2007
Annual Report

NATIONAL ACADEMY OF ENGINEERING

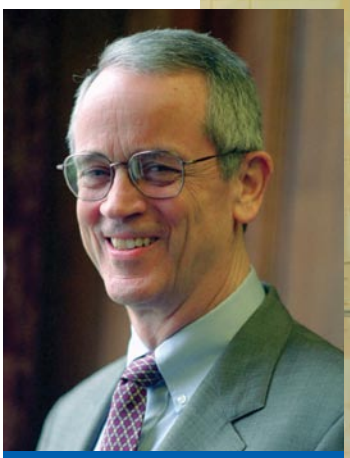




ENGINEERING THE FUTURE

NATIONAL ACADEMY OF ENGINEERING
OF THE NATIONAL ACADEMIES

Letter from the President



Charles M. Vest

On July 1, 2007, it was my honor to begin service as the President of NAE. I have been extremely gratified by the interest and good wishes offered to me, and have appreciated hearing many fine suggestions regarding the advancement of NAE's mission to promote the technological welfare of the nation. Under Bill Wulf's distinguished leadership, the NAE enhanced its role as a valued resource for our government and the engineering profession and it is my goal to continue to advance that role.

The Academies report, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, has continued to inspire serious national debate since its release in 2005. The report urges a comprehensive and coordinated federal effort to bolster U.S. competitiveness and pre-eminence in the world in the face of intense international competition. It cautions that U.S. advantages in the global marketplace and in science and technology have begun to erode due to the advance of technical knowledge and ready availability of talented, low-cost labor worldwide. A legislative response to the report's recommendations came in August 2007 when the America COMPETES Act was passed by Congress, unanimously by the Senate and by most of the House, and signed by the President. Unfortunately, subsequent resolution of the 2008 budget impasse resulted in little to no new funds for R&D and seriously earmarked some of the funds that were provided. The Academies will continue to assess the present situation and consider future actions.

I would like to call to your attention the Online Engineering Ethics Center website, hosted by NAE, which went live on June 26, 2007. NAE member Harry Bovay provided generous support to create the Center for Engineering, Ethics, and Society (CEES) and Rachelle Hollander, an ethicist, is the founding director. Dr. Hollander recently retired from the National Science Foundation after directing their ethics program for three decades. I look forward to providing future updates on this exciting and important program.

The topic of energy continues to swirl around Washington and across the country, as well as globally. Unfortunately, advocates for specific technologies or policies rarely place them in a solid, comparative framework for rational decision-making and deployment. In response, the NAE, along with the National Academy of Sciences and the National Research Council initiated an energy study, *America's Energy Future: Technology Opportunities, Risks and Tradeoffs*. The study will provide basic technical and economic analyses of technologies for production, transportation, and conservation of energy currently in use, and of potential new

technologies that could be commercially deployed within the next few decades. We intend for this foundational study to provide a definitive reference for policy makers and to be a resource to which proponents of specific technology or policy options must refer to be credible. Subsequent reports will provide in-depth investigations and discussions of the important policy issues.

The NAE continues in its efforts to recognize the accomplishments of engineers and engineering and we have been very pleased with the increasing media attention the prizes have garnered. In 2007, we awarded $2.8 million dollars to celebrate the contributions to society of engineers and engineering educators. These prizes included the $500,000 Draper, Russ, and Gordon Prizes and the Grainger Challenge competition, which awarded first, second and third place prizes of $1MM, $200K and $100K for the development of effective, inexpensive systems for removing arsenic from drinking water suitable for deployment and use in the developing world.

The goal of NAE international activities is to enhance the NAE mission by building and enhancing relationships with engineering and science communities worldwide, and by helping to provide a global perspective to all relevant NAE and NRC studies. The NAE continues to be viewed as an inspiring model by other academies worldwide, and we receive requests to develop joint programs in areas of common interest, such as Frontiers of Engineering. In 2007, we continued our bilateral frontiers of Engineering Programs with Germany and Japan and planned our second Indo US meeting to be held in 2008.

I thank all our members and friends who contributed to the *Wm. A. Wulf Campaign for Engineering Excellence*. Their generosity reflects sincere appreciation for all the things Bill Wulf has done for the NAE. I join in this appreciation and know that my work will benefit from the flexibility provided by those funds.

The pages that follow provide more detail of the broad scope and depth of NAE work performed in 2007. These activities have been conceived and executed to pursue our goal of providing objective and independent advice and proactively "promoting the technological welfare of the nation." This report also lists the financial support of our members and friends, whose generous contributions help the NAE to continue making meaningful contributions to the well being of the nation. We are deeply grateful for their support. Thank you.

Charles M. Vest
President

In Service to the Nation

Every day we face questions related to engineering and technology that are important to our nation. How can we keep our nation safe from terrorism? How can we increase diversity in the engineering workforce? What role should citizens play in decisions about technology development? How can we help journalists and others in the media provide accurate, timely information on engineering and technology? As we advance technologically and become more involved in the global community, answering these questions becomes increasingly difficult.

Since 1964, the National Academy of Engineering (NAE) has provided independent, objective advice to the nation on engineering-related topics and policies. NAE operates under the same congressional act of incorporation that established the National Academy of Sciences, signed in 1863 by President Abraham Lincoln, to respond "whenever called upon by any department or agency of the government, to investigate, examine, experiment, and report upon any subject of science or art."

NAE has more than 2,200 peer-elected members and foreign associates, approximately 47 percent from academia, 45 percent from industry, and 8 percent from nonprofit institutions and government. NAE members are leaders in bioengineering, computer science, electronics, aerospace, earth resources, civil engineering, mechanical engineering, chemical engineering, industrial engineering, materials engineering, and interdisciplinary engineering. They serve as members of research and study committees, plan and conduct symposia and workshops, and assist in the work of the organization in many other ways. Activities include collaborative projects at home and abroad to identify and solve technological problems, assessments of the technological needs of the nation and sponsorship of programs to meet those needs, advising Congress and government agencies on engineering-related matters of national importance, and recognizing and honoring outstanding engineers for their contributions to the well-being of the nation and the world.

NAE not only responds to requests from government at the federal level, but also sponsors activities with foundations, industry, and state and local governments and funds projects through endowment funds supported by private contributions. Thus NAE is a unique organization that brings together distinguished engineers for the purpose of improving the lives of people everywhere.

NAE is a member of the National Academies, which also includes the National Academy of Sciences, Institute of Medicine, and National Research Council.

Mission Statement

To promote the technological welfare of the nation by marshalling the expertise and insights of eminent members of the engineering profession.

PROGRAM REPORTS

Engineering Education

Members of the Committee on Engineering Education (CEE), a standing committee of the National Academy of Engineering Office of the President, are thought leaders and experts from the business, academic, and public sectors who have demonstrated a commitment to advancing engineering education. The mission of CEE is to ensure quality, diversity, and quantity in engineering education by providing guidance and advice to policy makers, administrators, employers, and other stakeholders in the engineering education enterprise.

In 2007, CEE moved forward on projects based on information and conclusions in the very successful Engineer of 2020 reports. The first initiative is concentrated on the content and structure of the undergraduate engineering curriculum. Many programs currently design courses that focus mostly on the technical content required for engineering and the underlying science and mathematics that support it. However, as was pointed out in the Engineer of 2020 reports, the changing nature of engineering practice and the way today's students access and use information necessitate changes in the traditional undergraduate curriculum. For example, practicing engineers today must have outstanding teamwork and communications skills to work effectively across departments and often across continents. The organizing committee for this CEE initiative is currently designing a workshop to identify and highlight efforts to revise the curriculum to meet these new requirements without sacrificing technical content.

CEE is also collaborating with the Center for the Advancement of Scholarship on Engineering Education (CASEE) on a consensus study tentatively entitled, "Evaluating Instructional Scholarship in Engineering Education." The study committee held a workshop in November 2007 that brought together thought leaders in engineering education and leading researchers on teaching and the evaluation of teaching methodologies, as well as a number of university administrators responsible for developing and implementing systems for evaluating faculty teaching proficiencies. The workshop provided the committee with much valuable input for a letter report that will be available in mid-2008.

Center for the Advancement of Scholarship on Engineering Education

The mission of the Center for the Advancement of Scholarship on Engineering Education (CASEE) is to make engineering education more valuable to employers, graduate schools, the graduates themselves, and society at large. To achieve this goal, CASEE is working collaboratively with a variety of institutions and organizations in

the engineering community to leverage opportunities for making continuous, significant improvements in engineering education.

In 2007, NAE hosted a Scholar in Residence and an Executive in Residence who worked on projects to extend the research base on engineering education and improve the public understanding of engineering education.

In October 2007, CASEE held the fourth Dane and Mary Louise Miller Symposium, a showcase for innovative research and development in engineering education. The symposium is an affiliate activity of the Frontiers in Education Conference sponsored by IEEE and the American Society for Engineering Education. At the symposium, CASEE released the fourth volume of the *CASEE Chronicles,* a community update on progress by CASEE's 43 organizational affiliates.

CASEE currently has external support for 10 projects on community building, as well as on advancing research on effective educational practices in engineering education. Many of these projects are also summarized in the *CASEE Chronicles <www.nae.edu/nae/caseecomnew.nsf/weblinks/JMMY-78RQFC?OpenDocument>*. In the future, CASEE plans to improve its use of information technologies to inform and connect its stakeholders.

Technological Literacy

The purpose of the Program on Technological Literacy is to identify ways Americans can become better prepared to navigate our technology-dependent society. What do adults and children need to know about technology? What role should citizens play in deciding which technologies are developed, and for what purposes? What changes in formal and informal education and in the policy arena are necessary to prepare citizens to be knowledgeable participants in these decisions?

The program, now in its ninth year, has contributed to the development of standards for the study of technology in elementary and secondary schools; carried out a variety of outreach efforts to educators, policy makers, and the general public; sponsored a number of informational workshops; and overseen two consensus studies. One of the program's most visible published works is the 2002 report, *Technically Speaking: Why All Americans Need to Know More About Technology,* which makes a strong case for technological literacy. The report is accompanied by a companion website, *<www.nae.edu/techlit>*. In summer 2006, *Tech Tally: Approaches to Assessing Technological Literacy*, was published. This follow-on project to *Technically Speaking* addresses theoretical and practical issues involved in measuring the level of technological literacy for students, teachers, and out-of-school adults. The project was carried out jointly by

NAE and the National Research Council (NRC) Board on Testing and Assessment.

In 2007, NAE partnered with the NRC Board on Science Education to launch a two-year consensus study of the teaching of engineering to K-12 students in the United States. The project committee, chaired by NAE member Linda Katehi, University of Illinois Urbana-Champaign, has commissioned an analysis of some two dozen K-12 engineering curricula, among other activities. The study is supported by gifts from NAE member Stephen D. Bechtel, Jr. and Boston software firm Parametric Technologies Corp. (PTC). A project report will be published in late 2008.

In fall 2007, NAE received a grant from the National Science Foundation (NSF) to conduct a study of the feasibility of developing content standards for K–12 engineering education. National standards have been adopted for science, mathematics, and technology education, among many other subjects, but not for engineering. This project will consider the pros and cons of developing standards, including the implications for STEM education policy and practices. In addition to NSF, the S.D. Bechtel, Jr. Foundation and PTC contributed funds to the project.

Public Understanding of Engineering

Developing Effective Messages

In 2007, the Committee on Public Understanding of Engineering Messages completed the research phase of a project to develop effective ways of communicating with the public about engineering. Based on focus groups and online surveys, the committee tested and refined a small set of messages. The results showed clearly that messages should focus on *creative ideas* and *impacts of engineering,* rather than on *required skills* and *the personal benefits of an engineering career*. The 10-person committee, chaired by NAE member Don P. Giddens, Georgia Institute of Technology, will publish a final report in spring 2008. The messaging study is funded by NSF with additional support from the Georgia Institute of Technology and the S.D. Bechtel, Jr. Foundation.

Media Relations

In 2007, NAE continued to work closely with journalists around the world. Stories about the NAE prizes and awards, for example, appeared in numerous broadcast and print outlets—ranging from the BBC to local newspapers to the Associated Press. Journalists also sought help from NAE with breaking news stories, like the collapse of the bridge over the Mississippi in Minnesota, and features, such as a profile of the NAE president in *The New York Times*.

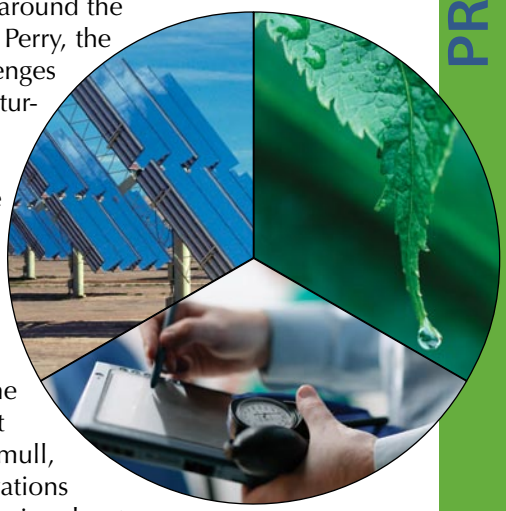
Planning continued for the nationwide series of workshops, "News and Terrorism: Communicating in a Crisis," which was on hiatus in 2007 but will resume in 2008. Produced by NAE in conjunction with the Radio and Television News Directors Foundation, these workshops are funded by the U.S. Department of Homeland

Security. More than a dozen workshops have been held so far, bringing together journalists, government officials, private-sector representatives, and science and technology experts to explore—through unique scenario exercises—the most effective ways of communicating complex information to the public in the midst of a terrorist incident.

Public Relations

NAE's popular radio segments about engineering innovations continued to air each week on Washington, D.C.'s all-news format WTOP Radio, the most listened-to station in the region. The engineering segments are also broadcast on Federal News Radio, WFED. The accompanying NAE website <*www.nae.edu/radio*> is updated each week with new scripts, audio, and links to information on the story topics. In 2007, NAE began producing a podcast of each segment called "Engineering Innovation." Podcasts are available through the NAE website and iTunes.

NAE launched the Grand Challenges for Engineering project in 2007, featuring a blue-ribbon committee of leading technological thinkers from around the world. Chaired by former Secretary of Defense William J. Perry, the committee's charge was to identify key engineering challenges for improving life in the 21st century. Goals included capturing the imagination and ideas of young people, engaging the general public, and focusing the efforts of public officials and engineers on vital innovations for improving the lives of people everywhere.



The public was invited to participate in the Grand Challenges project by contributing ideas at a website dedicated to that purpose, <*www.engineeringchallenges.org*>. Input was received from more than 40 countries. The website features exclusive essays by former U.S. President Jimmy Carter, NAE members Norm Augustine and Ed Catmull, and other VIPs. The site also includes articles about innovations and a forum for submitting and discussing ideas. News stories about this project appeared in MSNBC.com, *The Wall Street Journal*, and *Science* magazine. The challenges will be announced to the public at a press conference and on the website in 2008.

Center for Engineering, Ethics, and Society

In 2007, a gift from NAE member Harry E. Bovay Jr. established the Center for Engineering, Ethics, and Society (CEES) at NAE. In November, the CEES advisory group approved terms of reference for an ongoing advisory group, as well as for an advisory group to the Online Ethics Center (OEC), a CEES program. The OEC at NAE was launched at <*www.onlineethics.org*>, and a new section for practicing engineers was launched at <*www.ethicscasediscussion.org*>.

With co-sponsorship from the Association for Practical and Professional Ethics (APPE), CEES is planning a workshop on "Engineering, Social Justice, and Sustainable Community Development," to be held October 2 and 3, 2008, at the NAS building

on Constitution Avenue. The Science and Society Program at the National Science Foundation has recommended an award that would provide partial support for this meeting.

A tribute to Mr. Bovay will be presented at the APPE annual meeting in San Antonio on February 22, 2008. The CEES director and Bovay professors at Cornell and Texas A&M universities will describe their activities and suggest future directions for engineering ethics programs and activities.

Priorities for CEES include bringing in NAE fellows in engineering, ethics, and society and the development of programs on ethical and societal issues associated with emerging technologies and collective professional responsibilities. In addition, a program is under discussion to respond to the mandates in the America COMPETES Act (H.R. 2272, sections 7008 and 7009) for the responsible conduct of research.

Diversity in the Engineering Workforce

The Diversity in the Engineering Workforce Program was established to promote diversity in the U.S. engineering workforce to include well educated, talented individuals from diverse backgrounds. To fulfill this mission, NAE brings together experts and stakeholders to share information, identify needs, and initiate action.

Engineer Girl! Website

The *Engineer Girl!* website <*www.engineergirl.org*>, a major component of NAE's web presence, is a resource for middle-school girls interested in learning about engineering. With thousands of visitors weekly, this popular website is the number one listing on Google for "girls and engineering." The website is designed to be a general reference for young women considering careers in a field in which they have been, and are, underrepresented. *Engineer Girl!* provides career guidance for students and parents, links to other pertinent sites, games, and interesting facts about the history of women in engineering. In spring 2007, the *Engineer Girl!* website participated in outreach programs to students during National Engineers Week and the Global Marathon on Women in Engineering and ran an "Ask an Engineer" question and answer session that has since become a regular feature. During the marathon, students were able to chat, via the Internet, with women engineers and engineering students from around the world. Topics included "Strategies for Success in Engineering Studies" and "Questions Parents and Students Should Ask

When Choosing an Engineering College." *Engineer Girl!* also held its annual essay competition for students; the theme for 2007 was "Engineering's Grand Challenges," and the winning essays are posted on the website. In 2007 all of the profiles of women engineers were updated, and an automated form was created for adding new profiles. At the end of the year, there were 119 profiles, and the number was growing weekly.

Engineer Your Life Project

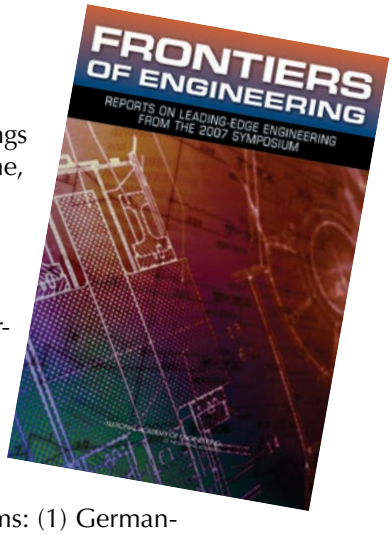
The Engineer Your Life Project is a national initiative to encourage college-bound high-school girls to consider pursuing undergraduate degrees in engineering. In addition to NAE, project participants include the American Association of Engineering Societies, American Society of Civil Engineers, and the WGBH Foundation. The project website <*www.engineeryourlife.org*>, developed in 2007 and hosted by NAE, provides resources for students, teachers, guidance counselors, and engineers about careers in engineering and profiles of 12 young women engineers. The project will also highlight the role of engineering and technology in solving the difficult challenges facing our planet.

Gender Equity Extension Service

The purpose of the Gender Equity Extension Service is to increase the enrollment, retention, and graduation of women as baccalaureate-level engineers. NAE, Institute of Electrical and Electronics Engineers (IEEE), American Society of Mechanical Engineers (ASME), and Project Lead the Way (PLTW) are working together to provide training in targeted areas for members of the collaborating organizations. ASME is focusing on how mechanical engineering faculty can retain students in their programs. IEEE is working with members who visit classrooms to improve outreach to pre-college students from all backgrounds. PLTW is enlisting the help of master teachers to show PLTW teachers how to encourage students from diverse backgrounds to consider pre-college engineering courses. The training is designed to engage traditional players in the engineering community and to work within existing structures to increase gender equity in current programs. The training methods and results are then disseminated by a variety of web-based tools and through seminars and workshops.

The Gender Equity Extension Service is unusual in that it brings expertise in both gender studies and research on science and engineering education to bear on the academic preparation of students from middle school through the sophomore year of college. The project includes assessments of the impact of in-class social environments and instructional styles on the attrition rate of female students and the importance of the out-of-class environment for recruiting and retaining young women in engineering programs. The NAE Center for the Advancement of Scholarship on Engineering Education (CASEE) is leading NAE's effort on this project.

Frontiers of Engineering



Frontiers of Engineering (FOE) is a symposium series that brings together emerging engineering leaders from industry, academe, and government laboratories to discuss pioneering technical work and leading-edge research in various engineering fields and industry sectors. The goals of the symposia are: (1) to introduce outstanding engineers (ages 30-45) to each other and promote contacts among the next generation of engineering leaders and (2) to facilitate collaboration and the transfer of techniques and approaches across engineering disciplines.

The annual U.S. Frontiers of Engineering (U.S. FOE) Symposium brings together approximately 100 engineers from across the country. FOE also has three bilateral programs: (1) German-American Frontiers of Engineering (GAFOE), in partnership with the Alexander von Humboldt Foundation; (2) Japan-America Frontiers of Engineering (JAFOE), in partnership with the Japan Science and Technology Agency and the Engineering Academy of Japan; and (3) Indo-American Frontiers of Engineering (IAFOE), in partnership with the Indo-U.S. Science and Technology Forum. Each bilateral symposium is attended by approximately 30 engineers from the partner country and 30 from the United States.

Three symposia were held in 2007. In May, the GAFOE Symposium was held in Hamburg, Germany. The topics were space technologies, robotics, smart materials and structures, and brain research technologies. The U.S. FOE Symposium, in September, was hosted by Microsoft Research in Redmond, Washington. The topics were engineering trustworthy computer systems, control of protein conformations, biotechnology for fuels and chemicals, modeling and simulating human behavior, and safe water technologies. The JAFOE Symposium was held in November at HP Labs in Palo Alto, California. The topics were human-computer interaction, battery technologies, rocketry and aerospace, next-generation data centers, and materials for medicine.

FOE encourages continuing interaction among participants in FOE symposia through ongoing outreach activities. Yearly proceedings, such as *Frontiers of Engineering: Reports on Leading Edge Engineering from the 2006 NAE Symposium on Frontiers of Engineering,* which was published in February 2007, are mailed to past U.S. FOE participants. Other outreach activities include U.S. and bilateral FOE alumni newsletters, which encourage alumni to keep in touch and share information about their work and current status, and an FOE website that includes a searchable database, a directory of all FOE alumni, and access to the presentations from the U.S. FOE meeting. In addition, the Alexander von Humboldt Foundation and the Indo-U.S. Science and Technology Forum provide support for ongoing collaborations among participants in the GAFOE and IAFOE symposia, respectively.

Armstrong Endowment for Young Engineers-Gilbreth Lectures

The Armstrong Endowment for Young Engineers-Gilbreth Lectures, a related but independent program, selects outstanding engineers from among FOE speakers to give presentations at the NAE Annual Meeting in Washington, D.C., and the NAE National Meeting in Irvine, California. In 2007, two speakers delivered Gilbreth lectures at the Annual Meeting. Mr. Brian Witten, senior director of government research at Symantec Research Labs, Symantec Corporation, spoke on "Cybersecurity—Transition from Science and Art to Engineering." Dr. Muriel Médard, associate professor, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, spoke on "New Directions in Wireless Communications."

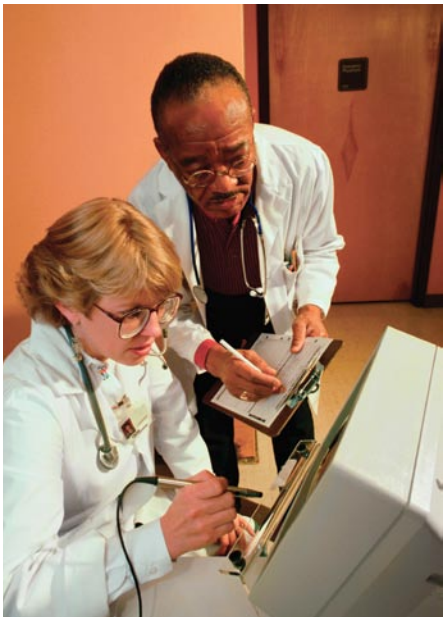
Engineering and Health Care

Building a Better Delivery System, a 2005 National Academy of Engineering (NAE)/Institute of Medicine (IOM) study, provided a thorough examination of opportunities for using systems engineering and information technology to redesign care-delivery processes and systems to improve the quality and efficiency of health care. At the same time, advances in life sciences and bioengineering, especially in genomics and proteomics, have opened the way to a profound change in American health care—from disease-driven, physician-centered, reactive care delivery to personalized, proactive, wellness-focused care delivery.

At NAE's Annual Meeting Technical Symposium, held in honor of NAE Home Secretary W. Dale Compton, five speakers addressed the promise, dynamics, and implications of the converging systems, information, and genomic revolutions for the future of health care as well as the future of engineering research, education, and practice in the United States. The specific topics included implications for the design and management of the complex, adaptive health care system, new therapies made possible by the integration of engineering and biological systems, the adaption of process-improvement techniques in an academic medical center, "disruptive innovations" in health care, and the adaptation of natural processes for change. Articles based on the symposium presentations will be published in the spring 2008 issue of *The Bridge*, the NAE quarterly, and posted on the NAE web site. Three of the five speakers also made presentations at the meeting of the National Academies Presidents Circle in Irvine, California, on November 7-9, 2007, at a special session called "Translating Medical Knowledge to Practice."

In October 2007, the NAE Program Office initiated two new collaborative activities with IOM. The first, jointly administered by NAE and the IOM Board on Veterans

and Military Health and funded by the U.S. Department of Defense, will identify near- and long-term opportunities for using systems engineering and information technology to improve the care of patients in the Military Health System with traumatic brain injuries. A 14-member committee of engineering and health care experts, co-chaired by NAE member Norman Augustine (retired CEO, Lockheed Martin Corporation), and IOM member, Jerome Grossman (JFK School of Government, Harvard University), will hold a two-day workshop on June 11–12, 2008. The end product will be a published workshop summary.



The second project is being conducted with the IOM Roundtable on Evidence-Based Medicine. A planning committee, chaired by NAE member William Rouse (Georgia Institute of Technology), is designing a two-day workshop on "Engineering a Learning Health Care System" for April 28-29, 2008. The purpose of the workshop is to bring together leading engineers, health professionals, and scholars to explore the challenge of building a "learning" healthcare system, that is, a system in which learning and improving are incorporated into the fabric of health care processes. Participants in the workshop will explore ways to capitalize on the technical talent of engineers to improve the efficiency and quality of operations in health care and to identify areas of engineering (e.g. systems engineering, information technology, standards development, and operations research) that can inform the development of decision support, feedback mechanisms, and infrastructure for such a system.

Technology and Peace Building

In December 2007, NAE held a one-day workshop to explore how information technology (IT) might be used to prevent conflicts and promote peace around the world. The workshop steering committee was chaired by NAE member Jack Gibbons (Resource Strategies). NAE members Vint Cerf (Google, Inc.) and Raj Reddy (Carnegie Mellon University) were committee members. The one-day event included presentations by a variety of IT innovators working in zones of conflict and representatives of organizations, such as the United Nations, that have specific needs for tools for promoting peace. Participants included Peter Cherry (SAIC), Deborah Estrin (UCLA), Bran Ferren (Applied Minds), Michael Hawley (MIT), Irwin Jacobs (Qualcomm), Alan Kay (Viewpoints Research Inc.), Colin Rule (E-Bay/PayPal), Nigel Snoad (Microsoft), and Steve Wozniak (Jazz Technologies). A workshop summary, including suggestions by attendees for next steps, will be published in late spring. The workshop was funded by the U.S. Institute of Peace.

Technology for a Quieter America

Noise—unwanted or harmful sounds—has an impact on the quality of life. An estimated 10 million Americans have some degree of noise-induced hearing loss, and some 30 million are exposed to dangerous levels of noise every day. Statistics show that the most common community complaints are related to unwanted noise, almost always a by-product of engineered systems, such as air transportation; highway and rail transportation; the operation of construction and other heavy equipment; large infrastructure projects, such as natural gas pipelines; manufacturing equipment; household appliances; and even toys and consumer electronics.

Efforts in the United States over the last 30 years to address noise-related concerns have been uneven at best. Other regions in the world have taken the lead in developing noise standards for various situations and applications—for example, for construction equipment and consumer products. Some of these regulations may limit the export of American products.

Significant advances have been made in understanding how individuals react to and are impacted by noise from both an auditory and non-auditory standpoint. For example, a growing body of evidence shows that high noise levels delay learning of reading and mathematics at the elementary and middle-school levels. However, the metrics used to assess noise levels are not always based on the most up-to-date technologies.

In September 2005, NAE hosted a three-day workshop for more than 70 engineers and scientists who specialize in noise-control technologies. The workshop resulted in a project proposal for a 30-month study called "Technology for a Quieter America." The project was approved in January 2006, and the first meeting of the study committee was held in May 2006.

The study committee identified three categories to be explored. Each category has three subtopics related to noise-control engineering and public concerns:

Applications of Current Technology
- Cost-benefit analysis of noise-control technologies
- Impact of noise on U.S. competitiveness
- Industry demand for, and educational system supply of, noise-control specialists

Research and Development Initiatives for Noise-Control Technology
- New technologies
- Engineering controls and common descriptors of hazardous noise
- Improved metrics for measuring community noise

Intra-governmental and Public Relations Programs

- Raising awareness of the benefits of low-noise products and the adverse effects of excessive noise
- Coordination of noise-control activities by federal and state agencies
- Assistance to state and local community noise-control programs

The subcommittees addressing these topics conducted several workshops in 2007 that yielded valuable information the committee can draw on in preparing the final report. The purpose of these ongoing workshops is to review state of the art noise-control engineering and connect it to broader noise-control practices and to identify gaps in research that can best be addressed when technological, economic, and policy factors are all taken into account.

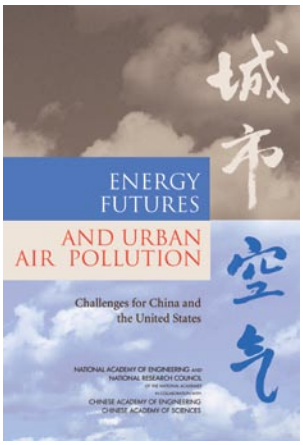
America's Energy Future: Technology Opportunities, Risks and Tradeoffs

Early in 2007, the National Academies initiated America's Energy Future (AEF): Technology, Opportunities, Risks and Tradeoffs, a study requested by Congress to inform the national debate about how science and technology can help shape the nation's energy future. The study will provide authoritative estimates of current and potential contributions of existing and new energy supply and demand technologies and their projected costs. The study is intended to be the first, foundational study in a portfolio of studies by the Academies and others related to priorities for energy research and development, the development of strategic energy technologies, policy analysis, and related subjects.

Chaired by former Princeton University President Harold Shapiro, the 25 member AEF committee, which includes 18 NAE, NAS, and IOM members, met for the first time in September 2007. The committee is divided into working groups that are addressing different topics, including energy efficiency, coal-fired power generation, nuclear power, renewable energy, oil and natural gas, alternative fuels, and electric power transmission and distribution.

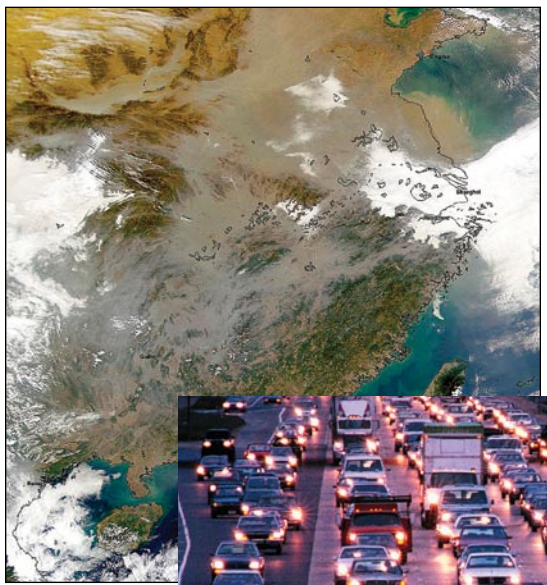
Three additional panels operating independently are looking into three classes of technologies, energy efficiency, alternative transportation fuels (such as biofuels), and renewable electric power-generating technologies. For the final comprehensive report, the committee will draw on the separate reports published by the panels, as well as other reports and studies by the National Academies. The final report is expected to be completed by the end of 2008.

China/U.S. Energy-Air Pollution Study



This joint study by NAE and the National Research Council (NRC) Policy on Global Affairs Division is the latest phase of an ongoing cooperative program with the Chinese Academies of Science and Engineering that dates back to the late 1990s. As the number of economic, scientific, and technical issues common to China and the United States increases, exchanges of information are becoming increasingly important to both countries. A case in point is China's current efforts to secure energy concessions from countries around the world to ensure its supply of transportation fuel for its rapidly increasing number of vehicles. Moreover, China's decisions about its burgeoning energy sector will have regional and global implications for energy resources, air quality, and greenhouse gas emissions.

China's most secure form of energy remains indigenous coal, which provides much of the power for its electricity, urban heating, and cooking. However, air pollution from burning coal has had detrimental effects on public health, as well as the nation's biota and water resources. Economists have determined that China's GDP growth rate would be several points higher without this pollution. In recent energy and air-quality policies, China has acknowledged the significant effects of pollution from coal, but implementation of these policies has largely been left to local leaders with little incentive to do so.



In 2007, a committee of Chinese and U.S. experts, led by Dr. John Watson, an air-quality researcher from the University of Nevada Desert Research Institute, completed a consensus study on energy and air-pollution challenges in both countries; the report also provides detailed descriptions of the local situation in four cities: Los Angeles and Pittsburgh in the United States and Dalian and Huainan in China. A prepublication version of the report released in September received widespread press coverage in China and the United States. In November, delegates from the U.S. committee traveled to China to hold joint workshops in Beijing, Huainan, and Tianjin and discuss their findings and recommendations. Mayors, environmental managers, and researchers, representing both national and local interests, participated in

the workshops and discussions. The final publication was released in January 2008; the Chinese translation is expected to be released in May 2008.

This study also identifies potential topics for future collaborative studies, such as coal-gasification technologies, carbon-mitigation, liquid fuels, and renewable energy. During the November meetings, the U.S. and Chinese Academies agreed, in principle, to a follow-on study on wind, solar, and biomass energy. Building on the ongoing NRC study, *America's Energy Future*, the proposed bilateral study would include an assessment of resource potential in China and near-term market opportunities for cross-country technology transfer and recommendations of priorities for future collaborations on cost reduction, efficiency improvement, grid connectivity, and energy storage.

NAE-CAE Cooperation on Countering Terrorism

The NAE, in partnership with the Chinese Academy of Engineering (CAE), held a three-day planning workshop in Beijing in November 2007 to outline future meetings on countering urban terrorism, with a focus on terrorist acts involving conventional explosives. The goal of the initial workshop was to define the scope and identify specific issues to be addressed on scientific and technical aspects of countering terrorism with explosives, including threats, vulnerabilities, and responses. Dr. Siegfried Hecker (NAE) headed a group of six U.S. delegates with expertise in explosives materials, detection, and emergency response. CAE organized a similar group to present Chinese perspectives on the state of relevant research.

The three-day planning workshop included presentations, site visits, and a discussion of potential follow-on workshops and other activities. After the formal presentations, participants toured the new Olympic stadium and a subway operations facility, where they discussed security measures with employees of the facility. All of the participants agreed that the dialogue had been useful and that a follow-on workshop should be held in the United States that would include more participants from the social and behavioral sciences, as well as emergency responders. The precise agenda will be determined at a later date, but suggestions for topics include: improving linkages between research institutes and operational agencies; increasing interdisciplinary research; and understanding the human factors in terrorism. The U.S. workshop would be the first in a series that might eventually address related challenges, such as pandemic and radiological threats. In addition, the group agreed that NAE and CAE should collaborate on other topics of mutual interest, such as energy and the environment.

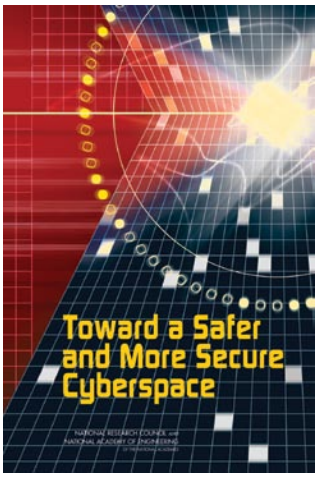
Terrorism and the Electric Power-Delivery System

This joint study by NAE and the National Research Council Board on Energy and Environmental Systems formally began in 2005 under the leadership Dr. Granger Morgan of Carnegie Mellon University. Members of the study committee were drawn from the

public-utility, academic, private-sector, and regulatory communities. Funded by the U.S. Department of Homeland Security (DHS), the purpose of the study is to identify vulnerabilities of the U.S. electricity-transmission system to terrorist attack and recommend ways to minimize those vulnerabilities.

The report was completed in 2007 and delivered to DHS for a security review. Although no classified information was used in preparing the report, the review was necessary to ensure that it does not include information that might be useful to terrorists. The review is expected to be completed in early February 2008, and the report will be released shortly thereafter. The committee expects the report to be useful to DHS, the U.S. Department of Energy, state and local agencies, and industry.

Toward a Safer and More Secure Cyberspace



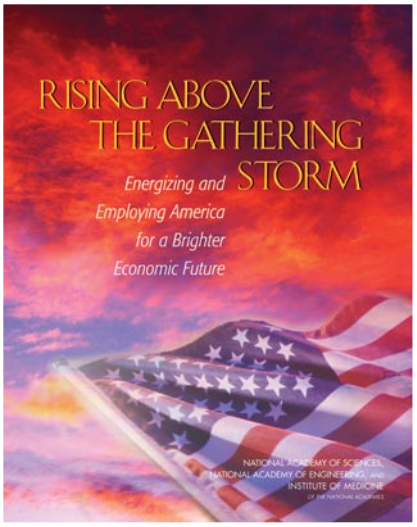
This report explores the nature of the threats to cybersecurity; considers why previous reports on cybersecurity have had less impact than desired; spells out objectives for trustworthy systems; proposes a wide-ranging strategy for cybersecurity research, including important areas that are not currently being investigated with any urgency; and argues that resources and funding to improve research in cybersecurity be increased to a level commensurate with the threats. Chaired initially by NAE member Joel Birnbaum, and subsequently by Seymour Goodman, the study was undertaken in response to a request in 2004 from Congress. It took several years to assemble the requisite funding for the study from a coalition of agencies, including the Defense Advanced Research Projects Agency, the National Science Foundation, the National Institute of Standards and Technology, and the U.S. Department of Homeland Security. Since publication of the report in June 2007, it has been briefed extensively to several agencies and working groups in the executive branch and congressional staffers for various committees.

Offshoring of Engineering

Launched in early 2006, "Offshoring of Engineering: Facts, Myths, Unknowns, and Implications," was completed in 2007 and will be published in April 2008. In this study, "offshoring" is defined as the transfer of work overseas, either through subsidiaries or the outsourcing of engineering work to other organizations. "Engineering" is defined as the full spectrum of activities, from research, product and process development and design to engineering management, manufacturing engineering, and so on. The 10-member study committee, chaired by NAE member William J. Spencer, included eight NAE members and two outside experts. Support for the project was provided by the National Science Foundation, United Engineering Fund, and National Academy of Engineering Fund.

The final report includes the committee's synthesis and findings, presentations from a workshop held in October 2006, and six commissioned papers on the offshoring of engineering in specific industry sectors: software, automobiles, pharmaceuticals, personal computer manufacturing, construction engineering and services, and semiconductors. Findings address (1) the current status and trends in offshoring of work with significant engineering content, including the extent, motivation, types of work subject to offshoring, industry-specific characteristics, and future prospects; (2) key areas where data are lacking and suggestions for filling those information gaps; and (3) implications by engineering educators, professional societies, industry leaders, policy makers, and the engineering community at large to strengthen the U.S. engineering enterprise. The report will be widely disseminated to policy makers, educators, and industry leaders.

Rising Above the Gathering Storm



In October 2005, the National Academies released *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. This landmark report describes the critical role of the U.S. science and technology enterprise in establishing and maintaining America's global leadership in science and technology, which has contributed to our high standard of living and national security. But in a world in which advanced knowledge is now widespread and low-cost labor is readily available, U.S. advantages in the marketplace and in science and technology have begun to erode.

This congressionally requested report was written by a 20-member committee chaired by NAE member Norman Augustine—retired chair of Lockheed Martin. The committee also included Nobel laureates and prominent business, government, and academic leaders, nine of them NAE members. The committee issues a strong warning that, unless we take concrete steps now, the United States could lose its global competitive edge in research and technology leading to a decline in U.S. prosperity.

The committee concludes that a comprehensive, coordinated federal effort is urgently needed to support U.S. competitiveness and pre-eminence in science and technology to enable the nation to continue to benefit from the opportunities offered by rapid globalization. Four recommendations, accompanied by 20 implementation actions, are proposed for strengthening K-12 mathematics and science education; sustaining long-term basic research; developing and retaining the world's top scientists, engineers, and students; and ensuring that the United States remains the premier place in the world for innovation.

Upon its release, *Rising Above the Gathering Storm* was received enthusiastically. At the federal level, several of the key recommendations were included in the president's 2006 State of the Union Address, and bipartisan legislation was quickly introduced to implement them. In addition, many of the committee's recommendations were included in the America COMPETES Act, which was passed by Congress and signed by the president in August 2007.

Although the report was focused on federal responsibilities and policies, several states also reviewed their science and technology enterprises, with a view toward strengthening their long-term capacity to compete in the global knowledge economy. During 2006, for example, California and Alabama organized expert committees and held convocations to develop action plans at the state level for catalyzing innovation-led growth. The National Academies held a highly successful national convocation in September 2006. Activities at the state level continued during 2007. Arkansas and Michigan, for example, brought together representatives of state government, universities, industry, and K-12 education to develop new programs and initiatives.

In addition to federal and state responses to *Rising Above the Gathering Storm,* the private sector has taken steps to ensure timely implementation of the report recommendations. For example, private sponsors have formed the National Math and Science Initiative (NMSI) to award grants to states that implement report recommendations for improving K-12 math and science education.

The National Academies are planning to host a large convocation in early 2008 to take stock of the accomplishments of the past few years, reinforce collaboration among stakeholders seeking to renew American innovation, and explore how progress can be sustained and accelerated.

2007 NAE AWARDS RECIPIENTS

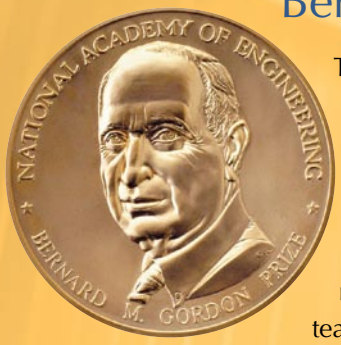
Charles Stark Draper Prize

Recognized as one of the world's preeminent awards for engineering achievement, this prize honors an engineer or engineers whose contributions have significantly improved the quality of life, enabled people to live more freely and comfortably, and/or permitted the access to information. Presented annually, the prize carries a $500,000 cash award and a gold medal.


Timothy J. Berners-Lee

Timothy Berners-Lee "for developing the World Wide Web."

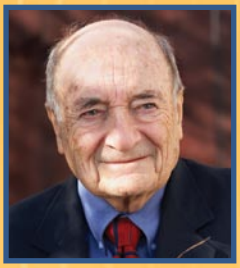
Bernard M. Gordon Prize



The Gordon Prize for Innovation in Engineering and Technology Education is a cash prize of $500,000, shared between the educator(s) and the educational institution, to support continuation of the award-winning program. The winning individuals also receive a gold medal. The Gordon Prize honors technology educators whose innovative programs have strengthened the engineering workforce by cultivating students' leadership, creativity, and teamwork skills. The Gordon Prize is presented annually.

Harold S. Goldberg, Jerome E. Levy and Arthur W. Winston "for the development of a multidisciplinary graduate program for engineering professionals who have the potential and the desire to be engineering leaders." (Gordon Institute, Tufts University)

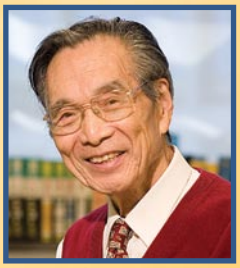

Harold S. Goldberg


Jerome E. Levy


Arthur W. Winston

Fritz J. and Dolores H. Russ Prize

The Russ Prize is awarded in recognition of outstanding achievement in an emerging engineering field that improves the quality of life and has widespread application or use. The prize is currently focused on bioengineering and encouraging the engineering and medical/biological professions to work together. Presented biennially, the prize carries a $500,000 cash award and a gold medal.

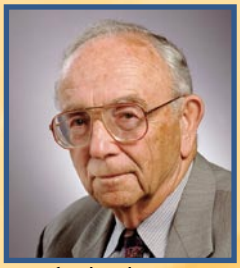


Yuan-Cheng B. Fung

Yuan-Cheng "Bert" Fung "for the characterization and modeling of human tissue mechanics and function leading to prevention and mitigation of trauma."

Founders Award

The Founders Award is given in recognition of an NAE member or foreign associate who has exemplified the ideals and principles of NAE through professional, educational, and personal achievement and accomplishment. The Founders Award is presented at the NAE Annual Meeting in October and carries a $2,500 cash prize and a gold medal.

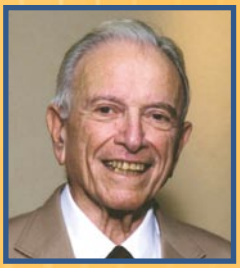


Stanford Sol Penner

Stanford Sol Penner "for pivotal studies on thermal radiation, propulsion, combustion, and energy systems, directing government studies, founding a university department and energy center, and training future leaders."

Arthur M. Bueche Award

The Bueche Award honors an engineer who has been actively involved in advancing U.S. science and technology policy, promoting U.S. technological development, and enhancing relations between industry, government, and universities. The award is presented at the NAE Annual Meeting and carries a $2,500 cash prize and a gold medal.



Jordan J. Baruch

Jordan J. Baruch "for the promotion of innovation and management of science and technology nationally and internationally, thereby enhancing the economy of the U.S. and developing nations."

For additional information about the NAE awards, please visit our website <*www.nae.edu/awards*>.

Grainger Challenge Prize for Sustainability

In 2005, with the support of The Grainger Foundation, NAE established the Grainger Challenge Prize for Sustainability—gold, silver, and bronze awards of $1,000,000, $200,000, and $100,000—for the design and production of a workable, sustainable, economical system for treating arsenic-contaminated groundwater in Bangladesh, India, Nepal, and other nations around the world. Complementary goals of the prize competition were: increasing awareness in the U.S. engineering community of the importance of engineering for sustainability, particularly in an international context; encouraging and showcasing efforts by U.S. engineers to bring sustainable technologies to the marketplace; and promoting green design philosophies.

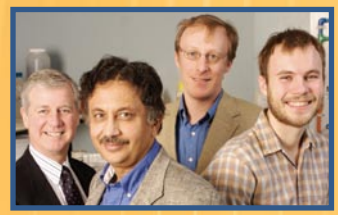
In 2006, a committee of experts headed by NAE member Charles O'Melia of Johns Hopkins University reviewed more than 70 proposals and selected 15 systems for laboratory testing. The selected systems were tested at the Environmental Protection Agency National Risk Management Research Laboratory in Cincinnati, Ohio, a leading laboratory for arsenic research in the United States.

On February 1, 2007, NAE announced the Grainger Challenge Prize for Sustainability gold, silver, and bronze award winners, all of whom were recognized for the development, in-field verification, and dissemination of effective systems for reducing arsenic levels in water. The winning systems were judged to be affordable, reliable, easy to maintain, socially acceptable, and environmentally friendly. All of the winning systems meet or exceed the local government guidelines for arsenic removal; none of them requires electricity. The prizes were presented at NAE's awards dinner and ceremony in Washington, D.C. on February 20, 2007.

GOLD AWARD

Abul Hussam for "the development, in-field verification, and dissemination of the SONO filter, an affordable, low life-cycle cost, robust, reliable, easily maintainable, and socially acceptable household water-treatment system for removing arsenic from contaminated groundwater in Bangladesh."

Abul Hussam



SILVER AWARD

Arup K. SenGupta, John E. Greenleaf, Lee M. Blaney, Owen E. Boyd, Arun K. Deb, and Water for People, for the development of a community-level water-treatment system for arsenic removal.

Owen E. Boyd, Arup K. SenGupta, John E. Greenleaf, Lee M. Blaney
Not pictured: Arun K. Deb

BRONZE AWARD

Children's Safe Drinking Water Program, directed by Greg Allgood of Procter & Gamble Company, for the development of an easy-to-use sachet coagulation and flocculation water-treatment system.

Greg Allgood

NAE ANNIVERSARY MEMBERS

40 YEARS OR MORE

Gene M. Amdahl
Harold Brown
Karl P. Cohen
Don U. Deere
Alexander H. Flax
Jay W. Forrester
Donald N. Frey
Charles H. Kaman
George E. Mueller
Mark K. Smith
Lombard Squires

35 TO 39 YEARS

Albert L. Babb
James R. Johnson
T. W . Lambe
Cedomir M. Sliepcevich
Morris Tanenbaum

30 TO 34 YEARS

Andreas Acrivos
Nathaniel Arbiter
C. G. Bell
Elwyn R. Berlekamp
William B. Bridges
Stephen H. Crandall
Elio D'Appolonia
Robert C. Dean
Charles A. Desoer
Leo Esaki
Ronald L. Geer
Wolf Hafele
Robert N. Hall
Grant L. Hansen
Stephen E. Harris
William J. Harris
Julius J. Harwood
Robert W. Hellwarth
Philip G. Hodge
C. L. Hogan
D. B. Holmes
Paul C. Jennings
Jan Kaczmarek
Eneas D. Kane
Arthur Kantrowitz
William M. Kays
Clyde E. Kesler
Thomas R. Kuesel
Christian J. Lambertsen
Frederick F. Ling
Frank W. Luerssen
Artur Mager
Perry L. McCarty
Ross E. McKinney
Johannes Moe
Kenneth H. Olsen
Carlos S. Ospina
Walter S. Owen
Stanford S. Penner
Joseph Penzien
Jacques Peters
William N. Poundstone
Ronald F. Probstein
Jean E. Sammet
Thorndike Saville
Mete A. Sozen
Arthur M. Squires
Morris A. Steinberg
Stanley D. Stookey
Lawrence E. Swabb
Paul B. Weisz
Robert H. Wertheim
Robert H. Widmer
Maurice V. Wilkes
Edward Woll

25 TO 29 YEARS

Jan D. Achenbach
Mihran S. Agbabian
Floyd Dunn
Peter S. Eagleson
Gunnar Fant
Kent F. Hansen
Kenneth E. Haughton
R. R. Heppe
Irwin M. Jacobs
Trevor O. Jones
James N. Krebs
George Leitmann
Hudson Matlock
Douglas C. Moorhouse
William R. Opie
M. K. Oshman
Walter L. Robb
Stanley T. Rolfe
James F. Roth
Donald G. Russell
William R. Schowalter
Willard F. Searle
John H. Seinfeld
John B. Slaughter
Gareth Thomas
Theodore Y. Wu
Dante C. Youla

2007 NEW MEMBERS AND FOREIGN ASSOCIATES

In February, NAE elected 64 new members and nine foreign associates, bringing the total U.S. membership to 2,217 and the number of foreign associates to 188. Election to the National Academy of Engineering is among the highest professional distinctions accorded to an engineer. Academy membership honors those who have made outstanding contributions to "engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature," and to the "pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education."

A list of newly elected members and foreign associates follows, with their primary affiliations at the time of the Induction Ceremony, September 30, 2007.

NEW MEMBERS

Asad A. Abidi
University of California, Los Angeles
Edward C. Aldridge Jr.
U.S. Department of Defense, retired
Nicolaos G. Alexopoulos
University of California, Irvine
George E. Apostolakis
Massachusetts Institute of Technology
Peter M. Asbeck
University of California, San Diego
Rudolph Bonaparte
Geosyntec Consultants
Eric A. Brewer
University of California, Berkeley
William R. Brody
Johns Hopkins University
Dale E. Burton
Northrop Grumman Corporation
Stuart K. Card
PARC (Palo Alto Research Center)
Edwin A. Chandross
Materials Chemistry, LLC
Stephen Y. Chou
Princeton University
George R. Cotter
National Security Agency
Harold G. Craighead
Cornell University
John J. Dorning
University of Virginia
Charles T. Driscoll Jr.
Syracuse University
Shun Chong Fung
ExxonMobil Research and Engineering Company, retired
Bruce C. Gates
University of California, Davis
Robert M. Gray
Stanford University
Karl A. Gschneidner Jr.
Iowa State University
John O. Hallquist
Livermore Software Technology Corporation
Leroy E. Hood
Institute for Systems Biology
Paul M. Horn
International Business Machines Corporation
Larry J. Hornbeck
Texas Instruments Inc.
Mark A. Horowitz
Stanford University
William A. Hustrulid
Hustrulid Mining Services
Stuart D. Jessup
Navy Surface Warfare Center
Paul J. Kern
The Cohen Group
Timothy L. Killeen
National Center for Atmospheric Research
James L. Kirtley Jr.
Massachusetts Institute of Technology
Charles T. Kresge
The Dow Chemical Company
Panganamala R. Kumar
University of Illinois at Urbana-Champaign
Stelios Kyriakides
The University of Texas at Austin
Simon S. Lam
The University of Texas at Austin
Ann L. Lee
Genentech, Inc.
David B. Marshall
Teledyne Scientific & Imaging Company
Robin K. McGuire
Risk Engineering Inc.

Teresa H. Meng
Stanford University
Silvio Micali
Massachusetts Institute of Technology
J Strother Moore
The University of Texas at Austin
John W. Morris Jr.
University of California, Berkeley
David J. Nash
BE&K Government Group
Martin E. Newell
Adobe Systems Inc.
Robert E. Nickell
Applied Science and Technology, Inc.
Syd S. Peng
West Virginia University
William P. Pierskalla
University of California, Los Angeles
Gintaras V. Reklaitis
Purdue University
Walter Jeremiah Sanders III
Advanced Micro Devices Inc.
James F. Stahl
County Sanitation Districts of Los Angeles County, retired
Thomas G. Stephens
General Motors Corporation – GM Powertrain
Kenneth E. Stinson
Peter Kiewit Sons', Inc.
Eva Tardos
Cornell University
Sebastian B. Thrun
Stanford University
Lloyd N. Trefethen
University of Oxford
James J. Truchard
National Instruments, Inc.
John N. Tsitsiklis
Massachusetts Institute of Technology
Jonathan S. Turner
Washington University
Sergio Verdú
Princeton University
Anil V. Virkar
University of Utah
David A. Whelan
The Boeing Company
Paul K. Wright
University of California, Berkeley
James C. Wyant
University of Arizona
Adrian Zaccaria
Bechtel Group, Inc.
Charles F. Zukoski
University of Illinois at Urbana-Champaign

NEW FOREIGN ASSOCIATES

Timothy Berners-Lee
Massachusetts Institute of Technology
Roy Billinton
University of Saskatchewan, Canada
Avelino Corma
Instituto de Tecnología Química, Spain
Joachim Heinzl
Technical University of Munich, Germany
Kenichi Iga
Japan Society for the Promotion of Science
Kees Schouhamer Immink
Turing Machines Inc., Netherlands
Joseph Kost
Ben Gurion University of the Negev, Israel
Arnold Migus
National Center of Scientific Research of France
Xi Yao
Xian Jiaotong University, People's Republic of China

2007 PRIVATE CONTRIBUTIONS

The National Academy of Engineering gratefully acknowledges the following members and friends who made charitable contributions during 2007. Their collective, private philanthropy helps to advance NAE's service and impact as advisor to our nation.

EINSTEIN SOCIETY

In recognition of members and friends who have made lifetime contributions of $100,000 or more to the National Academies. Names in bold are NAE members.

Anonymous
John Abelson
Bruce and Betty Alberts
Rose-Marie and Jack R. Anderson
John and Lise **Armstrong**
Richard C. and Rita Atkinson
Norman R. Augustine
William F. Ballhaus Sr.
Craig and Barbara **Barrett**
Jordan and Rhoda **Baruch**
Warren L. Batts
Stephen D. Bechtel Jr.
Kenneth E. Behring
C. Gordon Bell
Elwyn and Jennifer **Berlekamp**
Diane and Norman Bernstein
Mrs. Elkan R. Blout
Harry E. Bovay Jr.
David G. Bradley
Donald L. Bren
Sydney Brenner
Fletcher and Peg Byrom
James McConnell Clark
W. Dale and Jeanne **Compton**
Roman W. DeSanctis
Robert W. Deutsch
George and Maggie Eads
Richard Evans
Harvey V. Fineberg and Mary E. Wilson
Tobie and **Dan Fink**
George and Ann **Fisher**
Harold K. and Betty A. **Forsen**
William L. and Mary Kay **Friend**
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David Grainger
Jerome H. and Barbara N. Grossman
Corbin Gwaltney
Margaret A. Hamburg and Peter F. Brown
William M. Haney III
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Thomas V. Jones
Trevor O. Jones
Kenneth A. Jonsson
Yuet W. Kan
Fred Kavli
Cindy and **Jeong Kim**
Mrs. Olga Kirchmayer
Frederick A. Klingenstein
Daniel E. Koshland Jr.*
William W. Lang
Gerald and Doris **Laubach**
Whitney and Betty MacMillan
William W. McGuire
Burton and DeeDee McMurtry
Richard and Ronay Menschel
Dane and Mary Louise **Miller**
Mrs. G. William Miller
George and Cynthia Mitchell
Ambrose K. Monell
Gordon and Betty **Moore**
Joe and Glenna Moore
David and Lindsay Morgenthaler
Richard M. Morrow
Philip Needleman
Gerda K. Nelson
Ralph S. O'Connor
Peter O'Donnell Jr.
Kenneth H. Olsen
Doris Pankow
Jack S. Parker
Shela and **Kumar Patel**
Percy Pollard
Robert A. Pritzker
Dr. and Mrs. **Allen E. Puckett**
Ann and **Michael Ramage**
Simon Ramo
Carol and David Richards
Anne and **Walt Robb**
Henry M. Rowan
George Rowe
Jack W. and Valerie Rowe
Mrs. Joseph E. Rowe
Mrs. Fritz J. Russ*
William J. Rutter
Stephen and Anne Ryan
Jillian Sackler
Henry and Susan **Samueli**
Bernard G. and Rhoda Sarnat
Wendy and **Eric Schmidt**
Sara Lee and Axel Schupf
Shep and Carol Ruth Shepherd
Melvin I. Simon
Georges C. St. Laurent Jr.
Charlotte and **Morry Tanenbaum**
Ted Turner
Leslie L. Vadasz
Roy and Diana Vagelos
John C. Whitehead
Wm. A. Wulf
Alejandro Zaffaroni

**Recently deceased*

GOLDEN BRIDGE SOCIETY

The Golden Bridge Society recognizes the generosity of NAE members who have made cumulative contributions of $20,000 to $99,999.

Andreas Acrivos
William F. Allen Jr.
Gene M. Amdahl
William A. Anders
Bishnu S. Atal
William F. Ballhaus Jr.
William F. Banholzer
Paul Baran
Thomas D. Barrow
Roy H. Beaton*
Franklin H. Blecher
Erich Bloch
Barry W. Boehm
Lewis M. Branscomb
George Bugliarello
William Cavanaugh III
Robert A. Charpie
Joseph V. Charyk
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A. James Clark
Stephen H. Crandall
Malcolm R. Currie

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Governed by the National Academy of Engineering Fund (NAEF) Board of Trustees, the NAEF is the tax-exempt corporation (under section 501(c)(3) of the Internal Revenue Code) that serves as a holding entity for the independent assets and operating funds of the National Academy of Engineering (NAE). The NAE operates within the charter and framework of the National Academy of Sciences (NAS).

The table on page 34 summarizes both the NAEF and outside operating revenue and expenses as well as non-operation-related transactions for the NAE for 2007 and 2006. The information on the NAEF presented in this table has been extracted from the Fund's audited financial statements also contained in this report.

During 2007, contributions for the National Academy of Engineering were solicited from corporations, NAE members, and private foundations. These funds and contracts and grants from the federal government are a major source of support for the Academy's self-initiated programs, which are described in this report.

A second source of revenue for the Academy is the allocation from the overhead charge assessed on government and privately funded contracts for National Research Council (NRC) projects; the NRC is the operating arm of the NAE and the National Academy of Sciences. This allocation is used to offset expenses incurred in the oversight function and for such other administrative operations as NAE membership services and governance.

Under a policy established by the NAEF Board of Trustees, the Academy may use a certain percent of its unrestricted invested assets for operations each year. In 2007, 3.6 percent was allocated for normal operating expenses and 2.4 percent was allocated for fund-raising expenses. This allocation, combined with annual meeting registration fees, membership dues, and investment earnings on current operating funds, make up the remainder of the Academy's operating revenue.

The Academy welcomes corporate and private gifts, which are used to help finance the research, education, and public information programs of the institution. The NAE does not, however, conduct proprietary studies for private clients or corporations.

NAE/NAEF Combined Summary of Revenues, Expenses, and Changes in Net Assets (Unaudited-Pro Forma)

(Thousands of Dollars)

	2007	2006
NET ASSETS, BEGINNING	**$67,630**	**$63,052**
CONTRIBUTIONS RECEIVABLE, NET	**3,541**	**1,615**
TOTAL ASSETS, BEGINNING	$71,171	$64,667
OPERATIONS		
Revenue		
Contributions (Unrestricted)	$2,366	$1,501
Dues (Annual), Fees, Miscellaneous	268	438
Indirect Allowance From Contracts and Grants	3,068	2,799
Award Specific Funds Allocation to Operations*	3,478	1,746
Program Specific Funds Allocation to Operations*	4,463	4,238
Unrestricted Allocation to Operations	2,108	2,101
Total Operations Revenue	**$15,751**	**$12,823**
Expenses		
Awards	$3,794	$1,807
Development	831	908
Management	2,365	2,081
Membership	1,335	1,278
National Academies Activities	293	276
Programs	5,785	6,019
Total Operations Expenses	**$14,403**	**$12,369**
OPERATIONS SURPLUS	**$1,348**	**$454**
NONOPERATIONAL TRANSACTIONS		
Allocation to Operations	($6,891)	($5,218)
Contribution Expense to NAS/NAE Unrestricted Support	($1,000)	$0
Contributions to Reserves	4,602	2,981
Dues (Lifetime), Miscellaneous	124	109
Gain (loss) on Investments	4,680	4,608
Investment Earnings (Interest and Dividends)	1,937	1,915
Investment Fees	(330)	(271)
NONOPERATIONAL GAIN	**$3,122**	**$4,124**
NET ASSETS, ENDING	**$72,100**	**$67,630**
CONTRIBUTIONS RECEIVABLE, NET	**3,773**	**3,541**
TOTAL ASSETS, ENDING	$75,873	$71,171

*Restricted funds are reported in this unaudited-pro forma report as operating revenue when earned

NOTE: The audited financial statements that follow record contributions as revenue the year in which the pledge is received in accordance with generally accepted accounting principles.

NATIONAL ACADEMY OF ENGINEERING FUND
December 31, 2007 and 2006

Report of Independent Certified Public Accountants

Board of Trustees
National Academy of Engineering Fund

We have audited the accompanying statement of financial position of the National Academy of Engineering Fund (the Fund) as of December 31, 2007, and the related statements of activities and cash flows for the year then ended. These financial statements are the responsibility of the Fund's management. Our responsibility is to express an opinion on these financial statements based on our audit. The prior-year summarized comparative information has been derived from the Fund's 2006 financial statements and, in our report dated May 30, 2007, we expressed an unqualified opinion on those financial statements.

We conducted our audit in accordance with auditing standards generally accepted in the United States of America, as established by the American Institute of Certified Public Accountants. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Fund's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used, and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the National Academy of Engineering Fund as of December 31, 2007, and the changes in its net assets and its cash flows for the year then ended, in conformity with accounting principles generally accepted in the United States of America.

Grant Thornton LLP

McLean, Virginia
April 30, 2008

National Academy of Engineering Fund
Statement of Financial Position

December 31,	2007	2006
Assets		
Current Assets		
Cash and cash equivalents	$ 1,141,332	$ 175,116
Prepaid expenses	18,830	—
Short-term investments	2,044,545	1,509,458
Contribution receivable	1,180,208	1,052,525
Award medals and other assets	117,380	171,536
Total Current Assets	4,502,295	2,908,635
Non-current Assets		
Contribution receivable–long-term portion, net	2,592,847	2,488,496
Investments	69,889,901	65,977,595
Total Non-current Assets	72,482,748	68,466,091
Total Assets	$ 76,985,043	$ 71,374,726
Liabilities and Net Assets		
Liabilities		
Accounts payable–National Academy of Sciences	$ 1,112,017	$ 203,462
Commitments and Contingencies	—	—
Net Assets		
Unrestricted	34,439,215	32,904,133
Temporarily restricted	12,385,930	10,089,740
Permanently restricted	29,047,881	28,177,391
Total Net Assets	75,873,026	71,171,264
Total Liabilities and Net Assets	$ 76,985,043	$ 71,374,726

The accompanying notes are an integral part of this statement.

National Academy of Engineering Fund
Statement of Activities and Changes in Net Assets

Year ended December 31,

	2007				2006
	Unrestricted	Temporarily Restricted	Permanently Restricted	Total	Total
Revenue					
Interest and dividends	$ 953,145	$ 983,833	$ —	$ 1,936,978	$ 1,914,951
Realized gain on investments	2,729,498	2,746,120	—	5,475,618	2,753,495
Contributions	2,236,409	4,062,319	870,490	7,169,218	6,274,517
Membership dues	261,480	—	—	261,480	246,640
Registration fees	101,885	—	—	101,885	95,585
Miscellaneous revenue	28,817	1,122	—	29,939	204,238
Net assets released from restrictions:		—			
Satisfaction of program restrictions	5,055,455	(5,055,455)	—	0	—
Satisfaction of time restrictions	123,814	(123,814)	—	0	—
Total Revenue	11,490,503	2,614,125	870,490	14,975,118	11,489,426
Expenses					
Program services:					
Programs	2,349,991	—	—	2,349,991	2,793,319
Member programs	336,213	—	—	336,213	235,638
Support for NRC and NAS	293,181	—	—	293,181	275,857
Awards	3,793,780	—	—	3,793,780	1,806,904
Total program services	6,773,165	0	0	6,773,165	5,111,718
Supporting services:					
Fundraising	831,508	—	—	831,508	908,436
Operations	1,872,978	—	—	1,872,978	819,756
Total supporting services	2,704,486	0	0	2,704,486	1,728,192
Total Expenses	9,477,651	0	0	9,477,651	6,839,910
Change in Net Assets Before Unrealized (Loss) Gain on Investments	2,012,852	2,614,125	870,490	5,497,467	4,649,516
Unrealized (loss) gain on investments	(477,769)	(317,936)	—	(795,705)	1,854,989
Change in Net Assets	1,535,083	2,296,189	870,490	4,701,762	6,504,505
Net Assets, beginning of year	32,904,132	10,089,741	28,177,391	71,171,264	64,666,759
Net Assets, end of year	$ 34,439,215	$ 12,385,930	$ 29,047,881	$ 75,873,026	$ 71,171,264

The accompanying notes are an integral part of this statement.

National Academy of Engineering Fund
Statement of Cash Flows

Year ended December 31,	2007	2006
Cash Flows from Operating Activities		
Change in net assets	$ 4,701,762	$ 6,504,505
Adjustments to reconcile change in net assets to net cash (used in) provided by operating activities:		
Realized gain on investments	(5,475,618)	(2,753,495)
Unrealized loss (gain) on investments	795,705	(1,854,989)
Changes in assets and liabilities:		
Contributions receivable	(232,034)	(1,925,917)
Award medals	54,156	(38,983)
Prepaid Expenses	(18,830)	—
Accounts payable–National Academy of Sciences	908,555	(87,821)
Net Cash Used in (Provided by) Operating Activities	733,696	(156,700)
Cash Flows from Investing Activities		
Proceeds from sale of investments	149,762,324	63,858,977
Purchase of investments	(149,529,804)	(63,867,841)
Net Cash Provided by (Used in) Investing Activities	232,520	(8,864)
Net Change in Cash and Cash Equivalents	966,216	(165,564)
Cash and Cash Equivalents, beginning of year	175,116	340,680
Cash and Cash Equivalents, end of year	$ 1,141,332	$ 175,116

The accompanying notes are an integral part of this statement.

National Academy of Engineering Fund
Notes to Financial Statements

December 31, 2007 and 2006

NOTE A—GENERAL INFORMATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

General Information
The National Academy of Engineering Fund (the Fund) is an independent non-profit organization established by the National Academy of Engineering (NAE) to collect and disburse funds for accomplishing the goals of NAE. NAE operates within the charter and framework of the National Academy of Sciences (NAS), which accounts for NAE's expenses. The operating expenditures of NAE are accounted for by offices of NAS, and are offset by reimbursement from funds received from the Fund and from contracts administered by NAS on behalf of the National Research Council (NRC), which is the operating arm of NAS and NAE. The net expenditures of NAE, except for the approved budgeted indirect costs, are paid by the Fund to balance accounts with NAS.

Basis of Accounting
The Fund's financial statements are prepared using the accrual basis of accounting.

Cash and Cash Equivalents
For purposes of the statement of cash flows, the Fund considers all investments purchased with an original maturity of three months or less to be cash equivalents, except for the cash in the investment portfolio, which will be reinvested on a long-term basis.

Short-term Investments
Temporary investments consist of money market funds that are used to fund normal operations of the Fund and are recorded at their readily determinable fair values as determined by quoted market prices.

Contributions Receivable
Unconditional promises to give are recognized as revenue and contributions receivable in the period the promises are made. Unconditional promises to give that are expected to be collected within one year are recorded at their net realizable value. Unconditional promises to give that are expected to be collected in future years are recorded at the present value of their estimated future cash flows. The discounts on those amounts are computed using risk-free interest rates commensurate with the risk involved applicable to the years in which the promises are received. Amortization of the discounts is included in contribution revenue. Conditional promises to give are not included as support until the conditions are substantially met.

Awards Medals
The Fund maintains gold medals for various awards, which are carried at cost.

Investments
Investments, consisting of cash and money market funds, federal agency securities, treasury securities, corporate debt securities, and equity securities, are recorded at readily determinable fair values determined by quoted market price.

Temporarily Restricted Net Assets
Temporarily restricted net assets consist of amounts that are subject to donor-imposed time or purpose restrictions and income earned on temporarily and permanently restricted net assets. The Fund is permitted to use or expend the donated assets in accordance with the donor restriction.

Permanently Restricted Net Assets
Permanently restricted net assets consist of assets whose use is limited by donor-imposed restrictions that neither expire by the passage of time nor can be fulfilled or otherwise removed by action of the Fund. The restrictions stipulate that resources be maintained permanently, but permit the Fund to expend the income generated in accordance with the provisions of the agreement. Permanently restricted net assets consist of the following:

Draper Prize–represents an endowment given by the donor for the purpose of establishing and awarding an annual prize in honor of the memory of Charles Stark Draper. It is the Fund's intention to use the investment earnings of the endowment to cover the expenses incurred in connection with administration of the prize and in providing the honorarium awarded with the prize.

Gordon Prize–represents an endowment given by the donor for the purpose of establishing and awarding an annual prize in honor of Bernard M. Gordon. It is the Fund's intention to use the investment earnings of the endowment to cover the expenses incurred in connection with administration of the prize and in providing the honorarium awarded with the prize.

Capital Preservation and Hans Reissner–represent endowments requiring that the principal be invested and that only the income be used for general operations of NAE.

Hollomon–represents an endowment requiring that the principal be maintained in perpetuity and that the income be used to support the Hollomon Fellow.

Industry Scholar–represents an endowment to support fellowships for recently retired corporate executives to assist with strategy and management of program activities in NAE and NRC.

Senior Scholar–represents an endowment to support an outstanding member of industry or another field working as an advisor and assistant to the president of NAE in the management and execution of NAE's programmatic activities.

Young Engineer–represents an endowment to support programs aimed at engaging engineers at a younger age in the activities of NAE, and to provide an opportunity to identify nominees from industry for membership in NAE.

Wm. A. Wulf Initiative for Engineering Excellence–represents an endowment to ensure the future of programs that Bill Wulf instituted as president and provide his successor some flexibility in addressing the most pressing issues before the engineering community and the nation at any given time.

Restricted Support

The Fund reports gifts of cash and other assets as restricted support if they are received with donor stipulations that limit the use of the donated assets. When a donor restriction expires, i.e., when a stipulated time restriction ends or purpose restriction is accomplished, temporarily restricted net assets are reclassified to unrestricted net assets and reported in the statement of activities as net assets released from restrictions.

Allocation of Expenses

The costs of providing various programs and other activities have been summarized on a functional basis in the statement of activities. Accordingly, certain costs have been allocated among the programs and supporting services benefited.

Income Taxes

The Fund is incorporated under the District of Columbia Non-profit Corporation Act and is exempt from income taxes under Section 501(c)(3) of the Internal Revenue Code. In addition, the Fund has been determined by the Internal Revenue Service not to be a private foundation. The Fund is required to remit income taxes to the federal government and the District of Columbia for unrelated business income. For the years ended December 31, 2007 and 2006, there was no unrelated business income and, consequently, no provision for income taxes has been made.

Use of Estimates

In preparing financial statements in conformity with accounting principles generally accepted in the United States of America, management is required to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and revenue and expenses during the reporting period. Actual results could differ from those estimates.

Reclassifications

Certain 2006 amounts have been reclassified to conform to the 2007 presentation.

NOTE B—CONTRIBUTIONS RECEIVABLE

Contributions receivable consist of unconditional promises to give and are deemed fully collectible as follows at December 31, 2007:

	Unrestricted	Restricted	Total
Unconditional promises to give	$ 258,525	$ 3,805,709	$ 4,064,234
Less: unamortized discount	—	(291,179)	(291,179)
Net unconditional promises to give	$ 258,525	$ 3,514,530	$ 3,773,055
Amounts due in:			
Less than 1 year	$ 258,525	$ 921,683	$ 1,180,208
1 to 5 years	—	2,592,847	2,592,847
	$ 258,525	$ 3,514,530	$ 3,773,055

Contributions receivable consist of unconditional promises to give and are deemed fully collectible as follows at December 31, 2006:

	Unrestricted	Restricted	Total
Unconditional promises to give	$ 368,325	$ 3,492,643	$ 3,860,968
Less: unamortized discount	—	(337,227)	(337,227)
Net unconditional promises to give	$ 368,325	$ 3,155,416	$ 3,523,741
Amounts due in:			
Less than 1 year	$ 368,325	$ 684,200	$ 1,052,525
1 to 5 years	—	2,488,496	2,488,496
	$ 368,325	$ 3,172,696	$ 3,541,021

Net restricted contributions consist of $319,026 and $275,017 at December 31, 2007 and 2006, respectively, which is subject to time restrictions, and $3,195,504 and $2,880,399 at December 31, 2007 and 2006, respectively, which is subject to donor-imposed purpose restrictions.

NOTE C—INVESTMENTS

Investments at fair value consist of the following at December 31:

	2007	2006
Cash and money market	$ 14,046,732	$ 5,044,802
Federal agency securities	2,465,181	13,915,102
Certificate of deposit	—	865,189
Corporate debt securities	2,792,500	2,337,526
Equity securities	36,931,790	32,899,400
Managed futures	6,969,998	6,972,209
Other	8,728,245	5,452,825
	71,934,446	67,487,053
Less: short-term investments	(2,044,545)	(1,509,458)
	$ 69,889,901	$ 65,977,595

Investments are further classified as follows at December 31:

Unrestricted	$ 33,996,846	$ 32,869,321
Temporarily restricted	10,314,640	8,487,412
Permanently restricted	27,622,960	26,130,320
	$ 71,934,446	$ 67,487,053

Investment return consists of the following at December 31:

Dividends and interest	$ 1,936,978	$ 1,914,951
Unrealized (loss) gain	(795,705)	1,854,989
Realized gain	5,475,618	2,753,495
	$ 6,616,891	$ 6,523,435

NOTE D—PERMANENTLY AND TEMPORARILY RESTRICTED NET ASSETS

Permanently and temporarily restricted net assets consist of the following at December 31, 2007:

	Permanently Restricted	Temporarily Restricted
Draper Prize	$ 8,000,000	$ 3,518,318
Gordon Prize	13,438,250	2,791,061
Capital Preservation	2,376,776	1,203,587
Hollomon	201,200	397,296
Great Achievements	—	88,927
Public Understanding	—	708,523
Technology and Environment	—	5,290
Frontiers Fund	—	4,084
Bueche Award	—	49,718
AT&T	—	26,689
CASEE	—	222,433
Russ Prize	—	65,558
Engineering Ethics Center	—	—
Diversity in the Engineering Work Force	—	1,759
Engineering Education	—	421,677
Grainger Prize	—	225
Hans Reissner	25,624	24,417
Engineering Ethics	—	782,171
Information Technology	—	32,445
Engineering & Services	—	2,981
Homeland Security	—	8,421
Communication with Public in Crisis	—	1,917
Industry Scholar	353,038	130,342
Senior Scholar	1,000,000	82,687
Young Engineer	778,640	182,134
Media Relations Mettler	—	251
Noise Policy Development	—	146,927
Urban Infrastructure	—	404,046
Offshore in UEF	—	3,141
China Project	—	1,077
Wm. Wulf Initiative for Engineering Excellence	2,874,353	103,694
Unrestricted contributions to be received in future years	—	752,642
Others	—	221,492
	$ 29,047,881	$ 12,385,930

NOTE D—PERMANENTLY AND TEMPORARILY RESTRICTED NET ASSETS Continued

Permanently and temporarily restricted net assets consist of the following at December 31, 2006:

	Permanently Restricted	Temporarily Restricted
Draper Prize	$ 8,000,000	$ 2,992,002
Gordon Prize	13,438,250	2,116,477
Capital Preservation	2,370,119	1,006,213
Hollomon	201,200	345,571
Great Achievements	—	95,341
Public Understanding	—	641,020
Technology and Environment	—	5,091
Frontiers Fund	—	47,627
Bueche Award	—	61,765
AT&T	—	12,451
CASEE	—	121,174
Russ Prize	—	66,782
Engineering Ethics Center	—	10,252
Diversity in the Engineering Work Force	—	1,703
Engineering Education	—	651,935
Grainger Prize	—	928
Hans Reissner	25,624	33,892
Engineering Ethics	—	—
Information Technology	—	29,072
Engineering & Services	—	2,860
Homeland Security	—	8,080
Communication with Public in Crisis	—	1,916
Industry Scholar	353,038	88,928
Senior Scholar	370,000	61,705
Young Engineer	778,641	121,504
Media Relations Mettler	—	1,527
Noise Policy Development	—	291,243
Urban Infrastructure	—	388,550
Offshore in UEF	—	1,479
China Project	—	6,752
Wm. Wulf Initiative for Engineering Excellence	2,640,519	21,609
Unrestricted contributions to be received in future years	—	714,408
Others	—	139,884
	$ 28,177,391	$ 10,089,741

NOTE E—DESCRIPTION OF PROGRAM AND SUPPORTING SERVICES

The following program and supporting services are included in the accompanying financial statements:

Programs–programs that address relevant issues in the engineering field including, but not limited to: *Education, Engineering Practice and the Engineering Workforce; Engineering and the Environment; Engineering, the Economy and Society; Information Technology and Society; National Security and Crime Prevention; and Public Policy* and *Program Reviews.*

Member Programs–organization and administration of the Annual Meeting and publication of NAE Memorial Tributes.

Support for NRC and NAS–contributions to joint activities of the National Academies, including, but not limited to, the NAS/NAE/IOM Committee on Human Rights, the NRC Office of Scientific and Engineering Personnel, and *Issues in Science and Technology.*

Awards–NAE presents five awards: the Bernard M. Gordon Prize, the Charles Stark Draper Prize, the Fritz J. and Dolores H. Russ Prize, the Arthur M. Bueche Award, and the NAE Founders Award. Activities include soliciting nominations, selection of the recipients, announcement of the recipients and presentation of the prizes.

Fundraising–provides the structure necessary to encourage and secure private financial support from individuals, foundations and corporations.

Operations–includes the functions necessary to provide an adequate working environment, provide coordination and articulation of the Fund's programs, secure proper administrative function of the Board of Trustees, maintain competent legal services for program administration, and manage the financial and budgetary responsibilities of the Fund.

NOTE F—RELATED-PARTY TRANSACTIONS

The National Academies Corporation

The National Academies Corporation (TNAC) is a non-profit corporation that was incorporated in January 1986 for the purpose of constructing and maintaining a study and conference facility, the Arnold and Mabel Beckman Center, in Irvine, California, to expand and support the general scope of program activities of NAS, NAE, the Institute of Medicine (IOM), and NRC. TNAC is organized as a tax-exempt supporting organization for NAS and the Fund. The Board of Directors and officers of TNAC include certain officers of the Fund. The Fund had no transactions with TNAC for the years ended December 31, 2007 and 2006.

National Academy of Sciences and National Research Council

The Fund reimburses NAS by making monthly payments based on NAE's estimated expenditures for the year. This resulted in a payable to NAS at December 31, 2007 and 2006 of $1,112,017 and $203,462, respectively. Payments made to NAS by the Fund for the Fund's allocated portion of the expenditures shared jointly by NAS, NAE and IOM were $1,124,689 and $1,184,293 for the years ending December 31, 2007 and 2006, respectively. The Fund made no payments to NRC for the years ended December 31, 2007 and 2006. See Note A for the relationship of related parties.

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Ex Officio:
Ralph J. Cicerone (2011)
President, National Academy of Sciences

‡ *Indicates term ended June 30, 2007. Year in parentheses indicates the year term expires.*

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Laura Mersky, *Senior Executive Assistant* (from July)

Wm. A. Wulf, *President* (through June)
Barbara Schlein, *Senior Executive Assistant* (through June)

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Susan Sloan, *Executive-in-Residence (through November)*
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Carolyn Williams, *Christine Mirzayan Science and Technology Policy Graduate Fellow (Winter)*
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Deborah Young, *Awards Administrator*

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Denise Bauer, *Off-site CASEE Postdoctoral Fellow*
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Jennifer Patterson, *Senior Development Officer for the NAE (until July)*
Mark Carter, *Interim Senior Development Officer for the NAE (from August)*

NAE PUBLICATIONS

NAE reports can be purchased from the National Academies Press, <*www.nap.edu*> or 1-888-624-7654, or from the National Academies Bookstore, 500 Fifth Street, N.W., Washington, D.C.

All reports can also be read online.

Program Reports from 2007:

Energy Futures and Urban Air Pollution: Challenges for China and the United States

Frontiers of Engineering: Reports on Leading-Edge Engineering from the 2006 Symposium

Toward a Safer and More Secure Cyberspace

The Bridge, the NAE quarterly journal, is available from the NAE Program Office or can be read online at <*www.nae.edu/thebridge*>. A PDF version is also available on the website.

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