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Capsule Review of DOE Research and Development and Field Facilities

September 1986

U.S. Department of Energy
Office of Energy Research
Office of Field Operations Management
Washington, DC 20585

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FOREWORD

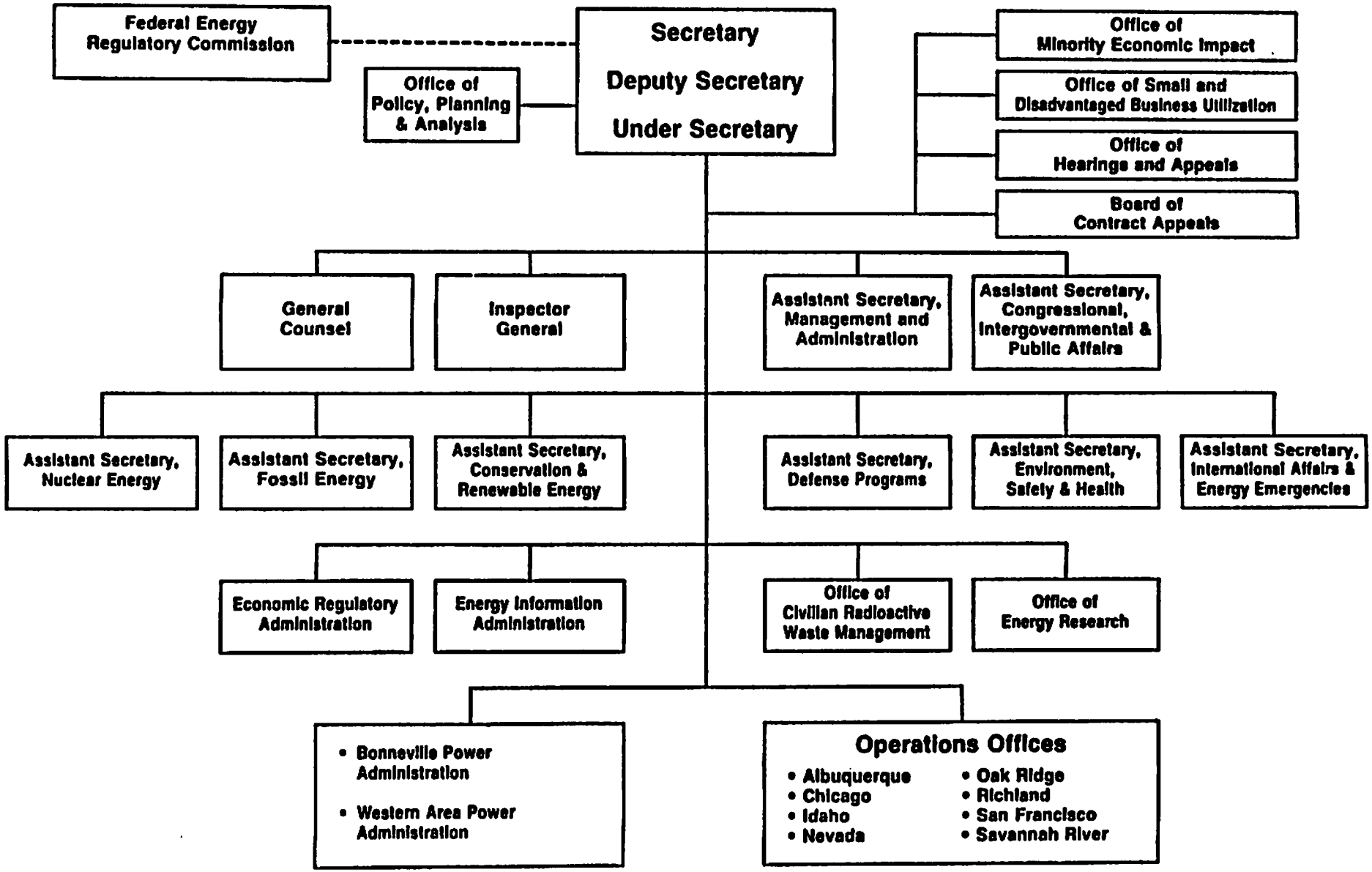
The Office of Energy Research supports the Under Secretary of Energy in his management of the Department's extensive field resources that carry out nationally important research and development and production missions.

The Department's scientific, engineering, technology and production facilities are dispersed throughout the Nation. They consist primarily of Government-owned and contractor-operated laboratories, engineering and production facilities. A few Government-owned and Government-operated centers are involved in fossil R&D, and Federal administrative management units are located at the Operations Offices, Naval Reactors Offices and small project and area offices across the country.

This document has been prepared by the Office of Field Operations Management in the Office of Energy Research to provide brief, comprehensive data on these extensive and diverse field resources.

Antionette Grayson Joseph
Director, Office of Field
Operations Management
Office of Energy Research

THE DEPARTMENT OF ENERGY



DOE FIELD OFFICES AND R&D FIELD FACILITIES*
BY STATE/TERRITORY AND CITY/COUNTY

State/Territory	City/County
CALIFORNIA	
San Francisco Operations Office	Oakland
Energy Technology Engineering Center	Canoga Park
Laboratory for Energy-Related Health Research	Davis
Laboratory of Biomedical and Environmental Sciences	Los Angeles
Laboratory of Radiobiology and Environmental Health	San Francisco
Lawrence Berkeley Laboratory	Berkeley
Lawrence Livermore National Laboratory	Livermore
Naval Petroleum Reserves	Elk Hills Buena Vista Hills
Sandia National Laboratories	Livermore
Stanford Linear Accelerator Center	Stanford
Stanford Synchrotron Radiation Laboratory	Stanford
COLORADO	
Rocky Flats Plant	Golden
Solar Energy Research Institute	Golden
Naval Oil Shale Reserve	Rifle
FLORIDA	
Pinellas Plant	Largo
IDAHO	
Idaho Operations Office	Idaho Falls
Idaho National Engineering Laboratory	Idaho Falls
ILLINOIS	
Chicago Operations Office	Argonne
Argonne National Laboratory	Argonne
Fermi National Accelerator Laboratory	Batavia
New Brunswick Laboratory	Argonne
INDIANA	
Notre Dame Radiation Laboratory	Notre Dame
IOWA	
Ames Laboratory	Ames
KENTUCKY	
Paducah Gaseous Diffusion Plant	Paducah
LOUISIANA	
Strategic Petroleum Reserve Project Office	New Orleans
MASSACHUSETTS	
Bates Linear Accelerator Facility	Middleton
MICHIGAN	
MSU-DOE Plant Research Laboratory	East Lansing
MISSOURI	
Kansas City Plant	Kansas City

* DOE Area Offices are not shown on this listing.

DOE FIELD OFFICES AND R&D FIELD FACILITIES BY STATE/TERRITORY AND CITY/COUNTY

State/Territory	City/County
NEVADA	
Nevada Operations Office	Las Vegas
Nevada Test Site	Mercury
Sandia National Laboratories	Tonopah
NEW JERSEY	
Princeton Plasma Physics Laboratory	Princeton
NEW MEXICO	
Albuquerque Operations Office	Albuquerque
Inhalation Toxicology Research Institute	Albuquerque
Los Alamos National Laboratory	Los Alamos
Sandia National Laboratories	Albuquerque
NEW YORK	
Brookhaven National Laboratory	Upton
Environmental Measurements Laboratory	New York
Knolls Atomic Power Laboratory	Schenectady
Schenectady Naval Reactors Office	Schenectady
OHIO	
Extrusion Plant	Ashtabula
Feed Materials Production Center	Fernald
Mound Facility	Miamisburg
Portsmouth Gaseous Diffusion Plant	Piketon
OKLAHOMA	
Bartlesville Project Office	Bartlesville

State/Territory	City/County
PENNSYLVANIA	
Bettis Atomic Power Laboratory	West Mifflin
Pittsburgh Energy Technology Center	Pittsburgh
Pittsburgh Naval Reactors Office	West Mifflin
PUERTO RICO	
Center for Energy and Environment Research	San Juan
SOUTH CAROLINA	
Savannah River Operations Office	Aiken
Savannah River Ecology Laboratory	Aiken
Savannah River Laboratory	Aiken
Savannah River Plant	Aiken
Savannah River Weapons Facility	Aiken
TENNESSEE	
Coal Fired Flow Facility	Tullahoma
Oak Ridge Operations Office	Oak Ridge
Oak Ridge Associated Universities	Oak Ridge
Oak Ridge Gaseous Diffusion Plant	Oak Ridge
Oak Ridge National Laboratory	Oak Ridge
Y-12 Plant	Oak Ridge
TEXAS	
Pantex Plant	Amarillo

DOE FIELD OFFICES AND R&D FIELD FACILITIES BY STATE/TERRITORY AND CITY/COUNTY

State/Territory	City/County
UTAH	
Radiobiology Laboratory	Salt Lake City
Naval Oil Shale Reserve	Carbon and Uintah Counties
WASHINGTON	
Richland Operations Office	Richland
Hanford Engineering Development Laboratory	Richland
Hanford Production Operations	Richland
Pacific Northwest Laboratory	Richland
WEST VIRGINIA	
Morgantown Energy Technology Center	Morgantown
WYOMING	
Naval Petroleum Reserve	Casper

INTRODUCTION

This report provides an overview of the unique complex of research, technical development, manufacturing and administrative facilities that comprise the Department of Energy field installations. Facilities are located in almost all states of the Union. The FY 1986 budget for the entire complex was over $10 billion, excluding the Strategic Petroleum Reserve and the Power Marketing Administrations. There are approximately 135,000 employees working within the complex. Approximately 5 percent of these are Federal employees; the remainder are employed and managed under contracts with industry and universities. The replacement cost of all field facilities would total well over $50 billion.

Stemming from the Manhattan Project of World War II, the DOE field facilities system has developed in several major directions. It contains the largest uranium enrichment and special nuclear materials production complex in the free world; its manufacturing facilities provide the nuclear devices for the national strategic defense system; and it develops the nuclear reactors that power the submarine fleet of the U.S. Navy. These extensions of the original military purpose of the Manhattan Project are natural outgrowths of the core capabilities developed during the war.

Equally important is the growth of the scientific and technological capabilities of the system. The original concentration on nuclear physics has been broadened to encompass the entire spectrum of the fundamental sciences. Research in the laboratories of the Department now ranges from forefront investigations into the nature of matter and chemical reactions, cosmology, the operation of biological cells, the process of genetic information coding, the ecosystem, the geosphere, mathematics and computing, and medicine. Almost no area of basic scientific knowledge is unrepresented in the research activities of the laboratories within the DOE field system.

The nine multiprogram laboratories and approximately thirty specialized laboratories accomplish the fundamental scientific work of the DOE field system and also the bulk of the research and development. They account for slightly more than 40 percent of the total field budget and employ in excess of 60,000 people. More than half of these are scientists, engineers and technicians. Altogether, the laboratories represent one of the largest complexes engaged in fundamental research anywhere in the world.

An important function of the DOE laboratories is advanced research and development in areas related to the generation and use of energy and to national defense. Much of the R&D of the Department is conducted within facilities also engaged in fundamental research. The resulting interdisciplinary environment provides these facilities with the capability to undertake very complex development projects and helps to ensure that fundamental scientific efforts are directed toward producing the necessary underlying technologies. Nine multiprogram laboratories are the mainstay of this type of activity. These major laboratories are engaged in the work of many DOE programs representing a broad range of scientific and R&D activity.

The industrial competitiveness of the nation strongly benefits from the DOE field system. Entire industries have been established on the basis of the technology initially developed within the DOE laboratories, as have many new companies and new or improved products. The results have been major economic and social benefits for the country. Recent legislation has focused and simplified the transfer of specific inventions and technologies from the laboratories to the public. There are many opportunities for U.S. industry to benefit from technology transfer and spin-off from the DOE R&D, such as participation in cooperative programs, visiting staff appointments, patent licensing, subcontracting and use of DOE facilities. Increasing the rate of technology transfer is a major goal of the Department and its laboratories.

University research and education also benefits indirectly from the DOE field system. Major support of national research is carried out through the cooperative design and use of major, capital intensive experimental facilities located at the DOE laboratories. The high capital costs of these complex experimental facilities, necessary for advances in modern science, are borne by the Department. Cooperating organizations include all of the major universities of the U.S., industrial researchers and international scientists of world renown. The use of these world class facilities is provided without cost for fundamental scientific experiments. Additional assistance to scientific education is provided through many residence programs for students and faculty at the laboratories. Science at U.S. universities is also benefitted by the substantial amount of R&D effort directed to universities from the DOE laboratories through subcontracting and cooperative programs.

The eight major operations offices and the specialized field offices of the Department provide administrative services and day to day oversight of the management and operation of the field complex. Much of the DOE contracting for R&D and other services is done by the operations and field offices. Their funding for operation and contracting was over $1.5 billion in FY 1986.

An unusual aspect of the DOE field facilities complex is the "GOCO" concept of management in extensive use throughout the system. This "Government Owned - Contractor Operated" concept arose through the exigencies of the early Manhattan Project. It permitted the government to provide the massive capital investments necessary to create the field facilities and, at the same time, employ experienced management under contract with industry and universities. This concept has applied the excellent talents of industry and universities to the national missions of the DOE.

We hope that this summary overview will provide a comprehensive introduction to the DOE field complex, defining the various types of facilities and their major areas of activity.

1. DOE HEADQUARTERS OFFICES

ENERGY RESEARCH. The Director of Energy Research manages the fundamental scientific research programs for the Department in a number of areas, including high energy physics, nuclear physics, the physical, biological and mathematical sciences, magnetic fusion energy and environmental and health effects. The Director also supports university research and university-based education and training activities. In addition, the Director acts as scientific advisor to the Secretary of Energy for the entire spectrum of energy research and development programs of the Department. He also advises the Secretary on the well-being and management of the multiprogram laboratories under the jurisdiction of the Department, excluding laboratories that constitute part of the nuclear weapons complex. He coordinates the Department's Institutional Planning Process and the development of policy for the utilization of the multiprogram laboratories. Five multiprogram and 17 single-purpose laboratories are administratively assigned to the Office of Energy Research. They are described in Section 3 of this publication.

DEFENSE PROGRAMS. The Assistant Secretary for Defense Programs manages the Department's programs for nuclear weapons research, development, testing and production, and surveillance; laser, heavy ion and particle beam fusion; safeguards and security programs; international safeguards programs; and information classification. In addition, the responsibility for the nuclear materials production program and defense nuclear waste programs, and overview responsibility for the DOE weapons complex is under the Assistant Secretary for Defense Programs. The field facilities assigned to Defense Programs are described in Section 3 of this publication.

NUCLEAR ENERGY. The Assistant Secretary for Nuclear Energy manages the Department's programs for nuclear fission power generation and fuel technology; the evaluation of alternative reactor fuel cycle concepts, including nonproliferation considerations; development of space nuclear generator systems; development of naval nuclear propulsion plants and reactor cores; remedial actions and nuclear waste technology. Much of the Nuclear Energy effort is directed toward technology and engineering development programs. The field facilities for which the Assistant Secretary for Nuclear Energy has administrative responsibility are described in Sections 2 and 3 of this publication.

CONSERVATION AND RENEWABLE ENERGY. The Assistant Secretary for Conservation and Renewable Energy manages programs designed to increase the production of renewable energy (including solar heat and electric energy, geothermal energy, biofuels energy and municipal waste energy) and to improve the energy efficiency of transportation, buildings, industrial and community systems and related processes. These programs include support of high-risk, high-payoff research and development that would not otherwise be carried out by the private sector and dissemination of the results to a broad spectrum of private and public sector interests.

The Assistant Secretary for Conservation and Renewable Energy also has responsibility for administering statutorily mandated programs that provide financial and technical assistance to encourage state energy management and

planning, weatherization of housing owned by the poor and disadvantaged and implementation of energy conservation measures by schools and hospitals, units of local government and public care institutions. The Office of the Assistant Secretary also provides management and administrative support to the Office of Alcohol Fuels and is responsible for overseeing the operations of the Alaska, Southeastern and Southwestern Power Administrations. The Solar Energy Research Institute described in Section 3 is also the responsibility of the Assistant Secretary for Conservation and Renewable Energy.

FOSSIL ENERGY. The Assistant Secretary for Fossil Energy has the responsibility to develop technologies that will increase domestic production of oil and gas or that will permit the Nation to shift from oil and gas to more abundant coal and oil shale resources. Specifically, the Fossil Energy role is to support long-term research toward the following objectives: provide an improved capability to convert coal and oil shale to liquid and gaseous fuels; increase domestic production of coal, oil and gas; ensure that current and new facilities that burn coal can do so in an economically viable and environmentally acceptable manner; and allow more efficient and more economically attractive utilization of fossil energy resources. Near-term technical support for large scale process activities is limited to cases where the government has a unique resource or facility. Program execution is primarily carried out in the Energy Technology Centers. More detail on these facilities, as well as on the Strategic Petroleum Reserve, the Naval Petroleum and Oil Shale Reserves and the Coal Fired Flow Facility, can be found in Section 3 of this publication.

DOE OPERATIONS OFFICES AND NAVAL REACTORS OFFICES

2. THE DOE FIELD OFFICES

A. OPERATIONS OFFICES

Albuquerque Operations Office
Albuquerque, New Mexico

The principal mission of the Albuquerque Operations Office (AL) is national security. Established in 1946, AL operates an extensive weapons laboratory and production complex from Florida to California and supervises six area offices, two project offices and two support offices. Facilities administered by AL include two national laboratories, the Inhalation Toxicology Research Institute, Ross Aviation, seven weapons production facilities, including the weapons production facilities at Oak Ridge and Savannah River, and the National Atomic Museum. AL directs weapons research, development and production and provides program execution and project management functions for assigned energy research and development activities. AL operates a system for safe and secure transport of all Government-owned Special Nuclear Material of strategic quantities, coordinates and administers nuclear test detection activities and maintains capabilities for radiological assistance and nuclear weapons accident response. AL also provides reimbursable assistance to local, state, Federal and foreign governments and the private sector and has working relationships with many state, university and regional energy organizations.

FY 1985 Statistics

DOE Operating Outlay:	$76 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$4.4 B
Number of Government Employees (Full-Time Equivalents):	1,282
Capital Investment (Plant and Equipment):	$70 M

Area Offices

Amarillo Area Office, Amarillo, Texas
Dayton Area Office, Miamisburg, Ohio
Kansas City Area Office, Kansas City, Missouri
Los Alamos Area Office, Los Alamos, New Mexico
Pinellas Area Office, Largo, Florida
Rocky Flats Area Office, Denver, Colorado
Dallas Support Office, Dallas, Texas
Kansas City Support Office, Kansas City, Missouri
Waste Isolation Pilot Plant Project Office, Carlsbad, New Mexico
Uranium Mill Tailings Remedial Action Project Office, Albuquerque, New Mexico

Major Program and Project Assignments

Nuclear Weapons Research, Development and Production
DOE Transportation Safeguards System
Nonweapons Work
- Energy Technology Projects
- Waste Management and Transportation Research
- Waste Isolation Pilot Plant
- Uranium Mill Tailings Remedial Action

Nuclear Weapons Accident Response Within Continental U.S. and Worldwide

Laboratories and Plants Administered

Facility Name	Contractor
Los Alamos National Laboratory	University of California
Sandia National Laboratories	AT&T Technologies
Rocky Flats Plant	Rockwell International
Pinellas Plant	General Electric
Mound Facility	Monsanto Research Corporation
Pantex Plant	Mason and Hanger-Silas Mason Co., Inc.
Kansas City Plant	Allied Corporation
Savannah River Plant	E.I. du Pont de Nemours & Co., Inc.
Waste Isolation Pilot Plant (under construction)	Westinghouse/Bechtel
Inhalation Toxicology Research Institute	Lovelace Biomedical and Environmental Research Institute

Chicago Operations Office
Argonne, Illinois

The Chicago Operations Office (CH), an offspring of the Manhattan Engineer District, was initially established in 1946 as one of the Atomic Energy Commission's first field offices. Almost 30 years later, CH expanded the scope of its activities as a major component of the Energy Research and Development Administration. In 1977, as part of the newly established DOE, the Chicago Operations Office focused its efforts on long-term, high-risk research and development in conjunction with business and industry as well as the academic community. CH's major missions include: institutional management of major Government-owned, contractor-operated laboratories and facilities and two Government-owned and operated laboratories; scientific and technical management of programs and projects, including special project assignments in nuclear waste management, magnetic fusion and coal gasification; and business and technical management of contracts and grants, including fiscal and construction management as well as responsibilities for safety, environmental protection and quality assurance.

FY 1985 Statistics

DOE Operating Outlay:	$28 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$1.5 B
Number of Government Employees (Full-Time Equivalents):	585
Capital Investment (Plant and Equipment):	$2.1 B

Area Offices

Argonne Area Office, Argonne, Illinois
Batavia Area Office, Batavia, Illinois
Brookhaven Area Office, Upton, New York
Princeton Area Office, Princeton, New Jersey
SERI Area Office, Golden, Colorado
Boston Support Office, Boston, Massachusetts
New York Support Office, New York, New York
Philadelphia Support Office, Philadelphia, Pennsylvania

Major Program and Project Assignments

Basic Energy Sciences
High Energy Physics
Nuclear Physics
Magnetic Fusion
Nuclear Fission R&D
Renewable Energy R&D
Civilian Radioactive Waste Management Projects
Nuclear Materials Safeguards
Biological and Environmental R&D
Superconducting Super Collider R&D Program
Integral Fast Reactor
Planned Relativistic Heavy Ion Collider
Planned Compact Ignition Tokamak

Major Program and Project Assignments (Continued)

State and Local Conservation Assistance Programs
Magnetohydrodynamics Facilities
Centralized Package Certification Program
Planned 6 GeV Synchrotron X-Ray Source
Cogeneration Program
University Construction Grant Programs

Laboratories and Plants Administered

Facility Name	Contractor
Argonne National Laboratory	University of Chicago
Brookhaven National Laboratory	Associated Universities, Inc.
Ames Laboratory	Iowa State University
Princeton Plasma Physics Laboratory	Princeton University
Fermi National Accelerator Laboratory	Universities Research Association
Bates Linear Accelerator Facility	Massachusetts Institute of Technology
Environmental Measurements Laboratory	Federally-Operated
New Brunswick Laboratory	Federally-Operated
Notre Dame Radiation Laboratory	University of Notre Dame
Coal Fired Flow Facility	University of Tennessee Space Institute
Radiobiology Laboratory	University of Utah
Michigan State University (MSU)-DOE Plant Research Laboratory	Michigan State University
Solar Energy Research Institute	Midwest Research, Inc.

Idaho Operations Office
Idaho Falls, Idaho

The Idaho Operations Office (ID), established in 1949, administers the Idaho National Engineering Laboratory (INEL) and associated support facilities. The Idaho Operations Office also has jurisdiction over the following field locations: 1) Butte, Montana, for the Magnetohydrodynamic (MHD) Component Development and Integration Facility (CDIF); 2) Grand Junction, Colorado, for Remedial Action Programs involving mill tailings; 3) Denver, Colorado, for awards and grants in programs such as state and local energy conservation; 4) West Valley, New York, for the Remedial Action Program; and 5) Harrisburg, Pennsylvania, Three Mile Island Site Office, for INEL's support role in cleanup of the Three Mile Island Unit 2 accident.

FY 1985 Statistics

DOE Operating Outlay:	$13 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$560 M
Number of Government Employees (Full-Time Equivalents):	359
Capital Investment (Plant and Equipment):	$162 M

Area Offices

Colorado Area Office, Grand Junction, Colorado
Denver Support Office, Denver, Colorado
MHD Site Office, Butte, Montana
West Valley Project Office, West Valley, New York

Major Program and Project Assignments

Nuclear Materials Production
Defense Waste and Transportation Management
Advanced Test Reactor (Reactor Technology Development and Irradiation Services)
Energy Conservation (Including Grants for State and Local Programs)
Alternate Energy (Including Industrial Conservation)
Remedial Action
Magnetohydrodynamics Component Integration Facility
Three Mile Island Program
Multi-Megawatt Space Reactor

Laboratories and Plants Administered

Facility Name	Contractor
Idaho National Engineering Laboratory	EG&G Idaho, Inc.
INEL's Idaho Chemical Processing Plant	Westinghouse Idaho Nuclear Co., Inc.
Specific Manufacturing Capabilities Project	Exxon Nuclear Idaho Company, Inc.
MHD-Component Development Integration Facility	Mountain States Energy, Inc.
West Valley Demonstration Project	West Valley Nuclear Services Co., Inc.
Three Mile Island (TMI-2)	EG&G Idaho, Inc.
Grand Junction Remedial Action Project	Bendix Field Engineering Corporation*

*UNC Nuclear Industries awarded contract, effective FY 1986.

Nevada Operations Office
Las Vegas, Nevada

The Nevada Operations Office (NV), established by the Atomic Energy Commission in 1962, is responsible for programs at the Nevada Test Site (NTS) and conducts all U.S. nuclear tests, including weapons development and weapons effects. NTS is an integral part of NV and does not operate as a separate entity. Located 65 miles northwest of Las Vegas, NTS was chosen as a continental proving ground in 1950 to reduce the expense and logistical problems of testing in the Pacific. The primary mission of NTS is to provide a remote, secure facility for the safe conduct of underground nuclear testing in support of national defense programs. Through NTS operations, NV contractors have developed unique expertise in fields such as big hole drilling, mining and downhole diagnostics in support of the weapons development laboratories and the Department of Defense. In addition, the site has been expanded to include many other programs and projects, including waste management; geologic, hydrologic and seismic investigations; biological and medical experiments to study plant and animal life in a radiation environment; and the investigation of the effects of liquid gaseous fuel spills. In addition to NTS operations, other program responsibilities assumed by NV and its contractors include maintaining a readiness base at Johnston Island to resume atmospheric testing in the Pacific Ocean area, operation of a medical and environmental monitoring program in the Marshall Islands of the Central Pacific, administration of laser fusion research, fuel conservation and management of programs and contracts assigned by Headquarters.

FY 1985 Statistics

DOE Operating Outlay:	$794 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$875 M
Number of Government Employees (Full-Time Equivalents):	248
Capital Investment (Plant and Equipment):	$702 M

Area Office

Honolulu Area Office, Honolulu, Hawaii

Major Program and Project Assignments

Nuclear Weapons Testing Program
Weapons Research and Development
Waste Management
Inertial Confinement Fusion

Laboratories and Plants Administered

Facility Name	Contractor*
Nevada Test Site	EG&G, Inc. Fenix and Scisson, Inc. Holmes and Narver, Inc. Reynolds Electrical and Engineering Co., Inc. Wackenhut Services, Inc.
Pacific Environs	Holmes and Narver, Inc.

*Primary contractors

Oak Ridge Operations Office
Oak Ridge, Tennessee

The Oak Ridge Operations Office (OR) was set up under the Atomic Energy Commission (AEC) in 1942. The principal programs of OR are the production of nuclear weapon components in support of national defense programs, production of enriched uranium for defense requirements and for fueling nuclear power plants in the U.S. and abroad, processing of uranium feed materials and fuel cores for DOE's plutonium production reactors and extensive energy research and development in all DOE program areas. In addition, OR provides assistance to local, state and Federal government agencies and the private sector, and administers DOE contracts with universities in the southeast. The OR reservation serves as a national environmental research site.

FY 1985 Statistics

DOE Operating Outlay:	$35 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$3 B
Number of Government Employees (Full-Time Equivalents):	669
Capital Investment (Plant and Equipment):	$8 M

Area Office

Feed Materials Center Office, Fernald, Ohio

Major Program and Project Assignments

Nuclear Materials in Support of Nuclear Weapons Production
Components and Subassemblies in Support of Nuclear Weapons
Production of Enriched Uranium
Clean up of Nuclear Waste from National Defense Activities
National Breeder Fuel Processing Program
National Low-Level Radioactive Management Program
Breeder Structural Materials Program
Alternate Concepts Study and Reactor Safety Program for Nuclear Regulatory Commission
Advanced Plasma Heating and Refueling Techniques
Advanced Toroidal Devices
Fuel Cycle Research and Development
Advanced Combustion Techniques
Advanced Materials Requirements Studies
Gaseous Diffusion Plants

Major Program and Project Assignments (Continued)

Advanced Isotope Separation Technology Research and Development
Continuous Electron Beam Accelerator Facility
Strategic Petroleum Reserve

Laboratories and Plants Administered

Facility Name	Contractor
Extrusion Plant	RMI Company
Center for Energy and Environment Research	University of Puerto Rico
Fernald Feed Materials Plant	Westinghouse Materials Co. of Ohio
Oak Ridge Associated Universities	Oak Ridge Associated Universities
Oak Ridge Gaseous Diffusion Plant	Martin Marietta Energy Systems, Inc.
Oak Ridge National Laboratory	Martin Marietta Energy Systems, Inc.
Paducah Gaseous Diffusion Plant	Martin Marietta Energy Systems, Inc.
Portsmouth Gaseous Diffusion Plant	Goodyear Atomic Corporation
Y-12 Plant	Martin Marietta Energy Systems, Inc.
Strategic Petroleum Reserve Project	Boeing Petroleum Services, Inc.

Richland Operations Office
Richland, Washington

The Richland Operations Office (RL), established in 1943 as the Manhattan Project Plutonium Production Facility, has several current missions. RL manages the 562-square mile Hanford Site where a broad range of nuclear and non-nuclear energy programs are conducted under all DOE Secretarial Offices. RL provides continuing operation of nuclear production, chemical processing and waste management programs, including interim storage and ultimate disposal of high-level radioactive wastes, and manages advanced reactor development programs. In addition, RL manages programs for facilities and site services and provides administrative and policy guidance to eight operating and support service contractors. In Alaska, Oregon and Washington, RL serves as the regional DOE representative. Interactions with universities include participation in the Used Energy-Related Equipment Grant program for universities and support for the local Tri-City University Center, which provides educational opportunities to agency and contractor staff. RL contracts with NORCUS, a consortium of 50 universities, through a University-Laboratory Cooperative program and contracts for energy-related research at all major northwestern universities.

FY 1985 Statistics

DOE Operating Outlay:	$20 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$973 M
Number of Government Employees (Full-Time Equivalents):	331
Capital Investment (DOE and direct support only):	$76 M
Capital Investment (Hanford Site total):	$2.7 B

Area Office

Shippingport Station Decommissioning Project Support Office, Shippingport, Pennsylvania

Major Program and Project Assignments

N Reactor
Nuclear Fuel and Materials Processing
Hanford Radioactive Waste Management
Advanced Reactor Program
Basalt Waste Isolation Project
Biomedical and Environmental Research Related to the Effects of Plutonium and Other Radionuclides
DOE-wide High Level Waste Management Program

Major Program and Project Assignments (Continued)

DOE-wide Surplus Facilities Management Programs
DOE-wide Commercial Spent Fuel Management Program
Shippingport Station Decommissioning
Process Facility Modification
Hanford Waste Vitrification

Laboratories and Plants Administered

Facility Name	Contractor
Pacific Northwest Laboratory	Battelle Memorial Institute
Hanford Engineering Development Laboratory	Westinghouse Hanford Company
Hanford Production Operations	
Fuel and Reactor Operations	UNC Nuclear Industries
Reprocessing and Waste Management	Rockwell Hanford Operations

San Francisco Operations Office
Oakland, California

Established in 1952, the San Francisco Operations Office (SAN) oversees defense and energy-related programs. SAN is responsible for the management, coordination and support of programs and projects involving weapons research and development, basic research and energy technologies. SAN administers contracts for the operation of eight laboratory and engineering facilities with a work force of almost 20,000, including two major national laboratories. SAN also manages field construction of major technical facilities.

FY 1985 Statistics

DOE Operating Outlay:	$18 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$1.3 B
Number of Government Employees (Full-Time Equivalents):	290
Capital Investment (Plant and Equipment):	$1.6 B

Area Offices

Pacific Site Office, Honolulu, Hawaii
Energy Technology Engineering Center Site Office, Canoga Park, California
Lawrence Berkeley Laboratory Site Office, Berkeley, California
Lawrence Livermore National Laboratory Site Office, Livermore, California
Stanford Linear Accelerator Center Site Office, Stanford, California

Major Program and Project Assignments

High Energy Physics
Magnetic Fusion
Basic Energy Sciences
Advanced Isotope Separation
Solar Thermal
Geothermal Loan Guaranty
High Temperature Gas Reactor
Inertial Confinement Fusion
Special Isotope Separation
NOVA Laser Facility
SDI New and Innovative Concepts
Doublet III-D
SP-100 Space Reactor
Heber Binary Geothermal Plant
Solar One Central Receiver Plant

Laboratories and Plants Administered

Facility Name	Contractor
Lawrence Livermore National Laboratory	University of California
Lawrence Berkeley Laboratory	University of California
Stanford Linear Accelerator Center	Stanford University
Stanford Synchrotron Radiation Laboratory	Stanford University
Energy Technology Engineering Center	Rockwell International
Laboratory for Energy-Related Health Research	University of California
Laboratory of Biomedical and Environmental Sciences	University of California
Laboratory of Radiobiology and Environmental Health	University of California

Savannah River Operations Office
Aiken, South Carolina

The Savannah River Operations Office, established in 1950, manages the Savannah River Plant (SRP), a key DOE installation for nuclear materials production and research. The primary mission of SRP is to produce tritium and plutonium for fabrication into weapons components for the nation's defense program. In addition, some of SRP's nuclear products have peaceful applications. Plutonium-238 is produced as a long-lasting fuel source to generate electrical power and warm instruments during space explorations. Research in nuclear energy and ecology are conducted at the Savannah River Laboratory and Savannah River Ecology Laboratory, respectively. In 1972, SRP was designated the nation's first National Environmental Research Park, where scientists from other Government agencies, private foundations and universities could use SRP land as a protected outdoor laboratory for long-term assessment of man's impact on the natural environment.

FY 1985 Statistics

DOE Operating Outlay:	$18 M
Approximate Outlays for DOE Activities Obligated through Operations Office:	$1.4 B
Number of Government Employees (Full-Time Equivalents):	326
Capital Investment (Plant and Equipment):	$88 K

Area Office

Atlanta Support Office, Atlanta, Georgia

Major Program and Project Assignments

Nuclear Materials for National Defense
Nuclear Materials for Industry and Medicine
Defense Waste Processing Facility
Fuel Materials Facility for Naval Nuclear Propulsion Systems
Joint Studies with the U.S. Forest Service on Forest Management
Environmental Monitoring
Environmental Research Related to the Effects of Different Forms of Energy Utilization on the Environment

Laboratories and Plants Administered

Facility Name	Contractor
Savannah River Ecology Laboratory	University of Georgia
Savannah River Forest Station	U.S. Forest Service
Savannah River Laboratory	E.I. du Pont de Nemours and Co., Inc.
Savannah River Plant	E.I. du Pont de Nemours and Co., Inc.
Savannah River Weapons Facility	E.I. du Pont de Nemours and Co., Inc.

2.B. NAVAL REACTORS OFFICES

Pittsburgh Naval Reactors Office
West Mifflin, Pennsylvania

The Pittsburgh Naval Reactors Office oversees the Bettis Atomic Power Laboratory in West Mifflin, Pennsylvania and the Naval Reactors Facility near Idaho Falls, Idaho. The program was established in 1948 when the U.S. Atomic Energy Commission contracted with Westinghouse to design, construct and operate a prototype nuclear propulsion plant. The Bettis Atomic Power Laboratory and the Naval Reactors Facility perform research and development of naval nuclear propulsion plants and operate associated prototype plants.

FY 1985 Statistics

DOE Operating Outlay:	$4 M
Approximate Outlays for DOE Activities Obligated through Naval Reactors Office:	$386 M
Number of Government Employees (Full-Time Equivalents):	79

Area Office

Idaho Branch Office, Idaho

Major Program and Project Assignments

Naval Reactors Development

Laboratories and Plants Administered

Facility Name	Contractor
Bettis Atomic Power Laboratory	Westinghouse Electric Corporation
Naval Reactors Facility	Westinghouse Electric Corporation

Schenectady Naval Reactors Office
Schenectady, New York

The Schenectady Naval Reactors (SNR) Office negotiates and administers contracts for the operation of the Knolls Atomic Power Laboratory and for the procurement of fuel and cores required for Naval Nuclear Propulsion Plant operation. SNR administers all technical and nontechnical aspects of these contracts. In addition, SNR serves as liaison with the Savannah River Operations Office for the Naval Nuclear Propulsion Plant in connection with the construction and operation of the Naval Fuel Material Facility.

FY 1985 Statistics

DOE Operating Outlay:	$3 M
Approximate Outlays for DOE Activities Obligated through Naval Reactors Office:	$500 M
Number of Government Employees (Full-Time Equivalents):	68

Area Offices

West Milton Field Office, New York
Windsor Field Office, Connecticut
Montville Audit Office, Connecticut

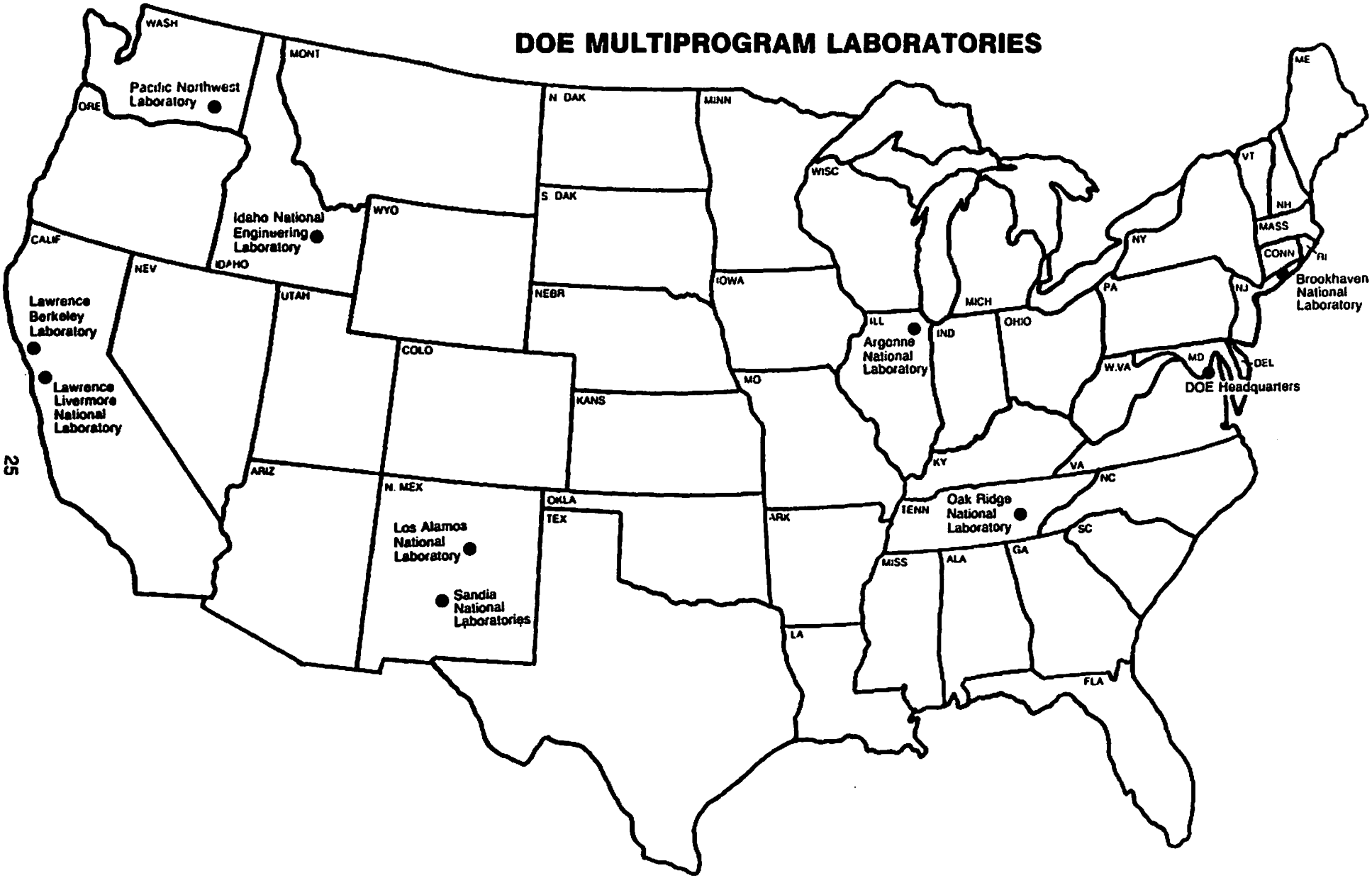
Major Program and Project Assignments

Naval Reactors Development

Laboratories and Plants Administered

Facility Name	Contractor
Knolls Atomic Power Laboratory	General Electric Company
Kesselring Site	General Electric Company
Windsor Site	General Electric Company

DOE MULTIPROGRAM LABORATORIES



3. THE DOE FACILITIES

A. MULTIPROGRAM LABORATORIES

Argonne National Laboratory
Argonne, Illinois

Argonne National Laboratory (ANL), established by the Atomic Energy Act of 1946, conducts applied research and engineering development in nuclear fission and other energy technologies and scientific research in basic physical and life sciences. Research and development at ANL links technology base research with engineering development, from concept stages to application. ANL's role is to develop and operate research facilities for members of the scientific community, maintain close interaction with personnel in universities and industry and aid in the education of scientists and engineers.

To fulfill its role as a multiprogram laboratory, ANL directs scientific and technical efforts toward several missions. ANL conducts nuclear fission programs that focus mainly on the breeder and other advanced reactor systems. These programs emphasize fast reactor physics, reactor safety and analysis, steam supply, operation of test facilities and innovative concepts using inherently safe features and cost-competitive design. In fossil energy, ANL concentrates on advanced conversion systems, instrumentation and control and directs significant development efforts in related technologies. Other programs include nuclear and materials research and development, solar and conversion systems and a variety of basic research. In physical and life sciences, ANL conducts basic research that emphasizes multidisciplinary efforts in chemistry and atomic and nuclear physics. Basic research is also conducted in materials science and in biological and environmental sciences concerning the nuclear and non-nuclear effects on organisms.

FY 1985 Statistics

DOE Operating Outlay:	$195 M
Staff (Full-Time Equivalents):	3,901
Capital Investment (Plant and Equipment):	$676 M
Number of Acres:	1,700

Operating Contractor	Responsible Operations Office
University of Chicago	Chicago Operations Office

Principal Program Activities

Nuclear Energy (34%)
Basic Energy Sciences (17%)
Miscellaneous Energy Research (8%)
Conservation and Renewable Energy (6%)
Nuclear Physics (5%)
Biological and Environmental Research (5%)
Fossil Energy (4%)
Miscellaneous DOE Programs (4%)
High Energy Physics (3%)
Fusion Energy (2%)
Work for Others (11%)
- Other Federal Agencies (3%)
- Nuclear Regulatory Commission (2%)
- Department of Defense (2%)
- Other DOE Contractors (2%)
- Non-Federal Organizations (2%)

Major Facilities

Active

Experimental Breeder Reactor II
Hot Fuels Examination Facilities
TREAT Reactor
Zero Power Plutonium Reactor
Argonne Tandem Linac Accelerator System
Intense Pulsed Neutron Source
High Voltage Electron Microscope - Tandem Facility

User

Argonne Fusion Electromagnetic Induction Experiment
Argonne Superconducting Heavy-Ion Linac
Biological-Materials Growth Facility
4-MV Dynamitron Facility
Facility for High Resolution Atomic Spectroscopy
60-Inch Fixed Frequency Accelerator
Fossil Energy Users Laboratory
Heat Exchanger Test Facility
High Voltage Electron Microscope - Tandem Facility
Hot Cell Facilities
Intense Pulsed Neutron Source
Janus Biomedical Research Reactor
National Battery Test Laboratory
22-MeV Pulsed Electron Linac
Salt Gradient Solar Pond
9-MV Tandem Electrostatic Accelerator Facility
User's Support Center
3-MeV Van de Graaff Accelerator
Argonne Liquid Metal Experiment

Brookhaven National Laboratory
Upton, New York

The Brookhaven National Laboratory (BNL), established in 1947, conceives, develops, constructs and operates complex research facilities for the study of fundamental properties of matter. BNL conducts basic and applied research in technology base areas, supports research facilities and establishes important new directions for research. Major disciplinary strengths at BNL are high energy, nuclear and solid state physics, chemistry and biology. Research programs include the exploration of the fundamental constituents of matter, properties and interactions. The physical, chemical and biological effects of radiation and chemical substances involved in the production and use of energy are also studied. Other research programs include combustion processes and emissions, physical and chemical cleanup of combustion gas, meteorological dispersion, atmospheric chemistry, structural biology, development of radiopharmaceuticals and nuclear medicine applications. Major facilities include the 33 billion electron volt Alternating Gradient Synchrotron (AGS), the High Flux Beam Reactor (HFBR), Tandem van de Graaff Facility and the National Synchrotron Light Source (NSLS). In addition, there are several smaller accelerators, a medical research reactor and two scanning transmission electron microscopes.

BNL makes its facilities available to researchers in all areas of the physical and biological sciences. Faculty and students have guest appointments, perform research and participate in summer programs at BNL. The NSLS is used by university and industrial scientists; currently, 16 beam lines at the facility are partially or completely supported by the industrial community.

FY 1985 Statistics

DOE Operating Outlay:	$153 M
Staff (Full-Time Equivalents):	3,216
Capital Investment (Plant and Equipment):	$627 M
Number of Acres:	5,265

Operating Contractor	Responsible Operations Office
Associated Universities, Inc.	Chicago Operations Office

Principal Program Activities

- High Energy Physics (31%)
- Basic Energy Sciences (25%)
- Environmental Research and Development (10%)
- Nuclear Physics (4%)
- Miscellaneous DOE Programs (13%)
- Work for Others (17%)
  - Nuclear Regulatory Commission (7%)
  - Department of Defense (1%)
  - Others (9%)

Major Facilities

Active	User*
Alternating Gradient Synchrotron	60-Inch Cyclotron
High Flux Beam Reactor	Scanning Transmission Electron Microscope
Tandem van de Graaff	Positron Emission Transaxial Tomography Facility
National Synchrotron Light Source	JSW168 Small Cyclotron

* In addition to facilities listed under Major Active Facilities column

Idaho National Engineering Laboratory
Near Idaho Falls, Idaho

The Idaho National Engineering Laboratory (INEL) was established in 1949 for the building and testing of nuclear reactors and support equipment. INEL now reprocesses and recovers spent nuclear fuel from several test reactors, the nuclear naval fleet and other nuclear noncommercial reactors and processes liquid waste into the calcine form for intermediate storage. The laboratory operates the Advanced Test Reactor and a radioactive waste management complex for storage and disposal of low-level waste and conducts associated programs in materials testing, isotope production, irradiation services and training and test support. In addition, INEL functions as the lead laboratory for the multi-megawatt space reactor program and fusion reactor safety research. Using the new Idaho Laboratory Facility, INEL supports DOE's non-nuclear energy research and development programs in geothermal and industrial conservation. INEL also supports other efforts in research and development of defense and civilian nuclear power conducted at INEL under the cognizance of other laboratories, and directs the Three Mile Island (TMI) technical information and examination program at the TMI reactor site and INEL.

FY 1985 Statistics

DOE Operating Outlay:	$390 M
Staff (Full-Time Equivalents):	5,748*
Capital Investment (Plant and Equipment):	$820 M
Number of Acres:	572,000

*Excludes Argonne National Laboratory-West/ Naval Reactors Facility personnel located at INEL

Operating Contractor

EG&G Idaho, Inc.
Westinghouse Idaho Nuclear Company, Inc.
Exxon Nuclear Idaho Company, Inc.

Responsible Operations Office

Idaho Operations Office

Principal Program Activities

Nuclear Materials Production (25%)
Defense Waste and Transportation Management (12%)
Remedial Action Programs (11%)
Energy Conservation and Alternate Energy Programs (9%)
Advanced Test Reactor Operations (6%)
Three Mile Island (TMI) Program (6%)
Site Support to Naval Reactor Facility, Argonne National Laboratory and Chicago Operations Office (5%)
Miscellaneous DOE Programs (11%)
Work for Others (15%)
- Nuclear Regulatory Commission (4%) (including Loss-of-Fluid Test and Power Burst Facility programs)
- Others (11%)

Major Facilities

Active	User
Idaho Chemical Processing Plant	Environmental Research Park
Radioactive Waste Management Complex	
New Waste Calcining Facility	
Fluorinel Dissolution and Fuel Storage Facility	
Process Experimental Pilot Plant	
Stored Waste Examination Pilot Plant	
Advanced Test Reactor	
Idaho Laboratory Facility	

Lawrence Berkeley Laboratory
Berkeley, California

Lawrence Berkeley Laboratory (LBL) was founded in 1931 to advance the development of the cyclotron invented by Ernest Lawrence. Currently, the major roles of LBL are to perform multidisciplinary research in the general and energy sciences; develop and operate unique national experimental facilities; educate and train the next generation of scientists and engineers; and foster productive relationships between LBL research programs and industry. Major research programs are conducted in nuclear and high energy physics, materials science and chemistry, medical and biological science, energy conservation and storage, environmental science, medical and biological science, earth science, chemical biodynamics, instrumentation and advanced accelerator design. The world's most advanced electron microscopes and heavy ion particle accelerators are operated at LBL and are available for use by industrial and other researchers.

LBL, located near the Berkeley campus, maintains a strong relationship with the University of California. Over 190 university faculty are on the staff, and 700 to 800 graduate students pursue advanced degrees at LBL. In addition to industry participation on LBL advisory panels, the Centers for Advanced Materials and X-Ray Optics have been created to enhance industry interactions.

FY 1985 Statistics

DOE Operating Outlay:	$125 M
Staff (Full-Time Equivalents):	2,524
Capital Investment (Plant and Equipment):	$308 M
Number of Acres:	130

Operating Contractor

University of California

Responsible Operations Office

San Francisco Operations Office

Principal Program Activities

Energy Research (64%)
Conservation and Renewable Energy (10%)
Miscellaneous DOE Programs (9%)
Work for Others (17%)
  Health and Human Services (8%)
  Others (9%)

Major Active and User Facilities

Bevalac
SuperHILAC
National Center for Electron Microscopy
National Tritium Labeling Facility
88-Inch Cyclotron

Lawrence Livermore National Laboratory
Livermore, California

The Lawrence Livermore National Laboratory (LLNL), established in 1952, is a scientific and technical resource for the nation's nuclear weapons program and other programs of national interest. LLNL's primary role is to perform the research, development and testing associated with the nuclear design aspects of all phases of the nuclear weapon life cycle and associated national security activities. Other important problems addressed at LLNL meet the following criteria: 1) significance to the weapons program, 2) sufficient size, importance and complexity to warrant the use of significant or unique laboratory capabilities, and 3) relative distinction from the research interests of the university and industrial sectors. Within this role, LLNL has developed expertise in inertial fusion, magnetic fusion, biomedical and environmental research, isotope separation and applied energy technology.

LLNL interacts with universities through faculty, students, programs and facilities. Faculty and students are employed year-round, and many work with LLNL scientists and engineers on a volunteer basis. Staff members give seminars, teach and participate in advisory boards at colleges and universities. LLNL sponsors cooperative programs that enable researchers from local universities to use its technology, facilities and expertise. In 1985, an internship program and a summer institute were initiated to increase student and academic awareness of LLNL's work. Educational television links have been established with local universities and a Bay Area industrial consortium, and companies and universities have inexpensive access to LLNL's continuing education courses on videotape.

FY 1985 Statistics

DOE Operating Outlay:	$623 M
Staff (Full-Time Equivalents):	8,063
Capital Investment (Plant and Equipment):	$863 M
Number of Acres:	631

Operating Contractor	Responsible Operations Office
University of California	San Francisco Operations Office

Principal Program Activities

Defense Programs (46%)
Isotope Separation (11%)
Magnetic Fusion (9%)
Laser Fusion Energy (8%)
Energy Programs (3%)
Biomedical/Environmental (2%)
Miscellaneous DOE Programs (5%)
Work for Others (16%)
  Department of Defense (12%)
  Others (4%)

Major Facilities

Active

Nova Laser Fusion Facility
National Defense-Supported Livermore Computer Center
Gaseous and Metallurgical Facility (Plutonium and Tritium)
Magnetic Fusion Energy Facility
Mirror Fusion Test Facility
Tandem Mirror Experiment
Large Optics Diamond Turning Facility
Fusion Target Development Facility
High Explosive Flash Radiograph Facility
Weapons Materials R&D Facility (in process)
High Explosive Application Facility
Special Isotope Separation Facility
Advanced Test Accelerator Facility
High Field Test Facility

User

14 MeV Rotating Target Neutron Source
100 MeV Accelerator Facility Center
National Gene Library Project
National Magnetic Fusion Energy Computation Center

Los Alamos National Laboratory
Los Alamos, New Mexico

The Los Alamos National Laboratory (LANL) was established in 1943 as part of the Manhattan Engineer District during World War II to develop the world's first nuclear weapons. Currently, LANL's primary mission is the application of science and technology to problems of national security, including the maintenance of a strong defense, the fulfillment of arms control commitments and the guarantee of a secure energy supply for the future. LANL also undertakes multidisciplinary fundamental and applied research.

Primary responsibilities include researching and developing nuclear warheads, designing and testing advanced technology concepts and maintaining an innovative weapons design program. In nuclear fission, programs include the separation of fissionable isotopes by lasers, development of space power and defense terrestrial power, modeling of reactor accident results for the Nuclear Regulatory Commission, evaluation of consequences of energy production and development of effective nuclear waste disposal methods. Nuclear fusion programs emphasize safe handling techniques for large quantities of tritium, studies on reactor components and systems and approaches to magnetic confinement. LANL conducts extensive research in life sciences, health, environmental sciences and basic energy sciences, including materials, chemical, nuclear and engineering sciences and geoscience. LANL also studies fossil, solar and geothermal energies and energy storage and conservation. For the Department of Defense (DOD), LANL works on new strategic concepts for defending against nuclear attack, energy research and development, non-nuclear weapons, conventional ordnance and materials technology. The specialized facilities at LANL are available to many users for purposes ranging from ion beam research and laser spectroscopy to radiation instrument calibration and rock mechanics studies.

FY 1985 Statistics

DOE Operating Outlay:	$545 M*
Staff (Full-Time Equivalents):	8,013
Capital Investment (Plant and Equipment):	$1.002 B
Number of Acres:	27,820

*Excludes Work for Others of $124 M

Operating Contractor	Responsible Operations Office
University of California	Albuquerque Operations Office

Principal Program Activities

Weapons (46%)
Nuclear Physics (6%)
Nuclear Materials Production (6%)
Magnetic Fusion (3%)
Verification and Control (3%)
Safeguards (2%)
Conservation and Renewable Energy (2%)
Nuclear Energy (2%)
Basic Energy Sciences (2%)
Miscellaneous DOE Programs (7%)
Work for Others (21%)
- Nuclear Regulatory Commission (2%)
- Department of Defense (14%)
- Others (5%)

Major Facilities

Active

800 Million Electron-Volt Linear Proton Accelerator (LAMPF)
8 Megawatt Nuclear Reactor
Plutonium Research Facility
Plutonium Heat Sources Fuel Production Facility
National Security Resources and Studies Center

User

Clinton P. Anderson Meson Physics Facility (LAMPF)
Environmental Research Park
National Flow Cytometry and Cell Sorting Research Facility
National Genetic Sequence Data Bank
Stable Isotopes Production Facility
Weapons Neutron Research Facility

Oak Ridge National Laboratory
Oak Ridge, Tennessee

The Oak Ridge National Laboratory (ORNL), founded in 1943, primarily supports the fission nuclear fuel cycle and development of magnetic fusion energy through scientific research and technology. In addition, ORNL identifies and solves generic research problems in energy technologies such as materials, separation techniques, chemical processes and biotechnology and is the major national source of stable and radioactive isotopes. Energy technology development at ORNL includes other important efforts in residential and commercial energy conservation, renewable energy sources and coal conversion and utilization. ORNL involves industry in its programs and encourages cooperative uses of facilities, formally through users' groups and informally through professional contacts and participation. ORNL also provides universities and secondary schools with ready access to major research facilities, state-of-the-art research capabilities, training facilities for faculty and students and opportunities for collaborative research.

FY 1985 Statistics

DOE Operating Outlay:	$398 M
Staff (Full-Time Equivalents):	4,955
Capital Investment (Plant and Equipment):	$400 M
Number of Acres:	10,270

Operating Contractor	Responsible Operations Office
Martin Marietta Energy Systems, Inc.	Oak Ridge Operations Office

Principal Program Activities

- Fission Energy Development (17%)
- Basic Physical Sciences (16%)
- Fusion Energy (14%)
- Conservation and Renewable Energy (10%)
- Biomedical and Environmental Sciences (8%)
- Fossil Energy (2%)
- Miscellaneous DOE Programs (8%)
- Nuclear Regulatory Commission (6%)
- Work for Others (19%)
  - Department of Defense (12%)
  - Others (7%)

Major Facilities

Active

Isotopes Separation Facility
High Flux Isotope Reactor
Electron Linear Accelerator
Transuranium Processing Plant
Oak Ridge Research Reactor
High Level Radiochemical Laboratory
Materials Processing Laboratory
High Radiation Level Examination Laboratory
Environmental Sciences Laboratory

User

Holifield Heavy Ion Research Facility
EN-Tandem Accelerator
Oak Ridge Electron Linear Accelerator (ORELA)
Neutron Scattering Facility
Surface Modification and Characterization Laboratory
Health Physics Research Reactor
National Center for Small-Angle Scattering Research
Ion-Solid Interactions Laboratory
Shared Research Equipment (SHARE)
Bioprocessing Research Facility
Environmental Research Park
Roof Test Facility

Pacific Northwest Laboratory
Richland, Washington

The Pacific Northwest Laboratory (PNL), established in 1965, has two principal missions. First, as a DOE multiprogram laboratory, PNL develops and deploys technology for energy security and national defense and transfers technology to enhance the international competitiveness of the U.S. Second, as the research and development laboratory for the Hanford site, PNL provides advanced technology and environmental surveillance to support Hanford operations. Using facilities owned by the Government and Battelle Memorial Institute, PNL applies a project-oriented, multidisciplinary approach to its missions. Current programs at PNL include technological advancement of nuclear reactor systems, nuclear waste management, defense materials production, energy conservation and renewable energy systems. PNL also studies the environmental and health effects of radionuclides, inorganic chemicals and complex organic mixtures encountered in energy production. PNL maintains scientific and engineering strengths in chemistry, chemical engineering, biology, physics, mechanical engineering, electronics-electrical engineering, metallurgical-ceramics engineering and mathematics-computer science. These disciplines are grouped to form technical centers-of-excellence in life sciences, materials sciences and technology, earth sciences, chemical technology, engineering development and the information sciences. Working closely with the private sector, PNL ensures successful deployment of DOE technology in the marketplace. With the academic community, PNL has traditionally developed and maintained strong ties through scientific research teams, exchange of staff and student research and cooperative research efforts to accelerate application of new ideas.

FY 1985 Statistics

DOE Operating Outlay:	$147 M
Staff (Full-Time Equivalents):	2,567
Capital Investment (Plant and Equipment):	$118 M
Number of Acres:	Shared with other Hanford contractors

Operating Contractor	Responsible Operations Office
Battelle Memorial Institute	Richland Operations Office

Principal Program Activities

Defense (18%)
Commercial Radioactive Waste (18%)
Life Sciences (10%)
Nuclear Energy (9%)
Conservation (8%)
Renewable (6%)
Basic Energy Research (3%)
Miscellaneous DOE Programs (1%)
Work for Others (27%)
- Nuclear Regulatory Commission (14%)
- Department of Defense (10%)
- Other Federal Agencies (3%)

Major Facilities

Active

Two Life Sciences Laboratories
Marine Research Laboratory
Meteorological Center
Nuclear Waste Technology Center
Materials Reliability Center
Steam Generator Examination Facility
Engineering Development Laboratory
Geophysical and Astronomical Observatory

User

Arid Lands Ecology Reserve and Hanford National Environmental Research Park
Supercritical Fluid Chromotography/Mass Spectrometry
Accelerator Laboratory
Low-Level Radionuclide Measurement Instrumentation
Materials Characterization Center
Surface Science Capability
Gas Chromatograph/Mass Spectroscopy

Sandia National Laboratories
Albuquerque, New Mexico
Livermore, California
Tonopah, Nevada

The principal mission of Sandia National Laboratories, established in 1949, is research, development and engineering of nuclear weapon systems, except for the nuclear explosive. The result of this effort is the existence of a national stockpile of operational nuclear weapons that are safe, secure, reliable and strictly controlled. Sandia also conducts energy programs in fossil, solar, fission and basic energy sciences. The strength of Sandia National Laboratories is its ability to conduct large, interdisciplinary engineering projects that are sophisticated but considered technologically risky.

At Sandia, fundamental understanding and technological development are combined,. resulting in an environment conducive to generating new products and processes that are unlikely to be produced in university or industry laboratories. These new technologies contribute significantly to the nation's scientific and economic prosperity and are transferred to the private sector through journals, workshops and other information-transfer mechanisms.

FY 1985 Statistics

DOE Operating Outlay:	$688 M*
Staff (Full-Time Equivalents):	8,254
Capital Investment (Plant and Equipment):	$694 M
Number of Acres:	7,422 (Albuquerque)** 192 (Livermore)

*Excludes Work for Others of $200 M
**Excludes approximately 32,000 acres of leased land

Operating Contractor	Responsible Operations Office
AT&T Technologies, Inc.	Albuquerque Operations Office

Principal Program Activities

Weapons (57%)
Commercial/Defense Waste (5%)
Solar (4%)
Verification and Control (3%)
Security and Safeguards (2%)
Fossil Energy (1%)
Basic Energy Sciences (1%)
Miscellaneous DOE Programs (3%)
Other DOE (2%)
Work for Others (22%)
- Department of Defense (17%)
- Nuclear Regulatory Commission (4%)
- Others (1%)

Major Facilities

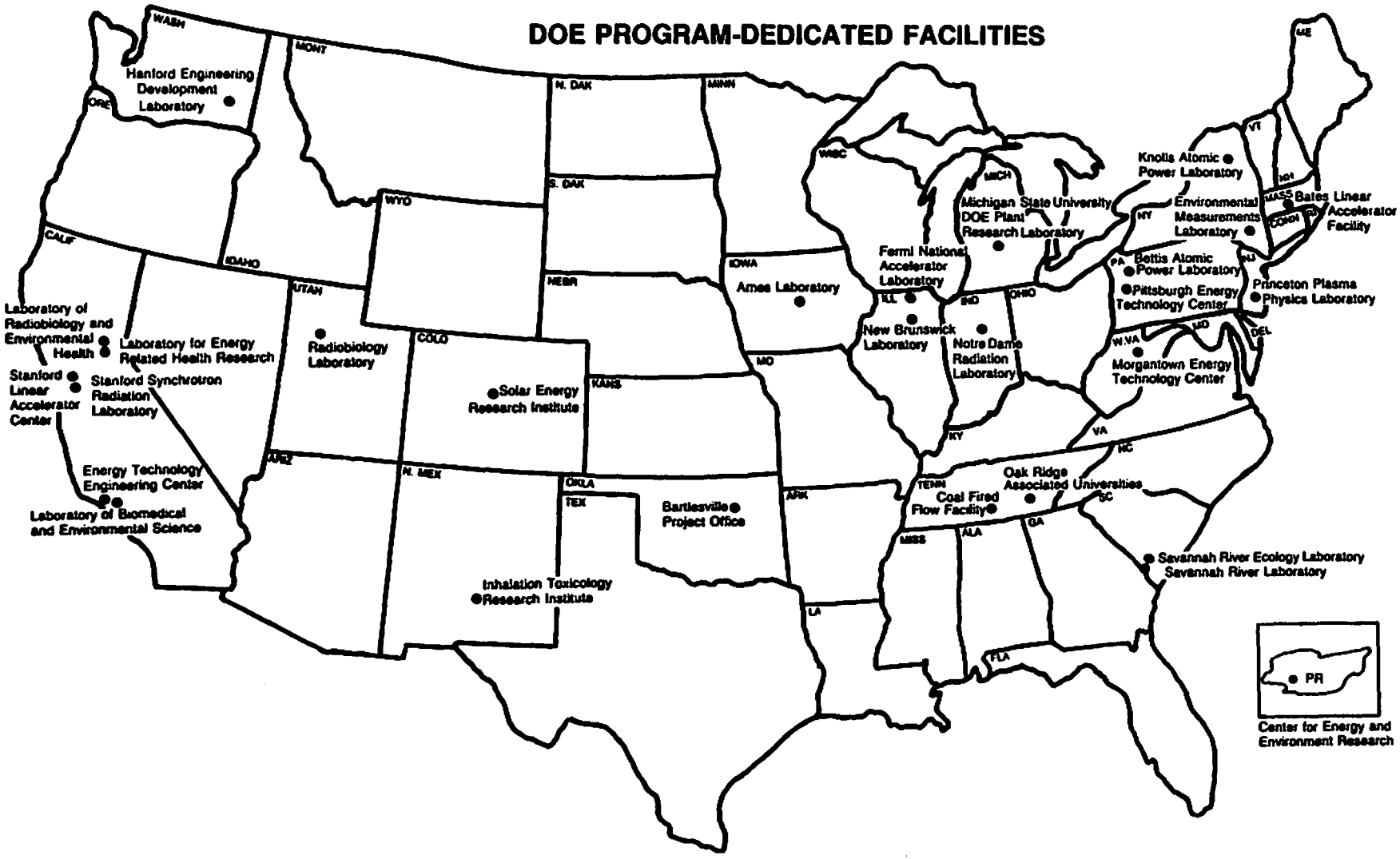
Active

Particle Beam Fusion Facility
Nuclear Safeguards and Security Facility
Combustion Research Facility
5-Megawatt Solar Central Power Test Facility
Center for Radiation-Hardened Microelectronics

User

Combustion Research Facility
5-Megawatt Solar Central Power Test Facility

DOE PROGRAM-DEDICATED FACILITIES



3.B. PROGRAM-DEDICATED FACILITIES

ADVANCED REACTOR FACILITY

Hanford Engineering Development Laboratory
Richland, Washington

The Hanford Engineering Development Laboratory (HEDL) is committed to the development of Liquid Metal Reactors (LMRs), including the operation and development of LMR fuels and materials and research and engineering development of advanced nuclear power concepts. The 400 MWt Fast Flux Test Facility at HEDL is the most advanced test reactor in the world and DOE's major test bed for LMR development. The special materials expertise of the laboratory supports the development of special reactor materials for fusion and space nuclear applications. Other HEDL expertise involves passive reactor safety, fuel cycle and engineering development of remotely operated systems and components. HEDL was established in July 1970.

FY 1985 Statistics

DOE Operating Outlay:	$106 M
Staff (Full-Time Equivalents):	1,844
Capital Investment (Plant and Equipment):	$1,164 M
Number of Acres:	540

Operating Contractor	Responsible Operations Office
Westinghouse Hanford Company	Richland Operations Office

Principal Program Activities

- Liquid Metal Reactor (72%)
- Fusion (2%)
- Nuclear Waste (2%)
- Work for Others (24%)
  - UNC Nuclear Industries - Materials Production (8%)
  - Rockwell Hanford Operations - Defense Waste (3%)
  - Pacific Northwest Laboratory - Various Programs (5%)
  - Others (performed outside of Hanford) (8%)

Major Facilities

Active

SP-100 Ground Engineering System
  Reactor Test
Hot Cell Verification Facility
Sodium Test Facilities

Fuels and Materials Examination
  Facility (including Secure
  Automated Fabrication Line)
Fast Flux Test Facility Control
  Room Simulator

User

Fast Flux Test Facility
Fabrication Facilities
  Fuel Development Laboratory
  Development, Fabrication and
  Test Laboratory
Hot Cell Facilities
  Chemical Engineering
    Laboratories
  Hot Cell Verification Facility
  Post Irradiation Testing
    Laboratory
Materials Technology Laboratory
  Electron Microscope
  Mechanical Property Testing

Michigan State University (MSU)-DOE
Plant Research Laboratory
East Lansing, Michigan

The Michigan State University (MSU)-DOE Plant Research Laboratory (PRL) was established in 1964 by the Atomic Energy Commission (AEC) to conduct research on the effects of radiation on plants and basic research in plant biology using peaceful applications of nuclear energy. Although the emphasis of these goals changed through periods of shifting national priorities, PRL has always been committed to the study of fundamental processes affecting plant growth, development and reproduction. Current research at PRL explores underlying mechanisms that limit biomass productivity and is directed at three levels of plant regulation: 1) the involvement of endogenous chemicals that function as plant growth regulators, 2) the regulation of cellular and physiological properties by environmental factors such as temperature, light and moisture, and 3) the regulation of genome expression. Research is also directed at methods of manipulating plant regulation to improve heritable physiological properties.

The spirit of cooperation within the laboratory produces a vigorous research environment and academic recognition of PRL as an international center for plant biology training. The breadth of research and training interests within PRL is reflected by faculty appointments to MSU academic departments, including Biochemistry, Botany and Plant Pathology, Crop and Soil Sciences, Microbiology and the Genetics Program. The future goal of PRL is to maintain and strengthen fundamental and innovative research programs in plant biology for a better understanding of the processes that regulate plant productivity.

FY 1985 Statistics

DOE Operating Outlay:	$2 M
Staff (Full-Time Equivalents):	42
Capital Investment (Plant and Equipment):	$2 M
Number of Acres:	Located on campus

Operating Contractor	Responsible Operations Office
Michigan State University	Chicago Operations Office

Principal Program Activities

Basic Energy Sciences (100%)

Notre Dame Radiation Laboratory
Notre Dame, Indiana

Founded in 1949, the primary purpose of the Notre Dame Radiation Laboratory is the study of radiation effects. Specifically, the laboratory seeks to obtain, through theoretical and experimental research, detailed descriptions of the mechanisms leading to chemical change following the absorption of high-energy radiation and light. The research also is designed to lead to the construction of predictive models that will be useful in experimental and technological applications where reactions are initiated by radiation chemical and photochemical methods.

The laboratory maintains an outstanding complement of equipment such as linear and Van de Graaff accelerators, cobalt-60 gamma-ray sources and laser and photochemical sources. Unique facilities include a coupled Van de Graaff-ESR spectrometer and a coupled Van de Graaff-Raman spectrometer for studying radiation-produced intermediates, a laser apparatus for similar studies of intermediates produced by visible and ultraviolet light and a computer-controlled apparatus for ready acquisition and processing of optical absorption data in pulse radiolysis and flash photolysis experiments. These facilities are made available to university and independent scientists for appropriate research.

FY 1985 Statistics

DOE Operating Outlay:	$3 M
Staff (Full-Time Equivalents):	67
Capital Investment (Plant and Equipment):	$5 M
Number of Acres:	0.9

Operating Contractor

University of Notre Dame

Responsible Operations Office

Chicago Operations Office

Principal Program Activities

Physical Research (97%)
Work for Others (3%)
National Bureau of Standards (3%)

Major Facilities

Van de Graaff - ESR Spectrometer Facility
8 MeV Linear Accelerator

Stanford Synchrotron Radiation Laboratory
Stanford, California

The Stanford Synchrotron Radiation Laboratory (SSRL) is a national facility concentrating on the development and utilization of synchrotron radiation for basic research in the natural sciences, engineering and medicine. Radiation is utilized from two storage rings: SPEAR (4 GeV) and PEP (16 GeV), located at the Stanford Linear Accelerator Center (SLAC). The laboratory, started in 1973 under the auspices of the National Science Foundation, became a DOE facility in 1982.

SSRL activities include accelerator design and modification specific to synchrotron radiation, and development of new sources and experimental techniques for use with synchrotron radiation. Both in-house and user research at SSRL is varied and includes X-ray Absorption Spectroscopy, X-ray Diffraction, Atomic Physics, X-ray Fluorescence Analysis, Photoemission, Photoelectron Diffraction, Non-invasive Angiography, X-ray Lithography, X-ray Microscopy and Time-Resolve Fluorescence Spectroscopy.

SSRL now has 19 experimental stations on seven beam lines covering the spectrum 6-45,000 eV and includes the world's brightest x-rays. A wide variety of specialized experimental equipment is available for the researcher. SSRL is used by approximately 550 researchers from 110 institutions, including 58 U.S. universities, 16 private corporations and 12 governmental laboratories. Graduate students from 19 different universities have received Ph.D.s based on work at SSRL.

FY 1985 Statistics

DOE Operating Outlay:	$8 M
Staff (Full-Time Equivalents):	75
Capital Investment (Plant and Equipment):	$19 M
Number of Acres:	Located on SLAC Site

Operating Contractor

Stanford University

Responsible Operations Office

San Francisco Operations Office

Principal Program Activities

Energy Research (81%)
Work for Others (19%)

Major Facilities

18 Experimental Stations on SPEAR Storage Ring
1 Experimental Station on PEP Storage Ring

Center for Energy and Environment Research
San Juan, Puerto Rico

The Center for Energy and Environment Research (CEER), established in 1957, is the focal point for energy research in Puerto Rico. The mission of CEER is to help the island achieve energy independence and train scientists, engineers and others in energy, the environment and related fields. CEER supports research and training programs in environmental sciences and technologies and serves as a center for international cooperation in energy and the environment, particularly for university and industry scientists and technicians who specialize in tropical and subtropical areas. Research at CEER is focused on developing alternative sources of energy for Puerto Rico through its most abundant resources--the sun, wind and sea--and includes programs in solar technology, conservation, materials, ocean thermal energy conversion (OTEC) and terrestrial and marine biomass and bioconversion technologies. Environmental research is conducted in CEER's Terrestrial and Marine Ecology Divisions.

FY 1985 Statistics

DOE Operating Outlay:	$360 K
Staff (Full-Time Equivalents):	14
Capital Investment (Plant and Equipment):	$8 M
Number of Acres:	241

Operating Contractor	Responsible Operations Office
University of Puerto Rico	Oak Ridge Operations Office

Principal Program Activities

Environmental Research (80%)
Energy Research (20%)

Environmental Measurements Laboratory
New York, New York

The Environmental Measurements Laboratory (EML), founded in 1947, conducts environmental research on pollutants from energy technologies and related national security activities to determine their effects on human health and the environment. Research on nuclear and non-nuclear pollutants is conducted by EML through studies of the distribution, composition, mechanism and rate of movement of pollutants from the atmosphere to soil, plants, animals and humans. EML also conducts advanced studies in the development and application of analytical chemistry and radioanalytical procedures and supports research and development of instruments to detect and measure environmental radioactivity and non-nuclear pollutants. EML's programs in radiological and chemical monitoring generate data that is used by other DOE components, Federal agencies and international organizations.

FY 1985 Statistics

DOE Operating Outlay:	$7 M
Staff (Full-Time Equivalents):	100
Capital Investment (Plant and Equipment):	$4 M
Number of Acres:	1.7

Operating Contractor

Federally-Operated

Responsible Operations Office

Chicago Operations Office

Principal Program Activities

Characterization, Measurement and Monitoring (61%)
Environmental Studies (30%)
Carbon Dioxide and Climate Research (8%)
Work for Others (1%)

Inhalation Toxicology Research Institute
Albuquerque, New Mexico

The primary mission of the Inhalation Toxicology Research Institute (ITRI), established in 1960, is to assess adverse human health effects associated with commercial energy technologies. The Institute investigates the degree to which the inhalation of by-products of energy technologies such as fugitive or operating emissions may harm the health of operators or the general public. ITRI addresses 40 percent of its program efforts to research on health effects associated with nuclear technologies. Additional research programs address other important energy technologies, including combustion and gasification of coal and use of diesel-powered vehicles.

FY 1985 Statistics

DOE Operating Outlay:	$7 M*
Staff (Full-Time Equivalents):	220
Capital Investment (Plant and Equipment):	$8 M
Number of Acres:	293

*Excludes Work for Others of $4 M

Operating Contractor

Lovelace Biomedical and Environmental Research Institute

Responsible Operations Office

Albuquerque Operations Office

Principal Program Activities

- Environmental Research and Development (58%)
- Miscellaneous DOE Programs (6%)
- Work for Others (36%)
  - Department of Defense (30%)
  - Nuclear Regulatory Commission (4%)
  - Other (2%)

Laboratory for Energy-Related Health Research
Davis, California

The Laboratory for Energy-Related Health Research (LEHR) is associated with the School of Veterinary Medicine at the University of California at Davis. Founded in 1951 by the Atomic Energy Commission, LEHR was established to evaluate latent health effects of acute and fractionated exposures in beagles and subsequently expanded to include radionuclide toxicology. LEHR performs research on the biomedical effects of internally deposited radionuclides and external radiation exposure and nuclear medicine radiopharmaceutical development. Staff at LEHR are completing a 25-year radionuclide study on approximately 1,000 dogs. Other current research concentrates on the mechanism of radiation-induced leukemia, unique radiopharmaceuticals using short-lived radionuclides and actinide metabolism. LEHR has facilities for research in bone immunology, inhalation toxicology, radiological physics and dosimetry pathology and general toxicology, including mutagenesis and carcinogenesis. In addition to laboratories for biomedical analysis, cell culture and pathology, LEHR maintains facilities for small and large animals, aerosol generation and exposure and special radiation sources. Equipment at LEHR includes a whole body counter and a minicomputer with distributed network. The laboratory collaborates with university faculty and sponsors graduate students in advanced research. In addition, the senior faculty of LEHR hold appointments in teaching departments of the university and are involved in formal course offerings. Information and technology transfer is achieved primarily through scientific literature in the open peer review process.

FY 1985 Statistics

DOE Operating Outlay:	$2 M
Staff (Full-Time Equivalents):	58
Capital Investment (Plant and Equipment):	$8 M
Number of Acres:	15

Operating Contractor	Responsible Operations Office
University of California	San Francisco Operations Office

Principal Program Activities

Biomedical Research (70%)
- Carcinogenesis (50%)
- Systems Damage (12%)
- Nuclear Medicine Applications (8%)

Work for Others (30%)

Laboratory of Biomedical and Environmental Sciences
Los Angeles, California

The Laboratory of Biomedical and Environmental Sciences (LBES) was established in 1947 to research problems of national significance in energy-related medical, biomedical and environmental fields. Scientists at LBES study the mechanism of damage to cellular constituents and processes by ionizing radiation, heavy metal contaminants and atmospheric gaseous pollutants. Research is also conducted on the mechanism of action of certain hormones and neurotransmitters, the control of metabolic reactions, the regulation of gene expression and carcinogenesis and the formation and properties of cellular membranes. Environmental research at LBES focuses on the effects of energy technologies on various environments, particularly arid regions, and includes basic research on desert ecosystem biology in support of the applied studies. In biomedical research, additional objectives are the introduction of new atraumatic diagnostic procedures for earlier detection of disease and the study of biochemical and physiological processes in vivo. Current research emphasizes positron emission tomography (PET) for studying physiological processes in the heart and brain and the mode of action of abusive and nonabusive drugs.

LBES interacts with UCLA and scientific organizations in developing its programs and provides short-term assignments of consultants and scientists from other laboratories and universities. Staff members hold academic appointments in university departments, and postdoctoral and graduate students are actively involved in LBES work.

FY 1985 Statistics

DOE Operating Outlay:	$4 M
Staff (Full-Time Equivalents):	96
Capital Investment (Plant and Equipment):	$7 M
Number of Acres:	Located on campus

Operating Contractor	Responsible Operations Office
University of California	San Francisco Operations Office

Principal Program Activities

Nuclear Medicine Applications (36%)
Carcinogenesis/Systems Damage (15%)
Biological Responses (8%)
Work for Others (41%)

Laboratory of Radiobiology and Environmental Health
San Francisco, California

The Laboratory of Radiobiology and Environmental Health, established by the Atomic Energy Commission in 1951, is an institute for research and training in cell biology. The laboratory is dedicated to fundamental research and investigation of the ways in which radiation and other energy-related biomedical insults affect cellular processes and lead to detrimental genetic and somatic biomedical effects. Six interrelated groups that comprise the laboratory research cell biology, including DNA replication and repair, chromosomal effects and cytogenetics, molecular immunology, cellular structure, physiology of the macrophage system and developmental biology. Research studies are undertaken to investigate the mechanisms by which perturbation and repair of cellular systems can affect the whole organism, cause cancer in the present generation and damage future generations. Research focuses specifically on ways in which the organism can cope with such insults. In addition to cataloging effects, scientists seek a basic understanding of ways in which perturbations of normal cellular and physiological processes are induced, repaired and expressed at the molecular, cellular, tissue and organismal levels. As a research unit in the School of Medicine, the laboratory is involved extensively with the academic programs of the university. Post-doctoral fellows seek professional training, and staff members hold faculty appointments and participate on university committees.

FY 1985 Statistics

DOE Operating Outlay:	$2 M
Staff (Full-Time Equivalents):	41
Capital Investment (Plant and Equipment):	$3 M
Number of Acres:	0.4

Operating Contractor

University of California

Responsible Operations Office

San Francisco Operations Office

Principal Program Activities

Biomedical and Environmental Research (100%)
- Systems Damage (50%)
- Mutagenesis (50%)

Oak Ridge Associated Universities
Oak Ridge, Tennessee

Oak Ridge Associated Universities (ORAU) is a private, not-for-profit association comprised of 49 colleges and universities. ORAU conducts research and educational programs in energy, health and the environment for DOE, member institutions of ORAU, other colleges and universities and private and governmental organizations. Established in 1946, ORAU was one of the first university-based, science-related corporate management groups. The purpose of ORAU is to advance learning and scientific knowledge in disciplines related to energy, health and the environment. ORAU conducts and encourages scientific research in the social and natural sciences; develops and operates educational and training facilities; and undertakes other related activities which may contribute to the welfare of ORAU. Through ORAU, the scientific resources of DOE are available to qualified individuals in universities and other educational and research institutions. ORAU also makes the education and research resources of these institutions available to DOE and other governmental agencies.

FY 1985 Statistics

DOE Operating Outlay:	$22 M
Staff (Full-Time Equivalents):	420
Capital Investment (Plant and Equipment):	$6 M
Number of Acres:	164

Operating Contractor	Responsible Operations Office
Oak Ridge Associated Universities	Oak Ridge Operations Office

Principal Program Activities

University/Laboratory Cooperation Programs (26%)
Environment, Safety and Health (17%)
Human Health Studies - Epidemiology (12%)
Health Effects Research in Biological Systems (7%)
Nuclear Medicine Research (4%)
Nuclear Physics (2%)
Miscellaneous DOE Programs (13%)
Work for Others (19%)

Radiobiology Laboratory
Salt Lake City, Utah

The mission of the Radiobiology Laboratory at the University of Utah is to study the biological effects of internally incorporated radioactive nuclides on humans. Established in 1950, the laboratory investigates nuclides in nuclear weapons, nuclear reactor fuels, high level radioactive wastes and space nuclear applications. Another area emphasized in recent years is retrospective environmental radiation dosimetry programs that use the laboratory's capabilities to measure thermo-luminescence in building materials and radiochemical and neutron activation in tissues.

FY 1985 Statistics

DOE Operating Outlay:	$2 M
Staff (Full-Time Equivalents):	47
Capital Investment (Plant and Equipment):	$5 M
Number of Acres:	4

Operating Contractor	Responsible Operations Office
University of Utah	Chicago Operations Office

Principal Program Activities

Carcinogenesis (54%)
Measurement (13%)
Mutagenesis (2%)
Work for Others (31%)

Savannah River Ecology Laboratory
Aiken, South Carolina

The Savannah River Ecology Laboratory (SREL), established in 1962, is a research facility at the Savannah River Plant. The overall goal of research conducted at SREL is to understand the impact of energy technologies and management practices on the natural and man-influenced ecosystems of the southeastern United States; a related goal is to apply this understanding to the management of environmental problems. SREL conducts basic and applied research in many disciplines, ranging from studies of environmental processes for widespread application to development of predictive relationships for southeastern ecosystems. Environmental data bases and predictive relationships that result from SREL research enable DOE to manage the Savannah River Plant and comply with statutes and regulations imposed by Federal and state governments.

The Savannah River Ecology Laboratory is an integral part of the Institute of Ecology at the University of Georgia. SREL draws students and visiting faculty from universities across the region and emphasizes the education of ecology students. Permanent research faculty at the laboratory are employees of the University of Georgia.

FY 1985 Statistics

DOE Operating Outlay:	$7 M
Staff (Full-Time Equivalents):	147
Capital Investment (Plant and Equipment):	$6 M
Number of Acres:	15

Operating Contractor	Responsible Operations Office
University of Georgia	Savannah River Operations Office

Principal Program Activities

Materials Production (83%)
Biological and Environmental Research (15%)
Laboratory Cooperative Program (2%)

FOSSIL ENERGY FACILITIES

Bartlesville Project Office
Bartlesville, Oklahoma

Established as a Bureau of Mines research station in 1918, the Bartlesville Project Office (BPO) currently administers the DOE petroleum research program, including the cooperative agreement between DOE and the ITT Research Institute (ITTRI). Under this agreement, the facilities are operated by the National Institute for Petroleum Research (NIPER), a division of ITTRI. The primary mission of BPO is to implement petroleum research programs that can expand the knowledge base required for industry to bring efficient, economically competitive and environmentally acceptable new petroleum resources and technology options into the marketplace. Thus, BPO is the lead fossil energy activity for implementing Advanced Exploratory Research (AER) and Enhanced Oil Recovery (EOR) projects. These projects are designed to improve the knowledge, technology and use of resources in unconventional processes to recover residual oil after conventional production processes are exhausted.

BPO publishes research results in DOE reports and provides technical support at the national, state and local levels through the Tertiary Oil Recovery Information System (TORIS), a national clearinghouse for EOR information. Conferences, workshops and symposia also are conducted to expand the knowledge base of the scientific community. BPO supports university petroleum research programs through contracted research and the Associated Western Universities Program.

FY 1985 Statistics

DOE Operating Outlay:	$16 M
Staff (Full-Time Equivalents):	15
Capital Investment (Plant and Equipment):	$25 M
Number of Acres:	17

Operating Contractor	Responsible Operations Office
Federally-Operated*	Not applicable

Principal Program Activities

Enhanced Oil Recovery (58%)
Advanced Exploratory Research (24%)
Strategic Petroleum Reserve (4%)
Coal (4%)
Underground Gas Recovery (2%)
Miscellaneous DOE Programs (1%)
Work for Others (7%)
Department of Defense (7%)

*NIPER is responsible for the facility, shares operating costs but receives no fee.

Coal Fired Flow Facility
Tullahoma, Tennessee

The Coal Fired Flow Facility (CFFF), located at the University of Tennessee Space Institute (UTSI), is the general test facility for magnetohydrodynamics (MHD) power and the only completely integrated MHD facility operating in the United States. UTSI manages the program to develop MHD power for commercial operations. The ultimate goal is a highly efficient, coal fired, combined MHD Steam Power Plant with environmental and economic advantages over currently operating fossil fuel fired systems. CFFF, established in 1980, conducts tests on combustors, heat and seed recovery systems and other MHD-related components.

FY 1985 Statistics

DOE Operating Outlay:	$7 M
Staff (Full-Time Equivalents):	160
Capital Investment (Plant and Equipment):	$20 M
Number of Acres:	13

Operating Contractor

University of Tennessee Space Institute

Responsible Operations Office

Chicago Operations Office

Principal Program Activities

Magnetohydrodynamics (95%)
Work for Others (5%)

Morgantown Energy Technology Center
Morgantown, West Virginia

The Morgantown Energy Technology Center (METC) was founded in 1946 as a Bureau of Mines Synthesis Gas Branch Experiment Station. In 1977, METC became a part of the new Department of Energy; additional expansion occurred in 1983 when DOE's Laramie and Grand Forks Project Offices (LPO and GFPO) were assigned to METC.

METC conducts research and development designed to expand the technology base for fossil energy production, conversion and utilization. METC is the lead center for 13 fossil energy programs: coal gasification, fluidized-bed combustion, instrumentation and control, components, gas stream cleanup, fuel cells, heat engines, low-rank coals, unconventional gas recovery, underground coal gasification, oil shale technologies, tar sands and Arctic and offshore research. In addition, the Center carries out an in-house research and development program. Much of this work is preliminary scoping of coal, unconventional gas, oil shale and enhanced oil recovery R&D that is characterized and quantified as sponsored work. Unique facilities include a 42-inch in diameter pressurized fixed-bed gasifier, an entrained coal devolatilization reactor, a fluidized-bed gasifier, several fluidized-bed combustion reactors in a range of sizes and specialized, highly sophisticated analytical equipment.

In addition to the facility at Morgantown, West Virginia, METC's research and development program is executed through LPO and GFPO. LPO is responsible for management of fossil energy projects in oil shale, tar sands and underground coal gasification, and administers the Western Research Institute Cooperative Agreement. GFPO manages fossil energy projects in low-rank coal applications, administers the University of North Dakota Research Center Cooperative Agreement and monitors the Great Plains Gasification Project.

Technology transfer efforts include data bases, publications, conferences, patents, personnel exchange, contracts, technical exchange programs and visitors to the laboratory. METC also supports interaction with the university community through its participation in a program sponsored by the Oak Ridge Associated Universities.

FY 1985 Statistics

DOE Operating Outlay:	$151 M
Staff (Full-Time Equivalents):	276*
Capital Investment (Plant and Equipment):	$59 M
Number of Acres:	132

*Includes 10 staff at LPO and 10 staff at GFPO

Operating Contractor	Responsible Operations Office
Federally-Operated	Not applicable

Principal Program Activities

- Fuel Cells (23%)
- Coal Gasification (21%)
- Fluidized-Bed Combustion (16%)
- Oil Shale (8%)
- Heat Engines (6%)
- Gas Stream Cleanup (5%)
- Low-Rank Coals (5%)
- Advanced Research and Technology (5%)
- Unconventional Gas Recovery (5%)
- Underground Coal Gasification (3%)
- Miscellaneous DOE Programs (3%)

Pittsburgh Energy Technology Center
Pittsburgh, Pennsylvania

Following the enactment of the Synthetic Fuels Act of 1944, the Bureau of Mines' Office of Synthetic Fuels constructed the energy research laboratory facilities known as the Bruceton Research Center. In 1975, specific coal research and development responsibilities and facilities were transferred to the Energy Research and Development Administration (ERDA). The ERDA research and development facilities, transferred to the Department of Energy in October 1977, became the Pittsburgh Energy Technology Center (PETC).

PETC is responsible for technical and administrative management of 12 lead mission research and development programs within the Office of Fossil Energy. The Center's program responsibilities are: coal preparation, advanced combustion technology, alternative fuels utilization, flue gas cleanup, coal liquefaction, magnetohydrodynamics, advanced research and technology development in direct utilization and liquefaction, solids transport, university coal research, peat resources and anthracite coal. In conjunction with these program responsibilities, PETC has established a National Coal Technology Data Center where users may have access to government data bases on coal research. Programs are implemented through R&D conducted in-house at PETC and work contracted to the private sector, universities, not-for-profit organizations or other DOE and government entities. PETC actively participates in the Oak Ridge Associated Universities Program and sponsors annual conferences that result in publication or presentation of more than 150 technical papers.

FY 1985 Statistics

DOE Operating Outlay:	$90 M
Staff (Full-Time Equivalents):	280
Capital Investment (Plant and Equipment):	$137 M
Number of Acres:	60

Operating Contractor	Responsible Operations Office
Federally-Operated	Not applicable

Principal Program Activities

Magnetohydrodynamics (30%)
Coal Liquefaction (23%)
Flue Gas (12%)
Coal Preparation (9%)
Combustion Systems (7%)
Advanced Research and Technology Development
- Process Liquefaction (6%)
- Direct Utilization (5%)
- Material and Components (1%)

University Coal Research (4%)
Alternate Fuels (2%)
Miscellaneous DOE Programs (1%)

Naval Petroleum and Oil Shale Reserves in California, Colorado, Utah and Wyoming

The Naval Petroleum and Oil Shale Reserves, founded by a series of Executive Orders between 1912 and 1924, were created to provide an emergency source of liquid fuels for the armed forces. Congress endorsed the reserves through the Naval Petroleum Reserves Act.

The Naval Petroleum Reserves in California are comprised of Naval Petroleum Reserves Number 1 (NPR-1) in Elk Hills and Number 2 (NPR-2) in Buena Vista Hills. NPR-1 and NPR-2 are located approximately 35 miles southwest of Bakersfield. NPR-1 is a major oil- and gas-producing field, with FY 1985 production averaging over 130,000 barrels of oil and 350-400 million cubic feet of gas per day. NPR-1 is operated under the provisions of a Unit Plan Contract executed in 1944 by the United States and Standard Oil Company of California, now Chevron Corporation, which owns approximately 22% of the land within the boundaries of the reserve. NPR-2 has been leased to private organizations since the early 1920s, with the Government receiving royalty payment for the petroleum.

Naval Petroleum Reserve Number 3 (NPR-3), located 35 miles north of Casper, Wyoming, is a small oil- and gas-producing field with FY 1985 production averaging about 2,900 barrels of oil and 2.9 million cubic feet of gas per day. All crude oil produced at NPR-3 is transferred to the Department of Defense and also sold on the open market. Natural gas produced at NPR-3 is injected back into the oil-producing formations to help maintain reservoir pressure and enhance oil production. Several enhanced oil recovery (EOR) projects are being evaluated at NPR-3, including in-situ combustion (air and oxygen-enriched), polymer waterfloods and steamflood.

Naval Oil Shale Reserve (NOSR) Numbers 1 and 3 are located about eight miles west of Rifle, Colorado. The Department is operating a small gas drilling program to prevent the migration of government-owned gas from NOSR-3. Naval Oil Shale Reserve Number 2, located in Carbon and Uintah Counties, Utah, presently has no oil shale development activities.

FY 1985 Statistics

Naval Petroleum Reserves in California

DOE Operating Outlay:	$111 M
Staff (Full-Time Equivalents):	70
Capital Investment (Plant and Equipment):	$965 M
Number of Acres (NPR-1):	47,985
Number of Acres (NPR-2):	30,181

Operating Contractor	Responsible Operations Office
Bechtel Petroleum Operations, Inc.	Not applicable

Naval Petroleum and Oil Shale Reserves in Colorado, Utah and Wyoming

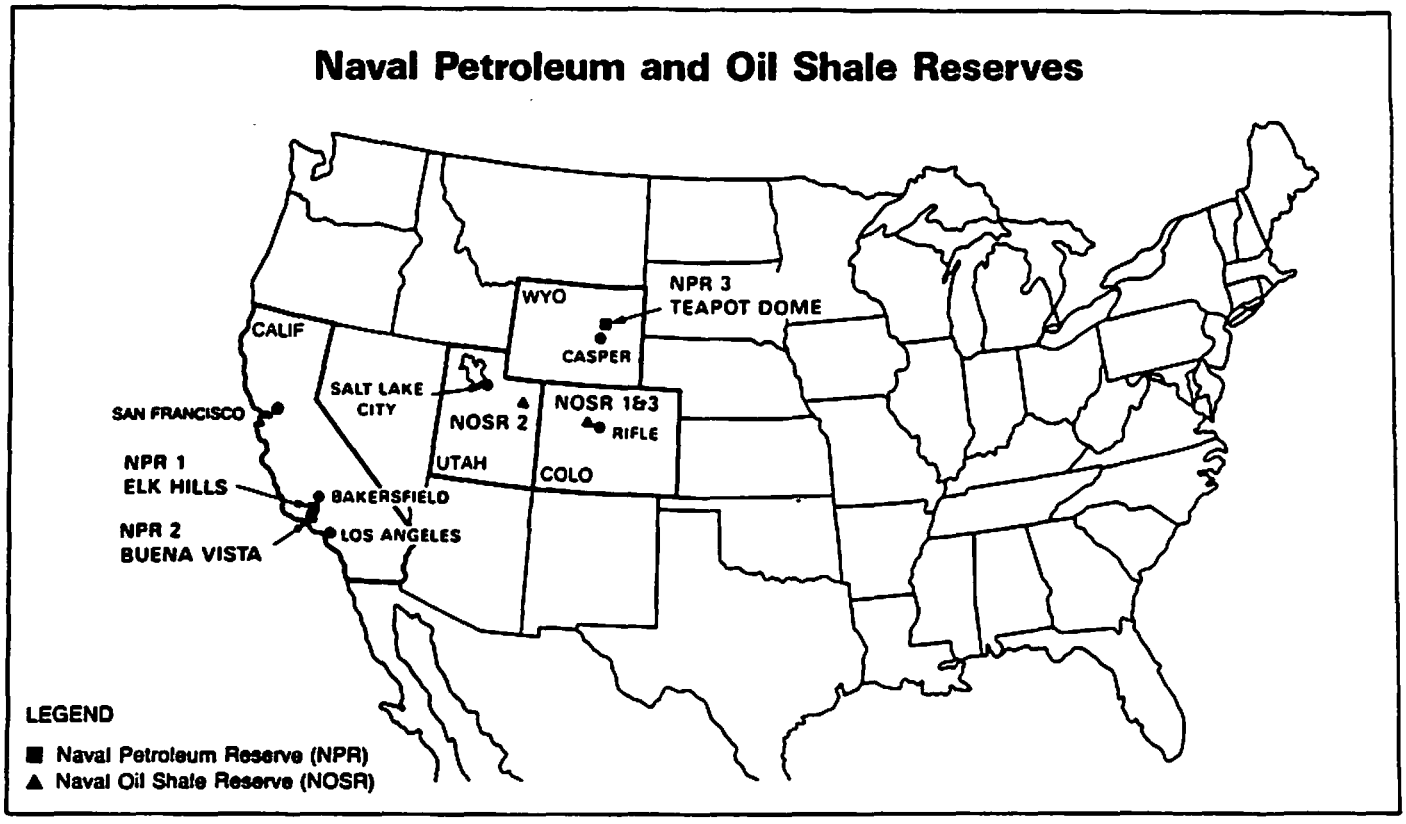
DOE Operating Outlay:	$24 M
Staff (Full-Time Equivalents):	16
Capital Investment (Plant and Equipment):	$92 M
Number of Acres:	9,481

Operating Contractor

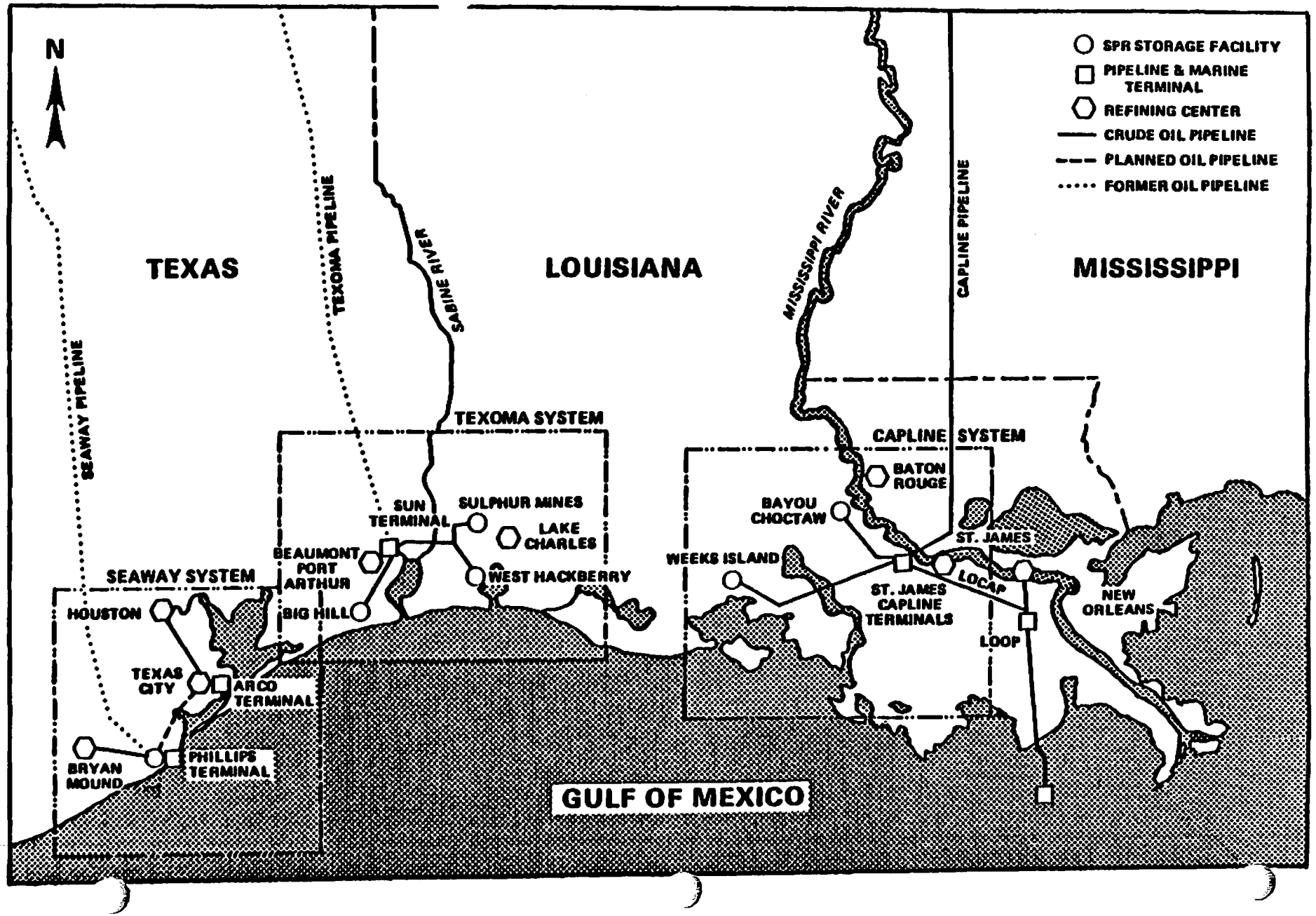
Lawrence-Allison and Associates West, Inc.

Responsible Operations Office

Not applicable



STRATEGIC PETROLEUM RESERVE SITES



Strategic Petroleum Reserve

The Strategic Petroleum Reserve (SPR) was created by the Energy Policy and Conservation Act (P.L. 94-163) in December 1975. The objective of the SPR program is to stockpile crude oil to reduce the vulnerability of the United States to a severe energy emergency involving a disruption in its petroleum supplies.

The SPR protects the U.S. from disruptions by supplementing oil supplies in the marketplace, thus mitigating the upward pressure on world oil prices and reducing the potential loss in economic output.

The Strategic Petroleum Reserve has acquired and developed six underground crude oil storage facilities in salt domes along the coasts of Texas and Louisiana, and a Government-owned marine terminal on the Mississippi River at St. James, Louisiana. These six sites are West Hackberry, Sulphur Mines, Bayou Choctaw and Weeks Island in Louisiana, and Bryan Mound and Big Hill in Texas. The Strategic Petroleum Reserve storage sites have been organized into three functionally independent groups based on proximity to the three existing (or former) major interstate crude oil pipeline systems serving the Midwest: Seaway, Texoma and Capline. Each of the Strategic Petroleum Reserve sites is linked via Department of Energy pipelines to commercial crude oil distribution systems and marine terminal facilities for water-borne distribution.

The current Strategic Petroleum Reserve facilities development program is designed to provide a cumulative storage capacity of 750 million barrels and a drawdown capability of 4.5 million barrels per day (MMB/D). As of May 31, 1986, the total permanent storage capacity created was approximately 509 million barrels and the crude oil inventory was approximately 500 million barrels.

FY 1985 Statistics

Bayou Choctaw, Louisiana

DOE Operating Outlay:	$7 M
Staff (Full-Time Equivalents):	62
Number of Acres:	356

Bryan Mound, Texas

DOE Operating Outlay:	$23 M
Staff (Full-Time Equivalents):	125
Number of Acres:	499

Big Hill, Texas

DOE Operating Outlay:	$3 M
Staff (Full-Time Equivalents):	30
Number of Acres:	269

Sulphur Mines, Louisiana

DOE Operating Outlay:	$1 M
Staff (Full-Time Equivalents):	32
Number of Acres:	174

FY 1985 Statistics (Continued)

St. James Terminal, Louisiana

DOE Operating Outlay:	$4 M
Staff (Full-Time Equivalents):	51
Number of Acres:	152

Weeks Island, Louisiana

DOE Operating Outlay:	$6 M
Staff (Full-Time Equivalents):	52
Number of Acres:	390

West Hackberry, Louisiana

DOE Operating Outlay:	$26 M
Staff (Full-Time Equivalents:	136
Number of Acres:	565

Operating Contractor	Responsible Operations Office
Boeing Petroleum Services, Inc.	Oak Ridge Operations Office

FUSION FACILITY

Princeton Plasma Physics Laboratory
Princeton, New Jersey

The Princeton Plasma Physics Laboratory (PPPL), established in 1951, is a single-purpose laboratory that conducts research in magnetic fusion energy using a Tokamak Fusion Test Reactor (TFTR) and associated experimental equipment. For more than three decades PPPL has been a world leader in research and development aimed primarily at the utilization of magnetic fusion energy as a safe, economical and environmentally acceptable method of generating electricity for the long term. The primary goal of the TFTR is to produce fusion power output equal to the plasma-heating power input; the ultimate goal is magnetic confinement of an ionized gas (plasma) composed of heavy isotopes of hydrogen (deuterium and tritium) at a density 1/100,000 that of air at sea level, a temperature of 100M°C and an energy confinement time of one second--the physical conditions required for the production of useful fusion energy in a power reactor.

TFTR, one of two tokamak facilities in the world capable of burning DT fusion fuel, is designed to produce 25 MW of fusion power for 0.5 second when the plasma is heated by a comparable amount of neutral-beam power. (This is referred to as energy breakeven or Q-1.) Other plasma test devices operated at PPPL include (1) the Princeton Large Torus to study plasma heating methods; (2) the Poloidal Devertor Experiment to investigate the dependence of the basic plasma parameters on machine configuration recently converted to the Princeton Beta Experiment; and (3) the S-1 Spheromak to test the spheromak magnetic confinement concept. The physics, engineering and technological efforts have led to a host of disciplines, including vacuum technology, mechanics and materials science, electronics, computer technology and high voltage power systems. These advances are applicable to activities such as aerospace, defense, high energy physics, communications, data processing and the power industry.

FY 1985 Statistics

DOE Operating Outlay:	$109 M
Staff (Full-Time Equivalents):	1,279
Capital Investment (Plant and Equipment):	$344 M
Number of Acres:	Located on campus

Operating Contractor	Responsible Operations Office
Princeton University	Chicago Operations Office (Princeton Area Office)

Principal Program Activities

Magnetic Fusion (99%)
Basic Energy Science/In-House Energy Management (1%)

NAVAL REACTORS DEVELOPMENT FACILITIES

Bettis Atomic Power Laboratory
West Mifflin, Pennsylvania

The Bettis Atomic Power Laboratory, established in 1959, is devoted exclusively to the Naval Nuclear Propulsion Program and includes two sites. Bettis, the principal site, performs research and development of naval nuclear propulsion plants. The Naval Reactors Facility, located within the Idaho National Engineering Laboratory site, operates three prototype naval reactor plants and a facility for examining expended naval reactor cores.

FY 1985 Statistics

DOE Operating Outlay:	$264 M
Staff (Full-Time Equivalents):	3,550
Capital Investment (Plant and Equipment):	$293 M
Number of Acres:	72

Operating Contractor	Responsible Field Office
Westinghouse Electric Corporation	Pittsburgh Naval Reactors Office

Principal Program Activities

Naval Reactors Development (100%)

Knolls Atomic Power Laboratory
Schenectady, New York

The Knolls Atomic Power Laboratory (KAPL), established in 1957, is devoted exclusively to the Naval Nuclear Propulsion Program. KAPL includes three sites. The principal site is in Niskayuna, Schenectady County, New York, where the mission is the design and development of improved naval nuclear propulsion plants and reactor cores in a wide range of power ratings designed to meet military requirements of the Department of Navy. KAPL also operates four land-based prototypes of shipboard pressurized-water reactor plants at the Kenneth A. Kesselring Site in nearby West Milton, New York, and one prototype at the Windsor Site, in Windsor, Connecticut. KAPL is also responsible for training officers and enlisted personnel as reactor operators for the nuclear fleet at the prototype sites.

FY 1985 Statistics

DOE Operating Outlay:	$145 M
Staff (Full-Time Equivalents):	3,171
Capital Investment (Plant and Equipment):	$522 M
Number of Acres:	4,100

Operating Contractor	Responsible Field Office
General Electric Company	Schenectady Naval Reactors Office

Principal Program Activities

Naval Reactors Development (100%)

NUCLEAR DEVELOPMENT FACILITY

Energy Technology Engineering Center
Canoga Park, California

The Energy Technology Engineering Center (ETEC), founded in 1966, provides management, engineering, testing, consultation and project monitoring services for a wide range of DOE programs. ETEC tests components being developed for the U.S. liquid metal reactor program. Liquid metal test facilities are maintained and operated for evaluating components such as heat exchangers, steam generators, pumps, valves, piping, vessels and instrumentation. In addition to the reactor component testing program, ETEC provides engineering support, technical management and monitoring for a number of DOE solar, conservation, geothermal and fusion energy programs. ETEC facility and capability users other than DOE include the Department of Defense, Nuclear Regulatory Commission and Electric Power Research Institute.

FY 1985 Statistics

DOE Operating Outlay:	$27 M
Staff (Full-Time Equivalents):	253
Capital Investment (Plant and Equipment):	$141 M
Number of Acres:	90

Operating Contractor

Rockwell International (Rocketdyne Division)

Responsible Operations Office

San Francisco Operations Office

Principal Program Activities

Nuclear Energy (78%)
Conservation and Renewable (15%)
Miscellaneous DOE Programs (3%)
Work for Others (4%)

Major Active Facilities

70 MWt Sodium Component Test Installation
Sodium Pump Test Facility
Sodium Component Test Loop
Thermal Transient Facility
Fragility Test System
Liquid Metal Development Laboratories
Component Handling and Cleaning Facility
Hydraulic Test Facility

NUCLEAR MATERIALS FACILITY

Savannah River Laboratory
Aiken, South Carolina

As part of the Savannah River complex, established in 1950 to produce plutonium for the nation's nuclear weapons, the Savannah River Laboratory (SRL) provides developmental and technical assistance in all areas of nuclear reactor technology and the nuclear fuel cycle, including fuel fabrication, isotope production, reactor physics and engineering, fuel reprocessing, waste management, environmental monitoring and heavy water production. Major programs include research, development and demonstration of selective removal of isotopes from irradiated fuels; radioactive waste storage; fabrication of fuel and target elements; operational techniques and protective systems for safe reactor operation; evaluation of reactor fuel assemblies and lattices; support of production and encapsulation of plutonium-238 for radioisotopic-thermal generators; and development and verification of models to predict and determine total population exposure from radioactive and nonradioactive releases to the atmosphere and water. The laboratory has made distinct contributions to the technical literature in all areas of the nuclear fuel cycle. SRL also provides training opportunities to universities through its temporary employment programs for university undergraduates and graduate and faculty personnel.

FY 1985 Statistics

DOE Operating Outlay:	$127 M
Staff (Full-Time Equivalents):	994
Capital Investment (Plant and Equipment):	$108 M
Number of Acres:	76

Operating Contractor

E.I. du Pont de Nemours & Co., Inc.

Responsible Operations Office

Savannah River Operations Office

Principal Program Activities

Materials Production (54%)
Defense Waste Management (30%)
Naval Reactors (6%)
Weapons (6%)
Miscellaneous DOE Programs (1%)
Work for Others (3%)

Major Active Facilities

Technical Nuclear Experiment Facility
Shielded Cell Facilities
Environmental Monitoring and Analysis Facilities

Ames Laboratory
Ames, Iowa

Ames Laboratory, established in 1947 as a result of the Manhattan Project, is dedicated solely to basic research. The primary mission of Ames Laboratory is to conduct basic research in materials and chemical sciences and related research in materials reliability and nondestructive evaluation. In support of its research mission, Ames Laboratory maintains capabilities for preparing high-purity metals, alloys, compounds and single crystals. Additional capabilities are maintained in high energy physics, nuclear physics, applied mathematics, and engineering, environmental and coal preparation sciences. Extensive cooperation with Iowa State University is achieved through faculty appointments, graduate student training and facility sharing programs. Undergraduate students and faculty, primarily from nonlocal institutions, participate in a summer research program. Ames Laboratory actively transfers the technology achieved from research programs through technical publications, presentations, consulting activities of staff members and cooperative projects with industrial and governmental concerns.

FY 1985 Statistics

DOE Operating Outlay:	$16 M
Staff (Full-Time Equivalents):	403
Capital Investment (Plant and Equipment):	$37 M
Number of Acres:	54

Operating Contractor	Responsible Operations Office
Iowa State University	Chicago Operations Office

Principal Program Activities

Materials Sciences (45%)
Chemical Sciences (17%)
Fossil Energy (11%)
High Energy Physics (5%)
Environmental Research and Development (4%)
Applied Mathematical Sciences (3%)
Advanced Nuclear Systems (2%)
Miscellaneous DOE Programs (5%)
Work for Others (8%)
- Department of Defense (6%)
- Others (2%)

Major User Facilities

Materials Preparation Center
Coal Preparation and Characterization Facility

Bates Linear Accelerator Facility
Middleton, Massachusetts

The Bates Linear Accelerator Facility conducts a program of basic research in nuclear physics, using intermediate energy electromagnetic probes to study the properties of atomic nuclei and the nature of the nuclear force. The central focus for the program has been high precision electron scattering studies of nuclear charge, current and magnetization distributions using a unique high-resolution spectrometer system. A recently constructed experimental hall, housing three magnetic spectrometer and photon detectors, has opened up a major program of coincidence and intermediate energy photoreaction studies. The laboratory began experimentation in 1974 and produces an electron beam of 1% duty factor, excellent emittance and maximum beam energy of 800 MeV; a further upgrade to 1 GeV is in progress. A polarized electron source is under construction and will, upon completion, permit studies of electroweak interactions, as well as provide a new tool for nuclear physics. The laboratory is used by faculty, staff and students from the Massachusetts Institute of Technology and fifty other universities and laboratories.

FY 1985 Statistics

DOE Operating Outlay:	$8 M
Staff (Full-Time Equivalents):	89
Capital Investment (Plant and Equipment):	$65 M
Number of Acres:	100

Operating Contractor	Responsible Operations Office
Massachusetts Institute of Technology	Chicago Operations Office

Principal Program Activities

Nuclear Physics (100%)

Fermi National Accelerator Laboratory
Batavia, Illinois

The central purpose of Fermi National Accelerator Laboratory (Fermilab), established in 1968, is to explore the field of elementary particle physics so that the understanding of the basic structure of matter may be broadened. A related mission is the improvement of accelerator design that has resulted in numerous technological spin-offs: the development of various applications other than magnets for superconductivity; fast electronics and particle detector technology; and special computers and computer programs.

In addition, Fermilab's linear accelerator is used in cancer therapy, and the laboratory has become deeply involved in a project outside high energy physics: a medical radiation therapy facility. The principal scientific instrument is a particle accelerator system consisting of a series of five accelerators capable of terminal energies up to 1,000 billion electron volts (GeV). Fermilab has several major construction projects underway, Tevatron I and II, that will upgrade the experimental areas to 1,000 GeV for fixed target physics and construct a matter/antimatter colliding beams facility at an energy level of 2,000 GeV.

FY 1985 Statistics

DOE Operating Outlay:	$119 M
Staff (Full-Time Equivalents):	2,160
Capital Investment (Plant and Equipment):	$746 M
Number of Acres:	6,800

Operating Contractor

Universities Research Association

Responsible Operations Office

Chicago Operations Office (Batavia Area Office)

Principal Program Activities

High Energy Physics (99%)
Miscellaneous DOE Programs (1%)

Major Facilities

1,000 GeV Superconducting Accelerator System
Meson Experimental Area
Proton Experimental Area
Neutrino Experimental Area
Colliding Beams Facility

Stanford Linear Accelerator Center
Stanford, California

The Stanford Linear Accelerator Center (SLAC), established in 1962, carries out experimental and theoretical research in high energy physics and developmental work in new techniques for particle acceleration and experimental instrumentation. SLAC's main research instrument is a two mile long linear electron accelerator, the largest in the world. This machine is augmented by two positron-electron colliding beam storage rings: SPEAR (Stanford Positron Electron Accelerator Ring), which has two interaction regions and generates 4.5 billion electron volts (GeV) per beam (9 GeV center of mass); and the PEP (Positron Electron Project) storage ring, which has six interaction regions and generates 16 GeV per beam. These accelerators are complemented by an impressive array of large detectors, including a number of sophisticated magnetic spectrometers, each uniquely optimized for some specific aspect of particle physics detection. The array of detectors is supported by a central computer facility consisting of one IBM 3081 mainframe central processing unit and associated peripherals. In addition, SPEAR and PEP support the Stanford Synchrotron Radiation Laboratory (SSRL), an independent entity dedicated to exploiting the synchrotron light emitted as a by-product of both storage rings. The SLAC Linear Collider (SLC), presently under construction, is scheduled for completion in 1986. The number of outside users at SLAC has grown from approximately 60 in FY 1977 to approximately 190. It is expected that outside user participation in the program will continue at a high level.

FY 1985 Statistics

DOE Operating Outlay:	$76 M
Staff (Full-Time Equivalents):	1,435
Capital Investment (Plant and Equipment):	$232 M
Number of Acres:	421

Operating Contractor

Stanford University

Responsible Operations Office

San Francisco Operations Office

Principal Program Activities

High Energy Physics (95%)
Work for Others (5%)

Major Facilities

Linear Accelerator
Positron Electron Project Storage Ring
SPEAR Storage Ring

SAFEGUARDS FACILITY

New Brunswick Laboratory
Argonne, Illinois

The New Brunswick Laboratory (NBL) is an independent Government-owned, Government-operated (GOGO) facility that serves as the U.S. Government's Nuclear Materials Measurement and Standards Laboratory. NBL, located on the site of the Argonne National Laboratory, satisfies DOE's statutory responsibility to ensure that nuclear materials are safeguarded. NBL was established in New Brunswick, New Jersey in 1949 and relocated to Argonne, Illinois in 1977. NBL provides an ongoing capability for: development, certification and distribution of reference materials for the calibration and standardization of nuclear material measurements; extensive inter-laboratory comparison and evaluation of measurement data from Government laboratories engaged in handling nuclear material; precise and accurate measurements of a variety of nuclear and related materials; and support and technical assistance to DOE-contractor facilities in safeguards measurement-related areas. NBL specializes in the measurement science and analytical chemistry of nuclear and related materials.

FY 1985 Statistics

DOE Operating Outlay:	$4 M
Staff (Full-Time Equivalents):	50
Capital Investment (Plant and Equipment):	$5 M
Number of Acres:	Located on site of Argonne National Laboratory

Operating Contractor	Responsible Operations Office
Federally-Operated	Chicago Operations Office

Principal Program Activities

Reference and Calibration Materials (32%)
Technology Development (27%)
Measurement Support (18%)
Measurement Evaluation (13%)
Site-specific Assistance (10%)

SOLAR FACILITY

Solar Energy Research Institute
Golden, Colorado

The Solar Energy Research Institute (SERI) was established in 1977. As the nation's primary Federal laboratory for solar energy research, development and testing, SERI conducts and coordinates work on solar technologies that private industry cannot be expected to undertake. Work at SERI advances scientific understanding and provides the private sector with information necessary to make informed choices on the technological options available in using solar energy.

Research activities at SERI are carried out under the guidance of three divisions: Solar Electric Research, Solar Fuels Research and Solar Heat Research. The Solar Electric Research Division operates the largest technical effort, the Photovoltaic Advanced Research and Development Program and the Wind Energy Program. The Solar Fuels Research Division combines chemical and biological sciences research with engineering research in the development of new processes for the production of fuels, including research in photoconversion, biomass thermochemistry, biotechnology and electrochemistry. The Solar Heat Research Division is responsible for solar thermal processes and materials research, including active and passive heating and cooling systems analysis. SERI is also charged with disseminating technical solar information to targeted technical audiences and conducts a summer student program, graduate cooperative program, joint SERI university faculty appointments and a post-doctoral/sabbatical research program.

FY 1985 Statistics

DOE Operating Outlay:	$65 M
Staff (Full-Time Equivalents):	509
Capital Investment (Plant and Equipment):	$32 M
Number of Acres:	300

Operating Contractor	Responsible Operations Office
Midwest Research Institute	Chicago Operations Office

Principal Program Activities

Conservation and Renewable Energy (96%)
Energy Research (3%)
Work for Others (1%)

Major Facilities

Active

Field Test Laboratory Building
Wind Energy Research Center
Denver West Leased Facilities

User

Photovoltaic Devices and Measurements Laboratory
Heat and Mass Transfer Research Laboratory
Surfaces and Interfaces Laboratory
SERI Daylighting Laboratory
Mobile Wind Acoustic Noise Characterization Laboratory

ENRICHMENT, PRODUCTION, TESTING AND FABRICATION FACILITIES

3.C. ENRICHMENT, PRODUCTION, TESTING AND FABRICATION FACILITIES

ENRICHMENT FACILITIES

Gaseous Diffusion Plants
Oak Ridge, Tennessee
Paducah, Kentucky
Portsmouth, Ohio

The Oak Ridge, Paducah and Portsmouth Gaseous Diffusion Plants represent a major part of the Free World's capacity to produce enriched uranium. Because of a declining demand for enriched uranium, the uranium enrichment process at the Oak Ridge Plant was placed in standby mode in early August 1985. The Paducah and Portsmouth plants continue to operate by enriching uranium in the isotope U-235 for use in nuclear power and propulsion reactors. The process is carried out in seven buildings at the two sites. In addition to the enrichment operations, the plants have the capability and facilities for technical support in all areas of gaseous diffusion technology; barrier, compressors, materials and chemistry, instrumentation and control systems and environmental, health, and safety. Portsmouth was to have been the first United States gas centrifuge uranium enrichment plant. However, because of the declining demand for enriched uranium, construction of the centrifuge plant was stopped and the centrifuge program cancelled.

FY 1985 Statistics

Oak Ridge Gaseous Diffusion Plant

DOE Operating Outlay:	$358 M, including power at $266 M
Staff (Full-Time Equivalents):	2,770
Capital Investment (Plant and Equipment):	$815 M
Number of Acres:	670

Paducah Gaseous Diffusion Plant

DOE Operating Outlay:	$426 M, including power at $378 M
Staff (Full-Time Equivalents):	1,285
Capital Investment (Plant and Equipment):	$679 M
Number of Acres:	3,423

Operating Contractor	Responsible Operations Office
Martin Marietta Energy Systems, Inc.	Oak Ridge Operations Office

Portsmouth Gaseous Diffusion Plant

DOE Operating Outlay:	$340 M, including power at $237 M
Staff (Full-Time Equivalents):	2,151
Capital Investment (Plant and Equipment):	$658 M, including Gas Centrifuge Enrichment Plant
Number of Acres:	3,708

Operating Contractor	Responsible Operations Office
Goodyear Atomic Corporation	Oak Ridge Operations Office

Principal Program Activities

Uranium Enrichment (100%)

NUCLEAR MATERIALS PRODUCTION FACILITIES

Extrusion Plant
Ashtabula, Ohio

The Extrusion Plant consists of two DOE-owned extrusion presses housed in a facility owned by RMI Company. These presses take depleted uranium ingots from the Feed Materials Production Center (FMPC) in Fernald, Ohio, extrude them into tubes and return them to the FMPC for finishing. The presses also take slightly enriched uranium ingots and extrude them into billets that are co-extruded at the Hanford Production Operations in Richland, Washington to form fuel elements for the N-Reactor. Significant equipment at the Extrusion Plant includes a 3,850-ton horizontal extrusion press, a 360-ton extrusion press and heating, handling and processing equipment designed for production levels of metal extrusion. Limited metallurgical laboratory facilities are maintained for the production effort.

FY 1985 Statistics

DOE Operating Outlay:	$6 M
Staff (Full-Time Equivalents):	119
Capital Investment (Plant and Equipment):	$2 M
Number of Acres:	Not applicable

Operating Contractor	Responsible Operations Office
RMI Company	Oak Ridge Operations Office

Feed Materials Production Center
Fernald, Ohio

The Feed Materials Production Center (FMPC) is a large-scale, fully integrated facility with capabilities for processing uranium compounds to metal, melting and casting uranium metal and machining of uranium shapes to finished dimensions. Current major activities include production of depleted uranium derbies and billets for use in weapons production at the Oak Ridge Y-12 Plant and the Rocky Flats Plant, production of depleted uranium target elements for use in Savannah River production reactors and production of slightly enriched uranium fuel billets for use in the N-Reactor at Richland. Special facilities include a refinery, vacuum induction casting furnaces, a rolling mill and various types of machine tools.

FY 1985 Statistics

DOE Operating Outlay:	$110 M
Staff (Full-Time Equivalents):	994
Capital Investment (Plant and Equipment):	$80 M
Number of Acres:	1,186

Operating Contractor	Responsible Operations Office
Westinghouse Materials Company of Ohio	Oak Ridge Operations Office

Hanford Production Operations
Reprocessing and Waste Management
Richland, Washington

Hanford Production Operations is managed by Rockwell Hanford Operations (Rockwell) and UNC Nuclear Industries. Rockwell is responsible for three major technical programs: chemical processing of irradiated production reactor fuel and plutonium-bearing scrap, management of nuclear waste from defense programs, research and development of interim waste storage, and ultimate disposal of civilian and defense nuclear wastes. Rockwell also provides support services for the entire site, including security forces, fire protection, transportation, central stores and electrical distribution. Major facilities of Hanford Production Operations include the PUREX, U03 and Plutonium Finishing Plants.

The PUREX Plant processes fuel from the N-Reactor to recover plutonium and uranium for defense purposes. PUREX has the capacity to process the annual fuel load from the N-Reactor in approximately six months. When the current backlog of N-Reactor fuel has been processed, PUREX will have significant excess capacity that could be used for other production missions. A new shear-leach head end for PUREX, which will be operational in FY1992, will be used to process both N-fuel and short campaigns of fuel from the Fast Flux Test Facility (FFTF). The U03 Plant converts liquid uranyl nitrate hexahydrate (60 percent by weight) into a solid, uranium trioxide. The Plutonium Finishing Plant conducts diversified plutonium handling and storage operations. Current operations include recovery of plutonium as plutonium nitrate from a wide range of plutonium-bearing scrap and conversion of plutonium nitrate solution into plutonium metal. The Plutonium Finishing Plant also manages storage and inventory of the scrap, product inventory including shipping, receiving and repackaging, and pilot plant and laboratory operations.

FY 1985 Statistics

DOE Operating Outlay:	$279 M
Staff (Full-Time Equivalents):	3,495
Total Staff (including civilian program and site services):	5,596
Capital Investment (Plant and Equipment):	$939 M
Number of Acres:	2,700* (200 Areas only)

*Rockwell has general landlord responsibilities for the balance of the site: 359,680 acres

Operating Contractor	Responsible Operations Office
Rockwell Hanford Operations	Richland Operations Office

Hanford Production Operations
Fuel and Reactor Operations
Richland, Washington

Production operations at the Hanford Site are conducted by UNC Nuclear Industries (UNC) and Rockwell Hanford Operations. UNC is responsible for fuel fabrication, conducts the DOE Surplus Facilities Management Program and operates and maintains the N Reactor. The N Reactor is a light water cooled, graphite moderated, process tube type reactor that produces nuclear materials for national defense. The N Reactor also produces steam that is sold to the Washington Public Power Supply System and converted to electricity. The Fuel Fabrication Plant at Hanford manufactures finished fuel elements for charging the N Reactor through controlled and precise metallurgical, mechanical and chemical operations involving a wide variety of metals and other process materials. In addition to producing high quality, high intensity fuel elements, the process regulates plant effluents to ensure protection of the environment.

FY 1985 Statistics

DOE Operating Outlay:	$204 M
Staff (Full-Time Equivalents):	2,242
Capital Investment (Plant and Equipment):	$358 M
Number of Acres:	95 (100-N Area only)

Operating Contractor	Responsible Operations Office
UNC Nuclear Industries	Richland Operations Office

Savannah River Plant
Aiken, South Carolina

The Savannah River Plant conducts fuel and target fabrication, isotope production in nuclear reactors, chemical separations, waste management and heavy-water extraction. The plant was established in 1950. Although activities at the facility are oriented primarily to defense, many of the programs and products (radioisotopes) have peacetime applications. Major facilities of the Savannah River Plant include nuclear production reactors, two chemical separation plants, a fuel fabrication plant, waste management facilities and extensive research and development facilities.

FY 1985 Statistics

DOE Operating Outlay:	$522 M
Staff (Full-Time Equivalents):	6,220
Capital Investment (Plant and Equipment):	$289 M
Number of Acres:	192,237

Operating Contractor	Responsible Operations Office
E.I. du Pont de Nemours & Co.	Savannah River Operations Office

WEAPON TESTING AND FABRICATION COMPLEX

Kansas City Plant
Kansas City, Missouri

The Kansas City Plant is operated by the Allied Corporation to produce non-nuclear weapon components. Established in 1949, the plant is a highly diversified, technically oriented operation that embraces the full spectrum of work on non-nuclear products--from research on new materials to production of complex and reliable weapons components. Production activities are directed toward three basic areas: electrical and electronics work, including microelectronics, mechanical products and plastic products. The plant develops processes and materials to support its primary production mission and also engages indirectly in energy research and development by providing developmental hardware for research programs conducted at DOE laboratories. The Kansas City Plant maintains controlled environment facilities, metal-working facilities, plastic facilities and materials and product development laboratories.

FY 1985 Statistics

DOE Operating Outlay:	$441 M
Staff (Full-Time Equivalents):	7,827
Capital Investment (Plant and Equipment):	$238 M
Number of Acres:	122

Operating Contractor	Responsible Operations Office
Allied Corporation	Albuquerque Operations Office

Mound Facility
Miamisburg, Ohio

The Mound Facility is an integrated production and laboratory facility that performs a variety of weapons production and process development activities and conducts research and development for several DOE programs. Based on specialized capabilities established since its founding in 1947, the Mound Facility emphasizes work in explosives technology, tritium technology, plutonium-238 isotopic heat source development, isotope separation and fossil energy technology. In addition, the Mound Facility conducts multi-disciplinary research and development on materials and instrumentation in association with all program activities.

FY 1985 Statistics

DOE Operating Outlay:	$161 M
Staff (Full-Time Equivalents):	2,447
Capital Investment (Plant and Equipment):	$156 M
Number of Acres:	307

Operating Contractor	Responsible Operations Office
Monsanto Research Corporation	Albuquerque Operations Office

Pantex Plant
Amarillo, Texas

The missions of the Pantex Plant, established in 1951, are to fabricate high explosives and other components of nuclear weapons, participate in weapon retirement and support plant maintenance. The high explosives and other components are needed to assemble, repair and test nuclear weapons. With components provided by other weapons complexes, the Pantex Plant performs final assembly of nuclear weapons and type units for the Department of Energy and Department of Defense testing and training programs. The plant also fabricates explosive device components for the design agency laboratories, conducts new material and stockpile laboratory tests, modifies weapons and repairs existing weapons in the U.S. nuclear stockpile. The Pantex Plant retires weapons surplus to stockpile and provides technical support in the field of high explosives.

FY 1985 Statistics

DOE Operating Outlay:	$125 M
Staff (Full-Time Equivalents):	2,808
Capital Investment (Plant and Equipment):	$139 M
Number of Acres:	10,177

Operating Contractor	Responsible Operations Office
Mason & Hanger-Silas Mason Co.	Albuquerque Operations Office

Pinellas Plant
Largo, Florida

The original mission of the Pinellas Plant, established in 1956, was to develop and produce neutron generators for nuclear weapons initiation. The present mission encompasses production of a wide range of weapon components, including neutron generators. Facilities are maintained to support process development and design laboratory and production activities. The Pinellas Plant uses technology and skills to develop and manufacture highly complex, miniaturized neutron generators and electronic assemblies; medium-power radioisotope thermoelectric generators and thermoelectric converters (electrical connectors that arrest lightning discharges); and special neutron generation and measurement devices for nuclear weapons testing. In addition, the Pinellas Plant designs and fabricates sophisticated electronic test systems for product acceptance testing by the Department of Energy and has made state-of-the-art advances in process technology.

FY 1985 Statistics

DOE Operating Outlay:	$107 M
Staff (Full-Time Equivalents):	1,980
Capital Investment (Plant and Equipment):	$68 M
Number of Acres:	99

Operating Contractor	Responsible Operations Office
General Electric Company	Albuquerque Operations Office

Rocky Flats Plant
Golden, Colorado

The mission of the Rocky Flats Plant is to produce nuclear components, non-nuclear assemblies and hardware for weapons. Established in 1953, the plant concentrates on metal production and chemical processing and emphasizes production-related research. Production activities at the Rocky Flats Plant include fabrication of plutonium and uranium alloy parts, fabrication and assembly of conventional metal components, operation of foundries and recovery of plutonium. The plant supports research and development for the recovery of plutonium residues for the weapons complex. In support of weapons design laboratories, the Rocky Flats Plant maintains extensive laboratories with development models for concept feasibility studies. Rocky Flats Plant is also the site of the National Small Wind Systems Test Center.

FY 1985 Statistics

DOE Operating Outlay:	$370 M
Staff (Full-Time Equivalents):	6,011
Capital Investment (Plant and Equipment):	$558 M
Number of Acres:	6,556

Operating Contractor	Responsible Operations Office
Rockwell International, Atomics International Division	Albuquerque Operations Office

Savannah River Weapons Facility
Aiken, South Carolina

The primary mission of the Savannah River Weapons Facility, located at the Savannah River Plant site, is the extraction, separation and recovery of tritium. Established in 1950 the plant maintains specific capabilities to support this mission, including tritium loading, unloading and reclamation of special components. The Savannah River Weapons Facility also conducts surveillance and materials compatibility testing for relevant components.

FY 1985 Statistics

DOE Operating Outlay:	$50 M
Staff (Full-Time Equivalents):	420
Capital Investment (Plant and Equipment):	$64 M
Number of Acres:	5

Operating Contractor	Responsible Operations Office
E.I. du Pont de Nemours and Co.	Savannah River Operations Office

Y-12 Plant
Oak Ridge, Tennessee

The Oak Ridge Y-12 Plant, built in 1943 as part of the Manhattan Project, was established to separate uranium isotopes using the electromagnetic process. When the process was discontinued after World War II, the role of the Y-12 Plant changed to manufacturing and developmental engineering. The missions of the Y-12 Plant include production of nuclear weapon components and subassemblies, development and fabrication of test hardware for the weapon design laboratories, fabrication support for other Martin Marietta Energy Systems plants and support for federal agencies.

The combination of production, development, engineering and support activities at Y-12 represents an integrated capability not normally available in production complexes. From a high technology base of operations, the plant can handle essentially all aspects of manufacturing. All the technology used in the manufacturing plant is supported by the Development Division. The major areas of effort include chemical processes, fabrication systems, metals and ceramics, instrumentation and characterization, nuclear materials processing and waste management.

In handling unique and special materials, the Y-12 Plant controls radioactive and toxic properties to protect employees and the public and maintains a high degree of security to protect the materials produced at the site.

FY 1985 Statistics

DOE Operating Outlay:	$436 M
Staff (Full-Time Equivalents):	7,300
Capital Investment (Plant and Equipment):	$727 M
Number of Acres:	600

Operating Contractor	Responsible Operations Office
Martin Marietta Energy Systems, Inc.	Oak Ridge Operations Office

APPENDIX A

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES

Facility/Laboratory Name	Date Established	Name of Contractor	Contract Expiration Date
Operations Offices			
Albuquerque Operations Office	1946	Federally-Operated	Not applicable
Chicago Operations Office	1946	Federally-Operated	Not applicable
Idaho Operations Office	1949	Federally-Operated	Not applicable
Nevada Operations Office	1962	Federally-Operated	Not applicable
Oak Ridge Operations Office	1942	Federally-Operated	Not applicable
Richland Operations Office	1943	Federally-Operated	Not applicable
San Francisco Operations Office	1952	Federally-Operated	Not applicable
Savannah River Operations Office	1950	Federally-Operated	Not applicable
Naval Reactors Offices			
Pittsburgh Naval Reactors Office	1948	Federally-Operated	Not applicable
Schenectady Naval Reactors Office	1948	Federally-Operated	Not applicable
Multiprogram Laboratories			
Argonne National Laboratory	1946	University of Chicago	September 30, 1988
Brookhaven National Laboratory	1947	Associated Universities, Inc.	December 31, 1987
Idaho National Engineering Laboratory	1949	EG&G Idaho, Inc.	September 30, 1991
		Westinghouse Idaho Nuclear Company, Inc.	September 30, 1989
		Exxon Nuclear Idaho Company, Inc.	December 28, 1986
Lawrence Berkeley Laboratory	1931	University of California	September 30, 1987
Lawrence Livermore National Laboratory	1952	University of California	September 30, 1987
Los Alamos National Laboratory	1943	University of California	September 30, 1987
Oak Ridge National Laboratory	1943	Martin Marietta Energy Systems, Inc.	September 30, 1989
Pacific Northwest Laboratory	1965	Battelle Memorial Institute	September 30, 1989
Sandia National Laboratories	1949	AT&T Technologies, Inc.	September 30, 1988

APPENDIX A

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES

Facility/Laboratory Name	Date Established	Name of Contractor	Contract Expiration Date
Program-Dedicated Facilities			
Ames Laboratory	1947	Iowa State University	December 31, 1988
Bartlesville Project Office	1983	Federally-Operated*	Not applicable
Bates Linear Accelerator Facility	1973	Massachusetts Institute of Technology	Yearly renewal
Bettis Atomic Power Laboratory	1959	Westinghouse Electric Corporation	September 30, 1988
Center for Energy and Environment Research	1957	University of Puerto Rico	September 30, 1988
Coal Fired Flow Facility	1980	University of Tennessee Space Institute	January 31, 1988
Energy Technology Engineering Center	1966	Rockwell International Corporation	September 30, 1988
Environmental Measurements Laboratory	1947	Federally-Operated	Not applicable
Fermi National Accelerator Laboratory	1968	University Research Association, Inc.	December 31, 1986
Hanford Engineering Development Laboratory	1970	Westinghouse Hanford Company	September 30, 1987
Inhalation Toxicology Research Institute	1960	Lovelace Biomedical and Environmental Research Institute	September 30, 1989
Knolls Atomic Power Laboratory	1957	General Electric Company	September 30, 1990
Laboratory for Energy-Related Health Research	1951	University of California	September 30, 1987
Laboratory of Biomedical and Environmental Sciences	1947	University of California	September 30, 1987
Laboratory of Radiobiology and Environmental Health	1951	University of California	September 30, 1989
Michigan State University (MSU)-DOE Plant Research Laboratory	1964	Michigan State University	Renewed yearly on January 1

*NIPER is responsible for the facility, shares operating cost but receives no fee.

APPENDIX A

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES

Facility/Laboratory Name	Date Established	Name of Contractor	Contract Expiration Date
Morgantown Energy Technology Center	1946	Federally-Operated	Not applicable
Naval Petroleum and Oil Shale Reserves in Colorado, Utah and Wyoming	1915	Lawrence-Allison and Associates West, Inc.	September 30, 1991
Naval Petroleum Reserves in California	1912	Bechtel Petroleum Operations	September 30, 1991
New Brunswick Laboratory	1949	Federally-Operated	Not applicable
Notre Dame Radiation Laboratory	1949	University of Notre Dame	Continuing
Oak Ridge Associated Universities	1946	Oak Ridge Associated Universities	September 30, 1987
Pittsburgh Energy Technology Center	1948	Federally-Operated	Not applicable
Princeton Plasma Physics Laboratory	1951	Princeton University	September 30, 1991
Radiobiology Laboratory	1950	University of Utah	December 31, 1988
Savannah River Ecology Laboratory	1962	University of Georgia	September 30, 1990
Savannah River Laboratory	1950	E. I. du Pont de Nemours & Company, Inc.	September 30, 1989
Solar Energy Research Institute	1977	Midwest Research Institute	September 30, 1988
Stanford Linear Acclerator Center	1962	Stanford University	September 30, 1987
Stanford Synchrotron Radiation Laboratory	1982	Stanford University	September 30, 1987
Enrichment, Production, Testing and Fabrication Facilities			
Extrusion Plant	1961	RMI Company	September 30, 1988
Feed Materials Production Center	1951	Westinghouse Materials Company of Ohio	September 30, 1991
Hanford Production Operations	1943	Rockwell Hanford Operations	September 30, 1987
		UNC Nuclear Industries	December 31, 1988
Kansas City Plant	1949	Bendix Corporation	December 31, 1986
Mound Facility	1947	Monsanto Research Corporation	September 30, 1988

APPENDIX A

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES

Facility/Laboratory Name	Date Established	Name of Contractor	Contract Expiration Date
Oak Ridge Gaseous Diffusion Plant	1943	Martin Marietta Energy Systems, Inc.	September 30, 1989
Paducah Gaseous Diffusion Plant	1950	Martin Marietta Energy Systems, Inc.	September 30, 1989
Pantex Plant	1951	Mason & Hanger-Silas Mason Co, Inc.	September 30, 1991
Pinellas Plant	1956	General Electric Company	September 30, 1988
Portsmouth Gaseous Diffusion Plant	1952	Goodyear Atomic Corporation	June 30, 1988
Rocky Flats	1953	Rockwell International Corporation	December 31, 1988
Savannah River Plant	1950	E. I. du Pont de Nemours & Company, Inc.	September 30, 1989
Savannah River Weapons Facility	1950	E. I. du Pont de Nemours & Company, Inc.	September 30, 1989
Y-12 Plant	1943	Martin Marietta Energy Systems, Inc.	September 30, 1989

APPENDIX B

ADDRESS LISTINGS FOR DOE R&D AND FIELD ACTIVITIES

OPERATIONS OFFICES

ALBUQUERQUE OPERATIONS OFFICE
U.S. Department of Energy
Post Office Box 5400
Albuquerque, New Mexico 87115
Manager: Raymond G. Romatowski
(505) 844-7231 or
FTS 844-7231

CHICAGO OPERATIONS OFFICE
U.S. Department of Energy
9800 South Cass Avenue, Bldg. 201
Argonne, Illinois 60439
Manager: Hilary J. Rauch
(312) 972-2110 or
FTS 972-2110

IDAHO OPERATIONS OFFICE
U.S. Department of Energy
785 DOE Place
Idaho Falls, Idaho 83402
Manager: Troy E. Wade II
(208) 526-1322 or
FTS 583-1322

NEVADA OPERATIONS OFFICE
U.S. Department of Energy
Post Office Box 14100
Las Vegas, Nevada 89114-4100
Manager: Thomas R. Clark
(702) 295-3211 or
FTS 575-3211

OAK RIDGE OPERATIONS OFFICE
U.S. Department of Energy
Post Office Box E
Oak Ridge, Tennessee 37831
Manager: Joe La Grone
(615) 576-4444 or
FTS 626-4444

RICHLAND OPERATIONS OFFICE
U.S. Department of Energy
Post Office Box 550
Richland, Washington 99352
Manager: Michael J. Lawrence
(509) 376-7395 or
FTS 444-7395

SAN FRANCISCO OPERATIONS OFFICE
U.S. Department of Energy
1333 Broadway, Wells Fargo Bldg.
Oakland, California 94612
Manager: Richard A. Du Val
(415) 273-7111 or
FTS 536-7111

SAVANNAH RIVER OPERATIONS OFFICE
U.S. Department of Energy
Post Office Box A
Aiken, South Carolina 29802
Manager: Robert L. Morgan
(803) 725-6211 or
FTS 239-6211

NAVAL REACTORS OFFICES

PITTSBURGH NAVAL REACTORS OFFICE
U.S. Department of Energy
Post Office Box 109
West Mifflin, Pennsylvania 15122
Manager: Carl K. Gaddis
(412) 476-7200 or
FTS 721-7200

SCHENECTADY NAVAL REACTORS OFFICE
U.S. Department of Energy
Post Office Box 1069
Schenectady, New York 12301
Manager: Barry M. Erickson
(518) 393-6611 X4690 or
FTS 563-4690

MULTIPROGRAM LABORATORIES

ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue
Argonne, Illinois 60439
Director: Alan Schriesheim
(312) 972-2000 or
FTS 972-2000

BROOKHAVEN NATIONAL LABORATORY
Upton, New York 11973
Director: Nicholas P. Samios
(516) 282-2123 or
FTS 666-2123

IDAHO NATIONAL ENGINEERING LABORATORY
785 DOE Place
Idaho Falls, Idaho 83402
Director: Troy E. Wade II
(208) 526-1322 or
FTS 583-1322

LAWRENCE BERKELEY LABORATORY
1 Cyclotron Road
Berkeley, California 94720
Director: David A. Shirley
(415) 486-5111 or
FTS 451-5111

LAWRENCE LIVERMORE NATIONAL LABORATORY
Post Office Box 808
Livermore, California 94550
Director: Roger E. Batzel
(415) 422-7401 or
FTS 532-7401

LOS ALAMOS NATIONAL LABORATORY
Post Office Box 1663
Los Alamos, New Mexico 87545
Director: Siegfried S. Hecker
(505) 667-5101 or
FTS 843-5101

OAK RIDGE NATIONAL LABORATORY
Post Office Box X
Oak Ridge, Tennessee 37831
Director: Herman Postma
(615) 576-2900 or
FTS 626-2900

PACIFIC NORTHWEST LABORATORY
Post Office Box 999
Richland, Washington 99352
Director: William R. Wiley
(509) 375-2201 or
FTS 444-6270

SANDIA NATIONAL LABORATORIES
Post Office Box 5800
Albuquerque, New Mexico 87185
Director: Irwin Welber
(505) 844-7261 or
FTS 844-7261

PROGRAM-DEDICATED FACILITIES

AMES LABORATORY
109 Office and Laboratory Building
Iowa State University
Ames, Iowa 50011
Director: Robert S. Hansen
(515) 294-2770

BARTLESVILLE PROJECT OFFICE
U.S. Department of Energy
Post Office Box 1398
Bartlesville, Oklahoma 74005
Director: Robert L. Folstein
(918) 337-4401 or
FTS 745-4401

BATES LINEAR ACCELERATOR FACILITY
Massachusetts Institute of Technology
Post Office Box 846
Middleton, Massachusetts 01949
Director: Ernest J. Moniz
(617) 245-6600

BETTIS ATOMIC POWER LABORATORY
Post Office Box 79
West Mifflin, Pennsylvania 15122
Manager: A. C. Davis
(412) 476-5111

CENTER FOR ENERGY AND ENVIRONMENT RESEARCH
General Post Office Box 3682
San Juan, Puerto Rico 00935
Director: Juan A. Bonnet, Jr.
(809) 767-0350

COAL FIRED FLOW FACILITY
University of Tennessee Space Institute
Tullahoma, Tennessee 37388
Program Manager:
Norman R. Johanson
(615) 455-0631

ENERGY TECHNOLOGY ENGINEERING CENTER
Post Office Box 1449
Canoga Park, California 91304
Vice President & General Manager:
H. C. Wieseneck
(818) 700-5326 or
FTS 983-5326

ENVIRONMENTAL MEASUREMENTS LABORATORY
U.S. Department of Energy
376 Hudson Street
New York, New York 10014
Director: Herbert L. Volchok
(212) 620-3619 or
FTS 660-3619

FERMI NATIONAL ACCELERATOR LABORATORY
Post Office Box 500
Batavia, Illinois 60510
Director: Leon M. Lederman
(312) 840-3211 or
FTS 370-3211

HANFORD ENGINEERING DEVELOPMENT LABORATORY
Westinghouse Hanford Company
Post Office Box 1970
Richland, Washington 99352
Director: John E. Nolan
(509) 376-3915 or
FTS 444-3915

INHALATION TOXICOLOGY RESEARCH INSTITUTE (ITRI)
Post Office Box 5890
Albuquerque, New Mexico 87185
Director: Roger O. McClellan
(505) 844-6835 or
FTS 844-6835

KNOLLS ATOMIC POWER LABORATORY
U.S. Department of Energy
Post Office Box 1072
Schenectady, New York 12301
Manager: Albert E. Kakretz, Jr.
(518) 393-6611, x4200

LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH
University of California
Davis, California 95616
Director: James W. Overstreet
(916) 752-1340

LABORATORY OF BIOMEDICAL AND ENVIRONMENTAL SCIENCES
University of California
900 Veteran Avenue
Los Angeles, California 90024
Director: Owen R. Lunt
(213) 825-9431 or
FTS 793-6762

LABORATORY OF RADIOBIOLOGY AND ENVIRONMENTAL HEALTH
University of California
LR-102
San Francisco, California 94143
Director: Sheldon Wolff
(415) 476-1636

MICHIGAN STATE UNIVERSITY (MSU)-DOE PLANT RESEARCH LABORATORY
106 Plant Biology Building
Michigan State University
East Lansing, Michigan 48824-1312
Director: Hans J. Kende
(517) 353-2270 or
FTS 353-2270

MORGANTOWN ENERGY TECHNOLOGY CENTER
U.S. Department of Energy
Post Office Box 880
Morgantown, West Virginia 26507-0880
Director: Augustine A. Pitrolo
(304) 291-4764 or
FTS 923-4764

NAVAL PETROLEUM AND OIL SHALE RESERVES
800 West Werner Court
Suite 342
Casper, Wyoming 82601
Director: C. Ray Williams
(307) 261-5161 or
FTS 328-5161

NAVAL PETROLEUM RESERVE IN CALIFORNIA
Post Office Box 11
Tupman, California 93276
Director: Robert L. Weller
(805) 325-1120

NEW BRUNSWICK LABORATORY
U.S. Department of Energy
9800 South Cass Avenue
Argonne, Illinois 60439
Director: Carleton D. Bingham
(312) 972-2443 or
FTS 972-2443

NOTRE DAME RADIATION LABORATORY
University of Notre Dame
Notre Dame, Indiana 46556
Director: Robert H. Schuler
(219) 239-7502 or
FTS 333-8222

OAK RIDGE ASSOCIATED UNIVERSITIES
Post Office Box 117
Oak Ridge, Tennessee 37831
Executive Director:
William E. Felling
(615) 576-3000 or
FTS 626-3000

PITTSBURGH ENERGY TECHNOLOGY CENTER
U.S. Department of Energy
Post Office Box 10940
Pittsburgh, Pennsylvania 15236
Director: Sun W. Chun
(412) 675-6122 or
FTS 723-6122

PRINCETON PLASMA PHYSICS LABORATORY
Post Office Box 451
Princeton, New Jersey 08544
Director: Harold P. Furth
(609) 683-2000 or
FTS 340-2000

RADIOBIOLOGY LABORATORY
Building 351
University of Utah
Salt Lake City, Utah 84112
Director: Frank Taylor, Acting
(801) 581-5917

SAVANNAH RIVER ECOLOGY LABORATORY
Post Office Drawer E
Aiken, South Carolina 29801
Director: Michael H. Smith
(803) 725-2472 or
FTS 239-2472

SAVANNAH RIVER LABORATORY
Aiken, South Carolina 29808
Director of Research:
John Thomas Lowe
(803) 725-3422 or
FTS 239-3422

SOLAR ENERGY RESEARCH INSTITUTE
1617 Cole Boulevard
Golden, Colorado 80401
Director: Harold M. Hubbard
(303) 231-1000 or
FTS 327-1000

STANFORD LINEAR ACCELERATOR CENTER
Post Office Box 4349
Stanford, California 94305
Director: Burton Richter
(415) 854-3300 or
FTS 461-9300

STANFORD SYNCHROTRON RADIATION LABORATORY
Stanford University
Bin 69, Post Office Box 4349
Stanford, California 94306
Director: Arthur Bienenstock
(415) 854-3300, X2874 or
FTS 461-9300, X2874

STRATEGIC PETROLEUM RESERVE
Project Management Office
U.S. Department of Energy
900 Commerce Road East
New Orleans, Louisiana 70123
Project Manager: John D. Wagoner
(504) 734-4200 or
FTS 686-4201

ENRICHMENT, PRODUCTION, TESTING AND FABRICATION FACILITIES

EXTRUSION PLANT
RMI Company
Post Office Box 179
Ashtabula, Ohio 44004
Manager: Merrit R. Schaeffer
(216) 997-5141 or
FTS 292-2280

FEED MATERIALS PRODUCTION CENTER
Westinghouse Materials Company of Ohio
Post Office Box 398704
Cincinnati, Ohio 45239
President: M. Bruce Boswell
(513) 738-6200 or
FTS 774-6200

HANFORD PRODUCTION OPERATIONS

ROCKWELL HANFORD OPERATIONS
Reprocessing and Waste Management
Post Office Box 800
Richland, Washington 99352
Vice President and General Manager:
Paul G. Lorenzini
(509) 373-1277 or
FTS 440-1277

UNITED NUCLEAR INDUSTRIES, INC.
Post Office Box 490
Richland, Washington 99352
President: L. L. Humphreys
(509) 373-1123 or
FTS 440-1123

KANSAS CITY PLANT
Allied Corporation
Bendix Kansas City Division
Post Office Box 1159
Kansas City, Missouri 64141
Vice President & General Manager:
Jack A. Knuth
(816) 997-3212 or
FTS 997-3212

MOUND FACILITY
Monsanto Research Corporation
Post Office Box 32
Miamisburg, Ohio 45342
Vice President & Director:
Wylie B. Hogeman
(513) 865-3222 or
FTS 774-3222

OAK RIDGE GASEOUS DIFFUSION PLANT
Post Office Box P
Oak Ridge, Tennessee 37831
Plant Manager: Waldo R. Golliher
(615) 574-9200 or
FTS 624-9200

PADUCAH GASEOUS DIFFUSION PLANT
Post Office Box 1410
Paducah, Kentucky 42001
Plant Manager:
Ralph G. Donnelly
(502) 444-6301 or
FTS 355-6301

PANTEX PLANT
Mason & Hanger - Silas Mason Co., Inc.
Post Office Box 30020
Amarillo, Texas 79177
Plant Manager:
C. R. Poole
(806) 381-3111 or
FTS 477-3111

PINELLAS PLANT
General Electric Company
Neutron Devices Department
Post Office Box 2908
Largo, Florida 34294
Plant Manager: S. N. Suciu
(813) 541-8173 or
FTS 848-8173

PORTSMOUTH GASEOUS
DIFFUSION PLANT
Post Office Box 628
Piketon, Ohio 45661
President, Goodyear Atomic
Corporation:
R. L. Shepler
(614) 289-2533 or
FTS 975-2533

ROCKY FLATS PLANT
Rockwell International
Energy Systems Group
Post Office Box 464
Golden, Colorado 80401
Vice President & General Manager:
J. E. Dorr
(303) 966-4361 or
FTS 320-4361

SAVANNAH RIVER PLANT
E. I. du Pont de Nemours
& Co., Inc.
Aiken, South Carolina 29808
Plant Manager: John T. Granaghan
(803) 725-2700 or
FTS 239-2700

SAVANNAH RIVER WEAPONS
FACILITY
E. I. du Pont de Nemours
& Co., Inc.
Aiken, South Carolina 29808
Plant Manager: John T. Granaghan
(803) 725-2700 or
FTS 239-2700

Y-12 PLANT
Martin Marietta Energy Systems, Inc.
Post Office Box Y
Oak Ridge, Tennessee 37831
Plant Manager: Gordon G. Fee
(615) 574-2527 or
FTS 624-2527

APPENDIX C

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES EMPLOYEES BY OCCUPATIONAL FIELD FY 1985

(Including Direct and Indirect Personnel)

Facility	Scientists	Engineers	Other Professionals	Technicians	Others	Total Staff*
MULTIPROGRAM LABORATORIES						
Argonne National Laboratory	575	711	499	154	1,495	3,434
Brookhaven National Laboratory	838	357	212	859	950	3,216
Idaho National Engineering Laboratory	252	1,163	1,482	744	2,107	5,748
Lawrence Berkeley Laboratory	657	201	260	1,148	258	2,524
Lawrence Livermore National Laboratory	1,792	1,160	717	919	3,672	8,260
Los Alamos National Laboratory	1,856	1,029	1,105	2,528	1,495	8,013
Oak Ridge National Laboratory	833	729	933	670	1,790	4,955
Pacific Northwest Laboratory	481	379	689	235	783	2,567
Sandia National Laboratories	956	1,720	1,145	1,903	2,530	8,254
Subtotal	8,240	7,449	7,042	9,160	15,080	46,971
PROGRAM-DEDICATED FACILITIES						
Ames Laboratory	278	46	49	26	87	486
Bartlesville Project Office	5	5	3	0	2	15
Bates Linear Accelerator Facility	17	23	0	34	42	116
Bettis Atomic Power Laboratory	121	1,027	841	713	697	3,399
Center for Energy and Environment Research	7	0	0	7	0	14
Coal Fired Flow Facility	14	35	28	56	27	160

* Staff totals for some facilities vary from those listed under FY 1985 Statistics in Part 3 of this publication. Differences in these statistics can be attributed to: (1) average total staff for the fiscal year vs. actual total staff at the end of the fiscal year and/or (2) computation of statistics by occupational field with no distinction of part-time, temporary and full-time personnel.

APPENDIX C

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES EMPLOYEES BY OCCUPATIONAL FIELD FY 1985

(Including Direct and Indirect Personnel)

Facility	Scientists	Engineers	Other Professionals	Technicians	Others	Total Staff
PROGRAM-DEDICATED FACILITIES (Continued)						
Energy Technology Engineering Center	0	131	15	51	24	221
Environmental Measurements Laboratory	55	8	4	20	13	100
Fermi National Accelerator Laboratory	230	160	520	780	470	2,160
Hanford Engineering Development Laboratory	56	406	528	143	711	1,844
Inhalation Toxicology Research Institute	53	6	5	29	127	220
Knolls Atomic Power Laboratory	123	1,393	597	169	889	3,171
Laboratory for Energy-Related Health Research	8	0	2	35	13	58
Laboratory of Biomedical and Environmental Sciences	43	2	16	48	77	186
Laboratory of Radiobiology and Environmental Health	12	0	8	16	11	47
Morgantown Energy Technology Center	60	100	4	27	85	276
MSU-DOE Plant Research Laboratory	11	0	7	9	15	42
Naval Petroleum Reserves in California	2	19	23	17	9	70
Naval Petroleum and Oil Shale Reserves in Colorado, Utah and Wyoming	0	5	7	2	2	16
New Brunswick Laboratory	36	0	2	5	7	50
Notre Dame Radiation Laboratory	50	2	1	8	15	76
Oak Ridge Associated Universities	94	7	78	62	179	420
Pittsburgh Energy Technology Center	70	72	46	68	24	280
Princeton Plasma Physics Laboratory	124	281	154	547	173	1,279
Radiobiology Laboratory	20	0	0	24	7	51
Savannah River Ecology Laboratory	26	0	3	56	62	147
Savannah River Laboratory	172	221	20	245	336	994
Solar Energy Research Institute	129	75	111	42	120	477

APPENDIX C

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES EMPLOYEES BY OCCUPATIONAL FIELD FY 1985

(Including Direct and Indirect Personnel)

Facility	Scientists	Engineers	Other Professionals	Technicians	Others	Total Staff
PROGRAM-DEDICATED FACILITIES (Continued)						
Stanford Linear Accelerator Center	224	309	155	240	599	1,527
Stanford Synchrotron Radiation Laboratory	12	9	21	14	19	75
Subtotal	2,057	4,342	3,248	3,493	4,842	17,977
Total	10,292	11,791	10,290	12,653	19,922	64,948
ENRICHMENT, PRODUCTION, TESTING AND FABRICATION FACILITIES						
Extrusion Plant	5	1	7	17	89	119
Feed Materials Production Center	62	64	88	4	776	994
Hanford Production Operations						
Rockwell Hanford Operations	244	902	1,398	188	2,864	5,596
UNC Nuclear Industries	0	593	613	35	1,001	2,242
Kansas City Plant	17	1,345	1,005	1,313	4,147	7,827
Mound Facility	227	256	195	0	1,769	2,447
Oak Ridge Gaseous Diffusion Plant	8	494	647	310	1,311	2,770
Paducah Gaseous Diffusion Plant	33	88	73	124	967	1,285
Pantex Plant	57	258	655	344	1,494	2,808
Pinellas Plant	49	203	492	252	984	1,980
Portsmouth Gaseous Diffusion Plant	42	163	153	185	1,608	2,151
Rocky Flats Plant	385	620	1,040	150	3,816	6,011
Savannah River Plant	280	918	147	0	4,875	6,220
Savannah River Weapons Facility	17	113	8	174	108	420
Y-12 Plant	36	975	1,299	639	4,351	7,300
Total	1,462	6,993	7,820	3,735	30,160	50,170

APPENDIX D

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES EMPLOYEES BY ACADEMIC DEGREE FY 1985

(Including Direct and Indirect Personnel)

Facility	Degrees			
	Ph.D.	M.S.	B.S.	Total
MULTIPROGRAM LABORATORIES				
Argonne National Laboratory	702	336	449	1,487
Brookhaven National Laboratory	653	300	458	1,411
Idaho National Engineering Laboratory	203	623	1,282	2,108
Lawrence Berkeley Laboratory	495	259	550	1,304
Lawrence Livermore National Laboratory	1,152	1,019	1,572	3,743
Los Alamos National Laboratory	1,524	880	1,003	3,407
Oak Ridge National Laboratory	909	592	956	2,457
Pacific Northwest Laboratory	321	418	639	1,378
Sandia National Laboratories	1,151	1,635	1,097	3,883
Subtotal	7,110	6,062	8,006	21,178
PROGRAM-DEDICATED FACILITIES				
Ames Laboratory	126	75	159	360
Bartlesville Project Office	3	0	7	10
Bates Linear Accelerator Facility	17	2	38	57
Bettis Atomic Power Laboratory	158	494	1,103	1,755
Center for Energy and Environment Research	5	3	1	9
Coal Fired Flow Facility	16	22	35	73
Energy Technology Engineering Center	4	36	76	116
Environmental Measurements Laboratory	11	15	40	66
Fermi National Accelerator Laboratory	240	215	315	770
Hanford Engineering Development Laboratory	88	300	776	1,164
Inhalation Toxicology Research Institute	51	8	35	94
Knolls Atomic Power Laboratory	108	536	928	1,572

APPENDIX D

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES EMPLOYEES BY ACADEMIC DEGREE FY 1985

(Including Direct and Indirect Personnel)

Facility	Degrees			
	Ph.D.	M.S.	B.S.	Total
PROGRAM-DEDICATED FACILITIES, continued				
Laboratory for Energy-Related Health Research	12	5	18	35
Laboratory of Biomedical and Environmental Sciences	62	20	55	137
Laboratory of Radiobiology and Environmental Health	14	4	25	43
Morgantown Energy Technology Center	52	57	89	198
MSU-DOE Plant Research Laboratory	13	4	13	30
Naval Petroleum and Oil Shale Reserves in Colorado, Utah and Wyoming	0	3	10	13
Naval Petroleum Reserves in California	0	9	29	38
New Brunswick Laboratory	33	11	14	58
Notre Dame Radiation Laboratory	41	6	8	55
Oak Ridge Associated Universities	53	56	103	212
Pittsburgh Energy Technology Center	52	42	92	186
Princeton Plasma Physics Laboratory	156	155	204	515
Radiobiology Laboratory	15	6	13	34
Savannah River Ecology Laboratory	26	38	21	85
Savannah River Laboratory	181	77	174	432
Solar Energy Research Institute	86	81	132	299
Stanford Linear Accelerator Center	177	129	272	578
Stanford Synchrotron Radiation Laboratory	21	22	10	53
Subtotal	1,821	2,431	4,795	9,047
Total	8,931	8,493	12,801	30,225

APPENDIX D

DOE RESEARCH AND DEVELOPMENT AND FIELD FACILITIES EMPLOYEES BY ACADEMIC DEGREE FY 1985

(Including Direct and Indirect Personnel)

Facility	Degrees			
	Ph.D.	M.S.	B.S.	Total
ENRICHMENT, PRODUCTION, TESTING AND FABRICATION FACILITIES				
Extrusion Plant	0	2	8	10
Feed Materials Production Center	1	28	168	197
Hanford Production Operations				
Rockwell Hanford Operations	116	349	1,178	1,643
UNC Nuclear Industries	19	114	457	590
Kansas City Plant	48	444	1,746	2,238
Mound Facility	86	157	435	678
Oak Ridge Gaseous Diffusion Plant	55	217	643	915
Paducah Gaseous Diffusion Plant	2	38	227	267
Pantex Plant	8	49	324	381
Pinellas Plant	10	84	393	487
Portsmouth Gaseous Diffusion Plant	11	60	299	370
Rocky Flats Plant	94	265	951	1,310
Savannah River Plant	43	284	1,018	1,345
Savannah River Weapons Facility	4	22	112	138
Y-12 Plant	61	440	1,120	1,621
Total	558	2,553	9,079	12,190

•U.S. GOVERNMENT PRINTING OFFICE:1986-181-180/40205