

# **DEPARTMENT OF ENERGY**

## **Office of Nonproliferation and National Security**

The Department of Energy (DoE) has been actively involved in preventing proliferation of nuclear weapons technology and protecting nuclear material and facilities. The Department and its system of national laboratories have conducted a vigorous program of nonproliferation research and development with direct benefit to countering the threat of proliferation. The Department is the lead Federal Department which provides technological and analytical support to guard against the spread of nuclear weapons and weapons-usable materials. The DoE is a major participant in federal and international nonproliferation efforts.

The Office of Nonproliferation and National Security oversees the technical capabilities that support a core program of nuclear nonproliferation activities to support and develop advanced technologies that aid in detecting and countering emerging proliferation threats. A primary issue addressed by the ONNS is the question of the adequate security of the nuclear materials managed by Russia and the NIS. This security issue also pertains to terrorism and the possible theft of fissible materials.

The nonproliferation focus is five-fold: (1) secure nuclear materials in the former Soviet Union; (2) ensure safe secure, long-term storage and disposition of surplus fissile materials; (3) establish transparent and irreversible nuclear reductions; (4) strengthen the nuclear nonproliferation regime, and (5) control exports of nuclear technology and materials. The Office's active nuclear nonproliferation program is augmented by aggressive research and development activities, technical and analytical support to treaty development and implementation, and timely and customized intelligence to support these efforts.

### **Technical Accomplishments and Responsibilities**

The Office of Nonproliferation has completed development and deployment of space-based sensors capable of detecting atmospheric and near-Earth nuclear explosions. These sensors, on Defense Department satellites, provide a system for the United States to continuously detect nuclear explosions and verify treaty compliance world-wide.

Responsibility for research and development of technologies to support U.S. requirements to monitor a future Comprehensive Test Ban Treaty (CTBT) was transferred from the Department of Defense to the Department of Energy (specifically to the Office of Nonproliferation and National Security). Four of the National Laboratories -- Livermore, Los Alamos, Sandia, and Pacific Northwest - have been enlisted to develop technological options for verification of arms control policy.

The office provides technical expertise and policy recommendations in support of diplomatic efforts to achieve an indefinite extension of the Non-Proliferation Treaty, a cornerstone of U.S. national security policy. Efforts include development of overall strategy, initiatives for transparency and irreversibility (including placing excess materials under International Atomic Energy Agency safeguards), technical and analytical support to CTBT negotiations, and the establishment of nuclear technology programs designed to assist in the fulfillment of U.S. obligations for peaceful nuclear cooperation.

The office leads a program of cooperation between DoE laboratories and nuclear research facilities in Russia to improve the protection, control, and accounting of nuclear materials which could be used to make nuclear

weapons. A demonstration project was successfully undertaken to upgrade and enhance the protection of the Kurchatov Nuclear Research Center in Moscow during 1994.

In 1996, the office expects an acceleration of efforts to protect fissile materials and redirect nuclear expertise in the former Soviet Union to peaceful projects plus expand efforts to end the civilian production and use of weapons-usable fissile materials through promotion of alternative energy sources.

The Office of Nonproliferation and National Security's role in monitoring U.S. and Russian inventories of plutonium and highly enriched uranium from weapons dismantlement through inspections and other activities that make dismantlement transparent and irreversible will continue. Unique expertise in support of national and international nonproliferation policies is augmented by efforts to develop more effective, cost-efficient safeguards and security of the DoE complex.

### **Office of Energy Intelligence**

The Department of Energy's mission is to contribute to the welfare of the nation by providing the scientific foundation, technology, policy, and institutional leadership necessary to achieve efficiency in energy use, diversity in energy sources, a more productive and competitive economy, improved environmental quality, and a secure national defense.

The Department's foreign intelligence program is a component of the Intelligence Community. Its missions are to provide the Department and other U.S. government policymakers and decision-makers with timely, accurate, high-impact foreign intelligence analyses; to detect and defeat foreign intelligence services bent on acquiring sensitive information about the Department's programs, facilities, technology, and personnel; to provide technical and analytical support to the Director of Central Intelligence; and to make the Department's technical and analytical expertise available to other members of the Intelligence Community.

The Department traces its membership in the Intelligence Community to July 1947 when national leaders recognized that the Atomic Energy Commission (AEC) had an appropriate foreign intelligence role and authorized AEC representation on the Intelligence Advisory Board.

Following enactment of the National Security Act of 1947, the AEC's intelligence role was affirmed by the National Security Council Intelligence Directive No. 1 of 12 December, 1947. The Energy Reorganization Act of 1974 transferred the AEC's intelligence responsibilities to the Energy Research and Development Administration. They were subsequently transferred to the Department of Energy by the Department of Energy Organization Act of 1977.

Executive Order 12333 directs the Department to provide expert technical, analytical and research capability to the Intelligence Community; formulate intelligence collection and analysis requirements where the expert capability of the Department can contribute; produce and disseminate foreign intelligence necessary for the Secretary of Energy's responsibilities; and participate with the Department of State in overtly collecting information with respect to foreign energy matters. Substantive areas of the Department's intelligence responsibility include nuclear proliferation, nuclear weapons technology, fossil and nuclear energy, and science and technology. The Nuclear NonProliferation Act of 1978 greatly expanded the proliferation-related responsibilities assigned to the Department.

## **Energy Assessments Division**

The Science and Technology Team and Program supports senior DoE policy-makers, as well as top-level officials at other US government agencies, through the assessment of foreign civil and military technology plans, programs and priorities. Customized intelligence products -- prepared and sponsored by EAD analysts and DoE national laboratories as well as by other US intelligence agencies -- alert U.S. officials to the challenges the country will face from its technology competitors and to possible opportunities for technology cooperation and/or exports .

Customers include the Secretary, Deputy Secretary and Under Secretary of Energy as well as all DoE programmatic offices that conduct foreign science and technology agreements and interactions or promote and protect U.S. industry and its export opportunities: other non-programmatic offices, such as the Secretary's Energy Advisory Board; other senior U.S. officials at the White House Office on Science and Technology Policy, the Departments of Commerce, State and Defense and the U.S. Trade Representative's Office; and the intelligence community, primarily the National Intelligence Council.

The S&T program analysts provide support to the Secretary, Deputy Secretary and Undersecretary and the Assistant Secretaries on a daily basis. Analysts from the program are members of a number of intelligence community committees as well as DoE internal working groups and task forces dealing with S&T issues.

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DOE Headquarters: <gopher://um1.hgadmin.doe.gov/>

DOE Technical Information Service: <gopher://dewey.tis.inel.gov.2010/>

# **DEPARTMENT OF ENERGY**

## **Office of Nuclear Energy, Science, and Technology**

The Department of Energy's Office of Nuclear Energy provides technical leadership to address critical domestic and international nuclear issues. The Office contributes to energy supply diversity and advances U.S. competitiveness and security by providing nuclear products and services that meet the needs of the U.S. and the world community. Goals and commitments include maintaining an adequate nuclear industrial and educational infrastructure; fostering increased exports of U.S. nuclear technologies and services; managing facilities in a safe, environmentally sound, and cost-effective manner; and providing nuclear power systems for space and national security purposes.

The Office of Nuclear Energy is the central home for the Federal government's expertise in nuclear engineering and technology. Activities cover a range of international programs, from working to enhance nuclear safety and providing critical isotopes to health care providers and industry to conducting important nuclear research and development and building the nuclear energy systems needed to explore outer space and support the Nation's defense.

Expertise in the nuclear energy field, including the management of nuclear facilities, is applied in ways important to the future. The Office works with industry in a cost-shared program to design a new safer and economical generation of nuclear energy plants. These advanced plant designs will be available for purchase by 1997. It works with industry to assure that current nuclear plants continue to operate safely and economically well into the next century. It also promotes the export of U.S. nuclear energy technology and services overseas and looks for opportunities to open new markets.

The Office supports U.S. foreign policy and national security objectives. International activities include work in the former Soviet Union which is helping reduce the availability of weapons-usable fissile materials. The international programs are also crucial to the U.S. industry through the monitor of world-wide nuclear plant safety concerns.

It also addresses the concern about proliferation of nuclear weapons and is working to implement an agreement to cease production of weapons-grade plutonium in the Russian Federation, and oversee the blending of highly enriched uranium from dismantled Russian weapons into low enriched uranium for fuel in light water reactors.

The newest and one of the most important areas of work for this organization is the Office's mission to enhance the safety of nuclear energy throughout the world and increase international cooperation. Cooperative research and development is being conducted with countries that have advanced nuclear programs such as Japan, the United Kingdom, and South Korea. DoE provides policy and technical leadership to international organizations concerned with nuclear safety, with steps being taken to improve nuclear safety practices and technology in countries such as India and China.

The Office of Nuclear Energy, Science, and Technology's International Nuclear Safety Program (INSP) is a comprehensive effort to cooperate with partners in other countries to improve nuclear safety worldwide. A major element of the program consists of extensive activities to improve the level of safety of Soviet-designed nuclear power plants. The INSP is assisting countries with Soviet-designed nuclear energy plants in bridging the gap between internationally-accepted safety practices and their existing level of design, maintenance, and

operation. The Office is working to facilitate Ukraine's shutdown of the Chernobyl units still in operation, and is strengthening its cooperation with international agencies involved in addressing nuclear safety issues.

DoE has assigned a dedicated program management team, with technical support from the national laboratories, to meet the objectives of the INSP.

These activities are conducted consistent with guidance and policies established by the U.S. Department of State, the Agency for International Development, and the Nuclear Regulatory Commission. All four agencies work collaboratively to achieve INSP objectives. Within DoE, the program is managed by the Office of International Nuclear Safety of the Office of Nuclear Energy.

The Office of Nuclear Energy has recently reorganized into the following structure:

- Planning and Analysis: policy analysis; external relations; planning and presentations; university nuclear engineering programs, and uranium inventory management
- Resource Management: budget; personnel; TQM, FOIA, HBCU, EEUO, security
- Engineering & Technology Development: advanced light water reactors, commercial light water reactor programs; space and national security; technology support
- Facilities: facilities operations; facilities shutdown; safety and environment; general technical support
- International Nuclear Safety: Soviet-designed reactor safety; replacement power initiatives; international cooperation; highly enriched uranium (HEU) transparency
- Isotope Production & Distribution: isotope sales; inventory management; production capability enhancement

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# **DEPARTMENT OF ENERGY**

## **Office of Scientific and Technical Information**

The Office of Scientific and Technical Information (OSTI) is the repository of DoE scientific and technical research results and international R&D results gained through bilateral and multilateral information exchanges.

The primary purpose of the international activities office at OSTI is to obtain international information in support of the DoE mission. International objectives of OSTI include:

### **Objectives**

- Obtain scientific and technical information resulting from R&D in other countries by negotiating bilateral/multilateral information exchange agreements;
- Ensure, on behalf of the Department and the U.S. public, the fullest utilization of foreign information obtained from Departmental International Activities;
- Identify international sources of scientific and technical information needed by the Department;
- Assist in the development and execution of Department policy in exchanging and communicating scientific and technical information.
- Develop and coordinate standards and mechanisms for exchanging information resulting from advanced technological systems.

### **Multilateral Agreements**

The Office participates in multilateral agreements that provide, according to agreed standards and in English: (1) abstracted and indexed foreign energy literature in electronic formats and (2) copies of "non-conventional" literature that are unavailable through commercial channels.

Bibliographic information is provided to OSTI via Internet, diskettes, or magnetic tape. The database created from the international and U.S. information is available on-line on Knight-Ridder/Dialog and STN and on CD-ROM from Dialog and SilverPlatter. Non-conventional literature is available through NTIS.

### **Current Active Agreements**

The Energy Technology Data Exchange (ETDE) was established in 1987 under the auspices of the International Energy Agency (IEA). Eleven countries initially signed the Implementing Agreement, to consolidate several bilateral agreements the Department had established with foreign governments. The 18 countries currently comprising the Exchange are Australia, Brazil, Canada, Denmark, Finland, France, Germany, Italy, Japan, The Netherlands, Norway, Poland, Republic of Korea, Spain, Sweden, Switzerland, United Kingdom, and the United States. Belgium, Mexico, and India are considering membership in 1996. In addition to representing the United States, OSTI is the Operating Agent for the Exchange. Through this Exchange, foreign literature is available to the Department, industry, educational institutions and the public.

The International Nuclear Information System (INIS), operated by the International Atomic Energy Agency (IAEA) under the aegis of the United Nations, provides for the exchange of nuclear information among more

than 90 countries and 17 international organizations. The United States is partnering with INIS and other international entities to determine how advances in telecommunication and information technology can be used to better meet the information needs of the international nuclear community.

In support of DoE's Office of Fossil Energy, OSTI provides U.S. coal information to the IEA Coal Research Service and disseminates within the United States information collected through agreement.

In addition to scientific literature, scientific and technical software is exchanged through an international agreement with the Nuclear Energy Agency (NEA). The DoE's Energy Science and Technology Software Center (ESTSC) maintained by OSTI and the Radiation Shielding Information Center (RSIC) at Oak Ridge National Laboratory are the primary DoE contacts in the U.S. These records are also cited in the database.

### **Bilateral Exchange Agreements**

OSTI negotiates bilateral exchange agreements to obtain information in broad energy areas for researchers and policymakers and implements information exchanges included as part of bilateral agreements negotiated by other Departmental elements. OSTI negotiated and maintains agreements with the Nordic Countries and Germany for exchanging descriptions of current research activities, conference information, and specialized energy information. OSTI also participates in a Departmental agreement with Australia for exchanging descriptions of current research activities.

### **OTHER ACTIVITIES**

- In support of Departmental commitments to the International Atomic Energy Agency, the office provides descriptions of current research activities in the field of health, physics and waste management.
- In support of DoE's Office of Nuclear Energy, OSTI manages an exchange of Applied Technology documents with several countries.
- OSTI ensures Departmental and U.S. public access to foreign information obtained through agreements of program elements.
- OSTI is a member of the International Council for Scientific and Technical Information (ICSTI), an organization comprising key international and domestic players in the scientific and technical information field. The organization fosters communication and interaction among all participants in the information transfer chain, in order to develop appropriate tools to better meet information requirements of the world community of scientists and technologies..
- OSTI maintains personal contacts with IAEA, IEA and NEA as well as with member country organizations participating in the exchanges. In addition, DoE staff are abroad or represented on decision-making bodies at various levels of INIS and the IEA.

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## **DEPARTMENT OF ENERGY**

### **Center for the Analysis and Dissemination of Demonstrated Energy Technologies**

The Center for the Analysis and Dissemination (CADDET) was formed by the International Energy Agency (IEA) in 1988 to collect and disseminate information on demonstrated, energy-efficient technologies. The ultimate goal of DoE involvement in the CADDET program is to assist U.S.- companies by promoting their energy-efficient technologies to potential new markets within and outside the United States. In addition, CADDET strives to make information on other countries' demonstrated energy technologies available to domestic decision-makers. It also contributes to an international effort to reduce the adverse environmental effects of fossil fuel consumption through energy conservation in the United States' Oak Ridge National Laboratory (ORNL) and coordinates involvement with the CADDET Energy Efficiency Annex for DoE. The National Renewable Energy Laboratory coordinates involvement with the recently created CADDET Renewable Energy Annex.

At the heart of the CADDET operation is the computerized Register of information on more than 1,600 energy technology demonstration projects. Each member country is responsible for preparing Register entries covering demonstrations in their countries. A majority of these entries focus on technologies for increasing the efficiency of energy use in buildings and industrial processes. Agriculture, transportation, utilities, and other end uses are also represented, but to a lesser degree. A total of 358 entries describe U.S. energy efficiency demonstration projects, and an additional 37 entries describe U.S. renewable energy demonstration projects. The CADDET also produces technical brochures, which provide expanded information on key technologies represented in the CADDET Register; analysis reports, which compare the technical and economic results of selected demonstration projects on a particular technology; and quarterly newsletters which are currently distributed to over 10,000 subscribers worldwide.

#### **Greenhouse Gas Technology Information Exchange**

**GREENTIE** was formed under the auspices of IEA in October of 1993. This pilot program was created in response to concerns of IEA member nations about the global rise in temperature caused by man-made changes in the composition of the atmosphere, and their questions about appropriate remedial action. The GREENTIE objectives are to identify suppliers of greenhouse gas mitigation technologies that have a potential for international deployment and to publicize the availability of these technology options to potential decision-makers and users. By helping to inform decision-makers worldwide about available greenhouse gas technologies, GREENTIE will contribute to increased exports and unit sales of energy-efficient products and will help to reduce the adverse effects of fossil fuel consumption on the global environment.

At present, 21 member countries participate in this IEA pilot program: 12 are members of IEA; the remaining nations, developing countries from around the world, are "pilot countries." The GREENTIE Center in the Netherlands acts as a focal point for information and technology sharing between these 21 countries. GREENTIE's primary product will be a directory of information about suppliers of product technologies, and information related to the mitigation of greenhouse gases. In 1995, the GREENTIE Center in the Netherlands completed the first edition of a directory of this supplier information and has made the directory available to all member countries. The directory categorizes the capabilities of suppliers along five dimensions: (1) the

greenhouse gases that their products and technologies help to mitigate, (2) the economic activities of the users of their products and technologies, (3) the types of greenhouse gas technologies that they supply (4) the technology's life cycle, and (5) the products, and services that they offer. During 1995 ORNL's directory information dealt with 2,500 organizations located in the United States.

### **Asia-Pacific Economic Cooperation**

Oak Ridge National Laboratory (ORNL) is assisting DoE in support of the Energy Working Group and Energy Efficiency and Conservation Expert Group in the Asia-Pacific Economic Cooperation (APEC) agreement. The APEC was created in 1989 to promote the economic and social well-being of the Asia-Pacific region through expanded trade and multilateral cooperation. Its Energy Working Group was established to address regional energy issues, improve the efficiency of energy utilization, and help protect the environment.

One focus for the activities of the Energy Working Group is the Expert Group on Energy Efficiency and Conservation (EE&C). ORNL provides technical support to DoE's involvement with this group. Among the recent activities of the EE&C Expert Group have been a workshop on integrated resource planning and DSM modeling (Kyongju, Korea, May 9-12, 1995); a workshop on cogeneration and waste heat recovery (Singapore, November, 1995), and a number of specific products. These products include a *Directory of Demand Side Management Program Service Providers and Vendors*, December 1995, a *DSM Guidebook* (in process), and protocols for commercial and industrial sector benchmarking. In addition, DSM assessments have been undertaken by ORNL and EPRI in Hong Kong with China Light & Power and Hong Kong Electric (September, 1995) and in Korea with the Korea Electric Power Company (October, 1995). These assessments have reviewed all aspects of company planning, rates, forecasting, customer service, and DSM toward the end of providing advice on how the DSM activities may usefully be expanded. Future workshops will address such topics as sustainable cities (Monterey, California, September 1996) and efficient gas technologies (East-West Center, Hawaii, July-August, 1996). The U.S. will support an Urban Transportation Forum in New Zealand in April, 1996. ORNL investigators will participate in this opportunity to share experiences in solving environmental, energy, and technology-related problems in urban transportation. A number of initiatives are being pursued through the Inter-Utility DSM Liaison Group including:

- developing advanced data collection schemes for load research and other customer data (Australia);
- producing a handbook for designing and operating energy centers (Australia);
- developing funding strategies for DSM (South Pacific Forum, Fiji);
- building load research capability (Thailand);
- defining joint regional action on appliance efficiency improvements (U.S.A.);
- undertaking an APEC-sponsored DSM-EE Specialist Training and Certification Program (U.S.A.)

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