Annual Report to the Congress: Fiscal Year 1991

March 1992

OTA-A-473
About the Report

The Office of Technology Assessment is an analytical support agency of the United States Congress. OTA works directly with and for the Committees of Congress, providing them with objective, thorough analysis of technological issues. This report to Congress is required under Sec. 11 of the Technology Assessment Act of 1972, Public Law 92-434. It describes the activities of the Office in Fiscal Year 1991 within the context of the legislative agenda of the 101st Congress and the events in the United States and the world during 1991.
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It has been my distinct pleasure to serve as Chairman of the Technology Assessment Board for the 102d Congress. Because my involvement with OTA stretches back to the agency's earliest days, becoming chairman has had special meaning to me.

Public policy is more than ever being determined by technology. This poses a true challenge for the Congress, for the issues with a technology content are often the most complex and subtle; yet science and technology is a field in which the average Member of Congress is not well equipped.

As OTA has become a mature and respected source of advice on science and technology, it has been of enormous assistance helping the Congress meet that challenge. When OTA staff address an issue of enormous complexity, they have had great success in distilling the issue to a range of options based on fact instead of rhetoric, and in a form that Members of Congress can understand and use. While the political judgments are properly left to us, we make them on a foundation of reality and hard analysis, as opposed to guesswork.

Some examples will illustrate the serious role that OTA now plays in Congressional policy consideration. The OTA work, Federally Funded Research: Decisions For A Decade, has given the Congress a wholly new view about how to manage the federal civilian research enterprise. OTA'S work in energy, such as the studies addressing fuel economy and our vulnerability to disruptions in our imported fuel supply, have become benchmarks in Congress' consideration of energy policy. The study, Exploring The Moon and Mars: Choices For A Nation, is now being used as a textbook by the Committees charged with deciding the future of our program for space exploration. OTA continues to give the Congress sophisticated advice on issues ranging from the management of our global environment to the future of our defense structure.

OTA has become one of the Congress' success stories, which perhaps are in short supply. So I look forward with happiness to a continuing relationship with this unique agency.

CONGRESSMAN GEORGE E. BROWN, JR.
The Office of Technology Assessment has grown over the years as Congress realized the value of shared staff.

In my judgment, this organization of technical experts has greatly matured—both as a resource to Congress and as a useful source of information to the public. OTA reports and background papers are used to help frame policy debates here in Congress and are used by those ranging from academics to engineers in the field. And, it is important to note most of these studies would have been done in the House and the Senate by separate staffs if OTA’S reputation for fairness had not been established.

OTA’S recent study, *U.S. Oil Import Vulnerability: The Technical Replacement Capability*, was a very helpful document in the debate over energy policy. The study makes clear the Nation’s growing dependence on imported oil, and our vulnerability in the event of disruption of foreign oil supply.

Another study, *Coping With An Oiled Sea*, has been very helpful to Congress. It got out the true facts about which oil spill cleanup measures are technologically feasible. Importantly, it told us that huge technological breakthroughs are not necessary, but good planning, training, and engineering are most helpful when addressing an oil spill.

OTA has done a good job providing Congress with sound technical analysis so that members of Congress and our staffs can make decisions based on the best facts available. OTA avoids waste and duplication because it is a resource shared by all the committees of Congress. In these times of tight budgets, I am glad we have such a resource—and believe we should do more to prevent duplication in basic staff research by the House and Senate.

I look forward to working with OTA in the future.

SENATOR TED STEVENS
It is a pleasure to submit this statement for the annual report. I wish to thank my Vice Chairman, Joshua Lederberg, and the Members of the Council for their support and assistance in what has been a most interesting and fulfilling year.

OTA has continued to perform as a first-rate analytical organization. Our 1991 review of four of OTA’S nine programs has reaffirmed our opinion that OTA’S staff and work product are very high. This applies to the quality of the work product, the experience and judgment of the staff, and the directions the agency is taking in the longer term.

The return on the Congress’ investment in OTA is appreciable, and we strongly support appropriations to ensure that OTA continues to receive the resources it needs not only to maintain its staff, but also to tap outside expertise. This latter support is especially important for an agency that has a small staff but a diverse, variable agenda of analytical responsibilities.

CHASE N. PETERSON
In last year’s report we projected that 1991 would be a “year undoubtedly filled with extraordinary events. That turned out to be a pretty safe bet. Some of the phenomena the world experienced in 1991, particularly the collapse of the Soviet-dominated system of centrally planned economies, will continue to ‘try our National spirit and our commitments to future generations’ for some time to come, making each new year unique and informed policymaking more important than ever.

OTA has long studied many of the technical issues that influenced the demise of the Soviet Union. For example, in 1981, we projected that the impending fall-off in Soviet gas and oil production (dominated by poor use of technology) would result in a slackened economic grip on Eastern Europe and decreased access to hard currency. Several OTA studies have illuminated the extraordinary impacts of computer and telecommunications technologies on production and service economies and have revealed the fact that these tools were readily adopted in market economies while they languished in centrally planned economies. Individuals who played crucial roles in the revolutions in Russia and Eastern Europe surely sensed that the globally integrating market was racing out of sight of the centrally planned economies and knew that radical change was imperative. Although the growing importance of information technologies contributed to the revolution, those same technologies also placed a subtle but effective control on its course by assuring universal access to events as they transpired.

Here at home, telecommunications provided constant contact with the rapid deployment, swift movements, in-process innovative problem-solving, and technologically advanced weapons wielded by well-trained coalition forces in Kuwait and Iraq. The world’s voracious appetite for oil lay at the heart of this conflict and lies at the heart of many of the environmental problems that threaten the community of Nations. Energy and environment issues continue to occupy a fourth of OTA’S analysis effort.

The stubborn and persistent deficits in international payments, led by oil and auto imports, and federal entitlement programs that inexorably race beyond receipts contribute toward a double-dip recession. The Nation is questioning the priority of big technology projects—from the faulty billion dollar Hubble Telescope and
Galileo space probe to the anachronistic Strategic Defense Initiative strategy to protect the continental U.S. And our revered halls of science are showing disturbing signs of stress. The country seems to yearn for a change for the better and remains an innovative, responsive, and capable society. How can OTA contribute to meeting the challenges before us?

First, the Nation needs to become more acutely aware of the facts and they need to be ordered and integrated. An old Chinese proverb states: ‘If we don’t change direction, we’re very likely to end up where we’re headed.” That early equivalent of Isaac Newton’s first law of motion is as true today as it was 3000 years ago. OTA not only describes where we are and where we are headed, but also how our trajectory can be modified if the country so chooses. In 1991, for example, OTA crafted a variety of energy and environmental strategies, including alternative long-range goals for levels of imports, reductions in greenhouse gases and cost-effective efficiency opportunities, stressing the vastly different endpoints likely to result from options ranging from maintaining the status quo all the way to decisions to make significant shifts in the economy. We pointed out the unhappy but true dimensions of our loss of industrial manufacturing competitiveness, its impact on U.S. standards of living, and the tough and long-term but necessary steps to turn things around. We described the serious health deficits of our children in a landmark review of adolescent health, and examined the crumbling health delivery system to rural America in our study of rural health care. We defined the sobering situation of the Nation’s defense nuclear and chemical waste mess and offered ways for more effective management and clean-up. We examined both the disadvantages and opportunities of rural areas to utilize telecommunications to improve public services as well as to improve their economic futures. We tackled the manifold issues surrounding point-of-sale record checks of firearms purchasers and helped clarify constraints and options, which resulted in successful legislation. And we outlined the principal conflicts facing the Nation’s basic research system.

Second, we need to help leaders who can help define who we are, as a people and Nation, and who can articulate plans of action that are fair and achievable. In carrying out studies for committees of Congress, OTA draws on a wide variety of
perspectives from outside government and delivers its studies to the public as well as the congressional requesters. Hopefully, this provision of carefully drawn information enables leaders to articulate well-conceived choices and goals, and helps citizens to have better access to the power that knowledge gives, so that a stronger democratic society can prevail.

Mindful of our role in the policy process, OTA carefully leaves decisionmaking to elected officials. OTA neither advocates particular decisions nor takes political sides. The agency’s job is to help focus, elevate, and illuminate debates about socio-technical issues. In a world increasingly dominated by technology, in a society increasingly influenced by science, people need trustworthy access to the specialized knowledge of science and technology.

As we look forward to 1992, OTA already has a full plate of analyses underway. These include studies of defensive medicine and health insurance, nuclear disarmament, counter-terrorism, defense conversion in our economy, renewable energy, defense waste cleanup, options to adapt to an unknown and future climate, computer software and intellectual property, prevention and treatment of osteoporosis, evaluation of the Oregon Medicaid proposal, agricultural alternatives to coca production, technology to improve literacy and learning by adults, and many more issues confronting Congress and the American people. With the continued assistance of hundreds of experts and stakeholders throughout the private and public sectors, both in the U.S. and from other countries, OTA will illuminate the facts, winnow the uncertainties, and weigh various potential impacts. With that task complete, we will faithfully synthesize, translate, and deliver the results for the Congress and the public to use as they see fit. The existence of knowledge—the fruit of research—is necessary but not sufficient. OTA’S job is to make knowledge truly accessible and therefore useful as we struggle as a Nation to govern ourselves wisely in a world full of both peril and opportunity.

JOHN H. GIBBONS
Created by the Technology Assessment Act of 1972 [86 Stat. 797], OTA is an agency of the legislative branch of the Federal Government (a copy of the Act is found on p. 50). OTA’s primary function is to provide congressional committees studies that identify the positive and negative consequences of policy alternatives affecting the uses of technology.

OTA assists Congress by identifying existing or probable impacts of technology; alternative technological methods and management programs for implementing specific actions (estimating and comparing the Impacts of alternatives); and areas where additional research or data collection is required to provide support for assessments. (OTA presents its completed analyses to the appropriate legislative authorities and, whenever possible, undertakes whatever additional related activities are necessary.

The Act provides for a bipartisan Technology Assessment Board, a director, and other employees and consultants that are necessary for the Office to conduct its work. The congressional board is made up of six Senators, appointed by the President pro tempore of the Senate, and six Representatives,
appointed by the Speaker of the House, evenly divided by party. In 1991, Rep. George E. Brown, Jr. (D-California) and Sen. Ted Stevens (R-Alaska) served as the Chairman and Vice Chairman, respectively, of the board. The two posts alternate between the Senate and House with each Congress. The board members from each Chamber select their respective officer.

The congressional board sets the policies of the Office and is the sole and exclusive body governing OTA. The board appoints the director, who is OTA’S chief executive officer and a nonvoting member of the board.

The Act also calls for a Technology Assessment Advisory Council composed of 10 public members eminent in scientific and technological fields, the Comptroller General of the United States, and the Director of the Congressional Research Service of the Library of Congress. The advisory council advises the board and the director on such matters as the balance, comprehensiveness, and quality of OTA’S work, and OTA’S nongovernmental resources.

Requests for OTA assessments may be initiated by:

● the chairman of any standing, special, select or joint committee of Congress, acting alone, at the request of the ranking minority member, or at the request of a majority of the committee members;
● the OTA board; or
● the OTA director, in consultation with the board.

The authorization of specific assessment projects and the allocation of funds for their performance are the responsibilities of the OTA board.

The analytical work of the Office is organized into three divisions, each headed by an assistant director. They encompass assessments grouped in the areas of energy and materials; international security and commerce; industry, technology, and employment; biological applications; food and renewable resources; health; oceans and environment; science, education, and transportation; and telecommunications and computing technologies.

Staff of the Operations Division support the analytical work of the Office. The Operations Division is divided into three main sections. Finance and Administrative Services includes Administrative Services and Budget and Finance. Information Management and Publishing Services includes Telecommunication and Information Systems, the InformationCenter, Publishing and Information Marketing. Personnel Services includes the Personnel Office. The Division provides the research staff and management with a variety of services and technologies vital to successful functioning of the Office. The Information Center also provides public access to the full collection of OTA publications, including an online index, and the Publications Unit within Information Marketing handles public dissemination of OTA publications.

The Congressional and Public Affairs Office assists in coordinating OTA’S work with various committees of the House and Senate, by initiating communications between OTA management and staff, and the Technology Assessment Board and the Technology Assessment Advisory Council. OTA publications are then widely dissemi-
nated on Capitol Hill and to the press.
(General Information on OTA and availability of OTA publications is listed on the inside back cover.)

FY1991 Activities

The United States finds itself simultaneously propelled by centripetal and centrifugal forces. Domestic problems, such as unemployment, lack of affordable health care, illiteracy, force the Federal Government to focus on internal business at an unusually fine level of detail which encourage a growing degree of isolationism among U.S. citizens. Yet global problems like climate change, loss of control over nuclear weapons, and increasing tensions between the economic “have’s” and “have not’s” force the government’s attentions outward, to focus on affairs far beyond national boundaries.

Concern about the technological changes which may impact the creation of a global economy lies at the heart of many of these problems. OTA provides Congress with thorough, impartial analyses of the potential role of science and technology in creating and addressing the pressing concerns of today . . . and tomorrow.

In FY1991, OTA highlighted the national and international implications of many technologies essential to economic well-being, such as energy supply and demand technologies. To help Congress grapple with domestic energy requirements (in particular the threat to Kuwait’s oil supplies imposed by war), OTA published assessments on U.S. oil import vulnerability and on energy efficiency in the Federal Government. OTA also addressed the energy needs of developing countries, and looked specifically at the contributions of energy consumption to climate change.

OTA furthered its comprehensive examination of the U.S. position in the world economy with studies on such diverse topics as public works infrastructure, trade, and biotechnology. In FY1991, OTA continued to be shaped and guided by the bipartisan Technology Assessment Board, reflecting the explicit needs of the committees of jurisdiction, OTA serves as a shared resource for Congress, providing high-quality analyses of scientific and technological issues that are intrinsic to all important policy decisions, in a cost-effective way.

During FY1991, OTA delivered 44 formal publications to Congress, including assessment reports, background papers, a special report, staff papers, and administrative documents. As of September 30, 1991, 46 approved studies were in progress. An integral aspect of OTA’s assessments includes providing expert advice, briefings, testimony, and results of OTA research to committees throughout the projects.

OTA served over 40 different Committees and Subcommittees of both Houses, typically in response to bipartisan requests.
The Energy and Materials Program is responsible for assisting Congress in understanding the technological possibilities for developing our energy and materials resources and the consequences of these developments for society. OTA’S Energy and Materials Program covers those technologies that concern the extraction, delivery, and use of energy and materials, in addition to focusing attention on world markets and policies, including imports and exports of energy and materials.

The Industry, Technology, and Employment Program examines how technology affects the ability of U.S. industry to contribute to a healthy national economy. Its responsibilities include consideration of the competitiveness of U.S. industries in international markets, trade and economic development issues, the number and nature of employment opportunities, needs for worker education, training and retraining, and ways to ease adjustment in structural economic transitions. A Program with a specific employment focus is new at OTA (the Program was established in 1983), although many assessments have considered employment impacts, and employment and training issues have
been of central importance in several studies. This section of the program centers on the quantity, nature, and quality of jobs, the nature of and changes in job skills, and training and retraining across the work force.

OTA’S analyses of issues of national defense, international security, and space are conducted primarily by the International Security and Commerce Program. In recent years this has included: defense industry and technology, aspects of defense management, international collaboration, space transportation, orbital debris, nuclear offense and defense, arms control, export controls, NATO defensive strategy, terrorism, and commercial uses of space. The multi-disciplinary staff-including scientists, engineers, social scientists, and others-brings a broad perspective to these and other complex problems.

**FY1991 Activities**

The Division contributed considerably to the debate on major issues in the 102d Congress. Its work on improving automobile fuel economy was used extensively in the draft legislation on increasing Corporate Average Fuel Economy (CAFE) standards, and its assessment on U.S. oil import vulnerability
was critical to the debate on the National Energy Security Act of 1991. Other important work in energy-related areas included studies of energy efficiency in the Federal Government and energy in developing countries.

Assessments focusing on trade and worker training assisted Congress in developing legislation which will expand America’s ability to compete in the global economy. Work on manufacturing and the economy provided critical information for Congress on the need for the development and diffusion of commercially important technologies.

Finally, the Division’s work in international security, defense reindustrialization, and space has broadened the debate in Congress. Assessments as diverse as technology against terrorism, the global arms trade, and exploration of the Moon and Mars have assisted Congress in sorting through these very complex issues. The timely study of defense reindustrialization issues is critical to the work in this area by the House and Senate Armed Services Committees.

ENERGY EFFICIENCY IN THE FEDERAL GOVERNMENT: GOVERNMENT BY GOOD EXAMPLE?, MAY 1991
Requested by:
Senate Committee on Governmental Affairs
Senate Committee on Energy and Natural Resources
House Committee on Energy and Commerce
House Committee on Science, Space, and Technology

ENERGY TECHNOLOGY CHOICES: SHAPING OUR FUTURE, JULY 1991
Requested by:
House Committee on Energy and Commerce
House Committee on Government Operations

ORBITING DEBRIS: A SPACE ENVIRONMENTAL PROBLEM—BACKGROUND PAPER, OCTOBER 1990
Requested by:
Senate Committee on Commerce, Science, and Transportation
House Committee on Science, Space, and Technology

TECHNOLOGIES FOR START AGREEMENT: Verification Technologies: Measures for Monitoring Compliance With the START Treaty, December 1990
Verification Technologies: Managing Research and Development for Cooperative Arms Control Monitoring Measures, May 1991
Verification Technologies: Cooperative Aerial Surveillance in International Agreements, July 1991
Requested by:
Senate Committee on Foreign Relations
House Committee on Foreign Affairs

Requested by:
Senate Committee on Labor and Human Resources
Senate Committee on Commerce, Science, and Transportation
Senate Committee on Armed Services
House Committee on Interior and Insular Affairs
House Committee on Government Operations

GLOBAL ARMS TRADE: COMMERCE IN ADVANCED MILITARY TECHNOLOGY AND WEAPONS, JUNE 1991
Requested by:
Senate Committee on Armed Services
House Committee on Government Operations

TECHNOLOGY AGAINST TERRORISM: THE FEDERAL EFFORT, JULY 1991
Requested by:
Senate Committee on Governmental Affairs
Senate Committee on Foreign Relations
Senate Committee on Commerce, Science, and Transportation

EXPLORING THE MOON AND MARS: CHOICES FOR THE NATION, JULY 1991
Requested by:
Senate Committee on Appropriations
House Committee on Appropriations
The Biological Applications Program assesses state-of-the-art technologies arising from the cutting edge of biological science. The Program is responsible for assisting Congress in understanding biomedical technologies by exploring the consequences of those technologies and their applications on society, government, the economy, ethics, and the law.

The Food and Renewable Resources Program assesses national and international agriculture-related technologies used to provide society with food, fiber, and chemicals; technologies that affect the ability to sustain in perpetuity the renewable resource base that makes such production possible; and other technologies that affect the provision of environmental services derived from renewable resource systems. The Program also provides extensive experience in these fields as they relate to the problems of developing countries.

The Health Program’s charter is reflected in two primary efforts: 1) assessment of specific clinical and general health care technologies, and 2) studies of broader issues of health policy related to, or with implications for, technology. In addition, it has
certain statutory methodology oversight responsibilities regarding Vietnam veterans health studies, and provides staff work for OTA’s mandated responsibility to appoint members of the Prospective Payment Assessment Commission and the Physician Payment Review Commission.

**FY1991 Activities**

The Health and Life Sciences Division contributed heavily to congressional consideration of issues in the 102d Congress. Studies on biotechnology addressed issues both economic and global as well as the specific concerns of the domestic dairy industry. Complex subjects such as neural grafting and health risks of immunotoxic substances were addressed in studies enabling several committees’ evaluation of policy in these important areas.

The Division’s work on agricultural approaches to reduce agrichemical contamination of groundwater was used to support development of several programs in the 1990 Farm Bill, and continues to be used to develop further legislation related to nitrate contamination of groundwater. The study on universities and development assistance has been used in rewriting the
Foreign Assistance Act, and work on agricultural commodities as industrial raw materials has been used in oversight of research on traditional and new crops for industrial use.

OTA’S Health Program completed a major assessment on adolescent health. Its continuing work on AIDS-related issues has been essential in keeping legislators informed on this most critical of health care issues.

NEW DEVELOPMENTS IN NEUROSCIENCE:
Neural Grafting: Repairing the Brain and Spinal Cord, October 1990
Biological Rhythms: Implications for the Worker, September 1991

Requested by:
House Committee on Energy and Commerce
House Committee on Veterans Affairs
House Committee on Science, Space, and Technology
House Committee on Appropriations

GENETIC MONITORING AND SCREENING IN THE WORKPLACE, OCTOBER 1990
Requested by:
Senate Committee on Commerce, Science and Transportation
House Committee on Energy and Commerce
House Committee on Science, Space, and Technology

IDENTIFYING AND CONTROLLING IMMUNOTOXIC SUBSTANCES—BACKGROUND PAPER, MAY 1991
Requested by:
Senate Committee on Environment and Public Works

BENEATH THE BOTTOM LINE: AGRICULTURAL APPROACHES TO REDUCE AGRICHEMICAL CONTAMINATION OF GROUNDWATER NOVEMBER 1990
Requested by:
House Committee on Agriculture
House Committee on Public Works and Transportation

EMERGING AGRICULTURAL TECHNOLOGY: ISSUES FOR THE 1990s:
Agricultural Commodities as Industrial Raw Materials, June 1991

Requested by:
Senate Committee on Agriculture, Nutrition, and Forestry
House Committee on Agriculture

NEW OPPORTUNITIES FOR U.S. UNIVERSITIES AND DEVELOPMENT ASSISTANCE: AGRICULTURE, NATIONAL RESOURCES, AND ENVIRONMENT—BACKGROUND PAPER SEPTEMBER 1991
Requested by:
House Committee on Foreign Affairs
House Committee on Science, Space, and Technology
Senate Committee on Foreign Relations

CHILDREN’S DENTAL SERVICES UNDER THE MEDICAID PROGRAM—BACKGROUND PAPER, OCTOBER 1990
Requested by:
House Committee on Energy and Commerce

ADOLESCENT HEALTH:
Volume I: Summary and Policy Options, April 1991
Volume 11: Crosscutting Issues in the Delivery of Health and Related Services, June 1991

Requested by:
Senate Select Committee on Indian Affairs
Senate Committee on Commerce, Science, and Transportation

OUTPATIENT IMMUNOSUPPRESSIVE DRUGS UNDER MEDICARE, AUGUST 1991
Requested by:
Senate Committee on Finance
OTA’s Oceans and Environment Program is responsible for all ocean-related questions, including ocean resources and maritime policy, and for large-scale environmental issues, such as climate modification and water pollution. The work of the Program usually falls under one of five basic categories: Federal services, natural resources, pollution control, marine industry, and large-scale environmental issues.

The Science, Education, and Transportation Program is responsible for work on a variety of topics, ranging from transportation and infrastructure to the newer issues of science policy and education. Science policy considers viability of the U.S. scientific enterprise, as well as allocation and decision-methods available to the Congress to support and manage research. Research in education, while concentrating on schools, also includes studies using technology for alternative learning environments.

The Telecommunication and Computing Technologies Program is responsible for assisting Congress in developing national policies related to telecommunications, information, microelectronics, software, and computer technologies. The Program’s responsibilities include monitoring the research...
and development of new information technologies and assessing the implications of these technologies for the American industry and the public.

**FY1991 Activities**

The diversified nature of the subjects the Division covers made it particularly useful in the legislative process of the 102d Congress. The Division released two major environmental studies during the year, both of which were used heavily in Congressional debate. Its study of defense nuclear waste was significant in developing such legislative proposals as the Federal Facilities Compliance Act and measures incorporated into the Department of Defense authorization act. The assessment of global climate change assisted Congress in the consideration of more than 150 bills dealing with some aspect of climate change.

OTA transportation studies played a prominent role in legislative action in FY1991. The study on infrastructure technology, management, and financing provided major impetus for consideration of dramatically new surface transportation legislation. The analysis of issues related to tiltrotor aircraft and
magnetic levitation vehicles was valuable in assisting committees in determining funding. OTA’s work on federally funded research has been instrumental in assisting the House Science, Space, and Technology Committee’s Task Force on the Health of Research.

The Division released a major assessment of rural telecommunications issues in FY1991 which has been instrumental in legislation relevant to the Rural Electrification Administration. The Division’s work on automated record checks for Firearm purchasers was critical in the debate on significant new crime legislation.

CHANGING BY DEGREES, STEPS TO REDUCE GREENHOUSE GASES, FEBRUARY 1991
Requested by: Senate Committee on Environment and Public Works
Senate Committee on Commerce, Science, and Transportation

COMPLEX CLEAN UP. THE ENVIRONMENTAL LEGACY OF NUCLEAR WEAPONS PRODUCTION, FEBRUARY 1991
Requested by: Senate Committee on Armed Services
House Committee on Merchant Marine and Fisheries
House Committee on Interior and Insular Affairs

FINDING THE RX FOR MANAGING MEDICAL WASTE, FEBRUARY 1991
Requested by: House Committee on Science, Space, and Technology

BIOREMEDIATION FOR MARINE OIL SPILLS—BACKGROUND PAPER, MAY 1991
Requested by: Technology Assessment Board

DELIVERING THE GOODS: PUBLIC WORKS TECHNOLOGIES, MANAGEMENT, AND FINANCING, APRIL 1991
Requested by:
Senate Committee on Environment and Public Works
Senate Committee on Commerce, Science, and Transportation

FEDERALLY FUNDED RESEARCH: DECISIONS FOR A DECADE, MAY 1991
Requested by: House Committee on Science, Space, and Technology

Requested by: Senate Committee on Environment and Public Works

SEEKING SOLUTIONS. HIGH-PERFORMANCE COMPUTING FOR SCIENCE—BACKGROUND PAPER, MARCH 1991
Requested by:
House Committee on Science, Space, and Technology
Senate Committee on Commerce, Science, and Transportation

RURAL AMERICA AT THE CROSSROADS: NETWORKING FOR THE FUTURE, MAY 1991
Requested by: Joint Economic Committee

AUTOMATED RECORD CHECKS OF FIREARM PURCHASERS: ISSUES AND OPTIONS, JULY 1991
Requested by: Senate Committee on the Judiciary
MARKET IN PROGRESS AT YEAR-END

More than 45 projects were in progress during fiscal year 1991. In addition, 16 new studies were undertaken. This section lists the titles of assessments underway or in press, as of September 30, 1991.

ENERGY, MATERIALS, AND INTERNATIONAL SECURITY DIVISION

Energy and Materials Program

- Technological risks and opportunities for future U.S. energy supply and demand
- New energy technologies in developing countries
- U.S. energy efficiency: past trends and future opportunities
- Materials technology: integrating environmental goals with product design
- Renewable energy technology: research development and commercial prospects
- Aging nuclear powerplants: life attainment, license extension and decommissioning

Industry, Technology, and Employment Program

- Competing economies: America, Europe, and the Pacific Rim
- Technology opportunities for economic conversion
- U.S.-Mexico trade, technology, and investment
- American industry and the environment: implications for trade and U.S. competitiveness

International Security and Commerce Program

- Technologies for START agreement
- Technology against terrorism
- Managing the Nation’s defense industrial strength in a changing security environment
- Policy body armor standards and testing

HEALTH AND LIFE SCIENCES DIVISION

Biological Applications Program

- New developments in neuroscience
- Biotechnology in a global economy
- Cystic fibrosis: implications of population screening
- Research on risk assessment of chemical carcinogens
- Technologies for understanding the root causes of substance abuse and addiction

Food and Renewable Resources Program

- Emerging agricultural technology: issues for the 1990s
- Forest service planning: accommodating uses, producing outputs, and sustaining ecosystems
- Agricultural alternatives to coca production
- Non-indigenous species in the United States

Health Program

- Monitoring of mandated veteran studies
- Drug labeling in developing countries
- Federal response to AIDS: congressional issues
- Adolescent health
- Government policies and pharmaceutical research and development
- Evaluation of the Oregon Medicaid Proposal
- Home intravenous and immunosuppressive drug therapies under the Medicare Program
- Appointment and monitoring of the prospective payment assessment commission and the physician payment review commission
- Technology, insurance and health care system
- Defensive medicine and the use of medical technology
- Policy issues in the prevention and treatment of osteoporosis

SCIENCE, INFORMATION, AND NATURAL RESOURCES DIVISION

Oceans and Environment Program

- Medical waste and other “non-hazardous” solid waste issues

Science, Education, and Transportation Program

- Schools, kids, and measurement: technologies of assessment
- New ways: tilt rotor aircraft and magnetically levitated vehicles
- Technologies for literacy
- Intercity bus access for individuals with disabilities
- Aviation research, technology development, and implementation: looking to the future

Telecommunication and Computing Technologies Program

- Information technology and research
- Computer software and intellectual property: meeting the challenges of technological change and global competition
- Miniaturization technologies
- Federal telecommunications for the 21st century: transforming the delivery of government services
The Technology Assessment Advisory Council (TAAC) was established by OTA's statute, and members are appointed by OTA's congressional Technology Assessment Board (TAB). The council advises TAB and the Director on issues and other matters related to science, technology, and technology assessment.

TAAC Members
CHASE N. PETERSON, Chairman
Dr. Peterson, formerly President, is a Professor of Medicine at the University of Utah. He practiced medicine at the Salt Lake Clinic and taught at the LDS Hospital and University of Utah Medical School until his appointment as Dean of Admissions and Financial Aids at Harvard College. There he also served as Vice President for Alumni Affairs and Development. Dr. Peterson returned to the University of Utah in 1978 as Vice President for Health Sciences, and has served as University President from 1983-1991.

JOSHUA LEDERBERG, Vice Chairman
Dr. Lederberg, former President, is now Professor at Rockefeller University. He is the former Chairman of the Department of Genetics at Stanford University School of Medicine. He is a member of the National Academy of Sciences and is a Nobel Laureate in Physiology and Medicine.

LEWIS M. BRANSCOMB
Dr. Branscomb is the Albert Pratt Public Service Professor at Harvard's John F. Kennedy School of Government. He is a former executive of International Business Machines. Prior to joining IBM, he was the Director of the National Bureau of Standards.

MICHEL T. HALBOUTY
Mr. Halbouty is Chairman of the Board of Michel T. Halbouty Energy Co. in Houston, Texas. Prior to establishing his company, he was a chief geologist and petroleum engineer with Glenn H. McCarthy and also with Yount-Lee Oil Co.

NEIL E. HARL
Dr. Harl is the Charles F. Curtiss Distinguished Professor of Economics at Iowa State University, where he has served on the faculty since 1964.

JAMES HUNT
Dr. Hunt is the chancellor of the University of Tennessee Health Science Center in Memphis. He previously served as the Dean of Medicine for the University and as Chairman of the Department of Medicine at the Mayo Clinic.

HENRY KOFFLER
Dr. Koffler, formerly President, is a Professor of Biochemistry and Microbiology at the University of Arizona. He previously served on the faculties of the University of Massachusetts, University of Minnesota, and Purdue University.

MAX LENNON
Dr. Lennon is President of Clemson University. He is the former Vice President for Agricultural Administration and Executive Dean for Agriculture at the Ohio State University. He previously served as Dean of Agriculture at the University of Missouri and Associate Dean and Professor at Texas Tech University.

JOHN F.M. SIMS
Dr. Sims is Vice President of Marketing for Usibelli Coal Mine, Inc. He previously served as Director of the Office of Mineral Development with the Alaska Department of Commerce and Economic Development. Dr. Sims also taught Geological Engineering at the University of Alaska-Fairbanks.

MARINA V.N. WHITMAN
Dr. Whitman is Vice President and Group Executive for Public Affairs Staff Group at General Motors Corporation. She previously served as Vice President and Chief Economist at General Motors. She also taught at the University of Pittsburgh.

Statutory Members
CHARLES A. BOWSHER
Mr. Bowscher is Comptroller General of the United States and Director of the U.S. General Accounting Office.

JOSEPH E. ROSS
Mr. Ross is Director of the Congressional Research Service, U.S. Library of Congress.
The Distinguished Service Award is given to those individuals who have made notable outstanding contributions to OTA and the accomplishment of OTA’S mission. Nominations are made by all OTA staff, and employees in all job categories are eligible. A rotating Employee Recognition Committee selects the recipients. The following OTA staff were honored with the Distinguished Service Award for 1991 at the Employee Recognition Reception, October 3, 1991:

- Peter Blair, Program Manager, Energy and Materials Program
- Larry Bond, Senior Systems Analyst, Telecommunications & Information Systems
- Kerry Kemp, Senior Analyst, Health and Life Sciences Division
- Peter Johnson, Senior Associate, Oceans and Environment Program
- John P. Andelin, Assistant Director, Science, Information, and Natural Resources

- John H. Gibbons, Director
  Federation of American Scientists
  1990 Public Service Award
  American Physical Society
  1991 Leo Szilard Award
- Linda G. Roberts, Senior Associate, Science, Education, and Transportation Program
  Electronic Learning magazine, Educator of the Decade

The National Association of Government Communicators conducts the Blue Pencil Competition as an annual recognition of outstanding government communications projects and their producers. Entries are judged on writing, editorial content, layout and design, achievement of purpose and cost-effectiveness. This year three OTA reports were recognized in the Blue Pencil Competition:

- Genetic Monitoring and Screening in the Workplace, Biological Applications Program, Margaret Anderson, Project Director—Second Place in the Publication for Technical Audience Category
In April 1991, the Technology Assessment Board established the Morris K. Udall Fellowship Program in honor of the retiring congressman from Arizona who served 30 years in the House of Representatives. Udall, one of the founders of OTA, had been a member of the Technology Assessment Board since February 6, 1973. He served as chairman during the 96th, 98th and 100th Congresses and as Vice Chairman during the 97th and 99th Congresses.

Udall contributed significantly to the work and direction of OTA. "Congressman Udall has supported, defended, and guided the OTA with great dignity, humor, wisdom, and sensitivity," said John H. Gibbons, Director of OTA, in announcing the new program. "We are surely saddened to see him retire. We express profound thanks for giving such full measure to public service.

The Udall Fellowship Program carries on the OTA Confessional Fellowship Program and is awarded to up to six individuals each year for a 1-year appointment at OTA. Qualified candidates must demonstrate exceptional ability in areas needed in OTA's work, such as the physical or biological sciences, engineering, law, economics, environmental and social sciences, and public policy. Candidates must have significant experience in technical fields or management or have completed research at the doctoral level.

Jacqueline Corrigan, Health Program
David Reeker, Health Program
Kathy Hudson, Food and Renewable Resources Program

Carol Edwards, Science, Education, and Transportation Program
Fiscal year '91 breakdown (in thousands)

OFFICE OF THE DIRECTOR
John H. Gibbons, Director
Susanne Bachtel, Executive Assistant
Holly Gwon General Counsel
Barbara Murphy, Division Assistant
Gilda Squire, Secretary

Congressional and Public Affairs
James Jensen Director, Congressional Affairs
Jean McDonald, Director, Press Affairs
Barbara Ketchum, Administrative Secretary
Karen Piccione, Administrative Assistant
Eugenia Ufholz, Congressional Affairs Officer

ENERGY, MATERIALS, AND INTERNATIONAL SECURITY DIVISION
Lionel S. Johns, Assistant Director
Beth Alexiou, Division Assistant
Henry Kelly, Senior Associate
Energy and Materials Program
Peter Blair, Program Manager
Tina Aikens, Secretary
Samuel Baldwin, Senior Analyst
Pidge Chapman, Office Administrator
Alan Crane, Senior Associate
Joy Dunkerley, Senior Analyst
Gregory Eyring, Senior Analyst
Karen Larsen, Senior Analyst
Linda Long, Administrative Secretary
John Newman, Senior Analyst
Steven Plotkin, Senior Associate
Robin Roy, Senior Analyst
Industry, Technology, and Employment Program
Audrey Buyum Program Manager
John Alie, Senior Associate
Wendell Fletcher, Senior Analyst
Kitty Gilman, Senior Associate
Julie Gorte, Senior Associate
Carol Gunter, Office Administrator
William Keller, Senior Analyst
Gretchen Kolsrud, Senior Associate
Robert Weisler, Senior Analyst
Diane White, Administrative Secretary
International Security and Commerce Program
Alan Shaw, Program Manager
Jacqueline Boykin Office Administrator
Michael Callahan, Senior Analyst

Health Program
Clyde J. Behney, Program Manager
Jackie Corrigan, Senior Analyst
Virginia Cwalina, Office Administrator
Denise Dougherty, Senior Associate
Jill Eden, Senior Analyst
Hellen Gelband, Senior Associate
Michael Gluck Senior Analyst
Marion Grochowski, Secretary
Maria Hewit, Senior Analyst
Katie Maslow, Senior Analyst
Robert McDonough, Senior Analyst
Elizabeth Molitor, Research Assistant
Eileen Murphy, PC Specialist
Elaine Power, Senior Analyst
Judith Wagner, Senior Associate
Leah Wolfe, Research Analyst

Arthur Charo, Senior Analyst
Gerald Epstein, Senior Analyst
Anthony Fainberg, Senior Associate
Thomas Karas, Senior Associate
Jack Nunn, Senior Analyst
Louise Suley, Administrative Secretary
Christopher Waychoff, Analyst
Roy Williamson, Senior Associate

HEALTH AND LIFE SCIENCES DIVISION
Roger Hendman, Assistant Director
Barbara Murphy, Division Assistant
Kerry Kemp, Analyst

Biological Applications Program
Michael Gough, Program Manager
Margaret Jakson, Analyst
Joyce Brentley, Analyst
Laura Lee Hall, Analyst
Kathie Hanna, Senior Analyst
Jacqueline Keller, Research Assistant
Jene Lewis, Secretary
David Liskowsky, Senior Analyst
Margaret McLoughlin Analyst
Rohyn Nishim, Senior Analyst
Kevin O'Connor, Senior Analyst
Cecile Parker, Office Administrator
Linda Rayford, Administrative Secretary

Food and Renewable Resources Program
Walter E. Parham, Program Manager
Patricia Durana, Analyst
Nellie Hammond, Administrative Secretary
Alison Hess, Senior Analyst
Nathaniel Lewis, Office Administrator
Michael Phillips, Senior Associate
Carolyn Swann, PC Specialist
Robin White, Analyst
Phyllis Wandle, Senior Associate

Health Program
Clyde J. Behney, Program Manager
Jackie Corrigan, Senior Analyst
Virginia Cwalina, Office Administrator
Denise Dougherty, Senior Associate
Jill Eden, Senior Analyst
Hellen Gelband, Senior Associate
Michael Gluck Senior Analyst
Marion Grochowski, Secretary
Maria Hewit, Senior Analyst
Katie Maslow, Senior Analyst
Robert McDonough, Senior Analyst
Elizabeth Molitor, Research Assistant
Eileen Murphy, PC Specialist
Elaine Power, Senior Analyst
Judith Wagner, Senior Associate
Leah Wolfe, Research Analyst
OTA Staff as of September 1991

SCIENCE, INFORMATION, AND NATURAL RESOURCES DIVISION
John Andelin, Assistant Director
Christopher Clary, Division Assistant

Oceans and Environment Program
Robert Niblock, Program Manager
Kathleen Beil, Office Administrator
Rosina Bierbaum, Senior Associate
Robert Friedman, Senior Associate
Emilia Govan, Senior Analyst
Joan Harn, Senior Analyst
Peter Johnson, Senior Associate
Howard Levenson, Senior Associate
Tara O'Toole, Senior Analyst
German Reyes, Analyst
Beth Robinson, Analyst
Sally Van Aller, Administrative Secretary
William Westermeyer, Senior Analyst

Science, Education, and Transportation Program
Nancy Carson, Program Manager
Jonathan Atkin, Analyst
Daryl Chubin, Senior Associate
Tamara Czernanski, Administrative Secretary
Kevin Doherty, Senior Analyst
Marsha Fenn, Office Administrator
Michael Feuer, Senior Analyst
Kathleen Fulton, Senior Analyst
Guy Jackson, PC Specialist
Edith Page, Senior Associate
Linda Roberts, Senior Associate

Telecommunication and Computing Technologies Program
James Carlin, Program Manager
Karen Bandy, Senior Analyst
Alan Burzaco, Analyst
Vary Coates, Senior Associate
Elizabeth Emanuel, Office Administrator
Linda Garcia, Senior Analyst
Karolyn St. Clair, PC Specialist
Joan Winston, Senior Analyst
Fred Wood, Senior Associate
David Wye, Analyst
Jo Anne Young, Secretary

OPERATIONS DIVISION
Bart McGarry, Operations Manager

Finance and Administrative Services
Claude Bowes, Director, Finance and Administrative Services
Diann Hoehnther, Contract Specialist

Oceans and Environment Program

Biology, physiology, zoology, pharmacology and chemistry (7)

Medicine and public health (5)

Public administration, international affairs, and industrial relations (8)

Communications, journalism, and library science (7)

Law (9)

Economics and business (12)

Physics (10)

Ecology, environmental sciences, geology, energy, resource management, and geography (9)

OTA is composed of 143 permanent staff members of which 75 percent are analytical and 25 percent are administrative.

Budget and Finance
Carolyn Harris, Budget and Finance Officer
Carolyn Datcher, Senior Accounting Technician
Frances Hemingway, Senior Finance Analyst
Carrie Miller, Accounting Technician

Information Management and Publishing Services
Martha Dexter, Director, Information Management and Publishing Services
Debra Datcher, Information Marketing Officer
Publishing Office
Katie S. Boss, Manager, Publishing Services
Dorinda Edmondson, Electronic Publishing Specialist
J. Christine Orubua, Graphic Designer/Illustrator

Telecommunications and Information Systems
Sylvester Boyd, Manager, Telecommunications and Information Systems
Larry Bond, Senior Systems Analyst
Mary Beth Breitbach, Systems Support Specialist
Darcel Copeland, Software-e Systems Specialist
Brenda Hahn, Systems Support Analyst
Philip Jackson, Senior Systems Integrator

Information Center
Gail Kouril, Manager, Information Services
Debra McCurry, Information Specialist
Linda Trout, Reference Librarian
Keith West, Information Technician

Personnel Office
William Norris, Personnel Director
Lola Crew, Personnel Specialist
Laura Ellinger, Administrative Assistant

Medical Services
Janet Hammond
Information Technology and OTA

The Office of Technology Assessment is an information resource for Congress. Within OTA itself, information management and technology are a high priority in gathering information, analyzing it, and producing high-quality reports for the Congress. In FY1991, OTA emphasized the importance of information management by reorganizing the Operations Division to include a group, Information Management and Publishing Services, which combines the Telecommunications and Information Systems office, the Information Center, the Publishing Office, and the Information Marketing office. The group is responsible for office automation support, information retrieval and research services, publishing services, and dissemination of OTA information and products.

The introduction of microcomputer technology in office systems has dramatically affected the quality and productivity of OTA. Since the first personal computer was purchased in 1984, the number of publications produced by OTA has increased from an average of 35 in 1984 to an average of 45-50 in 1991. Gradually, each OTA staff workstation was equipped with a personal computer and a local area network was established. The advantages this system has brought include more efficient communication of information within the agency, higher productivity for research staff, a higher proportion of research staff to support staff, and streamlined publishing services.

Information technology in OTA also includes sophisticated use of information retrieval technology, including online access to research databases from each workstation and research use of CD-ROM databases in the Information Center. In FY1991, OTA gained access for each workstation to the Internet international research network, advancing our abilities to communicate with the research community worldwide.

Looking to the future, OTA will continue to explore the leading edge of information technology for improvements in our own productivity and dissemination of information. Electronic delivery of OTA publications via online information systems and international research networks is currently being explored. Advanced systems for transfer of information and communication within the legislative branch are in the planning stages with the coordination of offices and agencies across Capitol Hill. OTA does more than assess technology—the application of new technologies in producing high-quality, cost-efficient information for the Congress is a top priority.
Energy and Materials Program

ENERGY, TECHNOLOGY AND THE ENVIRONMENT IN DEVELOPING COUNTRIES ADVISORY PANEL

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Executive Director
Critical Languages & Area Studies Consortium

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Department of Agriculture and Resource Economics
University of California, Berkeley

Jeffrey Anderson
Director
Comparative Country Analysis Institute of International Finance

Edward S. Ayensu
President
Pan-African Union for Science & Technology

Mohamed T El-Ashry
Director of Environment
World Bank

R.K. Pachauri
Director
Data Energy Research Institute

D. Lou Peoples
Senior Vice President
RCG/Hagler, Bailly, Inc.

Gabriel Sanchez-Sicna
Executive Director
OLADE

Kirk R. Smith
Program Coordinator
Risk, Resources, & Development Environment & Policy Institute

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Director
Research and Development Dow Chemical Co.

Thomas B Stool, Jr
Private Consultant

Lu Yingzhong
Professor
Professional Analysis Inc.

Montague Yudelman
Senior Fellow
World Wildlife Fund and The Conservation Foundation

Jack W. Wilkinson
Chief Economist & Director
International Economics

Mason Wilrich
Senior Vice President
Corporate Planning and Information Systems

Daniel A. Dreyfus
Vice President
Strategic Analysis & Energy Forecasts

Frederick J. Ellart
Consultant

David Lee Kulp
Manager
Econ Integ Economy Planning & Compliance
Ford Motor Co.

Jessica Mathews
Vice President and Director of Research
World Resources Institute

Edwin Rothschild
Citizen Action
Citizen/Labor Energy Coalition

Maxine Savitz
Director

Daniel A. Dreyfus
Vice President
Strategic Analysis & Energy Forecasts

Gas Research Institute

Frederick J. Ellart
Consultant

David Lee Kulp
Manager
Econ Integ Economy Planning & Compliance
Ford Motor Co.

Jessica Mathews
Vice President and Director of Research
World Resources Institute

Edwin Rothschild
Citizen Action
Citizen/Labor Energy Coalition

Maxine Savitz
Director

MATERIALS TECHNOLOGY: INTEGRATING ENVIRONMENTAL GOALS WITH PRODUCT DESIGN ADVISORY PANEL

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Associate Head
Department of Engineering and Public Policy
Carnegie Mellon University

Frank van den Akker
Head
Department of Environmental technology
Ministry of Housing, Physical Planning, and the Environment

The Netherlands

Harvey Alter
Manager
Resources Policy Department
U.S. Chamber of Commerce

David Chittick
Vice President
Environment and Safety Engineering
AT&T

*Affiliations are at time of appointment to panel or workshop.
Michael G. DeCata  
Manager  
Materials Management  
GE Plastics  

Michael A. Gallo  
Professor  
Environmental and Community Medicine  
University of Medicine & Dentistry of New Jersey  

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Commodities  
Institute of Scrap Recycling Industries  

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Chair and CEO  
(member Energy Foundation)  
Green Seal  

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Industrial Design Department  
Rhode Island School of Design  

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General Motors Corporation  

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Procter & Gamble Co.  

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Vanderbilt University  

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Office of Policy Planning  
New Jersey Department of Environmental Protection and Energy  

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Materials Modifications, Inc.  

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Hydrocarbons & Energy Department  
Dow Chemical  

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Pacific Gas and Electric Enterprise  

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The Alliance to Save Energy  

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President  
Strategic Performance Management  

LIFESTYLE AND PERSONAL ENERGY USE WORKSHOP  
OIL SUPPLY DISRUPTION OIL REPLACEMENT CAPABILITY WORKSHOP  

Industry, Technology, and Employment Program  

TECHNOLOGY AND ECONOMIC CONVERSION TO A PEACETIME ECONOMY ADVISORY PANEL  

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New York University  

Michael Borus  
Deputy Director  
Berkeley Roundtable on International Economics  
University of California  

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Leaders for Manufacturing  
Massachusetts Institute of Technology  

Charles Bradford  
Director  
Apprenticeship, Employment Training & Rehabilitation Programs  
International Association of Machinists and Aerospace Workers
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The MITRE Corp.

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Economics Department
New School of Social Research

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professor of Anthropology and Acting Chair
Department of Anthropology
Wayne State University

Wolfgang Demisch
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Director of Research
UBS Securities

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BM—Europe

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International & Associates Program
Microelectronics & Computer Technology Corp.

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Corporate Strategy
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Research Fellow
Institute for International Economics

Joseph A. Greenwald
Attorney/Consultant

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president
Kinectec Corp.

Peter Hall
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Government
Harvard University

F. William Hawley
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Governmental Relations for International Affairs
Citicorp

Sanford Kane
president & CEO
PCO, Inc.

Robert Kuttner
Economics Correspondent
The New Republic

Alek A. Mikolajczak
Vice President
Technology and New Business
Rohr Industries

Susan Pharr
professor of Government and Director
U.S.-Japan Relations Program
U.S. Japan Program—Harvard University

Margaret Sharp
Senior Research Fellow
Science Policy Research Unit
University of Sussex, East Sussex, England

Laura Tyson
Professor of Economics
Director of Research, BRIE
University of California, Berkeley

John D. Warner
Vice President
Engineering
Boeing Commercial Airplane Group

Stephen Woolcock
Fellow

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Senior Associate
Bill Usery Associates

Diego Asencio
Former Assistant Secretary of State
International Security and Commerce Program

INTERNATIONAL COLLABORATION IN DEFENSE TECHNOLOGY ADVISORY PANEL

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David M. Abshire
Chancellor
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Morton Bahr
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Hudson Institute

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Senior Vice President
The Analytic Sciences Corp.

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BG Raymond C. Preston (USAF/ret.)
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GE Aerospace

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James A. Tegnelia
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Martin Marietta Electronic and Missile Group

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SLI Avionic Systems

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J.F. Kennedy School of Government

Harvard University

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Vice President
Department General Manager, Strategic Business

and Technical Development

Douglas Aircraft Co.

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Caplin & Drysdale, Chartered

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Operations

Rockwell International Corp.

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Gordon Corlew
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Senior Vice President
The Analytic Sciences Corp.
Julius Harwood
Consultant
Harwood Consultant

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professor
Kennedy School of Government

P.X. Kelley
SMC (Ret)
Consultant

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President & CEO
Kingsbury Machine Tool Corp.

John Mearsheimer
professor
Department of Political Science
University of Chicago

Joseph Nye
Director
Center for International Affairs
Harvard University

Admiral Harry Train
Division Manager
Strategic Research & Management Services
Division
Science Applications International Corp.

Gen. John W. Vessey, Jr.
consultant

Albert D. Wheelon
Consultant

William J. Perry, Ex Officio
Chairman & CEO
Technology Strategies and Alliances

POLICE BODY ARMOR STANDARDS
AND TESTING ADVISORY PANEL

Lester B. Lave, Chair
Professor
Graduate School of Industrial Administration
Carnegie-Mellon University

George N. Austin, Jr.
National Officer & FOP Technical Advisor on Body Armor
Fraternal Order of Police, Poquoson, VA

Lane Bishop
Statistician
Center for Applied Mathematics
Allied-Signal, Inc.

Alfred Blumstein
Dean and J. Erik Johnson professor
School of Urban and Public Affairs
Carnegie Mellon University

Michael Bowman
Vice President & General Manager
Fibers Department
E.I. DuPont de Nemours Co., Inc.

Milton Brand
President
The Brand Consulting Group

James T. Curran
Professor
John Jay College of Criminal Justice
City University of New York

Donald R. Dunn
President
H.P. White Laboratory, Inc.

Martin L. Fackler
President
International Wound Ballistics Association

Michael A. Goldfarb
General Surgeon

Max Hemion
Member of the Technical Staff
Rockwell Science Center

David C. Hill
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Fibers Division
Allied-Signal, Inc.

Alexander J. Jason
Director
Center for Ballistic Analysis

Harlin R. McEwen
Chief
Ithaca New York Police Department

Issac Papier
Managing Editor
Burglary Detection & Signaling Department
Underwriters Laboratories, Inc.

Richard Stone
President
Point Blank Body Armor, Inc.

Dieter Wachter
Vice President of High-Performance Fabrication
Clark-Schwebel Fiberglass Corp.

Robert Wantz
President, PPA
Director of Domestic Safes
American Body Armor & Equipment CO.

TECHNOLOGIES FOR VERIFYING A
STRATEGIC ARMS REDUCTION
TREATY ADVISORY PANEL

Rodney W. Nichols, Chairman
Scholar-in-Residence
The Carnegie Corp. of New York

James R. Blackwell
Director, International Security Division
Meridian Corp.

Ashton Carter
Director
Center for Science & International Affairs
J.F. Kennedy School of Government
Harvard University

Sidney D. Drell
professor and Deputy Director
Stanford Linear ACC Center
THE USE OF TECHNOLOGY IN COUNTERING TERRORISM ADVISORY PANEL

Marvin Goldberger, Chairman
Director
Institute for Advanced Study

Peter F. Bahnson
Executive Vice President
MLI International, Ltd.

Terry Bearce
Manager
Program on Low Intensity Conflict
Los Alamos National Laboratory

Homer Boynton
Managing Director for Security
American Airlines

L. Paul Bremer
Managing Director
Kissinger Associates

Chris Chicles
Security Managing Consultant
C.H. Chicles & Associates

Arthur Donahue
President
Softworld, Inc.

Lee Grodzins
Professor
Physics Department
Massachusetts Institute of Technology

John (Chris) Hatcher
Professor
Department of Psychiatry
University of California San Francisco

Carolyn Inamura
Director of Planning & Programs
Pacific Basin Development Council

Wilfred (Bill) Jackson
Director of International Affairs Securities
Airport Operators Council International

Jim Jacobs
Director
Nuclear Security Systems
Sandia National Laboratory

Brian Jenkins
Managing Director
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Michael K. Johns
President
Johns & Bhatia Engineering Consultants, Ltd.

Donald Kerr
President
EG&G, Inc.

Joseph Krofcheck
President
Yarrow Associates

Robert Kupperman
Senior Advisor
Center for Strategic & International Studies

Joshua Lederberg
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Richard Porter
Consultant

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Senior Vice President
Aerospace Services International, Inc.

Stanley Weiner
Professor of Internal Medicine
University of Illinois, Chicago

WORKSHOP ON DEFENSE INDUSTRIAL BASE DATA

WORKSHOP ON THE ROBOTIC EXPLORATION OF MOON AND MARS

Biological Applications Program

BIOTECHNOLOGY IN A GLOBAL ECONOMY ADVISORY PANEL

Robert Reich, Chairman
Lecturer in Public Policy
John F. Kennedy School of Government
Harvard University

Alberto Adam
Vice President, Agricultural Division
American Cyanamid Co.

Brian Ager
Director
Senior Advisory Group on Biotechnology, Brussels

Robert H. Benson, Esq.
Genentech Inc.

Stephen A. Bent, Esq.
Foley, Lardner, and Schwartz

Sarah Sheaf Cabot
Director of Corporate Technology Affairs
Centocor, Inc.
Jerry Caulder  
President and Chief Executive Officer  
Mycogen Corp.

Peter Drake  
Executive Vice President and Director of Equity Research  
Vector Securities

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The Conservation Foundation

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President  
Asm/Pacific Bioventures Co.

Dennis Longstreet  
President  
Ortho Biotech

Kenneth J. Macek  
president  
TMS Management

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Technology Licensing Officer  
Massachusetts Institute of Technology

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Director of the Research Division  
Central Research and Development Department  
DuPont Experimental Station

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Chairman and Chief Executive Officer  
Transgenic Sciences, Inc.

Donna M. Tanguay, Esq.  
Partner  
William, Brinks, Olds, Hofer, Gilson & Lione

William J. Walsh  
Executive Vice President and Chairman  
Currents International, Inc.

Thomas C. Wiegele*  
Director, Program for Biosocial Research  
Northern Illinois University

W. Wayne Withers, Esq.  
Senior Vice president and General Counsel  
Emerson Electric

*Deceased

CYSTIC FIBROSIS ADVISORY PANEL

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Professor  
Howard Hughes Medical Institute  
Baylor College of Medicine

Debra L. Collins  
Genetic Counselor  
University of Kansas Medical Center

Jessica G. Davis  
Co-Director  
Genetics Department  
New York Hospital

Beth A. Fine  
Genetic Counselor/Clinical Instructor  
Section of Reproductive Genetics  
Northwestern University Medical School

Lynn D. Flessher  
Attorney  
Sidley & Austin

Clark C. Havighurst  
William Neal Reynolds Professor of Law  
School of Law  
Duke University

John Z. Jacoby, III  
Clinical Assistant  
The Cystic Fibrosis Center  
St. Vincent’s Hospital and Medical Center

Angele Khachdour  
General Counsel  
Hastings College of Law

Katherine W. Klinger  
Vice President, Science  
Integrated Genetics

Arthur Lifson  
Vice president  
Health Management Services

CIGNA Companies

Robert F. Murray, Jr.  
Professor  
Department of Pediatrics and Child Health  
College of Medicine-Howard University

Mark Pauly  
Executive Director  
Leonard Davis Institute of Health Economics  
Wharton School—University of Pennsylvania

Susan Poling  
Parent

Thomas K. Reed, Jr.  
Chairman  
Vivigen Inc.

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President  
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Joseph D. Schulman  
Director  
Genetics & IVF Institute

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Special Advisor to the president  
Carnegie Corp. of New York

Judy Hayes Bernhardt  
professor and Department Chair  
Community and Mental Health Nursing  
East Carolina University

Patricia A. Buffler  
professor  
School of Public Health  
University of Texas, Houston

Martin G. Chemiack  
Director, Occupational Health Center  
Lawrence and Memorial Hospital

Kurt R. Fenolio  
Genetic Counselor  
California Pacific Medical Center

Theodore Friedmann  
Professor, School of Medicine  
University of California, San Diego

Elizabeth Grisch  
Senior Occupational Health Physician  
The Dow Chemical Co.

Bruce W. Karth  
Vice President  
Safety, Health and Environmental Affairs  
E.I. du Pont de Nemours & Co.

Marvin S. Legator  
Professor  
Division of Environmental Toxicology  
UTMB-Galveston

Lewis L. Maltby  
Director  
National Task Force on Civil Liberties in the Workplace
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Peter S. Spencer, Chairman
Professor of Neuroscience
Center for Occupational Disease Research
Vellum Institute for Advanced Biomedical Research
Oregon Health Sciences University
Robert H. Blank
Professor and Associate Director
Social Science Research Institute
Northern Illinois University
J. Robert Carr
Special Assistant to the Vice President for Administration
Howard University

Mary A. Carskadon
Director of Chronobiology
Emma P. Bradley Hospital
James F. Childress
Commonwealth Professor of Religious Studies
Department of Religious Studies
University of Virginia
Charles A. Creesler
Director
Center for Design of Industrial Schedules
Patricia J. DeCoursey
Professor
Department of Biology
University of South Carolina, Columbia
David F. Dinges
Co-Director
Unit for Experimental Psychiatry
The Institute of Pennsylvania Hospital
Fred H. Gage
Professor
Department of Neuroscience, School of Medicine
University of California, San Diego
Michael S. Gazzaniga
Director, Program in Cognitive Neuroscience
Department of Psychiatry
Dartmouth Medical School
Bernice Grafstein
Vincent & Brooke Astor Professor of Neuroscience
Department of Physiology
School of Medicine, Cornell University
James T. Havel
Associate Director
Mental Health Policy Resource Center, Inc.
Ronald Kartzinel
Vice President for Central Nervous System Development
CIBA-Geigy Pharmaceuticals
Alan Kraut
Executive Director
American Psychological Society
David J. Kupfer
Director of Research
Western Psychiatric Institute and Clinic
Alfred J. Lewy
Director
Sleep and Mood Disorders Laboratory
The Oregon Health Sciences University
Ellen McGrath
Director
The Psychology Center

Laurene G. Mendelsohn
Research Scientist
Central Nervous System and Endocrine Research
Lilly Research Laboratories
Franklin E. Mirer
Director, Health and Safety Department
International Union, United Auto Workers
Albert S. Moraczewski
Regional Director
Pope John XXIII Medical-Moral Research and Education Center
Marion Moses
Physician-Private Practice
John L. O’Donoghue
Director
Toxilogical Sciences Laboratory
Health and Environment Laboratories
Eastman Kodak Co.
Herbert Pardes
Professor and Chairman
Department of Psychiatry
Columbia University
Richard M. Restak
Physician-Private Practice
Neil J. Risch
Associate Professor
Department of Epidemiology and Public Health
Yale University School of Medicine
Sara-Arm Steber
Director of the Technical Assistance Education Center
Department of Psychiatry
University of Pennsylvania
Alan A. Stone
Touroff-Glueck Professor of Law and Psychiatry
in the Faculty of Law and Faculty of Medicine
Harvard University
Harvard Law School
Fred W. Turek
Professor and Chairman
Department of Neurobiology and Physiology
Northwestern University
David B. Wexler
John D. Lyons Professor of Law
College of Law
University of Arizona
Frank White
Attorney
Jones, Day, Reavis & Pogue
David Taiwai Wong
Research Advisor
Lilly Research Laboratories
Eli Lilly and Co.
WORKSHOP ON CYSTIC FIBROSIS, GENETIC SCREENING AND INSURANCE

WORKSHOP ON CYSTIC FIBROSIS, GENETIC SCREENING AND SELF-INSURANCE UNDER ERISA

WORKSHOP ON HORMONE REPLACEMENT THERAPY

WORKSHOP ON PULMONARY TOXICANTS

Food and Renewable Resources Program

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Professor
Department of Agricultural Economics
Virginia Polytechnic Institute

John Abernathy
Resident Director of Research
Agricultural Research and Extension Center
Texas A & M University

Donald Davick
Vice president of Research
Pioneer Hi-Bred International, Inc.

Richard S. Fawcett
Associate Professor, Department of Agronomy
Iowa State University

Scott Ferguson
Vice President/General Counsel
National Agricultural Chemicals Association

Roger Gold
Coordinator, Environmental programs
Institute of Agriculture and Natural Resources
University of Nebraska

George Hallberg
Chief, Geological Studies
Geological Survey Bureau
Iowa State Department of Natural Resources

Joseph Harkins
Director, Water Office
State of Kansas

Roland Hauck
Senior Soil Scientist
Agriculture Research Department
National Fertilizer Development Center
Tennessee Valley Authority

Dennis Keeney
Director
The Leopold Center for Sustainable Agriculture
Iowa State University

Bobby McKown
Executive Vice President
Florida Citrus Mutual

Robert H. Miller
Director, Soil Science Department
North Carolina State University

Peter Nowak
Professor, Department of Rural Sociology
University of Wisconsin

Donna Pratt
Chairman, Natural Resources
Women Involved in Farm Economics

Carl Pulvermacher
Farmer
Consultant

Richard Rominger
Farmer
Consultant

Velma Smith
Project Director, Groundwater Protection
Environmental Policy Institute

Ford West
Vice President for Government Relations
The Fertilizer Institute

I. Garth Youngberg
Executive Director
Institute for Alternative Agriculture

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J. Baird Callicott
Professor
Department of Philosophy
University of Wisconsin-Steven Point

Faith Campbell
Senior Scientist
Natural Resources Defense Council

James Carlton
Director
Maritime Studies program
Williams College-Mystic Seaport

Alfred Crosby
Professor
Department of American Studies
University of Texas

Les Ehler
Professor
Department of Entomology
University of California-Davis

William Flemer, III
President
Wm. Flemer’s Son’s, Inc.
Princeton Nurseries

John Grandy
Vice President
Wildlife & Habitat protection
Humane Society of the U.S.

William B. Kovalak
Supervisor
Environmental & Regulatory Compliance
Detroit Edison Company

Jack Lattin
Curator of the Museum
Entomology Museum
Oregon State University-Corvallis

Joseph P. McCraren
Executive Director
National Aqua Culture Association

Robert Morris
Resource Manager
Western Division
Louisiana Pacific

Marshall Myers
General Council
Pet Industry Joint Advisory Council

Philip Regal
Professor
Department of Ecology & Behavioral Biology
University of Minnesota

Katherine H. Rechelderfer
Senior Fellow & Director
National Center for Food Resource for the Future

Rudolph Rosen
Director of Wildlife
Parks and Wildlife Department
State of Texas

Don Schmitz
Biological Scientist
Bureau of Aquatic Plant Management
Florida Department of Natural Resources

Jerry Scribner
Attorney-at-Law
Howard M. Singletary, Jr.
Director
Plant Industry Division
North Carolina Department of Agriculture

Clifford W. Smith
Director, Cooperative Park Study Unit
Department of National Parks
University of Hawaii, Manoa

Reggie Wyckoff
consultant

U.S. FOREST SERVICE PLANNING TECHNOLOGIES ADVISORY PANEL

Hannah Cortner, Chairman
Associate Director
Water Resources Research Center
University of Arizona

Clark Collins
Executive Director
Blue Ribbon Coalition

Richard Collins
Professor
School of Architecture
University of Virginia, Charlottesville

Dennis Dykstra
Professor of Forestry
School of Forestry
North Arizona University, Flagstaff

Paul Ellefson
Professor
Department of Forest Resources
University of Minnesota St. Paul

Jerry Franklin
Bloedel Professor of Ecosystem Analysis
College of Forestry
University of Washington

George T. Hamilton
consultant
Recreation Resources Management CO.

Willard Hamilton
Coordinator
Timber Resource Policy
Potlatch Corp.

Betty Huskins
Vice President
Ridgetop Associates

Lawrence R. Jahn
President
Wildlife Management Institute

Andy Kerr
Director
Conservation & Education
Oregon Natural Resource Council

Dennis LaMaster
Professor
Department of Forestry & Natural Resources
Purdue University

William S. Platt
Fisheries Consultant
Don Chapman Associates

Robert Ragon
Executive Vice President
Sun Stads, Inc.

Gerald Rose
Director/State Forester
Division of Forestry
Minnesota State Department of Natural Resources

R. Neil Sampson
Executive Vice President
American Forestry Association, Maitland

S. Sharpe
Conservation Director
Izaak Walton League of America

Maynard Smith
president
Smith 6-S Livestock

Gaylord L. Stavel
President
National Forest Recreation Association

Louisa Willcox
Policy Director
Greater Yellowstone Coalition

A. Milton Whiting
chairman & President
Kaibab Industries, Inc.

WORKSHOP ON COCA CROP SUBSTITUTION

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ADOLESCENT HEALTH ADVISORY PANEL

Felton Earls, Chairman
Professor
Department of Behavioral Sciences
Harvard School of Public Health

Michael I. Cohen, Vice Chairman
chairman, Department of Pediatrics
Montefiore Hospital

Claire Brindis
Co-Director
Center for Population and Reproductive Health Policy
Institute for Health Policy Studies

Ann W. Burgess
van Ameringen Professor of Psychiatric Mental Health Nursing
University of Pennsylvania School of Nursing, Philadelphia

Delores L. Delaney
President
State of Virginia Parent Teacher Association

Abigail English
Staff Attorney
National Center for Youth Law

Jewelle Taylor Gibbs
Associate Professor, School of Social Welfare
University of California, Berkeley

Michel Graf
Director, Mental Health
Tanana Chiefs Conference, Inc.
Fairbanks, AK

David E. Hayes-Bautista
Professor, School of Medicine
Director, Chicano Studies Research Center
University of California, Los Angeles

Karen Hein
Associate Professor, Adolescent Medicine
Division of Pediatrics
Albert Einstein College of Medicine

Charles E. Irwin, Jr.
Director, Adolescent Medicine
Department of Pediatrics
University of California School of Medicine, San Francisco

Robert Johnson
Associate Professor, Adolescent Health
Department of Pediatrics
New Jersey Medical School, Newark

Alan Kazdin
Professor, Department of Psychology
Yale University

Teresa LaFromboise
Assistant Professor, School of Education
Stanford University

Mary Nell Lehnharl
Vice President
Office of Government Relations
Blue Cross & Blue Shield Association

Barbara D. Matula
Director, Division of Medical Assistance
State of North Carolina Department of Human Resources

Robert B. Millman
Director, Adolescent Development Program
Cornell University Medical College
New York Hospital

Daniel Offer
Director, Center for Study of Adolescence
Michael Reese Hospital Medical Center, Chicago
Leticia Paez  
Associate Director, Area Health Education Center  
Texas Technical University  
School of Medicine, El Paso

Cheryl Perry  
Associate Professor, Division of Epidemiology  
School of Public Health  
University of Minnesota

Anne C. Petersen  
Dean  
College of Health and Human Development  
Pennsylvania State University

Lee Etta Powell  
Superintendent of Schools  
State of Ohio

Bernard Mirkin  
Head & Director of Research  
Children’s Memorial Institute for Education  
Northwestern University Medical School

Mary Ellen Mortensen  
Assistant Professor-Pharmacy & Toxicology  
Columbus Children’s Hospital  
Ohio State University, Columbus

Robert Neimeth  
President  
Pfizer International, Inc.

Mark Novitch  
Executive Vice President  
Upjohn Pharmaceutical Corp.

Johanna F. Perlmutter  
Head  
Division of Human Sexuality  
Beth Israel Hospital

Michael Reich  
Associate Professor  
Harvard School of Public Health

Regina Rowan  
Chair, Pharmaceutical Workgroup  
Interfaith Center on Corporate Responsibility

Albert Wertheimer  
Professor  
Philadelphia College of Pharmacy

Sidney Wolfe  
Director  
Public Citizen Health Research Group

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Partner  
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President  
AERG

Joseph Cook  
Director  
Program for Tropical Disease Research  
Edna McConnell Clark Foundation

Enrique Fefer  
Regional Advisor  
Essential Drugs Program  
Patt American Health Organization

Paula Fujiwara  
Clinical Instructor  
Department of Internal Medicine  
University of California-San Francisco

Harris Gleckman  
Research Officer  
Centre on Translational Corporations  
United Nations

Keith Johnson  
Director of Drug Information  
United States Pharmacopeia

William S. Merkin  
Senior Vice President  
Strategic Policy, Inc.

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EGS Partners

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Legislative Director  
Consumer Federation of America

Jeffrey Levi  
Consultant  
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Amgen Inc.

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Vice President for Pharmaceutical Research  
(retired)  
Upjohn Co.

Peter Baddett  
Director  
Department of Health Services Administration  
George Washington University

Alexander M. Capron  
Bruce University Prof. of Law & Medicine  
The Law Center  
The University of Southern California–Los Angeles

GOVERNMENT POLICIES AND PHARMACEUTICAL RESEARCH AND DEVELOPMENT ADVISORY PANEL

Frederick M. Scherer, Chairman  
Professor of Economics  
John F. Kennedy School of Government  
Harvard University

Jerome Avorn  
Associate Professor  
Program for Analysis of Clinical Strategies  
Harvard Medical School

Martin Neil Baily  
Professor  
Department of Economics  
University of Maryland, College Park

William S. Comanor  
Professor  
Department of Economics  
University of California, Santa Barbara

Oregon Medicaid Proposal Advisory Panel

Peter Baddett  
Director  
Department of Health Services Administration  
George Washington University

Alexander M. Capron  
Bruce University Prof. of Law & Medicine  
The Law Center  
The University of Southern California–Los Angeles
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ADVISORY PANEL

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John A. Creighton Professor
Creighton University

Steven R. Cummings
Research Director
Division of General Internal Medicine
University of California, College of Medicine

Barbara L. Drinkwater
Research Physiologist
Department of Medicine
Pacific Medical Center

Deborah T. Gold
Assistant Professor of Medical Sociology
Center for Study of Aging & Human Development
Duke University

Caren Marie Gundberg
Assistant Professor
Department of Orthopedics
Yale University School of Medicine

Sylvia Houghland
Associate Director
Laboratory for Clinical Computing

C. Conrad Johnston, Jr.
Director
Division of Endocrinology and Metabolism
Indiana University School of Medicine

Shiriki K. Kumanyika
Associate Professor of Nutritional Epidemiology
College of Health and Human Development
Pennsylvania State University

Edward O. Lamphier, II
President & CEO
BioGrowth, Inc.
CASE MANAGEMENT WORKSHOP
HIV TRANSMISSION IN THE HEALTH CARE WORKPLACE WORKSHOP
HOME DRUG INFUSION THERAPY UNDER MEDICARE WORKSHOP
Telecommunications and Computing Technologies Program

HIGH PERFORMANCE COMPUTING: Networking FOR SCIENCE ADVISORY PANEL

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Georgia Institute of Technology

Charles Bender
Director
Ohio Supercomputer Center

Charles DeLisi
Chairman
Department of Biomathematical Science
Mount Sinai School of Medicine

Deborah Estrin
Assistant Professor
Computer Science Department
University of Southern California, Los Angeles

Robert Ewald
Vice President, Software
Cray Research

Kenneth Flamm
Senior Fellow
The Brookings Institution

Malcolm Getz
Associate Provost
Information Services & Technology
Vanderbilt University

Ira Goldstein
Vice President, Research Department
Open Software Foundation

Robert E. Kraut
Manager
Interpersonal Communications Group
Bell Communications Research

Lawrence Landweber
Chairman, Computer Science Department
University of Wisconsin, Madison

Carl Ledbetter
President
ETA Systems

Donald Marsh
Vice President, Technology Division
Contel Corp.

Michael J. McGill
Vice President
Technical Assessment & Development
On-Line Computer Library Center, Inc.

Kenneth W. Neves
Manager
Research and Development Program
Boeing Computer Services

Bernard O’Lear
Manager of Systems
Scientific Computer Division
National Center for Atmospheric Research

William Poduska
Chairman of the Board
Stellar Computer, Inc.

Elaine Rich
Director, Artificial Intelligence Lab
Microelectronics & Computer Technology Corp.

Sharon J. Rogers
University Librarian, Gelman Library
The George Washington University

William Schrader
President
New York State Educational Research Network

Ken Toy
Scientist
 Scripps Institution of Oceanography

Keith Uncapher
Vice President
Corporation for the National Research Initiatives

Al Weiss
Vice President
Engineering & Scientific Computer Data Systems Division
IBM Corp.

RURAL AMERICA AT THE CROSSROADS: NETWORKING THE FUTURE ADVISORY PANEL

George Callhoun
Senior Vice President
International Mobile Machines Corp.

Lloyd Callihan
consultant

Don Dillman
Director
Social & Economic Sciences Research Center
Washington State University

Wilbur Hawkins
Executive Director
Lower Mississippi Delta Commission

Ronald L. Lehr
Commissioner
Colorado Public Utilities Commission

Karen Merrick
Mayor
Gutenberg, Iowa

Roger G. NoII
Professor
Department of Economics
Stanford University

Edwin Parker
President
Parker Telecommunications

Joseph Pelton
Director
Graduate Telecommunications Program
University of Colorado, Boulder

Richard Plunkett
President
Fairmont Cable Television

Everett Rogers
Annenberg School of Communications
University of Southern California

William Schaphorst
General Attorney
U.S. West Communications

Gail Garfield Schwartz
Commissioner
State of New York Public Services Commission

Sharon Strover
Assistant Professor
Department of Radio/TV/Film
University of Texas, Austin

Margaret Trevathan
Director
Calloway County Library

Arthur Tweeten
Anderson Chair for Agricultural Trade
Department of Agricultural Economics & Rural Sociology
Ohio State University

Dave Waldron
President
Electronic Marketing Resource Group

Keith N. Ware
Manager
Energy County Telephone Co.
COMPUTER SOFTWARE AND INTELLECTUAL PROPERTY:
MEETING THE CHALLENGES OF TECHNOLOGICAL CHANGE &
GLOBAL COMPETITION ADVISORY PANEL

Michael S. Mahoney, Chairman
Professor of History
Princeton University

F. Christian Byrnes
Vice President, Product Planning
Landmark Systems Corp.

Dana E. Cartwright III
Director
Academic Computing Service
Syracuse University

Bill Curtis
Director
Human Interface Laboratory
Microelectronics & Computer Technology Corp.

Randall Davis
Associate Director
Artificial Intelligence Laboratory
Massachusetts Institute of Technology

Walter J. Doherty
Computing Systems Department
IBM T.J. Watson Research

Carol Edwards
Director
Southern Coalition for Educational Equity

Nicholas A. Farmer
Director of Information Systems
chemical Abstracts Service

John Gage
Director of Science Office
Sun Research Labs

Morton David Goldberg
Partner
Schwab, Goldberg, Price, & Dannay

Robbie Hardy
Senior Principal
American Management Systems, Inc.

Mitchell D. Kapor
 chairman
ON Technology, Inc.

Ronald S. Laurie
Litigation Partner
Irrell & Manella

Clifford A. Lynch
Director
Library Automation
University of California, Oakland

Anita Mergener
Director
Kelly Services

Jerome H. Reichman
Professor of Law
School of Law
Vanderbilt University

Richard Rubinstein
Manager
Technology Assessment and Planning
Digital Equipment Corp.

Robert Schware
Senior Information Technology Specialist
The World Bank

Mary Shaw
Professor, Computer Science
Software Engineering Institute
Carnegie-Mellon University

WORKSHOP ON ACCESS TO NATIONAL RESEARCH AND EDUCATION NETWORK

WORKSHOP ON AUTOMATED FIREARM PURCHASER CHECKS

WORKSHOP ON COMPUTER SOFTWARE AND INTELLECTUAL PROPERTY

WORKSHOP ON DIGITAL LIBRARIES, ELECTRONIC PUBLISHING, AND INTELLECTUAL PROPERTY

WORKSHOP ON FBI FINGERPRINT IDENTIFICATION

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WORKSHOP ON PATENT, COPYRIGHT AND TRADE SECRET-PROTECTION FOR COMPUTER SOFTWARE

WORKSHOP ON SOFTWARE INTERFACES

Oceans and Environment Program

ADVISORY GROUP ON BUILDINGS

Fred Abel
Senior Economist
Office of Building Technologies
U.S. Department of Energy

Edward Baily
Vice President
Government and Industry Relations
Carrier Corp.

Douglas C. Bauer
Senior Vice President
ERC Environmental & Energy Services Co.

G.Z. Brown
Professor of Architecture
Department of Architecture
University of Oregon

William Chandler
Director, Advanced International Studies Unit
Battelle, Pacific Northwest Laboratories

Armond Cohen
Senior Attorney
Conservation Law Foundation

Drury Crowley
Senior Research Scientist
Pacific Northwest Laboratories

Daniel Dreyfus
Strategic Analysis/ Energy Forecasting
Gas Research Institute

Ezra Ehrenkranz
President
The Ehrenkranz Group

Dave Engel
Deputy Division Director
Technology and Research Division
U.S. Department Of Housing and Urban Development

Charles Field
Staff Vice President
National Association of Home Builders

Howard Geller
Associate Director
American Council for an Energy-Efficient Economy

Jim Gross
Deputy Director
Center for Building Technology
National Institute of Standards and Technology

Erik Hailes
Principal
Barakat & Chamberlain
Cheryl Harrington  
Commissioner  
Maine Public Utilities Commission  
Michael Joroff  
Director, Laboratory of Architecture and Planning  
Massachusetts Institute of Technology  
Henry Kelly  
Senior Associate  
Office of Technology Assessment  
David MacFadyen  
President  
NAHB National Research Center  
Ronald Morony  
Director, Innovative Technology and Research  
U.S. Department of Housing and Urban Development  
Brad W Oberg  
Program Manager  
New Systems Laboratory  
USC Corp.  
Bill Prindle  
Senior Program Manager  
Alliance to Save Energy  
Art Rosenfeld  
Director, Center for Building Science  
Lawrence Berkeley Laboratory  
John Scalzi  
Program Director, Structures and Building Systems  
National Science Foundation  
John Slattery  
Director of Research and Engineering  
The Ryland Group  
Peter Smellia  
Director, Geotechnical Board  
National Research Council  
Bill Stanbitz  
Manager Marketing Development  
Sylvania Corp/GTE  
Mary Tucker  
Acting Manager, Energy Program  
City of San Jose, CA  
Steven Winter  
President  
Steven Winter Associates, Inc.  
Richard Wright  
Director  
Center for Building Technology  
National Institute of Standards and Technology  
ADVISORY GROUP ON INDUSTRY  
John Barker  
Vice President, Energy Affairs  
ARMCO Inc.  
Deborah Blevis  
Executive Director  
International Institute for Energy Conservation  
Kenneth Burgess  
Vice President  
Dow Chemical Co.  
William Chandler  
Director, Advanced International Studies Unit  
Battelle, Pacific Northwest Laboratories  
Thomas J. Gross  
Director, improved Energy Productivity  
U.S. Department of Energy  
Hillard G. Huntington  
Senior Research Associate  
Energy Modeling Forum  
Stanford University  
Martin Klepper, Esq.  
Partner  
Skadden Arps  
Paul Leiby  
Economist  
Oak Ridge National Laboratory  
Alastair McKechnie  
Chief, Energy Efficiency and Strategy Unit  
Industry and Energy Department  
World Bank  
Jeremy Metz  
Director, Energy, Materials, and Technology  
American Paper Institute  
Steve Rayner  
Coordinator, Policy, Energy and Human Systems Analysis  
Center for Global Environmental Studies  
Oak Ridge National Laboratory  
Joe Roep  
Staff Scientist  
International Energy Agency  
Organization for Economic Cooperation & Development  
Marc Ross  
Professor  
Physics Department  
University of Michigan  
Irv Snyder  
Director, Research and Development  
Dow Chemical Co.  
Jack Vanderryn  
Agency Director for Energy and Natural Resources  
Bureau for Science and Technology  
U.S. Agency for International Development  
Ronald Wishart  
Vice President for Public Affairs  
Union Carbide Corp.  
James Wolf  
Executive Director  
Alliance to Save Energy  
Eric Young (retired)  
Vice President of Environment and Energy  
Environmental and Energy Department  
American Iron and Steel Institute  
ADVISORY GROUP ON ENERGY SUPPLY  
Stanley R. Bull  
Director, Solar Fuels Research Division  
Solar Energy Research Institute  
William Chandler  
Director, Advanced International Studies Unit  
Battelle, Pacific Northwest Laboratories  
David Choengold  
Bureau Director, Systems Planning  
Wisconsin Public Service Commission  
Joel Darmstadter  
Senior Associate  
Resources for the Future  
William Fulkerson  
Director, Energy Division  
Oak Ridge National Laboratory  
Michael German  
Senior Vice President  
American Gas Association  
Connie Holmes  
Senior Vice President for Policy Analysis  
National Coal Association  
Don Kash  
Director  
Science and Public Policy Program  
University of Oklahoma, Norman
Daniel Lashof  
Environmental Scientist  
Natural Resources Defense Council  

Doug McDonald  
Economist  
American Petroleum Institute  

Joan Ogden  
Research Professor  
Center for Environmental and Energy Studies  
Princeton University  

Rajat Sen  
Professional Senior Scientist  
 Battelle, Pacific Northwest Laboratories  

Fred Sissine  
Analyst, Science and Technology  
Congressional Research Service  

The Library of Congress  

Angelo Skalafuris  
President  
Modular Cogeneration Corp.  

Jim Sullivan  
Director, Office of Energy  
Bureau for Science and Technology  
U.S. Agency for International Development  

Alvin M. Weinberg  
Distinguished Fellow  
Institute for Energy Analysis  

Michael Greene  
Associate Director  
Board on Science and Technology in Development  
National Academy of Sciences  

Erik Helland-Hansen  
Principal Technical Advisor  
Bureau of program Policy and Evaluation  
United Nations Development Programme  

David Hijarad  
Senior Energy Advisor  
Office of Energy  
U.S. Agency for International Development  

Linda Ladis  
Director of programs  
U.S. Export Council for Renewable Energy  

Mark Levine  
Program Leader  
International Energy Studies  
Lawrence Berkeley Laboratory  

Frances Li  
Acting Director  
Office of Global change  
U.S. Department of State  

Janice Mazur  
Major Projects Officer  
U.S. Department of Commerce  

Mohan Munasinghe  
Division Chief  
Brazil Energy and Infrastructure Operations Division  

World Bank  

D. Lou Peoples  
Vice President & Manager of Marketing and Strategy  
Bechtel Power Corp.  

Paul Schwengels  
Senior Analyst  
Air Economics Branch  
U.S. Environmental Protection Agency  

Joseph Selik  
Director of Domestic Programs  
Volunteers in Technical Assistance  

James Sullivan  
Director, Office of Energy  
Bureau for Science and Technology  
U.S. Agency for International Development  

Franklin Tugwell  
Project Director, Biomass Energy  
Winrock International Institute for Agricultural Development  

Jack Vanderven  
Director, Energy and Natural Resources  
Bureau for Science and Technology  
U.S. Agency for International Development  

Frank Vukmanic  
Director, Office of Multilateral Development Banks  
U.S. Department of the Treasury  

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WORKSHOP ON MAGLEV AND TILTROTOR TRANSPORTATION: SYSTEM CONCEPTS, ECONOMIES, AND REGULATORY ISSUES
The Technology Assessment Act of 1972.

Public Law 92-484
92d Congress, H.R. 10243
October 13, 1972
An Act

To establish an Office of Technology Assessment for the Congress as an aid in the identification and consideration of existing and probable impacts of technological application; to amend the National Science Foundation Act of 1950; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Technology Assessment Act of 1972."

Findings and Declaration of Purpose

SEC. 2. The Congress hereby finds and declares that:

(a) As technology continues to change and expand rapidly, its applications are-
(1) large and growing in scale; and
(2) increasingly extensive, pervasive, and critical in their impact, beneficial and adverse, on the natural and social environment.

(b) Therefore, it is essential that, to the fullest extent possible, the consequences of technological applications be anticipated, understood, and considered in determination of public policy on existing and emerging national problems.

(c) The Congress further finds that:
(1) the Federal agencies presently responsible directly to the Congress are not designed to provide the legislative branch with adequate and timely information, independently developed, relating to the potential impact of technological applications, and
(2) the present mechanisms of the Congress do not and are not designed to provide the legislative branch with such information.

(d) Accordingly, it is necessary for the Congress to-
(1) equip itself with new and effective means for securing competent, unbiased information concerning the physical, biological, economic, social, and political effects of such applications; and
(2) utilize this information, whenever appropriate, as one factor in the legislative assessment of matters pending before the Congress, particularly in those instances where the Federal Government may be called upon to consider support for, or management or regulation of, technological application.
Establishment of the Office of Technology Assessment

SEC. 3. (a) In accordance with the findings and declaration of purpose in section 2, there is hereby created the Office of Technology Assessment (hereinafter referred to as the “Office”) which shall be within and responsible to the legislative branch of the Government.

(b) The Office shall consist of a Technology Assessment Board (hereinafter referred to as the ‘Board’) which shall formulate and promulgate the policies of the Office, and a Director who shall carry out such policies and administer the operations of the Office.

(c) The basic function of the Office shall be to provide early indications of the probable beneficial and adverse impacts of the applications of technology and to develop other coordinate information which may assist the Congress. In carrying out such function, the Office shall:

(1) identify existing or probable impacts of technology or technological programs;  
(2) where possible, ascertain cause-and-effect relationships;  
(3) identify alternative technological methods of implementing specific programs;  
(4) identify alternative programs for achieving requisite goals;  
(5) make estimates and comparisons of the impacts of alternative methods and programs;  
(6) present findings of completed analyses to the appropriate legislative authorities;  
(7) Identify areas where additional research or data collection is required to provide adequate support for the assessment and estimates described in paragraph (1) through (5) of this subsection; and

(8) undertake such additional associated activities as the appropriate authorities specified under subsection (d) may direct.

(d) Assessment activities undertaken by the Office may be initiated upon the request of:

(1) the chairman of any standing, special, or select committee of either House of the Congress, or of any joint committee of the Congress, acting for himself or at the request of the ranking minority member or a majority of the committee members;  
(2) the Board; or  
(3) the Director, In consultation with the Board.

(e) Assessments made by the Office, including Information, surveys, studies, reports, and findings related there to, shall be made available to the initiating committee or other appropriate committees of the Congress. In addition, any such information, surveys, studies, reports, and findings produced by the Office may be made available to the public except where-

(1) to do so would violate security statutes; or

(2) the Board considers it necessary or advisable to withhold such information in accordance with one or more of the numbered paragraphs in section 552(b) of title 5, United States Code.


Technology Assessment Board

Membership.

SEC. 4. (a) The Board shall consist of thirteen members as follows:

(1) six Members of the Senate, appointed by the President pro tempore of the Senate, three from the majority party and three from the minority party;

(2) six Members of the House of Representatives appointed by the Speaker of the House of Representatives, three from the majority party and three from the minority party; and

(3) the Director, who shall not be a voting member.

Vacancies.

(b) Vacancies in the membership of the Board shall not affect the power of the remaining members to execute the functions of the Board and shall be filled in the same manner as in the case of the original appointment.

Chairman and vice chairman.

(c) The Board shall select a chairman and a vice chairman from among its members at the beginning of each Congress. The vice chairman shall act in the place and stead of the chairman in the absence of the chairman. The chairmanship and the vice chairmanship shall alternate between the Senate and the House of Representatives with each Congress. The chairman during each, even numbered Congress shall be selected by the Members of the House of Representatives on the Board from among their number. The vice chairman during each Congress shall be chosen in the same manner from that House of Congress other than the House of Congress of which the chairman is a Member.

Meetings.

(d) The Board is authorized to sit and act at such places and times during the sessions, recesses, and adjourned periods of Congress, and upon a vote of a majority of its members, to require by subpoena or otherwise the attendance of such witnesses and the production of such books, papers, and documents, to administer such oaths and affirmations, to take such testimony, to procure such printing and binding, and to make such expenditure, as it deems advisable. The Board may make such rules respecting its organization and procedures as it deems necessary, except that no recommendation shall be reported from the Board unless a majority of the Board assent. Subpoenas may be issued over the signature of the chairman of the Board or of any voting member designated by him or by the Board, and maybe served by such person or persons as may be designated by such chairman or member. The chairman of the Board or any voting member thereof may administer oaths or affirmations to witnesses.

Director and Deputy Director

SEC. 5. (a) The Director of the Office of Technology Assessment shall be appointed by the Board and shall serve for a term of six years unless sooner removed by the Board. He shall receive basic pay at the rate provided for level III of the Executive Schedule under section 5314 of title 5, United States Code.

(b) In addition to the powers and duties vested in him by this Act, the Director shall exercise such powers and duties as may be delegated to him by the Board.
(c) The Director may appoint with the approval of the Board, a Deputy Director who shall perform such functions as the Director may prescribe and who shall be Acting Director during the absence or incapacity of the Director or in the event of a vacancy in the office of Director. The Deputy Director shall receive basic pay at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code.

(d) Neither the Director nor the Deputy Director shall engage in any other business, vocation, or employment than that of serving as such Director or Deputy Director, as the case may be; nor shall the Director or Deputy Director, except with the approval of the Board, hold any office in, or act in any capacity for, any organization, agency, or institution with which the Office makes any contractor other arrangement under this Act.

Authority

SEC. 6. (a) The Office shall have the authority, within the limits of available appropriations, to do all things necessary to carry out the provisions of this Act, including, but without being limited to, the authority to-

(1) make full use of competent personnel and organizations outside the Office, public or private, and form special ad hoc task forces or make other arrangements when appropriate;

(2) enter into contracts or other arrangements as may be necessary for the conduct of the work of the Office with any agency or instrumentality of the United States, with any State, territory, or possession or any political subdivision thereof, or with any person, firm, association, corporation, or educational institution, with or without reimbursement, without performance or other bonds, and without regard to section 3709 of the Revised Statutes (41 U.S.C. 5);

(3) make advance, progress, and other payments which relate to technology assessment without regard to the provisions of section 3648 of the Revised Statutes (31 U.S.C. 529);

(4) accept and utilize the services of voluntary and uncompensated personnel necessary for the conduct of the work of the Office and provide transportation and subsistence as authorized by section 5703 of title 5, United States Code, for persons serving without compensation;

(5) acquire by purchase, lease, loan, or gift, and hold and dispose of by sale, lease, or loan, real and personal property of all kinds necessary for or resulting from the exercise of authority granted by this Act; and

(6) prescribe such rules and regulations as it deems necessary governing the operation and organization of the Office.

(b) Contractors and other parties entering into contracts and other arrangements under this section which involve costs to the Government shall maintain such books and related records as will facilitate an effective audit in such detail and in such manner as shall be...
prescribed by the Office, and such books and records (and related documents and papers) shall be available to the Office and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination.

(c) The Office, in carrying out the provisions of this Act, shall not, itself, operate any laboratories, pilot plants, or test facilities.

(d) The Office is authorized to secure directly from any executive department or agency information, suggestions, estimates, statistics, and technical assistance for the purpose of carrying out its functions under this Act. Each such executive department or agency shall furnish the information, suggestions, estimates, statistics, and technical assistance directly to the Office upon its request.

(e) On request of the Office, the head of any executive department or agency may detail, with or without reimbursement, any of its personnel to assist the Office in carrying out its functions under this Act.

(f) The Director shall, in accordance with such policies as the Board shall prescribe, appoint and fix the compensation of such personnel as may be necessary to carry out the provisions of this Act.

Establishment of the Technology Assessment Advisory Council

SEC. 7. (a) The Office shall establish a Technology Assessment Advisory Council (hereinafter referred to as the “Council”). The Council shall be composed of the following twelve members:

(1) ten members from the public, to be appointed by the Board; who shall be persons eminent in one or more fields of the physical, biological, or social sciences or engineering or experienced in the administration of technological activities, or who may be judged qualified on the basis of contributions made to educational or public activities;

(2) the Comptroller General; and

(3) the Director of the Congressional Research Service of the Library of Congress.

(b) The Council, upon request by the Board, shall—

(1) review and make recommendations to the Board on activities undertaken by the Office or on the initiation thereof in accordance with section 3(d);

(2) review and make recommendations to the Board on the findings of any assessment made by or for the Office; and

(3) undertake such additional related tasks as the Board may direct.

(c) The Council, by majority vote, shall elect from its members appointed under subsection (a)(1) of this section a Chairman and a Vice Chairman, who shall serve for
such time and under such conditions as the Council may prescribe. In the absence of the Chairman, or in the event of his incapacity, the Vice Chairman shall act as Chairman.

(d) The term of office of each member of the Council appointed under subsection (a)(1) shall be four years except that any such member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term. No person shall be appointed a member of the Council under subsection (a)(1) more than twice. Terms of the members appointed under subsection (a)(1) shall be staggered so as to establish a rotating membership according to such method as the Board may devise.

(c)(1) The members of the Council other than those appointed under subsection (a)(1) shall receive no pay for their services as members of the Council, but shall be allowed necessary travel expenses (or, in the alternative, mileage for use of privately owned vehicles and per diem in lieu of subsistence at not to exceed the rate prescribed in sections 5702 and 5704 of title 5, United State Code), and other necessary expenses incurred by them in the performance of duties vested in the Council, without regard to the provisions of subchapter 1 of chapter 57 and section 5731 of title 5, United States Code, and regulations promulgated thereunder.

( 2 ) The members of the Council appointed under subsection (a)(1) shall receive compensation for each day engaged in the actual performance of duties vested in the Council at rates of pay not in excess of the daily equivalent of the highest rate of basic pay set forth in the General Schedule of section 5332(a) of title 5, United State Code, and in addition shall be reimbursed for travel, subsistence, and other necessary expenses in the manner provided for other members of the Council under paragraph (1) of this subsection.

SEC. 8. (a) To carry out the objectives of this Act, the Librarian of Congress is authorized to make available to the Office such services and assistance of the Congressional Research Service as may be appropriate and feasible.

(b) Such services and assistance made available to the Office shall include, but not be limited to, all of the services and assistance which the Congressional Reserch Service is otherwise authorized to provide to the Congress.

(c) Nothing in this section shall alter or modify any services or responsibilities, other than those Performed for the Office, which the Congressional Research Service under law peforms for or on behalf of the Congress. The Librarian is, however, authorized to establish within the Congressional Research Service such additional divisions, groups, or other organizational entities as may be necessary to carry out the purpose of this Act.
(d) Services and assistance made available to the Office by the Congressional Research Service in accordance with this section may be provided with or without reimbursement from funds of the Office, as agreed upon by the Board and the Librarian of Congress.

Utilization of the General Accounting Office

SEC. 9. (a) Financial and administrative services (including those related to budgeting, accounting, financial reporting, personnel, and procurement) and such other services as may be appropriate shall be provided the Office by the General Accounting Office.

(b) Such services and assistance to the Office shall include, but not be limited to, all of the services and assistance which the General Accounting Office is otherwise authorized to provide to the Congress.

(c) Nothing in this section shall alter or modify any services or responsibilities, other than those performed for the Office, which the General Accounting Office under law performs for or on behalf of the Congress.

(d) Services and assistance made available to the Office by the General Accounting Office in accordance with this section may be provided with or without reimbursement from funds of the Office, as agreed upon by the Board and the Comptroller General.

Coordination with the National Science Foundation

SEC. 10. (a) The Office shall maintain a continuing liaison with the National Science Foundation with respect to-

(1) grants and contracts formulated or activated by the Foundation which are for purpose of technology assessment; and

(2) the promotion of coordination in areas of technology assessment, and the avoidance of unnecessary duplication or overlapping of research activities in the development of technology assessment techniques and programs.

(b) Section 3(b) of the National Science Foundation Act of 1950, as amended (42 U.S.C. 1862(b)), is amended to read as follows:

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(b) The Foundation is authorized to initiate and support specific scientific activities in connection with matters relating to international cooperation, national security, and the effects of scientific applications upon society by making contracts or other arrangements (including grants, loans, and other forms of assistance) for the conduct of such activities. When initiated or supported pursuant to requests made by any other Federal department or agency, including the Office of Technology Assessment, such activities shall be financed whenever feasible from funds transferred to the Foundation by the requesting official as provided in section 14(g), and any such activities shall be unclassified and shall be identified by the Foundation as being undertaken at the request of the appropriate official.
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Annual Report
SEC. 11. The Office shall submit to the Congress an annual report which shall include, but
not be limited to an evaluation of technology assessment techniques and
identification, insofar as may be feasible, of technological areas and programs requiring
future analysis. Such report shall be submitted not later than March 15 of each year.

Appropriations
SEC. 12. (a) To enable the Office to carry out its powers and duties, there is hereby
authorized to be appropriated to the Office, out of any money in the Treasury not
otherwise appropriated, not to exceed $5,000,000 in the aggregate for the two fiscal years
ending June 30, 1973, and June 30, 1974, and thereafter such sums as may be necessary.

(b) Appropriations made pursuant to the authority provided in subsection (a) shall remain
available for obligation, for expenditure, or for obligation and expenditure for such
period or periods as may be specified in the Act making such appropriations.


LEGISLATIVE HISTORY:
HOUSE REPORTS: NO. 92-469 (Comm. on Science and Astronautics) and
No. 92-1436 (Comm. of Conference).
SENATE REPORT No. 92-1123 (Comm. on Rules and Administration).
CONGRESSIONAL RECORD, Vol. 118 (1972):
Feb. 8, considered and passed House.
Sept. 14, considered and passed Senate, amended.
Sept. 22, Senate agreed to conference report.
Oct. 4, House agreed to conference report.
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