they compete in offering better incentives?

A1. NASA contractors, in our view, are unlikely to be "open-ended" in the amount of any recruitment or retention bonuses they provide. Since NASA is only one of several potential competitors for the sought-after talent, we do not think that enabling NASA to become more competitive by increasing the amount of the recruitment and retention bonuses they can provide would be canceled out by a concomitant increase by its contractors. The marketplace for talent, in essence, is much larger than that. Overall, therefore, we think the provisions of H.R. 1085 would provide a net benefit for NASA and its mission capability by allowing them to become more competitive in that marketplace.

Questions submitted by Representative Bart Gordon

Q1. As part of the President's Management Agenda, 50 percent of the remaining NASA jobs are to be made available for potential outsourcing over the next few years.

How effective are bonuses and other incentives likely to be in attracting employees to NASA if they believe that their jobs could be transferred to the private sector within a few years?

A1. Despite the potential for some outsourcing of NASA jobs, the increases in recruitment, relocation, and retention bonuses proposed in H.R. 1085 should still be effective in helping NASA attract highly capable employees. Part of our reasoning behind this conclusion is that the outsourcing goals of the President's Management Agenda call for fifty percent of jobs that are commercial in nature to be made available for potential outsourcing, not fifty percent of all agency jobs. The total number of NASA positions affected by outsourcing, therefore, may be much smaller than some anticipate. The Partnership also takes the view that work that is not inherently governmental can in some circumstances be appropriately competed, but great care must be taken to ensure that the "not inherently governmental" standard is indeed met. In addition, where jobs are appropriate for competition, public sector employees are often the best value. Accordingly, the competitive sourcing process must ensure a level playing field for public employees. Further, the rhetoric around this issue should not in any way denigrate public servants. If these conditions are met, the impact of outsourcing considerations on potential applicants should be fairly minimal. If NASA is successful in attracting the highly qualified applicants it needs, we think most of those applicants will not be deterred by possible commercial sourcing competitions since they will accurately see their skills as highly marketable under any conditions. Our bottom line is that good civil servants are essential to America's well-being. The core responsibilities of government should not be outsourced and every effort must be made to retain the talented federal workers the government needs to meet those responsibilities. The provisions of H.R. 1085 will be helpful in that regard.

Q2. Do you have any survey data or other empirical data to justify your view?

A2. We know that starting salaries and bonuses are important to new college graduates with student loans and other debts that were incurred while obtaining advanced degrees. The results of a recent survey co-sponsored by the Partnership which examined the impact of law school debt are transferable to other occupations as well. As the report of that study, "From Paper Chase to Money Chase: Law School Debt Diverts Road to Public Service," notes ". . .many law school graduates must forgo the call to public service despite their interest and commitment to such a career. Public interest and government employers will increasingly lose in their efforts to recruit and retain talented and dedicated attorneys." Students graduating from schools of engineering or science, particularly those with advanced degrees are likely to be in a similar position. Recruitment bonuses or the offer of student loan repayments as a recruitment incentive can make a very positive difference. Further, there is a growing body of research on the expectations of new entrants to the job market and particularly new college graduates who are likely to anticipate and even look forward to several different employers throughout their careers. The possibility that a potential employer may outsource some positions is not likely to be nearly as important a consideration as initial salary levels or recruitment and relocation bonuses.

With regard to the value of retention bonuses, the recently released results from OPM's 2002 Federal Human Capital Survey lends support to the proposition that retention bonuses can be an effective tool for retaining some needed employees. For example, while nearly two-thirds of all federal employees are satisfied with their retirement benefits (an incentive to leave) fewer than half of them are satisfied with the recognition they receive for doing a good job (a disincentive to stay). A retention bonus sends a very strong signal to an employee that they are valued and their contributions are recognized.

Note: Four questions from Congressman Gordon are most appropriately answered by NASA and we assume that responses have been provided. Those questions are:

H.R. 1085 contains retention bonuses to incentivize employees to stay at NASA. Do you have any hard data on how many employees NASA loses to industry and how many employees NASA gains form industry on an annual basis?

Are you aware of any exit surveys by NASA to determine the specific reasons employees have left the agency and what would have made them stay?

How many employees does NASA need to carry out its missions over the next ten years? Does NASA currently have too many employees or not enough?

Associated with these latter questions, however, Congressman Gordon asks two additional questions to which we can respond as follows:

Q3. Would such data be useful to have in determining what, if any, additional legislative authorities should be provided to NASA?

A3. Answers to the questions raised by Congressman Gordon are certainly useful in determining what, if any, additional legislative authorities should be provided to NASA. The Partnership for Public Service is an advocate of employee surveys, including exit surveys, as a useful method of gaining valuable information and insights regarding workforce management. Also, the use of hard data or employment metrics such as employee turnover via resignations and retirements can be very useful, particularly when tracked over time.

Q4. How would you recommend this committee go about determining the answers to those questions?

A4. Much of this information should be obtainable from NASA. Additional information, including some benchmark data on the experiences of other agencies should be available from the Office of Personnel Management either from the information contained in the Central Personnel Data File or via government-wide studies and surveys such as the "2002 Federal Human Capital Survey."

ANSWERS TO POST-HEARING QUESTIONS

Responses by Bobby L. Harnage, Sr., President, American Federation of Government Employees, AFL–CIO

Questions submitted by Chairman Sherwood Boehlert

Q1. What is the basis of the statement in your written testimony that H.R. 1085 "undermines merit system principles" when the legislation clearly tells NASA to plan "the safeguards and other measures that will be applied to ensure that this title is carried out in a manner consistent with merit system principles."

A1. AFGE believes several of the proposed changes to NASA's personnel system undermine merit system principles. The direct hire authority—on the spot hiring—undermines the principle that there should be free and open competition for federal jobs. The bonus authority undermines the principle of equal pay for substantially equal work since not everyone will be eligible for the bonuses, only those who threaten to leave or refuse to join NASA without a bonus. Those who perform equal work but don't threaten to leave, and don't refuse to join in the absence of a bonus will not receive the same pay as those who do.

Questions submitted by Representative Ralph M. Hall

Q1. Should federal workforce issues be addressed legislatively on a government-wide basis or only for selected agencies? For example, the DOE designs nuclear weapons and has similar workforce issues as NASA. Why should NASA be singled out, but not DOE.

A1. AFGE is strongly opposed to agency-by-agency civil service reform. It undermines the merit system principles of equal pay for substantially equal work, and raises costs for the government at large as agencies compete with one another for resources and employees. There is nothing to prevent a race to the bottom as is so often the case in the private sector.

Q2. If a NASA only bill is passed, what will the consequences be for other government agencies with significant numbers of scientists and engineers? Could there be an unintended brain drain from an agency with less generous incentives to one with more employee incentives?

A2. We believe that the NASA only approach is wrong for exactly those reasons. NASA has a poor record for personnel management and contract oversight. NASA has had difficulty in recruitment because of its relentless contracting out and privatization, and its failure to support or invest in its own workforce. Bonus authority is a Band-Aid for them that does not address its more profound management problems.

Q3. How appropriate is it to single out one agency's science and engineering workforce for special treatment?

A3. It is highly inappropriate and will further undermine morale in an agency that is already suffering from low morale because of its penchant for contracting out and privatization without giving incumbent federal employees the opportunity to compete. NASA's workforce will languish while a few temporary employees who are in favor will receive large bonuses under the Administrator's plan. His plan is profoundly unpopular with the career workforce at NASA.

Q4. Is it reasonable to presume that NASA and its contractors are competing for many of the same employees due to the specialized skills involved. Given that, would increased recruitment and retention bonuses as envisioned in H.R. 1085 have any net positive effect—or would it just result in higher costs for both NASA and contractors as they compete in offering better incentives?

A4. Ironically, if a scientist or engineer wants to work "for" NASA and is interested in job security and career development and good pay, he or she should work for NASA's contractors. NASA's record is to contract out everything it can, without competition. Taxpayers foot the bill, but the contractor gets all the institutional knowledge and the agency and we are at the contractors' mercy because in-house capacity is depleted. Contractors have exploited this situation and overcharge making the task of rebuilding in-house capacity ever more expensive and difficult.

Questions submitted by Representative Bart Gordon

Q1. Since H.R. 1085 doesn't establish separate funding for the proposed incentive payments, one has to assume that the funds for bonuses, critical pay authorities, and VSIPs would have to come out of NASA's general salary funds. Therefore, NASA's use of those incentives would reduce the funds available for raises for the rest of the workforce. What will be the net effect of the proposed incentives on employee morale and retention if the overall workforce salaries are being depressed to pay for bonuses and incentives for selected employees? Is your conclusion based upon any hard data?

A1. AFGE members at NASA tell me unequivocally that they oppose the use of the incentives for what is essentially a temporary workforce. NASA's own rationale for these authorities is that federal salaries are too low, but they will not be able to address the problem of low salaries across the board without additional funding. So necessarily some will benefit and others will lose in this zero-sum game. AFGE has requested data from the Office of Personnel Management (OPM) from demonstration projects throughout the government that have experimented with the types of authorities NASA wants so that we can find out if our suspicions are correct. After almost a year of repeated requests, even from the pay workgroups at the Department of Homeland Security, we still have never gotten any information from OPM on how different pay systems affect the distribution of salary monies.

Q2. H.R. 1085 would allow the NASA Administrator to carry out agency-wide changes to the workforce rules under the demonstration projects provision. Could the Administrator use that authority to eliminate the federal pay classification system at NASA? Could the Administrator arbitrarily establish his own pay classification system? Could the Administrator arbitrarily eliminate the current administrative appeals procedures available to NASA employees and replace it with something else? What would be the effect of this authority on the establishment of a diverse workforce? Would this authority increase the NASA Administrator's power to expand outsourcing?

A2. The answer to the first three questions is YES. We cannot know the effect on diversity, but if officials exercised their discretion in a discriminatory way, the workforce could certainly become less diverse, but the burden would be on disappointed job seekers to prove that they were victims of discrimination. The Administrator has already expanded outsourcing without giving taxpayers the benefits of public-private competition. He could simply fill all positions he calls "new" with contractors.

Q3. As part of the President's Management Agenda, 50 percent of the remaining NASA jobs are to be made available for potential outsourcing over the next few years. How effective are bonuses and other incentives likely to be in attracting employees to NASA if they believe that their jobs could be transferred to the private sector within a few years?

A3. AFGE believes that the bonuses will simply be given to individuals making their way in the revolving door between NASA and its contractors. The current Administrator has met the President's entire privatization quota without any public private competition at all, i.e., without ever once giving NASA employees the chance to compete in defense of their jobs, according to the President's own FY04 Budget Scorecard. Since NASA has shown so little commitment to its career workforce—either in preventing their jobs from being arbitrarily outsourced without competition, or in paying them competitive salaries, it is highly unlikely the bonuses will help NASA with its stated recruitment goals.

Q4. Do you have any survey data or other empirical data to support your view?

A4. Agencies are not required to collect data on the government work that they contract out to the private sector. But NASA own submission to OMB as published in the President's '04 Budget shows that they simply contract out without competition.

Q5. H.R. 1085 contains retention bonuses to incentivize employees to stay at NASA. Do any of you have any hard data on how many employees NASA loses to industry and how many employees NASA gains from industry on an annual basis?

A5. No.

Q6. Are you aware of any exit surveys by NASA to determine the specific reasons employees have left the agency and what would have made them stay?

A6. AFGE's members at NASA leave because their salaries are too low and because their jobs have been privatized. They would have stayed if FEPCA would have been complied with, and if their jobs hadn't been contracted out.

Q7. The proposed modifications in H.R. 1085 to the existing statutes governing term appointments are potentially significant. It has been argued by employee unions that the rules governing the hiring of term employees are less stringent with respect to diversity, veterans preferences, and so forth, than regular employee hiring rules. The proposed legislation would make it easier to convert term appointments to permanent appointments. What is the rationale for such a provision, and how will it alter the makeup of the NASA workforce over time if it is implemented?

A7. It is likely to make the workforce less diverse, and the hiring of veterans more rare. It is an invitation to management to hire without the benefit of full an open competition, and will benefit insiders, but not taxpayers and citizens who should have an open and fair opportunity to compete for any federal job. It will also reduce career development opportunities for the existing federal workforce and allow managers to "wire" promotions and hirings.

Q8. Could significant numbers of political appointees be converted to permanent employees if this provision were adopted? What is to prevent such a possibility?

A8. Yes, this authority can be abused to allow political appointees to "burrow in" to permanent jobs. Nothing will prevent this.

Q9. How many employees does NASA need to carry out its missions over the next 10 years? Does NASA currently have too many employees or not enough? How would you recommend this committee go about determining the answers to these questions?

A9. No one knows how many employee NASA has because NASA doesn't count its contractor employees and doesn't have to. NASA and all agencies should be required to report not only how many contractor employees they have, but what the contractors do, how much they cost, and whether what they do is of an acceptable level of quality. Until those questions are answered, no one will be able to evaluate NASA or any other agency's operations fairly.

ANSWERS TO POST-HEARING QUESTIONS

Responses by George Nesterczuk, Nesterczuk and Associates

Questions submitted by Chairman Sherwood Boehlert

Q1. How do recruitment, relocation, and retention bonuses for industry and academia compare to the current legal limits for Federal Government employees?

A1. While there is considerable variance among different industries and academia with regard to their use of recruitment, relocation, and retention bonuses, overall both sectors provide larger bonuses to proportionately more recruits or employees compared to the Federal Government. The December 1999 report by the Office of Personnel Management, "The 3Rs: Lessons Learned from Recruitment, Relocation, and Retention Incentives," does a good job of outlining some of the major differences between the federal and non-federal environment regarding use of these tools. In that report, for example, OPM notes that ". . .use of recruitment bonuses in the private sector is increasing. In a recent survey of 41 companies offering recruitment bonuses, over half offered bonus amounts of more than $3,500. The majority of all bonuses range from 6 to 15 percent of base pay." Private sector employers also frequently use finder's fees as part of their recruitment techniques and there is more managerial discretion regarding when and how recruitment incentives are used.

Similarly, OPM found that 50 percent of non-federal public sector and private sector contacts said they provide relocation incentives as either lump sum bonuses or salary differentials. OPM also found that non-federal employers typically provide a variety of additional relocation incentives typically not available in the federal sector, including housing allowances and reimbursement for cost of evaluating school systems. Finally, OPM found that retention or "stay for pay" incentives are administered differently outside the Federal Government, particularly in the private sector where there are the options of using deferred compensation, cash on a lump sum basis, stock options and profit sharing.

Q2. How do recruitment, relocation, and retention bonuses for industry and academia compare to the new limits for NASA employees in H.R. 1085?

A2. The new and higher limits for recruitment, relocation, and retention bonuses proposed in H.R. 1085 for NASA employees would bring NASA closer to what industry and academia can provide when competing to attract or retain talented applicants or employees. Overall, the proposed higher limits in H.R. 1085 seem quite reasonable, particularly since they are contingent upon the employee entering into a service agreement with NASA. Of course, the ultimate utility of these incentives will depend to a large degree on whether NASA has sufficient resources to use them effectively. If they do, the incentives should be quite useful and, ultimately, very cost effective.

Questions submitted by Representative Ralph M. Hall

Q1. It is reasonable to presume that NASA and its contractors are competing for many of the same employees due to the specialized skills involved. Given that, would increased recruitment and retention bonuses as envisioned in H.R. 1085 have any net positive effect—or would it just result in higher costs for both NASA and its contractors as they compete in offering better incentives?

A1. NASA contractors, in our view, are unlikely to be "open-ended" in the amount of any recruitment or retention bonuses they provide. Since NASA is only one of several potential competitors for the sought-after talent, we do not think that enabling NASA to become more competitive by increasing the amount of the recruitment and retention bonuses they can provide would be canceled out by a concomitant increase by its contractors. The marketplace for talent, in essence, is much larger than that. Overall, therefore, we think the provisions of H.R. 1085 would provide a net benefit for NASA and its mission capability by allowing them to become more competitive in that marketplace.

Q2. What is the nature of your concerns with the Voluntary Separation Incentive provision in H.R. 1085?

A2. The VSIP as proposed is far too generous and will work at cross purposes. Employees approaching retirement may develop expectations of separating with a bonus as opposed to simply retiring when they are ready to do so. Employees will have an incentive to stay on until they are bought out thereby affecting normal retirement rates.

Experience with VSIs in the Federal Government has shown that over 90 percent have gone to retirement eligible employees. The notion that such incentives can somehow be used to "restructure" the federal workforce by eliminating skills imbalances is fictitious. Further, if the agency has experienced a loss of talented and experienced personnel then the focus ought to be on retention bonuses rather than on separation incentives. Finally, if the VSI is to be an inducement to usher a poor performer out the door then what signal does this send to the good performers in the agency?

Question submitted by Representative Bart Gordon

Q1. How many employees does NASA need to carry out its missions over the next ten years? Does NASA currently have too many employees or not enough? How would you recommend this committee go about determining the answers to those questions?

A1. The appropriate level of staff for NASA is dependent on its mission and the programs NASA undertakes to fulfill this mission. It is up to Congress in its oversight and appropriating capacities to authorize and fund the agency's programs. Subsequently NASA can determine what mix or combination of federal employees and contracted labor is most effective in implementing those programs. Without a thorough review of this aspect of NASA operations I am unable to provide a more concise response to the question.

Appendix 2:

Additional Material for the Record

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(Original Signature of Member)

108TH CONGRESS
1ST SESSION

H. R. 1085

IN THE HOUSE OF REPRESENTATIVES

Mr. BOEHLERT introduced the following bill; which was referred to the Committee on _____

A BILL

To make certain workforce authorities available to the National Aeronautics and Space Administration, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "NASA Flexibility Act of 2003".

SEC. 2. COMPENSATION FOR CERTAIN EXCEPTED PERSONNEL.

(a) IN GENERAL.—Subparagraph (A) of section 203(c)(2) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2473(c)(2)(A)) is amended by striking "the highest rate of grade 18 of the General Schedule of the Classification Act of 1949, as amended," and inserting "the rate of basic pay payable for level III of the Executive Schedule,".

(b) EFFECTIVE DATE.—The amendment made by this section shall take effect on the first day of the first pay period beginning on or after the date of enactment of this Act.

SEC. 3. WORKFORCE AUTHORITIES.

The National Aeronautics and Space Act of 1958 (42 U.S.C. 2451 and following) is amended by adding at the end the following:

"TITLE V—WORKFORCE AUTHORITIES

"DEFINITIONS

"SEC. 501. For purposes of this title—

"(1) the term 'employee' means an individual employed in or under the Administration;

"(2) the term 'appropriate committees of Congress' means—

"(A) the Committee on Science and the Committee on Appropriations of the House of Representatives; and

"(B) the Committee on Commerce, Science, and Transportation and the Committee on Appropriations of the Senate;

"(3) the term 'critical need' means a specific and important requirement of the Administration's mission that the Administration is unable to fulfill because the Administration lacks the appropriate employees either because of the inability to fill positions or because employees do not possess the requisite skills;

"(4) the term 'Workforce Plan' means the plan required under section 502(a); and

"(5) the term 'redesignation bonus' means a bonus under section 504 paid to an individual described in subsection (a)(2) thereof.

"PLANNING, NOTIFICATION, AND REPORTING REQUIREMENTS

"SEC. 502. (a) Not later than 90 days before first exercising any of the workforce authorities made available by this title, the Administrator shall submit to the appropriate committees of Congress a written plan, which shall include a description of—

"(1) each critical need of the Administration and the criteria used in its identification;

"(2) the functions, approximate number, and classes or other categories of positions or employees that address critical needs and that would be eligible for each authority proposed to be exercised under section 503, and how the exercise of those authorities with respect to the eligible positions or employees involved would address each critical need identified under paragraph (1);

"(3) any critical need identified under paragraph (1) which would not be addressed by the authorities made available by section 503, and the reasons why those needs would not be so addressed;

"(4) the specific criteria to be used in determining which individuals may receive the benefits described in sections 504, 505, and 506 (including, in the case of sections 504 and 505, the criteria for granting bonuses in the absence of a critical need), and how the level of those benefits will be determined;

"(5) the safeguards or other measures that will be applied to ensure that this title is carried out in a manner consistent with merit system principles;

"(6) the means by which employees will be afforded the notification required under subsection (b) and the third sentence of subsection (c)(1), respectively; and

"(7) the methods that will be used to determine if the authorities exercised under section 503 have successfully addressed each critical need identified under paragraph (1).

"(b) Not later than 60 days before first exercising any of the workforce authorities made available by this title, the Administrator shall provide to all employees the Workforce Plan, along with any additional information which the Administrator considers appropriate.

"(c)(1) The Administrator may from time to time modify the Workforce Plan. Not later than 90 days before implementing any such modifications, the Administrator shall submit a description of the proposed modifications to the appropriate committees of Congress. Not later than 60 days before implementing any such modifications, the Administrator shall provide an appropriately modified plan to all employees of the Administration.

"(2) Any reference in this title or any other provision of law to the Workforce Plan shall be considered to include any modification made in accordance with this subsection.

"(d) None of the workforce authorities made available by section 503 may be exercised in a manner inconsistent with the Workforce Plan.

"(e) Not later than 6 years after the date of enactment of this title, the Administrator shall submit to the appropriate committees of Congress an evaluation and analysis of the actions taken by the Administration under this title, including—

"(1) an evaluation, using the methods described in subsection (a)(7), of whether the authorities exercised under section 503 successfully addressed each critical need identified under subsection (a)(1);

"(2) to the extent that they did not, an explanation of the reasons why any critical need (apart from the ones under subsection (a)(3)) was not successfully addressed; and

"(3) recommendations for how the Administration could address any remaining critical need and could prevent those that have been addressed from recurring.

"(f) Whenever the Administration submits its performance plan under section 1115 of title 31, United States Code, to the Office of Management and Budget for any year, the Administration shall at the same time sub-

mit a copy of such plan to the appropriate committees of Congress.

"WORKFORCE AUTHORITIES

"SEC. 503. (a) The workforce authorities made available by this title are as follows:

"(1) The authority to pay recruitment, redesignation, and relocation bonuses, as provided by section 504.

"(2) The authority to pay retention bonuses, as provided by section 505.

"(3) The authority to apply subchapter II of chapter 35 of title 5, United States Code (relating to voluntary separation incentive payments), as added by section 1313(a)(1)(A) of the Homeland Security Act of 2002 (Public Law 107–296), in accordance with section 506.

"(4) The authority to make term appointments and to take related personnel actions, as provided by section 507.

"(5) The authority to fix rates of basic pay for critical positions, as provided by section 508.

"(6) The authority to extend intergovernmental personnel act assignments, as provided by section 509.

"(b) No authority under this title may be exercised with respect to any officer who is appointed by the President, by and with the advice and consent of the Senate.

"(c) Unless specifically stated otherwise, all authorities provided under this title are subject to section 5307 of title 5, United States Code. For purposes of applying such section 5307, cash payments made under authority of this title shall be treated in the same way as if they had instead been made under the corresponding provisions of such title 5 (if any).

"RECRUITMENT, REDESIGNATION, AND RELOCATION BONUSES

"SEC. 504. (a) Notwithstanding section 5753 of title 5, United States Code, the Administrator may pay a bonus to an individual, in accordance with the Workforce Plan and subject to the limitations in this section, if the Administrator determines that the Administration would be likely, in the absence of a bonus, to encounter difficulty in filling a position, and if the individual—

"(1) is newly appointed as an employee of the Federal Government;

"(2) is currently employed by the Federal Government and is newly appointed to another position in the same geographic area; or

"(3) is currently employed by the Federal Government and must relocate to a different geographic area to accept a position with the Administration.

"(b) If the position is described as addressing a critical need in the Workforce Plan pursuant to section 502(a)(2), the amount of a bonus may not exceed—

"(1) 50 percent of the employee's annual rate of basic pay (including comparability payments under sections 5304–5304a of title 5, United States Code) as of the beginning of the service period multiplied by the service period specified pursuant to subsection (d)(1)(A); or

"(2) 100 percent of the employee's annual rate of basic pay (including comparability payments under sections 5304–5304a of title 5, United States Code) as of the beginning of the service period.

"(c) If the position is not described as addressing a critical need in the Workforce Plan pursuant to section 502(a)(2), the amount of a bonus may not exceed—

"(1) 25 percent of the employee's annual rate of basic pay (including comparability payments under sections 5304–5304a of title 5, United States Code) as of the beginning of the service period multiplied by the service period specified pursuant to subsection (d)(1)(A); or

"(2) 100 percent of the employee's annual rate of basic pay (including comparability payments under sections 5304–5304a of title 5, United States Code) as of the beginning of the service period.

"(d)(1) Payment of a bonus under this section shall be contingent upon the individual entering into a service agreement with the Administration. The service agreement shall, at a minimum, set forth—

"(A) the required service period;

"(B) the method of payment, including a payment schedule; the method of payment may include a lump-sum payment, installment payments, or a combination thereof;

"(C) the amount of the bonus and the basis for calculating such amount; and

"(D) the conditions under which the agreement may be terminated before the agreed-upon service period has been completed, and the effect of the termination.

"(2) For purposes of determinations under subsections (b)(1) and (c)(1), the employee's service period shall be expressed as the number equal to the full years and twelfth parts thereof, rounding the fractional part of a month to the nearest twelfth part of a year. The service

period may not be less than 6 months and may not exceed 4 years.

"(3) A bonus under this section may not be considered to be part of the basic pay of an employee.

"(e) Before paying a bonus under this section, the Administration shall establish a plan for paying recruitment, redesignation, and relocation bonuses, subject to approval by the Office of Personnel Management.

"(f) The Administrator shall submit to the appropriate committees of Congress, not later than February 28 of each year, a summary of all bonuses paid under subsections (b) and (c) during the previous calendar year. Such summary shall include the number of bonuses paid, the total amount of bonuses paid, and the average percentage used in calculating the total average bonus amount, under each such subsection.

"RETENTION BONUSES

"SEC. 505. (a) Notwithstanding section 5754 of title 5, United States Code, the Administrator may pay a bonus to an employee, in accordance with the Workforce Plan and subject to the limitations in this section, if the Administrator determines that—

"(1) the unusually high or unique qualifications of the employee or a special need of the Administration for the employee's services makes it essential to retain the employee; and

"(2) the employee would be likely to leave in the absence of a retention bonus.

"(b) If the position is described as addressing a critical need in the Workforce Plan pursuant to section 502(a)(2), the amount of a bonus may not exceed 50 percent of the employee's annual rate of basic pay (including comparability payments under sections 5304–5304a of title 5, United States Code).

"(c) If the position is not described as addressing a critical need in the Workforce Plan pursuant to section 502(a)(2), the amount of a bonus may not exceed 25 percent of the employee's annual rate of basic pay (including comparability payments under sections 5304–5304a of title 5, United States Code).

"(d)(1) Payment of a bonus under this section shall be contingent upon the employee entering into a service agreement with the Administration. The service agreement shall, at a minimum, set forth—

"(A) the required service period;

"(B) the method of payment, including a payment schedule; the method of payment may include a lump-sum payment, installment payments, or a combination thereof;

"(C) the amount of the bonus and the basis for calculating such amount; and

"(D) the conditions under which the agreement may be terminated before the agreed-upon service period has been completed, and the effect of the termination.

"(2) The employee's service period shall be expressed as the number equal to the full years and twelfth parts thereof, rounding the fractional part of a month to the nearest twelfth part of a year. The service period may not be less than 6 months and may not exceed 4 years.

"(3) Notwithstanding paragraph (1), a service agreement is not required if the Administration pays a bonus in biweekly installments and sets the installment payment at the full bonus percentage rate established for the employee with no portion of the bonus deferred. In this case, the Administration shall inform the employee in writing of any decision to change the retention bonus payments. The employee shall continue to accrue entitlement to the retention bonus through the end of the pay period in which such written notice is provided.

"(e) A bonus under this section may not be considered to be part of the basic pay of an employee.

"(f) An employee is not entitled to a retention bonus under this section during a service period previously established for that employee under section 5753 of title 5, United States Code, or under section 504.

"(g) Before paying a bonus under this section, the Administration shall establish a plan for paying retention bonuses, subject to approval by the Office of Personnel Management.

"(h) The Administrator shall submit to the appropriate committees of Congress, not later than February 28 of each year, a summary of all bonuses paid under subsections (b) and (c) during the previous calendar year. Such summary shall include the number of bonuses paid, the total amount of bonuses paid, and the average percentage used in calculating the total average bonus amount, under each such subsection.

"VOLUNTARY SEPARATION INCENTIVE PAYMENTS

"SEC. 506. (a) In applying subchapter II of chapter 35 of title 5, United States Code, the Administrator may provide for voluntary separation incentive payments in excess of the dollar-amount limitation that would otherwise apply under section 3523(b)(3)(B) of such title, subject to subsection (b).

"(b) Voluntary separation incentive payments described in subsection (a)—

"(1) may not exceed 50 percent of the annual rate of basic pay of the employee receiving such payments (computed disregarding any comparability payments under sections 5304–5304a of title 5, United States Code);

"(2) may not, in any calendar year, be made to more than—

"(A) 10 employees; or

"(B) such greater number of employees as the Administrator may, with the approval of the Office of Management and Budget, establish in lieu of the number specified in subparagraph (A) following notification to the appropriate committees of Congress;

"(3) may not be made to an employee if the employee has within the last 12 months received, or if the employee is then receiving, a bonus or allowance under section 5753 or 5754 of title 5, United States Code, or under section 504 or 505; and

"(4) may be made only if the position in which the employee is serving addresses a critical need identified in the Workforce Plan pursuant to section 502(a)(2).

"(c)(1) The proposed use of workforce authorities in this section shall be included in the plan required by section 3522 of title 5, United States Code.

"(2) Whenever the Office of Personnel Management approves the Administration's plan required in such section 3522, the Administration shall submit a copy of the

approved plan to the appropriate committees of Congress within 15 days after the date on which it is so approved.

"TERM APPOINTMENTS

"SEC. 507. (a) The Administrator may authorize term appointments within the Administration made under authority of subchapter I of chapter 33 of title 5, United States Code, for a period of not less than 1 year and not more than 6 years.

"(b) Notwithstanding chapter 33 of title 5, United States Code, or any other provision of law relating to the examination, certification, and appointment of individuals in the competitive service, the Administrator may convert an employee serving under a term appointment to a permanent appointment in the competitive service within the Administration without further competition if—

"(1) such individual was appointed under open, competitive examination pursuant to provisions of subchapter I of chapter 33 of title 5, United States Code, to the term position;

"(2) the announcement for the term appointment from which the conversion is made stated that there was potential for subsequent conversion to a career-conditional or career appointment;

"(3) the employee has completed at least 2 years of current continuous service under a term appointment in the competitive service;

"(4) the employee's performance under such term appointment was at least fully successful or equivalent; and

"(5) the position to which such employee is being converted under this section is in the same occupational series, is in the same geographic location, and provides no greater promotion potential than the term position for which the competitive examination was conducted.

"(c) Notwithstanding chapter 33 of title 5, United States Code, or any other provision of law relating to the examination, certification, and appointment of individuals in the competitive service, the Administrator may convert an employee serving under a term appointment to a permanent appointment in the competitive service within the Administration through internal competitive promotion procedures if the conditions under paragraphs (1) through (4) of subsection (b) are met.

"(d) An employee converted under this section becomes a career-conditional employee, unless the employee has otherwise completed the service requirements for career tenure.

"(e) An employee converted to career or career-conditional employment under this section acquires competitive status upon conversion.

"(f) Not later than February 28 of each year, the Administrator shall submit to the appropriate committees of Congress—

"(1) the total number of term appointments converted during the previous calendar year; and

"(2) of that total number, the number of conversions that were made to address a critical need described in the Workforce Plan pursuant to section 502(a)(2).

"PAY AUTHORITY FOR CRITICAL POSITIONS

"SEC. 508. (a) For the purpose of this section, the term 'position' means—

"(1) a position to which chapter 51 of title 5, United States Code, applies, including a position in the Senior Executive Service;

"(2) a position under the Executive Schedule under sections 5312–5317 of title 5, United States Code;

"(3) a position established under section 3104 of title 5, United States Code; or

"(4) a senior-level position to which section 5376(a)(1) of title 5, United States Code, applies.

"(b) Authority under this section—

"(1) may be exercised only with respect to a position which is described as addressing a critical need in the Workforce Plan pursuant to section

502(a)(2), and which requires expertise of an extremely high level in a scientific, technical, professional, or administrative field;

"(2) may be exercised only to the extent necessary to recruit or retain an individual exceptionally well qualified for the position; and

"(3) may be exercised only in retaining employees of the Administration or in appointing individuals who were not employees of another Federal agency as defined by section 5102(a)(1) of title 5, United States Code.

"(c)(1) Notwithstanding section 5377 of title 5, United States Code, the Administrator may fix the rate of basic pay for a position in the Administration in accordance with this section. The Administrator may not delegate this authority.

"(2) The number of positions with pay fixed under this section may not exceed 10 at any time.

"(d)(1) The rate of basic pay fixed under this section may not be less than the rate of basic pay (including any comparability payments) which would otherwise be payable for the position involved if this section had never been enacted.

"(2) The annual rate of basic pay fixed under this section may not exceed the per annum rate of salary payable under section 104 of title 3, United States Code.

"(3) Notwithstanding any provision of section 5307 of title 5, United States Code, in the case of an employee who, during any calendar year, is receiving pay at a rate fixed under this section, no allowance, differential, bonus, award, or similar cash payment may be paid to such employee if, or to the extent that, when added to basic pay paid or payable to such employee (for service performed in such calendar year as an employee in the executive branch or as an employee outside the executive branch to whom chapter 51 of such title 5 applies), such payment would cause the total to exceed the per annum rate of salary which, as of the end of such calendar year, is payable under section 104 of title 3, United States Code.

"(e) The Administrator shall submit to the appropriate committees of Congress, not later than February 28 of each year, the number of critical pay positions that were established and the number of critical pay positions that were disestablished during the previous calendar year.

"ASSIGNMENTS UNDER THE INTERGOVERNMENTAL PERSONNEL ACT MOBILITY PROGRAM

"SEC. 509. For purposes of applying the third sentence of section 3372(a) of title 5, United States Code (relating to the authority of the head of a Federal agency

to extend the period of an employee's assignment to or from a State or local government, institution of higher education, or other organization), the Administrator may, with the concurrence of the employee and the government or organization concerned, take any action which would be allowable if such sentence had been amended by striking 'two' and inserting 'four'.

"ENHANCED DEMONSTRATION PROJECT AUTHORITY

"SEC. 510. When conducting a demonstration project at the Administration, section 4703(d)(1)(A) of title 5, United States Code, may be applied by substituting 'such numbers of individuals as determined by the Administrator' for 'not more than 5,000 individuals'.

"TERMINATION

"SEC. 511. The workforce authorities under section 503 shall terminate as of October 1, 2009, except that nothing in this section shall—

"(1) affect any bonus payment under sections 504 or 505 agreed to by the employee and the Administration before the termination date;

"(2) prevent an employee from being allowed to complete a term appointment made under section 507(a) if the appointment was made before the termination date;

"(3) prevent the Administrator from converting any term employees to career or career-conditional

status under section 507 if the term appointment was made before the termination date;

"(4) prevent an employee from continuing to receive a rate of basic pay fixed under section 508 before the termination date; or

"(5) prevent an employee assigned under section 3372 of title 5, United States Code, from completing the extended term made under section 509 if the extension was made before the termination date.".