

Government Should Improve Hiring, Keeping of Top Scientists, Report Says

The federal government should take additional steps to improve its ability to recruit and retain top researchers, concludes a report recently released by the Committee on Scientists and Engineers in the Federal Government of the National Research Council (NRC). The report, *Improving the Recruitment, Retention, and Utilization of Federal Scientists and Engineers*, also recommends fully implementing the Federal Employees Pay Comparability Act to provide federal agencies with greater flexibility in compensating employees.

Although federal agencies are having little difficulty hiring scientists and engineers, the report warns that the government's competitive advantage in this area, like the just-ending recession that spawned it, is probably only temporary. Over the next seven years, veteran federal researchers are expected to retire in higher numbers, while at the same time there is reason to believe that fewer young people will enter the scientific and engineering pipeline. When the economy becomes strong again, it is likely that the federal government will once more find itself competing with industry and academia to recruit high-level talent, the report says.

According to the committee, one of the government's first steps should be to fully implement the provisions of the Federal Employees Pay Comparability Act of 1990. Additional actions, however, such as creating a new federal pay system for senior researchers, should be taken to correct other civil service system problems that relate to scientists and engineers.

According to the report, the 1990 pay act could provide more pay flexibility for workers in geographically higher-pay areas and higher-pay occupations, as well as to those who perform better. One specific recommendation was that the Office of Personnel Management establish an office of personnel policy on scientists and engineers.

The rigidity of the federal personnel system has long created difficulties for the government in attracting and keeping specialized personnel. The pay act authorizes changes including indexed yearly pay adjustments, pay raises for certain localities, bonuses and incentives for critical positions, and the creation of special pay systems for hard-to-fill positions.

According to the report, issues that Congress and the executive branch need

to address are:

- Scientists having to give up research to take higher-paying management positions;
- Simplifying the position classification system, suiting appraisals to researchers, and linking pay to performance;
- The need to create support for professional training and education and for participation in professional associations;
- The need to create a new interagency committee, part of the president's Federal Coordinating Council for Science, Engineering, and Technology.

A copy of the report, *Improving the Recruitment, Retention, and Utilization of Federal Scientists and Engineers*, is available from the National Academy Press, 2101 Constitution Avenue NW, Washington, DC 20418; phone (202) 334-3313 or 1-800-624-6242.

NRC Studies Chemical Weapons Disposal

The National Research Council's (NRC) Committee on Alternative Chemical Demilitarization Technologies has released a report, *Alternative Technologies for the Destruction of Chemical Agents and Munitions*, that identifies several technologies of potential use in eliminating the U.S. stockpile of chemical agents and munitions. The report is a detailed study, outlining a number of requirements and considerations for use in such work. It makes no recommendations, however, about whether any of these technologies should be used to replace or supplement the Army's baseline technology.

Disassembly and incineration is the baseline technology the Army has been considering for the job of dismantling the nation's chemical arms stockpile. Chemical munitions and containers of chemical agents are separated into four different types of materials: agent, energetics, metal parts, and packing materials. Four separate furnaces, each equipped with an afterburner and a pollution-abatement system, are employed to burn the four types of materials.

A former NRC committee concluded in 1984 that incineration was a safe and effective method for destroying chemical weapons. The current committee supports this finding in a 1992 letter report. However, public concern about risks—to the environment and the population—of the incineration approach resulted in a growing interest in alternative disposal technologies. Congress has instructed the Army to provide a report on the matter by December 31, 1993. This report is the first step in that process.

Committee chair John P. Longwell said, "The committee found that there are many technologies that in various combinations could potentially be used to replace or augment incineration." An assessment as to whether these alternatives represent a significant improvement to safety and, therefore, warrant additional development costs still needs to be conducted, he said.

"One of the committee's most notable findings may be that gas storage and treatment technologies are available to further ensure that emissions resulting from chemical weapons destruction are nontoxic and capable of meeting all health and environmental requirements," Longwell said.

According to the report, a closed-system process would significantly reduce accidental toxic gas release, and allow storage for processed gases prior to chemical analysis. The tanks needed can be made adequate for storing any accidental release of vaporized agent from the destruction facility.

The committee studied a variety of alternative destruction processes, which can be grouped into several broad categories:

- High-temperature, low-pressure oxidation. Two variations from the baseline technology include toxic-gas combustion using a molten salt bed and combustion using a high-temperature bed of pulverized solids. These methods involve contact with high-temperature materials rather than open flame for chemical agent combustion.
- High-temperature, low-pressure pyrolysis. These processes use heat to destroy molecular bonds. Some of these processes can destroy or decontaminate all major stockpile components. These technologies include electrically heated ovens, molten metal reactors, and plasma arcs.
- Moderate-temperature, high-pressure oxidation. Two processes, wet-air oxidation and supercritical water oxidation can be used to treat all three principal agents in the U.S. stockpile (GB and VX nerve agents and mustards).
- Low-temperature, low-pressure, liquid-phase detoxification processes. Low-temperature chemical and biological treatment of nerve or mustard gas agents in liquid solution can reduce their toxicity. Chemical treatment with relatively low temperatures and pressures has been used for the nerve agent GB.
- Low-temperature, low-pressure, liquid-phase oxidation processes. These processes are being considered for further conversion of the detoxified waste to reduce other risks to the environment

and public health.

A copy of the report, *Alternative Technologies for the Destruction of Chemical Agents and Munitions*, is available from the National Academy Press, 2101 Constitution Avenue NW, Washington,

DC 20418; phone (202) 334-3313 or 1-800-624-6242.

ISF Opens Washington Office

The International Science Foundation (ISF), a New York-based charitable

organization established in December to support basic science in the former Soviet Union, has announced the opening of its Program Office in Washington, DC. Over the next two years, program activities will increasingly be shifted to the Foundation's Offices in Moscow and other locations in the nations formerly part of the U.S.S.R.

The bulk of the foundation's activity will be devoted to substantial awards to support research and education. Grants have been approved in the areas of long-term research (over half of ISF's resources), equipment (certain institutions may receive up to \$5,000), Soros professorships (more than 100 awards lasting five years), telecommunications (for greater information access to scientists and educational users), and libraries and journals (to support greater bulk shipment of scientific journals and greater institutional support for libraries and their staffs).

ISF's initial mandate is to allocate \$100 million to former Soviet Union countries within two years. While an initial program of emergency grants is over, organizers of international conferences may still apply to ISF for support for scientists to attend their conferences. Support consists of travel fees and a modest stipend for *in-situ* expenses. In addition, conference organizers must agree to waive all registration and attendance fees. Participation is limited to no more than 2% of the registered participants at the conference. This program is designed solely to support attendance at international conferences, and is not meant to support travel to joint meetings, working groups, or research-planning sessions. Funds will be allocated on a noncompetitive basis for as long as they are available. No individual will be eligible for more than one travel award in any calendar year. Interested parties may contact: Conference Travel Program, International Science Foundation, Suite 110, 1054 31st Street NW, Washington, DC 20007; phone (202) 342-2760; fax (202) 342-2765.

DOE Notes

DOE Undergoes Realignment

The Department of Energy (DOE) is to provide a restructured, more streamlined organization to meet the priorities of the Clinton administration. Hazel R. O'Leary, DOE secretary, said DOE plans to combine duplicative efforts, remove bureaucratic layers, and group organizations with like goals and missions together to work on common issues. Cross-cutting organizations—those offices that



No Frills



Incredibly Flexible



High Performance



Top of its Class

UTI's New DetecTorr™ RGA Is All This and Less ... Less Than \$10,000!

DetecTorr I (100 AMU) and DetecTorr II (200 AMU) have everything you need in a basic RGA. Operating simplicity: two key strokes and you're up and running. Unbeatable performance: 8-decade dynamic range. Full-feature software: spectrum scanning, trend analysis, calibration and more. Best of all, DetecTorr prices start under \$10,000. Call **1-800-428-9401** today and learn how much more you get for less with DetecTorr.



UTI Instruments Company, 2030-C Fortune Drive, San Jose, CA 95131
Tel 408-428-9400 Fax 408-428-0823

Circle No. 12 on Reader Service Card.

have functions that transcend organizational boundaries—report directly to the secretary and the deputy secretary.

The various energy programs—including energy efficiency and renewable energy, fossil energy, and nuclear energy—are now grouped together. The department's deputy secretary will head this area. The focus area will also include the power marketing administrations, the Energy Information Administration, and the Office of Civilian Radioactive Waste Management, responsible for wastes from commercial nuclear power plants.

Defense and cleanup programs are being grouped with science and technology programs; this area is headed by DOE's undersecretary. A major focus of this group will be DOE's continued role in maintaining the U.S. nuclear arsenal and other national security programs, as well as managing the task of environmental restoration at weapons-production facilities. This effort will bring together DOE's offices of Defense Programs, Intelligence and National Security, and Environmental Restoration and Waste Management.

DOE will emphasize the transfer of technologies from the national laboratories into "real-world" applications. This program will be carried out by the Office of Energy Research, the Office of Science Education and Technical Information, and the Office of Laboratory Management.

DOE's realignment also establishes an office of the associate deputy secretary for field management, to provide cohesion to the department's diverse field missions. This office will coordinate day-to-day activities for DOE field sites, resulting in the elimination of duplicative efforts.

Also, DOE is freezing salaries paid to DOE contractors for one year. The restructuring and salary freeze are expected to result in a \$1.5 billion savings over the next five years. Of this savings, \$1 billion is planned to go toward deficit reduction, \$300 million to DOE defense labs for technology transfer, and \$250 million to energy-efficiency programs.

DOE Plans Public-Private Partnerships for Renewable Energy Commercialization

The Department of Energy (DOE) has announced a series of public-private partnerships designed to advance the commercialization of renewable energy technologies. The budget request announced in early April includes a 30% increase for research and development in

renewable energy technologies. Initiatives include:

- A \$40-million, five-year program, cost-shared with industry, to develop solar cells that do double duty as building components. Proposals have been selected for negotiation from five companies (Advanced Photovoltaic Systems, Princeton, New Jersey; Delmarva Power and Light, Newark, Delaware; Energy Conversion Devices, Troy, Michigan; Fully Independent Residential Solar Technology, Hopewell, New Jersey; and Solar Design Associates, Harvard, Massachusetts). A primary goal of the program, called Building Opportunities in the U.S. for Photovoltaics (PV: BONUS), is to pave the way for widespread use of solar cells in homes and businesses.

- A cooperative agreement between DOE and a consortium led by Southern California Edison Company to develop an advanced central-receiver solar ther-

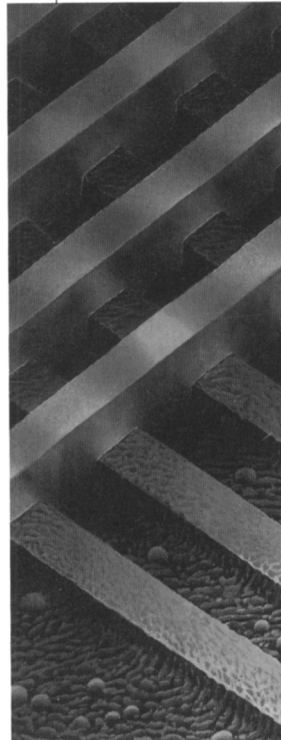
mal power plant with 10 million watts of power near Barstow, California. The \$40-million project, called Solar Two, will use molten salt in the receiver and as the storage mechanism, allowing electricity to be generated for several hours even when the sun is not shining.

- A federal/state/industry partnership to determine the feasibility of turning sugarcane residue and other biomass products into energy. Jointly funded by DOE and Hawaii, with contributions from industry, the project will include the construction of a Biomass Gasifier Facility on the island of Maui. The cost for Phase I of the project is \$9.2 million.

- A collaborative effort between DOE, the Edison Electric Institute, and the American Public Power Association, to provide technical assistance to utility companies that wish to develop solar water-heating programs as part of their services to consumers. □

Processing of Metals and Alloys

edited by R.W. Cahn



Volume 15 from the series **Materials Science and Technology** edited by R.W. Cahn, P. Haasen and E. Kramer

1991. XIV, 628 pages with 475 figures and 33 tables. Hardcover. \$ 325.00.
ISBN 0-89573-802-3

This volume focuses on the practical processing of metals and alloys, all chapters written by recognized experts in the field. Topics include: ● solidification processing ● powder metallurgy ● electrodeposition ● rapid solidification ● laser modification ● mechanical milling and alloying ● ion implantation ● epitaxy ● metallic multilayers ● recrystallization and recovery ● nanophase materials.

To order please contact your bookseller or:
VCH, 220 East 23rd Street, New York, NY 10010-4606, USA
(toll free: 1-800-367-8249)
VCH, P.O. Box 10 11 61, D-6940 Weinheim
VCH, Hardstrasse 10, P.O. Box, CH-4020 Basel
VCH, 8 Wellington Court, Cambridge CB1 1HZ, UK



Circle No. 13 on Reader Service Card.