THE NATIONAL ACADEMIES
Advisers to the Nation on Science, Engineering, and Medicine

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Aeronautics and Space Engineering Board News

Welcome to the latest installment of the ASEB News! This newsletter will update you on ASEB events and activities, as well as policy items of interest to the aerospace community.

Inside this issue:

ASEB JOB OPENINGS—See p. 10

New Report Evaluates NASA's Exploration Technology Development Program

NASA's Exploration Technology Development Program (ETDP) is making progress towards its stated goals of technology development, but it is operating within significant constraints that limit its ability to accomplish those goals successfully, says a new report issued by the ASEB's Committee to Review NASA's Exploration Technology Development Program. The ETDP operational constraints include the still-dynamic nature of the Constellation Program requirements, a limited budget, the aggressive time scale of early technology deliverables, and the desire to employ the NASA workforce fully. The committee described these constraints in its final report, *A Constrained Space Exploration Technology Program: A Review of NASA's Exploration Technology Development Program*, issued in prepublication form in August 2008.

The committee found that in 20 of the 22 ETDP projects, corrective action leading to project improvement was either warranted or required. However, the committee found that the ETDP contains a range of technologies that will, in principle, help realize many of the early endeavors currently envisioned in the architecture developed in NASA's *Exploration Systems Architecture Study*. The committee concluded that the ETDP, if adequately and stably funded and executed in a manner consistent with the planning process, would likely make available the required technology on-schedule to its customers in the Constellation Program.

Because of the constraints cited above, NASA has created in the ETDP a supporting technology program very closely coupled to the near-term needs of the Constellation Program. This program contains only incremental gains in capability and two programmatic gaps (in the integration of human systems and nuclear thermal propulsion). NASA has effectively suspended research in a number of technology areas traditionally within the agency's scope, and has in many areas effectively ended support for longer-term technology research, traditionally carried out within NASA and with strong university collaboration. These omissions could have important consequences for those portions of the Vision for Space Exploration beyond the initial short-duration lunar missions—including extended human presence on the Moon, human exploration of Mars, and beyond.

A prepublication copy of the *ETDP* report can be downloaded as a PDF document for free from <http://www.nap.edu/catalog.php?record_id=12471>. The final printed version will be available in January.

From the Chair: NASA Aeronautics--Connecting the Dots between Funding and Leadership

Raymond S. Colladay

The NASA Aeronautics Program is funded at its lowest level in 45 years—this at a time when we most need advanced technology to address challenges that threaten U.S. leadership in aviation. Given our geographic size and economy, having the best air transportation system in the world is vital to our country's prosperity and mobility. Had we been investing in research at historical levels over the last decade, we would be in a better position now to revitalize our air transportation system with its high-leverage impact on the economy in terms of jobs and commerce; we would be ready with technology to reduce noise and emissions that can lessen impact on the environment; and we would have proven concepts to reduce fuel consumption that would reduce our dependence on foreign oil.

Roy Harris, former Director of Aeronautics at NASA's Langley Research Center, has analyzed the historical funding for the NASA Aeronautics Program on a consistent basis of full-cost dollars. His analysis takes into account the changes made from earlier periods when NASA civil service salaries and overhead were included in its Research and Program Management (R&PM) budget up through the last change two years ago when certain facility overhead costs were moved to agency-level budgeting. The figures on p. 3, taken from his analysis, show the historical budget data for NASA aeronautics from the 2009 level back to the beginning when the program was reconstituted after NASA was established from the National Advisory Committee Aeronautics (NACA) in 1958.

To reflect the positive effect the change two years ago had on the program, the 2009 requested level of $447M corresponds to the plotted figure of $557M, as a point of reference. With his familiarity and insight into the historical budget and program content, Roy was able, for the first time, to put the post-NACA history of the aeronautics program into perspective and we are greatly indebted to him for his efforts.

The program reached its peak funding level about a decade ago, exceeding $1.8 billion in current-year dollars, before starting a steep decline in 1999 to a current level just 30% of what it was in 1998. As a percent of the Agency's total budget, it has declined from a high of over 11% in 1979 or 10% in 1998 to its current level of just over 3%. In the last 40 years, Aeronautics Program funding had not gone below 4% of the NASA total until the recent plunge. The first high-point in funding as a percentage of the Agency's budget occurred in the late 1970's, which coincides with the buildup in the Aircraft Energy Efficiency Program—a response to the last energy crisis in the U.S. That program produced much of the technology that is incorporated in today's most efficient aircraft. The second peak corresponds to the buildup in research for supersonic transport vehicles.

The consequence of budget cuts of the last decade is that now when we need the technology most, we have largely depleted the "reservoir." Too often those who make budget decisions in the government fail to see the unintended consequences that result.

"If the United States wants to be a leader in developing safe, clean, quiet, efficient aircraft able to operate in a next-generation 21st century air traffic system, the budget declines of the last decade will need to be reversed so that we can build on the solid foundation of the restructured NASA Aeronautics Research Program with focused systems-level research."

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From the Chair: NASA Aeronautics--Connecting the Dots between Funding and Leadership

(Continued from page 2)

Now having seen the impact of more than a 3X reduction in funding of the NASA aeronautics program, the question is what we, as a country, should do about it. Congress has been trying to address reductions that have gone too far by raising appropriation levels and authorizing more, but those increases have not been sustained in subsequent budget requests from the administration. If the United States wants to be a leader in developing safe, clean, quiet, efficient aircraft able to operate in a next generation 21st century air traffic system, the budget declines of the last decade will need to be reversed so that we can build on the solid foundation of the restructured NASA Aeronautics Research Program with focused systems-level research. For guidance, we should look back in history to see what the funding levels were when NASA was providing leadership with technology that found its way into most of today's aircraft.

Raymond S. Colladay
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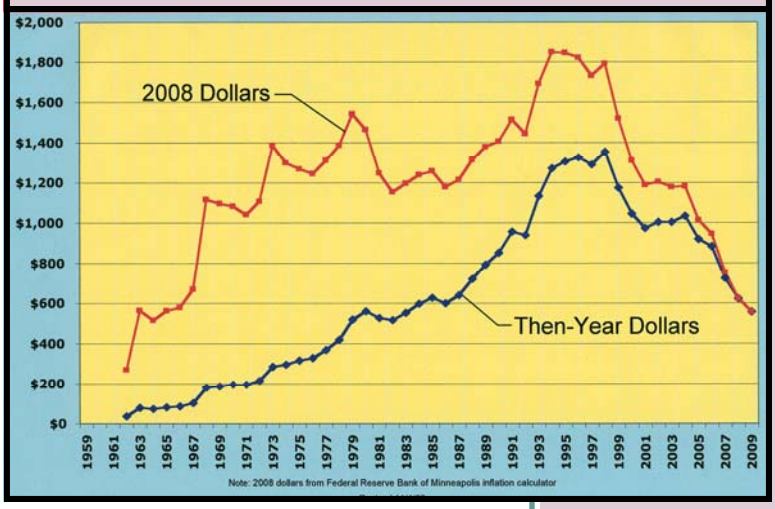
"Having the best air transportation system in the world is vital to our country's prosperity and mobility."

NASA Aeronautics Funding History
Full-Cost Dollars in Millions



Aeronautics Funding
as Percent of Total NASA Budget

Figures were prepared by Roy V. Harris, Jr., former Director of Aeronautics, Langley Research Center.

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Director's Corner: The Space Program, President-Elect Obama, and the NRC

Marcia S. Smith

The number one question in the space community today is what the election of Barack Obama as President means for U.S. space policy and programs.

At this point in the presidential transition, it is far too early to tell, but unlike most other presidential transitions, space issues may not be relegated to the back burner. The Government Accountability Office (GAO) identified retirement of the space shuttle as one of the top 13 urgent issues for the new President (see <http://www.gao.gov/transition_2009/urgent/>), joining such critical issues as oversight of financial institutions and markets and U.S. efforts in Iraq and Afghanistan. In the 2008 NASA Authorization Act (P.L. 110-442, Sec. 611), Congress directed NASA to suspend any activities between enactment of the law and April 30, 2009 that would preclude continuation of the shuttle program after FY2010, giving the new administration a little time to assess the multitude of issues associated with such a decision.

During the campaign, Mr. Obama released a 7-page statement of the key elements of his civil space policy <http://www.barackobama.com/pdf/policy/Space_Fact_Sheet_FINAL.pdf>. He also made statements supporting the space program and ran a campaign ad showing the landing of an Apollo lunar mission while he talked about how it inspired him as a youth. He pledged to reinstate the White House National Aeronautics and Space Council to coordinate interagency space policy, and to add $2 billion to NASA's funding to reduce the gap between when the shuttle program ends and the new Ares/Orion system is available.

Those promises were made when the world's economy seemed on much firmer footing, however. It is difficult to know how they will hold up to current realities.

A few changes also are coming in Congress. Mark Udall (D-CO), who chaired the space and aeronautics subcommittee of the House Science and Technology Committee, won his bid for the Senate. Tom Feeney (R-FL), the ranking Republican on that subcommittee, lost his race for reelection. Thus the House subcommittee that will help draft the next NASA authorization bill will have new leadership (to be determined), though many other space supporters in the House and Senate retained their positions.

It is against this landscape that the joint ASEB-SSB ad hoc Committee on Rationale and Goals of the U.S. Civil Space Program is meeting. Chaired by General Les Lyles (USAF, Ret.) , the committee held its first meeting on Nov 5-7. Two more are scheduled for December and January, with a report expected in the April-May 2009 timeframe. ASEB chair Ray Colladay, and SSB immediate past chair Len Fisk, are co-vice chairs of the committee. The full slate and the statement of task are available at <http://www8.nationalacademies.org/cp/projectview.aspx?key=48933>.

A somewhat unique aspect of this NRC committee is that it is not funded by the government. The vast majority of NRC studies are funded by agencies of the U.S. Government or state governments. In a few cases, however, the Presidents of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine—which together with the NRC comprise The National Academies—elect to use internal funds for studies they feel are of significant importance, but that could not or should not be funded by the government.

This is one of those instances. The Presidents feel that it is time for the National Academies to be on record as to how they view the reasons why the nation has a civil space program and what should be its goals. It was 1988 when the Academies last weighed in on these issues, with a report led by H. Guyford Stever. Twenty years later, it is time to do it again.

"In these difficult times, it is imperative that the nation understand where the civil space program fits into our overall national goals."

The study is not specifically about the NASA program or the NOAA program or commercial space activities. As its name implies, the committee's task is to examine and articu-

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Director's Corner: The Space Program, President-Elect Obama, and the NRC

(Continued from page 4)

late WHY we have a civil space program. Some may feel this is a well-worn subject that does not require reexamination. To the contrary, in these difficult times, it is imperative that the nation understand where the civil space program fits into our overall national goals. The economy is in crisis—where and how does the civil space program impact the nation's economy, or does it at all? What is the intersection between civil space and national security? A myriad of questions are listed in the committee's Statement of Task. The eyes of those reading it are naturally drawn to the bulleted items, but for this study in particular, close attention should be paid to the opening paragraph:

An ad hoc committee will prepare a report to advise the nation on key goals and critical issues in 21st century U.S. civil space policy. The committee will identify overarching goals that are important for our national interest. Issues that are critically important to achieving these goals and ensuring the future progress of the U.S. civil space program will be identified, and options to address unresolved issues will be discussed. Using its best objective judgment and recognizing other national priorities, the committee will explore a possible long term future for U.S. civil space activities that is built upon lessons learned and past successes; is based on realistic expectations of future resources; and is credible scientifically, technically, and politically.

Many in the space community lament the seeming failure of space advocates to effectively explain to the public the value of investing in a civil space program. Intangible benefits such as national prestige, knowledge, and inspiration are too – well, intangible – to sway those who are not already convinced of that message. More tangible benefits, such as a healthy aerospace industry or technological advances that feed into other sectors of the economy or health care, are difficult to quantify credibly.

As our nation struggles with today's economic challenges, it is more important than ever to make the connection between investing in civil space activities and the nation's future in a way that taxpayers understand. No less of a task awaits the Lyles Committee.

Marcia Smith
Director, ASEB

ASEB Calendar—Fall 2008 and Winter 2009

December 1-2, 2008	Aeronautics and Space Engineering Board Meeting. Washington, DC.
December 3-5, 2008	Rationale and Goals for the U.S. Civil Space Program committee meeting. Washington, DC.
December 8-9, 2008	NASA Institute for Advanced Concepts (NIAC) committee meeting. Washington, DC.
December 9-11, 2008	Near-Earth Objects committee meeting. Washington, DC.
December 11-12, 2008	Radioisotope Power Systems committee meeting. Washington, DC.
January 12-13, 2009	Radioisotope Power Systems committee meeting. Irvine, CA.
January 13-15, 2009	Rationale and Goals for the U.S. Civil Space Program committee meeting. Washington, DC.
January 15-16, 2009	NAOMS committee meeting. Irvine, CA.
Late January 2009	Ohio Third Frontier committee meeting. Washington, DC.

For updates to the ASEB calendar, please see http://www.national-academies.org/aseb

Where's the executive summary?

Looking for a more extended summary of one of our reports? On the report's page on the National Academies Press website (such as <http://www.nap.edu/catalog.php?record_id=12202>), scroll down a little bit to a section called "Free Resources." There, in a box titled "Download Free," you will see a link called "PDF Summary." Click the link to download the full executive summary in PDF format.

Where's the report?

Each of our reports is also available in its entirety in PDF format from the National Academies Press website. Each report highlighted in this newsletter has its corresponding NAP website listed (such as <http://www.nap.edu/catalog.php?record_id=12202>). On the report's page, click on the button that says "Sign in to download free PDFs" and follow the instructions to download the full report.

You can browse or search the NAP website at <http://www.nap.edu> for other ASEB titles.

New Report Summarizes an ASEB Workshop on the Research and Development Plan for the Next Generation Air Transportation System

The U.S. aviation industry, airline passengers, aircraft pilots, airports, and airline companies all face challenges. The air transportation system is experiencing unprecedented and increasing levels of use, with air traffic expected to increase two- to threefold by 2025. The federal government understands the critical need to update the U.S. air transportation system and is taking steps to do so by planning for a new, satellite-based air traffic control system intended to increase the efficiency of airport and air space use in the United States.

A copy of the NextGen report can be purchased, or downloaded as a PDF document for free, from <http://www.nap.edu/catalog.php?record_id=12447>.

The Next Generation Air Transportation System (NextGen) is an example of active networking technology that updates itself with real-time shared information and tailors itself to the individual needs of all U.S. aircraft. NextGen's computerized air transportation network stresses adaptability by enabling aircraft to immediately adjust to ever-changing factors such as weather, traffic congestion, aircraft position via GPS, flight trajectory patterns, and security issues. (www.jpdo.gov/nextgen.asp, accessed May 15, 2008.)

In response to a request from the Federal Aviation Administration's (FAA's) interagency Joint Planning and Development Office (JPDO), a workshop was held at the National Academies' Beckman Center on April 1-2, 2008, to gather observations on the research and development aspects of the NextGen Integrated Work Plan (version 0.2). Chaired by John K. Lauber, senior vice president and chief product safety officer (retired), Airbus S.A.S., the workshop included invited guests from the JPDO, and others from government, industry, and academia who were familiar with air traffic management. About 50 participants attended.

The workshop was intended not to conduct a consensus-building activity or formal assessment, but to provide a forum for open discussion. A summary report was prepared by rapporteur Prof. Deborah Boehm-Davis, George Mason University, and describes the main points and the themes that emerged, but does not set out consensus findings or recommendations.

Based on information contained in the IWP, the presentations focused on the description of the NextGen concept of operation, the operational improvements to be offered by the technologies in each working group area, and requirements for implementation of these capabilities. Each presentation was followed by a discussion. Over the course of the discussions, a number of themes became apparent:

- The sense of a lack of urgency on the part of the JPDO;
- The perception of an inability to clearly articulate the goals of the NextGen program;
- A concern with the narrow boundaries and with the inward focus (viz., on FAA and NASA) of the program;
- A concern that readability and format issues make it difficult to understand the NextGen program as it was presented in version 0.2 of the Integrated Work Plan;
- A concern that the JPDO has not developed an adequate transition plan with test implementations, demonstration projects, and so on, and does not have either the resources or the organizational authority to execute such a plan;
- A concern with the ability of the organization to make difficult (politically charged) decisions; and
- An awareness that NextGen faces technical challenges and risks in the research and development that needs to be undertaken.

The summary report also lists a number of specific research-related questions raised by individual workshop participants. The summary was sent to the JPDO in prepublication format in late July 2008, and the final edited version was publicly released in September 2008.

The ASEB Welcomes New Board Members

The Aeronautics and Space Engineering Board is pleased to welcome seven new members to the Board. The Board is made up of experts in aeronautics, space engineering, and complementary disciplines. Members serve staggered two-year terms. Additional biographical information is available on our website at <http://www.national-academies.org/aseb>.

Kyle T. (Terry) Alfriend (NAE) is the TEES Distinguished Research Chair and professor of aerospace engineering at Texas A&M University. His primary areas of interests cover astrodynamics, satellite altitude dynamics and control, space debris, space surveillance, and space systems engineering, with current research focused on space surveillance and the dynamics and control of satellite formations. Dr. Alfriend has received many honors and awards including the 2005 American Association for the Advancement of Science International Cooperation Award, the 1998 American Institute of Aeronautics and Astronautics (AIAA) Mechanics and Control of Flight Award, and 1989 AIAA Dirk Brouwer Award. He is also a member of the National Academy of Engineering and a fellow of the AIAA and the American Astronautical Society (AAS). Dr. Alfriend served on the NRC Committee on the Future of the U.S. Aerospace Infrastructure and Aerospace Engineering Disciplines to Meet the Needs of the Air Force and the Department of Defense and the Committee on Space Shuttle Meteoroid/Debris Risk Management.

John-Paul Clarke is an Associate Professor in the School of Aerospace Engineering and Director of the Air Transportation Laboratory at the Georgia Institute of Technology. He received S.B. (1991), S.M. (1992), and Sc.D. (1997) degrees in aeronautics and astronautics from the Massachusetts Institute of Technology. His research and teaching in the areas of control, optimization, and system analysis and design are motivated by his desire to simultaneously maximize the efficiency and minimize the societal impact (especially on the environment) of the global air transportation system. He has made seminal contributions in the areas of air traffic management, aircraft operations, and airline operations—three key elements of the air transportation system—and has been recognized globally for developing, among other things, the analytical foundations for the Continuous Descent Arrival and novel concepts for robust airline scheduling. His research has resulted in significant changes in engineering methods, processes and products – most notably the development of new arrival procedures for four major U.S. airports and one European Airport, and changes in airline scheduling practices. Dr. Clarke is an Associate Fellow of AIAA and a member of AGIFORS, INFORMS, and Sigma Xi. He serves or has served on several national and international committees including the AAA Air Transportation Systems Technical Committee and the AIAA Technical Committee on Management. He was the first director of PARTNER, the Center of Excellence for Aviation Noise and Aircraft Emissions Mitigation, and is a researcher in PARTNER and NEXTOR, the Center of Excellence for Aviation Operations Research. Dr. Clarke was awarded the AIAA/AAAE/ACC Jay Hollingsworth Speas Airport Award in 1999, the FAA Excellence in Aviation Award in 2003, and was selected as a Gilbreth Lecturer by the National Academy of Engineering in 2006.

Ravi B. Deo is the Director, Technology, Space Systems Market Segment at Northrop Grumman Corporation's Integrated Systems Sector. He has worked as a program and functional manager for government and company sponsored projects on Cryotanks, Integrated System Health Management, Aerospace Structures, Materials, Subsystems, Avionics, Thermal Protection Systems, and software development. He has extensive experience in roadmapping technologies, program planning, technical program execution, scheduling, budgeting, proposal preparation, and business management of technology development contracts. Among his significant accomplishments are the NASA funded SLI, NGLT, OSP, and High Speed Research programs where he was responsible for the development of multidisciplinary technologies. Dr. Deo is the author of over 50 technical publications and is the editor of one book. He served on the NRC Panel C: Structures and Materials of the Steering Committee on Decadal Survey of Civil Aeronautics and the Panel J: High-Energy Power and Propulsion and In-space Transportation of the Committee for the Review of NASA's Capability Roadmaps. He has also served on the Scientific Advisory Board to the Air Force Research Laboratories.

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New to the ASEB in 2008:

Kyle T. (Terry) Alfriend (NAE)
Texas A&M University

John-Paul Clarke
Georgia Institute of Technology

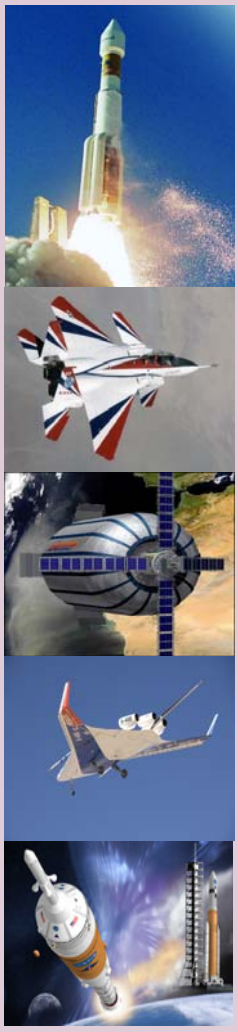
Ravi Deo
Northrop Grumman

Mica Endsley
SA Technologies

John Hayhurst
The Boeing Company (retired)

Elaine Oran (NAE)
Naval Research Laboratory

Eli Reshotko (NAE)
Case Western Reserve University



The ASEB Welcomes New Board Members

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Mica R. Endsley is recognized as a pioneer and world leader in the study and application of situation awareness in advanced systems, including air traffic control systems. Dr. Endsley is the author of over 200 scientific articles and reports on situation awareness. She is the co-author of Designing for Situation Awareness (2003) and speaks extensively at conferences. As founder and president of SA Technologies, Dr. Endsley leads a team of researchers, designers, and engineers, providing research, advanced system design, and seminars in situation awareness. Dr. Endsley served on the NRC Army Research Laboratory Technical Assessment Board Panel on Soldier Systems and the Committee on Human-Systems Integration Panel on Human Factors in the Design of Tactical Display Systems for the Individual Soldier.

John B. Hayhurst retired in 2004 as senior vice president of the Boeing Company and president of Boeing Air Traffic Management after 33 years at Boeing. Mr. Hayhurst joined Boeing in 1969 as a customer support engineer. He held positions of increasing responsibility related to commercial airplanes and in 1987 was promoted to vice president of marketing. In this position, he played a significant role in the launch of the Boeing 777. Subsequently, he was responsible for leading teams planning the design, development, and manufacture of aircraft larger than the Boeing 747. In addition to the previously noted Boeing positions, Mr. Hayhurst also served as vice president of business development for the Commercial Airplane Services business unit of Boeing Commercial Airplanes Group (BCAG); vice president and general manager of 737 programs; general manager of the BCAG production site in Renton, Washington; and vice president-general manager of the Boeing 747-500X/600X program. Mr. Hayhurst is a fellow of the Royal Aeronautical Society. His most recent NRC membership service includes the Committee for the Evaluation of NASA's Fundamental Aeronautics Research Program and the Organizing Committee for the Workshop on Assessing the Research and Development Plan for the Next Generation Air Transportation System.

Elaine S. Oran (NAE) is the Senior Scientist for Reactive Flow Physics at the Naval Research Laboratory. As Senior Scientist, Dr. Oran's research includes development of numerical algorithms and the use of these algorithms in computerized models that describe a wide variety of complex fluid systems. These systems are used in research and applications ranging from microfluidics to astrophysics and cosmology. Her current work applies these simulation methods to design micron-sized devices for use in biosensors; design of micro-propulsion systems for use in air vehicles, space and planetary exploration; hazard reduction involved in the storage and handling of energetic materials including hydrogen fuels; basic physics of combustion processes involving flames; detonations and the transition to denotations; and explosions of supernovae. She was elected to the NAE for unifying engineering, scientific, and mathematical disciplines into a computational methodology to solve challenging aerospace combustion problems. She is a Fellow of the American Institute of Aeronautics and Astronautics, and a Fellow of the American Physical Society.

Eli Reshotko (NAE) is the Kent H. Smith Professor Emeritus of Engineering at Case Western Reserve University. His area of expertise is viscous effects in external and internal aerodynamics; two- and three-dimensional compressible boundary layers and heat transfer; stability and transition of viscous flows, both incompressible and compressible; and low-drag technology for aircraft and underwater vehicles. He has expertise in propulsion engineering, thermodynamics, aerodynamics, and aircraft propulsion. He is a fellow of the AIAA, ASME, the American Physical Society, and the American Academy of Mechanics, for which he served as president. He is co-author of more than 100 publications and is affiliated with many task forces, committees, and governing boards, and on several he served as chair. Dr. Reshotko currently serves as the NAE Section 1 liaison members chair and his NRC service includes membership on the Committee for the Evaluation of NASA's Fundamental Aeronautics Research Program, the Committee on Analysis of Air Force Engine Efficiency Improvement Options for Large Non-Fighter Aircraft, and the Committee on Assessment of Aircraft Winglets for Large Aircraft Fuel Efficiency.

Committee News

Committee to Assess NASA's National Aviation Operations Monitoring System (NAOMS) Project. This committee held its second meeting on October 13-14 at the National Academies' Keck Center in Washington, D.C. The NAOMS project was a survey-driven approach to gathering data concerning flight safety. Data was gathered from 2001 to 2004 by surveying commercial and general aviation pilots. The committee is charged with assessing the survey's methodology, analyzing the generated data, and is to provide recommendations on the best way to utilize the project in the greater field of aviation safety. The committee received briefings from NASA Ames Research Center, NASA Glenn Research Center, EasyJet, and AOPA. The committee's next meeting will be at the Beckman Center in Irvine, Calif. on January 15-16, 2009. The committee's final report is due to NASA at the end of June 2009.

Radioisotope Power Systems Study. Radioisotope power systems, such as radioisotope thermoelectric generators, provide electrical power for spacecraft and planetary probes that cannot rely on solar energy, as they will operate either too far from the Sun (where solar energy density is inadequate) or too close to the Sun (where solar arrays would be imperiled by the Sun's proximity). This study is assessing the technical readiness and programmatic balance of NASA's radioisotope power systems technology portfolio in terms of its ability to support NASA's near- and long-term mission plans. In addition, the study will also examine related public and private infrastructure and the effectiveness of other federal agencies involved in relevant R&D, and it will review strategies for re-establishing domestic production of Pu-238, which serves as the fuel for radioisotope power systems. The committee will hold its final two meetings on December 11-12 in Washington, D.C., and on January 12-13 in Irvine, CA. The final report is scheduled to be released by June 30, 2009.

NASA Institute for Advanced Concepts. A committee to review the NASA Institute for Advanced Concepts (NIAC) will hold its first meeting, a data-gathering session, on December 8-9, 2008 in Washington D.C. A second and final meeting will be held in February 2009 and the committee's findings will be submitted to NASA in the summer of 2009. NIAC was established in 1998 with a mandate to fund grants for concept development of revolutionary aeronautical and space systems; it was terminated by NASA in 2007. The committee will evaluate NIAC's effectiveness in meeting its mission, including a review of the grants made by the Institute, their results, and the likelihood that they will contribute to the Institute's stated goals; evaluate the method by which grantees are selected and recommend changes, if needed; make recommendations on whether NIAC or a successor entity should be funded by the federal government and, if so, what changes, if any, should be made to NIAC's original mission, goals, operations, or other matters; and make recommendations as to how the federal government in general and NASA in particular should solicit and infuse advanced concepts into its future systems. The study will address (1) the extent to which the NIAC-sponsored advanced concept studies are innovative and technically competent; (2) the effectiveness of the NIAC in infusing advanced concepts into NASA's strategic vision, future mission plans, and technology development programs; (3) the relevance of these studies to the aerospace sector at large; (4) NIAC's success in leveraging potential partnerships or cost-sharing arrangements; and (5)the potential approaches NASA could pursue to generate advanced concepts, either internally or from external sources of innovation.

Rationale and Goals for the U.S. Civil Space Program. This purpose of this study is to advise the nation on key goals and critical issues in 21st century U.S. civil space policy. The committee will identify overarching goals that are important for our national interest. The committee will explore a possible long term future for U.S. civil space activities that is built upon lessons learned and past successes; is based on realistic expectations of future resources; and is credible scientifically, technically, and politically. The committee held its initial meeting on Nov 5-7 in Washington DC. The committee spoke with policy officials from a number of agencies including NASA, NOAA, the Department of Defense, and the FAA. The committee will continue its data gathering at its next two meetings, Dec 3-5, 2008 and January 13-15, 2009. Both meetings will be held at the Keck Center of the National Academies in Washington DC. The committee is planning to release its report in the spring of 2009. *(See the Director's Corner, p. 4, for additional information on this study.)*

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The ASEB is hiring!

Associate Director/Senior Program Officer with a background in aeronautics research and/or next generation air transportation system issues. The Associate Director would be the deputy manager of the Board, as well as serve as a study director.

Program Associate to serve in an administrative capacity for the Board.

Visit our website at <http://www.nationalacademies.org/aseb> for links to these job postings.

Graduate students can apply to work with the ASEB as a Fellow through the National Academies' **Christine Mirzayan Science & Technology Policy Graduate Fellowship Program**. The Fellowship is a ten-week program designed to introduce graduate students to science and technology policy, the National Academies, and the ASEB. For more information on the Fellowship program, visit <http://www.national-academies.org/policyfellows>.

Committee News

(Continued from page 9)

Review of Proposals to the 2009 Engineering and Physical Science Research and Commercialization Program (ERCP) of the Ohio Third Frontier Program. For the seventh year, the NRC will review proposals submitted to Ohio's Research and Commercialization Program. The purpose of the program is to create jobs and business opportunities within Ohio through the development and commercialization of innovative technologies and new products that will have long-term economic impacts for Ohio. The ASEB will form an ad hoc committee to review proposals for the Engineering and Physical Sciences portion of the competition. The committee will likely hold its first meeting in late January 2009 at the National Academies' Keck Center in Washington, DC. The committee's recommendations will be submitted in a letter report to Ohio during late spring of 2009.

Near-Earth Objects (NEOs): Survey and Hazard Mitigation Strategies. The steering committee for this congressionally-mandated study was formed in November and will hold its first meeting December 9-11 at the National Academies' Keck Center in Washington, DC. NEOs are asteroids, comets, and large meteoroids whose orbits bring them close to Earth's orbit. This ad hoc committee is undertaking a two-phase study to review the NASA reports, "2006 Near-Earth Object Survey and Detection Study" and "Near-Earth Object Survey and Deflection Analysis of Alternatives: Report to Congress", as well as other relevant literature to provide recommendations addressing two major tasks: to determine the best approach to completing the NEO census required by Congress to identify potentially hazardous NEO's larger than 140 meters in diameter by the year 2020; and to determine the optimal approach to developing a deflection strategy and ensuring that it includes a significant international effort. Both tasks will include an assessment of the costs of various alternatives, using independent cost estimating. An interim report focusing on the first task will be released in September 2009. The committee's final report, which will cover both survey and mitigation tasks, will be released in December 2009.

Upcoming Studies

The ASEB is starting one new project this quarter. If you would like further information or have recommendations for potential committee members for this activity, please contact us at aseb@nas.edu.

Aviation Safety Program Review. The ASEB staff is preparing a study reviewing NASA's aviation safety-related programs. The study was requested by the Congress in the 2008 NASA Authorization Act. It will begin in early 2009 and is due to NASA on Jan 15, 2010. The ASEB is conducting the study in conjunction with the NRC's Transportation Research Board.

Staff News

The ASEB would like to thank **Sarah Capote** for her service to the Board over the past 1.5 years as our Program Associate. Sarah accepted a new position within the NRC. Her last day with the ASEB was November 21, 2008. We will all miss the energy and enthusiasm Sarah brought to the Board and wish her a bright future! We are now seeking Sarah's successor; see the sidebar at left for the position announcement.

Celeste Naylor of the Space Studies Board staff is filling in for Sarah until a successor is hired.

Hill News: House Holds Hearing on the Next Generation Air Transportation System

U.S. House of Representatives Committee on Science and Technology
The Next Generation Air Transportation System: Status and Issues
September 11, 2008

The House Committee on Science and Technology held a hearing to review the status of Next Generation Air Transportation System (NextGen). The hearing explored the NextGen Interagency Partnership's interactions with other stakeholders, as well as their efforts to continue overcoming the engineering challenges that face the country. In his opening remarks, Committee Chairman Bart Gordon acknowledged the complexity of the NextGen Initiative and highlighted the importance of making the NextGen Initiative a national priority for the incoming administration. Representative Ralph Hall (Ranking Member) emphasized the need for the JPDO to continue to define and meet its NextGen challenges. He stated that accountability within the FAA and its federal partners was extremely important; the duties for each agency involved in the management of NextGen need to be specifically defined.

The testimonies of each witness highlighted the fact that NextGen is a complex system, and it requires an ongoing effort to change the air transportation system of the United States. Ms. Victoria Cox (NextGen and Operations Planning, Federal Aviation Administration) stated that the FAA has accelerated many of its specific implementation plans. However, Ms. Cox also acknowledged that there are many hurdles to overcome. Dr. Gerald L. Dillingham (Government Accountability Office) stated that JPDO's Integrated Work Plan did not sufficiently articulate JPDO's responsibilities and the goals that it needs to achieve. He testified that, due to its recent restructuring, the JPDO needs more time to compose a new plan and to define new responsibilities. Mr. Calvin L. Scovel III, (Department of Transportation) stated that the FAA needs to take actions to help JPDO make the shift from research to implementation. Dr. Paul Kaminski (Technovation Inc.) highlighted action items that need to be accomplished to accelerate NextGen (such as near-term demos linked with modeling and simulation and validated by testing). Professor Ian Waitz (Massachusetts Institute of Technology) felt that "the United States must accelerate efforts to address the environmental impacts of aviation."

In summary, the hearing served to highlight the next steps that JPDO and other stakeholders need to undertake to implement such a vast and complex integration plan. The question and answer period demonstrated this by noting where progress should be achieved. Representative Gordon asked each of the panelists what type of recommendations they would have for the next administrations. Professor Waitz stated that "mobility" and "environment" are both for the public good. Unfortunately they are standing in each other's way; thus, there needs to be a better investment in each of these air transportation system topics to enable a stronger scientific understanding. Dr. Dillingham suggested that the nomination of an FAA administrator and a JPDO cabinet level position was needed to achieving a champion for NextGen. Dr. Kaminski stated that the stakeholder community needed to better define the type of skills desirable for experts in the JPDO and NextGen field. Mr. Scovel recommended that additional funding for JPDO and NextGen initiatives (as well as NASA Aeronautics) was necessary. Ms. Cox highlighted the importance of continued and consistent JPDO program support.

This summary was prepared by Sarah Capote, ASEB Program Associate.

THE NATIONAL ACADEMIES
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About Us...

The Aeronautics and Space Engineering Board (ASEB) was established in 1967 "to focus talents and energies of the engineering community on significant aerospace policies and programs." In undertaking its responsibility, the ASEB oversees ad hoc committees that recommend priorities and procedures for achieving aerospace engineering objectives and offers a way to bring engineering and other related expertise to bear on aerospace issues of national importance.

The majority of ASEB studies originate with the National Aeronautics and Space Administration (NASA), particularly the Aeronautics Research Mission Directorate and the Exploration Systems Mission Directorate. Some of these studies are requested by Congress in related legislation. ASEB also conducts proposal reviews for the State of Ohio's Third Millennium Program through the Ohio Department of Development (ODOD), and identifies experts to assist the Government Accountability Office (GAO) in conducting its studies. The ASEB also has performed technical and policy studies for the Nuclear Regulatory Commission, the Defense Nuclear Agency, the Federal Aviation Administration, the National Science Foundation, the Defense Threat Reduction Agency, Air Force Space Command, the Air Force Office of Scientific Research, the National Oceanic and Atmospheric Administration, and others.