

# Nonproliferation and National Security

## Executive Budget Summary

### Mission

The worldwide proliferation of Weapons of Mass Destruction (WMD) and their missile delivery systems has emerged as one of the most serious dangers confronting the United States. This problem is continuing and evolving, with far-reaching consequences for international security and stability.

The President has made nonproliferation one of the nation's highest National Security priorities. For FY 2000, he has proposed an expanded, multi-agency threat reduction initiative for the Russian WMD complex. At least 20 countries -- some of them hostile to the United States -- already have or may be developing WMD through the acquisition of dual-use technology, indigenous development and production, and/or support from rogue supplier states.

Based on the highly specialized scientific, technical, analytical, and operational capabilities of the Department and its National Laboratories, the Department of Energy (DOE), through its Office of Nonproliferation and National Security, is uniquely suited to provide leadership in national and international efforts to reduce the danger to U.S. National Security posed by WMD. The Office of Nonproliferation and National Security accomplishes this mission by: (1) **preventing** the spread of WMD materials, technology, and expertise; (2) **detecting** the proliferation of WMD worldwide; (3) **reversing** the proliferation of nuclear weapons capabilities; and (4) **responding** to WMD emergencies.

### Strategy

In order to reduce the international proliferation threat, the Office of Nonproliferation and National Security is focusing its resources and expertise on the following near-term priorities: (1) securing nuclear materials, technology, and expertise in Russia and the Newly Independent States; (2) maintaining effective protection, control, and accountability of nuclear materials, technology, and expertise in the United States; (3) limiting weapons-usable fissile materials worldwide; (4) developing new technologies against emerging chemical and biological threats; (5) developing and integrating a program for preventing, detecting and responding to nuclear terrorism and smuggling; (6) enabling transparent and irreversible nuclear reductions; (7) supporting the implementation of a Comprehensive Test Ban Treaty (CTBT); (8) controlling nuclear exports; (9) strengthening the nuclear nonproliferation regime; and (10) reducing the threat posed by the operation of unsafe nuclear facilities worldwide.

Some of our most important international activities include: conducting the government-to-government and laboratory-to-laboratory programs of cooperation between U.S. nuclear experts and their counterparts at nuclear facilities and institutes in the former Soviet Union to improve materials protection, control and accountability; assisting Russia and the Newly Independent States in establishing and enhancing nuclear material export control systems; developing technologies and systems to detect the proliferation of WMD and to monitor and verify existing treaties; working with the Democratic Peoples

Republic of Korea (DPRK) to maintain the integrity of long-term storage of the spent fuel canisters at Nyongbyon nuclear site prior to their removal from North Korea; working with the private sector to engage WMD weapons scientists, engineers, and technicians in the former Soviet Nuclear Cities in activities which reduce the proliferation threat and promote their transition to non-defense sector employment; and providing technical support for long-term monitoring of Iraqi facilities and other nuclear safeguards and emergency programs of the International Atomic Energy Agency (IAEA). In addition, we are providing unique and in-depth technical, policy, and research expertise as part of the U.S. Government's integrated efforts to implement a CTBT. We also provide emergency management experts to assist other foreign governments in reviews of their emergency preparedness plans and capabilities.

In concert with our international activities, we are responsible for wide-ranging activities to accomplish nonproliferation and national security goals in the United States. These activities include: directing a rigorous safeguards and security program for the entire Department of Energy complex, thereby ensuring the security of our own nuclear materials, technology and expertise; declassifying millions of DOE documents while protecting critical information that has the potential to facilitate the proliferation of weapons of mass destruction; managing and improving the Department's emergency management and response capability and providing assistance to other government agencies as well as state, tribal, and local governments; and maintaining a security investigations and reinvestigations program for both Federal and contractor employees of the Department. DOE also provides technical, analytical, policy and implementation support to the efforts of the nation's policy community to deal with nonproliferation issues.

In FY 2000, the Department will achieve its nonproliferation and national security priorities by: (1) providing materials protection, control and accountability for fissile materials in Russia and the Newly Independent States; (2) working to complete installation of MPC&A upgrades on all Russian Naval fresh fuels by December 2000; (3) cooperating with authorities in the former Soviet Union to redirect scientific intellectual capital through the science and technology centers and the Initiatives for Proliferation Prevention Program; (4) promoting the transition of nuclear weapons workers to non-defense work through the Russian Nuclear Cities Initiative; (5) shipping stabilized fuel canisters from the Aktau site in Kazakhstan and putting them in underground storage silos for long-term storage; (6) enhancing efforts to detect and stem the proliferation of chemical and biological weapons and to respond to potential terrorist use of such weapons; (7) concentrating efforts toward limiting the production and use of weapons-usable fissile materials in the civil sector by reducing and eventually eliminating the use of highly enriched uranium and promoting alternatives to the civil use of plutonium, continuation of the Reduced Enrichment for Research and Test Reactors (RERTR) Program, and by purchasing, where appropriate, at-risk weapons-usable nuclear materials; (8) providing necessary research, technology development, analysis, and training as part of the U.S. Government's efforts to complete and implement a CTBT; (9) developing and implementing an integrated approach to nuclear smuggling, terrorism, and emergency response; (10) enabling transparency and irreversibility in the nuclear weapon dismantlement process; (11) strengthening the international nonproliferation regime through measures which include our efforts in North Korea, negotiation of an international fissile material cutoff convention and cooperation with and support for the IAEA safeguards programs,

including the facilitation of IAEA inspections in the United States.

During FY 2000, DOE will support the President's initiative on Keeping America Secure for the 21<sup>st</sup> Century by increasing funding to accelerate the development and fielding of key technologies to improve the U.S. capability to prepare for and respond to domestic terrorism involving chemical and biological agents. In addition, we will initiate design of the Nonproliferation and International Security Center at Los Alamos National Laboratory, Los Alamos, New Mexico.

The Department will sustain support to the domestic safeguards and security of nuclear weapons, nuclear materials, classified information and facilities against theft, sabotage, espionage, and terrorist activities. A major emphasis will be support to the Declassification program and implementation of Section 3161 of the National Defense Authorization Act for FY 1999. In addition, DOE will support a Critical Infrastructure Program to help insure protection of certain critical national infrastructures against both physical and cyber attacks. It will also maintain an emergency management program for response to domestic hazards and to provide assistance internationally.

Beginning in FY 2000, NN will budget for the International Nuclear Safety Program. The Program supports international nuclear safety cooperation, and addresses safety issues associated with nuclear materials facilities in Russia. In addition NN will budget for the Highly Enriched Uranium Transparency Implementation program that is responsible for insuring that the nonproliferation aspects of an agreement between the United States and the Russian Federation are met.

Finally, in support of all of the Department's nonproliferation capabilities, we will continue to develop technologies and systems for detecting, characterizing, and monitoring proliferant activities worldwide.

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Rose Gottemoeller  
Director  
Office of Nonproliferation  
and National Security

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January 26, 1999  
Date

## FY 2000 Congressional Budget Request

(dollars in thousands)

	FY 1998 Current Appropriation	FY 1999 Current Appropriation	FY 2000 Request
Research and Development .....	204,859	210,000	221,000
Arms Control .....	234,600	256,900	296,000
Intelligence .....	33,600	41,600	0
International Nuclear Safety .....	70,000	30,000 <sup>1</sup>	34,000 <sup>a</sup>
HEU Transparency Implementation .....	0	0	15,750
Nuclear Safeguards and Security .....	47,200	55,200	59,100
Security Investigations .....	30,000	30,000	30,000
Emergency Management .....	20,000	21,000	21,000
Program Direction .....	82,900	86,900	90,450
Subtotal, Nonproliferation and National Security .....	723,159	731,600	767,300
Use of Prior Year Balances .....	-1,163	-6,176	0
Offset by Programs .....	0	-20,000	-20,000
Total, Nonproliferation .....	721,996 <sup>2</sup>	705,424	747,300
Full Time Equivalents .....	398	408	374

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<sup>1</sup>Program Offices are providing funding for Security Investigations to be used for all contractor personnel in the field. For FY 1999 \$20 million appropriated plus \$15 million may be allocated through Congressional Notification letter, and for FY 2000 a request of \$20 million.

<sup>2</sup>Includes \$35.0 million from AID.

# Nonproliferation and Verification Research and Development

## Program Mission

The Department of Energy (DOE) Nonproliferation and Verification Research and Development (R&D) Program is devoted to conducting applied research, development, testing, and evaluation of science and technology for strengthening the U.S. response to National Security threats and threats to world peace posed by the proliferation of nuclear, chemical, and biological weapons and special nuclear material diversion. Activities are focused on the development, design, prototype construction and production of operational sensor systems needed for proliferation detection, proliferation prevention, treaty monitoring, and support to related intelligence activities.

The DOE will continue to leverage its considerable nuclear nonproliferation R&D base to address important objectives including: nuclear warhead dismantlement initiatives; countering nuclear smuggling and terrorism; applying DOE's resident chemical and biological science expertise to support U.S. preparation for and response to the use of chemical and biological agents; and supporting Law Enforcement agencies. All activities also support the timely transfer of tested prototype systems to other U.S. Government agency users. The program also supports commercialization of technologies and contributes to the Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs.

## Program Goal

The program goal is to enhance U.S. National Security through needs-driven research and development, with emphasis on developing the requisite fundamental science and technology to detect and prevent nuclear proliferation, meet U.S. treaty monitoring goals, and assist in equipping domestic agencies to mitigate against potential threats to the U.S. from chemical and biological agents.

## Program Objectives

- # Develop and demonstrate technologies needed to remotely detect the early stages of a proliferant nation's nuclear weapons program.
- # Develop and demonstrate technologies to locate, identify, and characterize nuclear explosions underground, underwater, in the atmosphere, and in space. Delivery of these R&D products will enhance the Comprehensive Test Ban Treaty (CTBT) ratification process.
- # Produce operational satellite-based nuclear test monitoring sensor systems.
- # Develop and demonstrate detection technologies for nuclear materials protection, control, and accounting; nuclear warhead dismantlement monitoring; and intelligence support.
- # Develop and demonstrate technologies to detect and deter the diversion and smuggling of nuclear weapons and special nuclear material, and to support Law Enforcement forensics.

- # Transition developed technologies to other agencies; for example, the Military (counter proliferation) and Law Enforcement (counter narcotics).
- # Develop and test, in partnership with the Department of Defense (DoD) and other agencies, capabilities that dramatically improve our ability to detect the proliferation of chemical and biological agents at an early stage, and to minimize the consequences of potential use of chemical or biological agents.

## **Performance Measures**

### **Proliferation Detection**

- # Complete laboratory testing of lidar science base/prototype instrument for detection and classifying chemical effluents related to proliferation activities. Ready for integration into an aircraft.
- # Following launch of the Multispectral Thermal Imager (MTI) small satellite in FY 2000, the sensor will be operated on-orbit- to provide data for scientific analysis by DOE and other agencies to demonstrate thermal imaging technology for nonproliferation treaty monitoring and other National Security and civil applications.
- # Complete field testing of a passive spectral imaging system for remote detection and characterization of chemical effluents related to proliferation activities.

### **Treaty Monitoring**

- # Deliver the hardware, software and analytical capability to the U.S. National Data Center to evaluate CTBT data and to make verification assessments.
- # Deliver three operational nuclear treaty monitoring sensor systems per year to the U.S. Air Force (USAF) Global Positioning System (GPS) spacecraft integrating contractor.

### **Deterrence and Detection Technologies**

- # Develop analytical methods to enhance U.S. laboratory equipment for monitoring nuclear proliferation and for supporting forensic investigations of intercepted nuclear materials by domestic or international Law Enforcement agencies.
- # Achieve major technical advances in the areas of chemical and biological detection, analysis, transport modeling, and decontamination; define and evaluate system concepts for two demonstration projects that integrate current capabilities in these technical areas.
- # Develop detection technology for U.S. Law Enforcement and Intelligence agencies to provide new capabilities to respond to incidents and threats involving weapons of mass destruction. Technology will provide a rapid, sensitive and specific detection capability for domestic first responders or unattended applications.

## **Significant Accomplishments and Program Shifts**

### **Proliferation Detection**

- # Field testing of a passive spectral imaging system for remote detection and characterization of chemical effluents related to proliferation activities will be completed. The program will conduct experimentation and modeling to extend passive special imaging capability beyond test libraries to best estimates of levels expected for actual nuclear proliferation signatures.
- # Complete construction of the MTI small research satellite that will demonstrate and evaluate space-based multispectral and thermal imaging technology for nonproliferation treaty monitoring and other National Security and civilian applications.
- # Hyperspectral algorithms will be developed and demonstrated to identify ecological regions that may have been affected by effluents from proliferation activities and potential causes of the ecological changes will be identified.
- # Develop Interferometric Synthetic Aperture Radar (IFSAR) terrain mapping algorithms for treaty monitoring purposes, and provide the DoD with algorithms for their use in battle damage assessment and terrain elevation determination.

### **Treaty Monitoring**

- # Provide uninterrupted capability for continuous worldwide monitoring for atmospheric nuclear explosions, with sensors designed, developed, and produced by the program and deployed on the Air Force GPS satellite constellation. Research focus will continue to shift from the cold war Nuclear Explosion Detection (NUDET) mission to the emerging nuclear test threats from threshold states. Working closely with the U.S. Air Force, a replenishment plan will be implemented to ensure future GPS payloads address new threats.
- # Work accomplished by the U.S. CTBT research and development program to detect underground, underwater, atmospheric, and space nuclear detonations will result in the delivery of integrated analysis software products to the U.S. National Data Center as well as providing support for commercialization of previously provided radionuclide and infrasound prototype detection systems. Research focus will shift toward calibration of globally distributed monitoring stations and associated monitoring equipment and data analysis tools.
- # Following successful launch aboard an Air Force Pegasus-XL launch vehicle, the Fast On-orbit Recording of Transient Events (FORTE) small satellite is demonstrating advanced radio frequency technologies for monitoring the CTBT. FORTE is also providing scientists information on lightning and the structure of the ionosphere for possible use in weather forecasting and understanding the relationship of the ionosphere to environmental phenomena affecting the Earth.
- # Reduce funding to the CTBT program will be used as an offset to the growing priorities of the Chemical and Biological Nonproliferation program and the new construction of the Nonproliferation and International Security Center at LANL.

## Deterrence and Detection Technologies

- # Analytical methods to enhance U.S. laboratory equipment capabilities to monitor nuclear proliferation and to support forensic investigations of intercepted nuclear materials by domestic and international Law Enforcement agencies will be developed.
- # Undertake a comprehensive research and development program for detection and analytical technologies which integrate arms control, counter proliferation and counter terrorism objectives in order to prevent nuclear smuggling and terrorism using weapons of mass destruction (WMD).
- # Within the chemical and biological nonproliferation research program, major advances have occurred in the development of new detection and forensic analysis technologies. In the detection area major technical successes have occurred that will enable the power of conventional laboratory instrumentation to be put into a hand-held device. In the biological forensics area, new techniques for strain analysis of high-priority threat pathogens are a key step in the detection of engineered organisms, and the identification of the geographical origin of biological agents samples to aid in the identification of proliferants.
- # Increase funding for the Chemical and Biological Nonproliferation program due to the increased threat of terrorist use of chemical and biological weapons. Deterrence and Detection Technologies activities have been refocused to accommodate the priorities of the growing chemical and biological weapon threat as well as the new construction of the NISC at LANL.

## Nonproliferation and International Security Center

- # The Nonproliferation and International Security Center (NISC) will house approximately 465 people in a 164,000 square foot area at the Los Alamos National Laboratory. The facility will house laboratories for physics, electronics, and instrumentation development along with technical work spaces and administrative functions. The NISC will also include areas for program management, safeguard assessments, and intelligence activities.

## Funding Profile

(dollars in thousands)

	FY 1998 Current Appropriation	FY 1999 Original Appropriation	FY 1999 Adjustments	FY 1999 Current Appropriations	FY 2000 Request
Nonproliferation and Verification R&D					
Proliferation Detection .....	64,789	67,416	0	67,416	67,500
Treaty Monitoring .....	78,034	77,499	0	77,499	73,500
Deterrence and Detection Technologies .....	62,036	65,085	0	65,085	74,000
Subtotal, Nonproliferation and Verification R&D	204,859	210,000	0	210,000	215,000
Construction .....	0	0	0	0	6,000
Total, Nonproliferation and Verification R&D ..	204,859	210,000	0	210,000	221,000

Other Defense Activities/  
Nonproliferation and National Security/  
Nonproliferation and Verification R&D

FY 2000 Congressional Budget

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
<b>Albuquerque Operations Office</b>					
Albuquerque Operations Office . . . . .	2,108	3,363	3,363	0	0.0%
Kansas City Plant . . . . .	210	0	0	0	0.0%
Los Alamos National Laboratory . . . . .	60,180	57,418	64,964	+7,546	+13.1%
Sandia National Laboratory . . . . .	68,235	69,902	71,747	+1,845	+2.6%
<b>Total, Albuquerque Operations Office . . . . .</b>	<b>130,733</b>	<b>130,683</b>	<b>140,074</b>	<b>+9,391</b>	<b>+7.2%</b>
<b>Chicago Operations Office</b>					
Ames Laboratory . . . . .	252	570	570	0	0.0%
Argonne National Laboratory . . . . .	2,036	1,975	1,975	0	0.0%
Brookhaven National Laboratory . . . . .	1,246	980	980	0	0.0%
Environmental Measurements Laboratory . . . . .	408	385	385	0	0.0%
<b>Total, Chicago Operations Office . . . . .</b>	<b>3,942</b>	<b>3,910</b>	<b>3,910</b>	<b>0</b>	<b>0.0%</b>
<b>Idaho Operations Office</b>					
Idaho National Eng. & Env. Laboratory . .	2,846	2,185	2,185	0	0.0%
<b>Nevada Operations Office</b>					
Nevada Operations Office . . . . .	680	465	465	0	0.0%
Bechtel Nevada . . . . .	3,375	2,515	2,515	0	0.0%
<b>Total, Nevada Operations Office . . . . .</b>	<b>4,055</b>	<b>2,980</b>	<b>2,980</b>	<b>0</b>	<b>0.0%</b>
<b>Oakland Operations Office</b>					
Lawrence Berkeley National Laboratory	1,272	1,110	1,110	0	0.0%
Lawrence Livermore National Laboratory	36,293	38,548	40,393	+1,845	+4.8%
<b>Total, Oakland Operations Office . . . . .</b>	<b>37,565</b>	<b>39,658</b>	<b>41,503</b>	<b>+1,845</b>	<b>+4.7%</b>
<b>Oak Ridge Operations Office</b>					
Oak Ridge Y-12 Plant . . . . .	5,760	6,479	6,479	0	0.0%
<b>Richland Operations Office</b>					
Pacific Northwest Laboratory . . . . .	15,839	16,651	16,651	0	0.0%
<b>Savannah River Operations Office</b>					
Savannah River Technology Center . . . .	2,079	2,445	2,445	0	0.0%
Washington Headquarters . . . . .	2,040	5,009	4,773	-236	-4.7%
<b>Total, Nonproliferation &amp; Verification Research &amp; Development . . . . .</b>	<b>204,859</b>	<b>210,000</b>	<b>221,000</b>	<b>+11,000</b>	<b>+5.2%</b>

**Other Defense Activities/  
Nonproliferation and National Security/  
Nonproliferation and Verification R&D**

**FY 2000 Congressional Budget**

## **Site Description**

### **Albuquerque Operations Office**

The Albuquerque Operations Office will provide administrative support for financial assistance awards to selected recipients who have submitted unsolicited proposals relevant to CTBT research and development activities. The Albuquerque Operations Office also oversees work at the Directed Energy Directorate of the Air Force Research Laboratory, located at the Kirkland Air Force Base in New Mexico. The Directed Energy Directorate will instrument the ARGUS RC-135 research aircraft which will be used to conduct remote chemical detection experiments using DOE sensors. The Directed Energy Directorate will integrate DOE prototype equipment on the aircraft and conduct field test over sites in the U.S.

### **Ames Laboratory**

Ames Laboratory will develop standard methods for state-of-the-art commercial systems to enable U.S. forensics laboratories to attribute future terrorism associated with WMD. These research results will be transferred to local U.S. Law Enforcement agencies to improve investigations and for mitigation of the consequences of nuclear material release during foreign testing, terrorism or accidents.

### **Argonne National Laboratory**

Argonne National Laboratory will conduct research on deployable arms control technology which can be used to analyze signatures from the production or reprocessing of nuclear weapon material, participate as a member of the Radiation Detection Panel, provide technical advisor services on nuclear systems for treaty monitoring, and develop nuclear material measurement techniques which can be used during investigations and for mitigation of the consequences of nuclear material release during foreign testing, terrorism or accidents.

### **Brookhaven National Laboratory**

Brookhaven National Laboratory will develop stand-off detection and analysis technologies for arms control, nonproliferation and counter terrorism applications.

## **Environmental Measurements Laboratory**

The Environmental Measurements Laboratory (EML) will provide advisory and quality assurance services to the radionuclide subsystem being installed internationally for the CTBT. EML is the leading candidate to replace the McClellan AFB radionuclide laboratory specified in the treaty when McClellan AFB is closed.

## **Idaho National Engineering and Environmental Laboratory**

The Idaho National Engineering and Environmental Laboratory (INEEL) will participate as a member of the Radiation Detection Panel and will develop detection technologies for arms control applications using accelerator systems. INEEL is a member of an interlaboratory group to develop technologies to counter terrorism and search/locate Highly Enriched Uranium. Additionally, INEEL will develop modeling capabilities for the design and test of specific advanced materials.

## **Lawrence Berkeley National Laboratory**

Lawrence Berkeley National Laboratory will be a participant in the interlaboratory effort to develop a room temperature high resolution gamma spectrometer based on cadmium zinc telluride (CZT) materials.

## **Lawrence Livermore National Laboratory**

Lawrence Livermore National Laboratory (LLNL) will develop specific geographical regional models to improve U.S. technical capability and confidence to locate and identify seismic events to support CTBT verification assessments, gamma ray imaging technology for arms control applications, advanced technologies to search and locate special nuclear material used in a threatening manner, analytical methods to use the investment of “smart highway systems” to detect WMD during crisis situations and consequence management, and forensics methods for law enforcement which will improve the U.S. capability to investigate the threat of WMD. LLNL will conduct research in the areas of active (lidar) and passive hyperspectral remote chemical detection, including hardware and software (algorithm) development and field testing systems onboard aircraft. LLNL personnel will provide planning for experiments conducted at the chemical gas release facility at the Nevada Test Site which is used to test all remote chemical detection sensors. LLNL will have a key role in the development of CBW transport modeling capabilities for prediction in urban areas and supports our development of DNA diagnostics for forensic analysis.

## **Los Alamos National Laboratory**

Los Alamos National Laboratory (LANL) will provide the U.S. National Data Center with improved analytic tools and sensors for discriminating small earthquakes and industrial activities from clandestine nuclear explosions. LANL will continue to develop the next generation electromagnetic pulse sensor and radiation sensor systems for satellite-based systems. The laboratory will investigate remote unattended methods to monitor SNM in long-term storage for arms control and domestic safeguards, including unmanned systems which can strengthen internal safeguards by monitoring fissile materials in support of future arms control negotiations (e.g. START III) and other international safeguards initiatives. LANL will provide analysis of neural network applications to supply low cost and simple detection technology for treaty monitoring, regional and bilateral conflict resolution and advanced concepts for counter terrorism response. LANL will continue developing innovative algorithms and specialized processors to process voluminous quantities of remote sensing data into the specific information required by decision makers. LANL will continue developing a CO<sub>2</sub> laser system and performing modeling and calibration for the MTI satellite sensors for surface temperature measurements. LANL is central to development of DNA diagnostics for forensic analysis, and in development of a biological detection system capable of biological agent strain differentiation.

## **Nevada Operations Office**

The Nevada Operations Office will support experimental field tests at the HAZMAT Spill Center, a facility managed by the Nevada Operations Office and located at the Nevada Test Site. The HAZMAT Spill Center will be used because it is a unique, one-of-a-kind facility, built to conduct testing using hazardous materials under controlled conditions. The Nevada Operations Office will be the contracting office for grants to universities that participate in various detection and analysis research projects in partnership with the DOE National Laboratories.

## **Oak Ridge Y-12 Plant**

The Oak Ridge Y-12 Plant will support the development of sampling technology and measurement protocols to improve the application of non-nuclear monitoring technology to detect and track nuclear materials production. To support this nonproliferation mission, Y-12 collaborates with Oak Ridge National Laboratory (ORNL) to develop concepts and prototype advanced monitoring tools for analytical systems to be used by DoD special operations and U.S. domestic Law Enforcement. ORNL will conduct research to support cooperative monitoring requirements for bilateral nonproliferation and arms control initiatives with Russia. ORNL will provide leading-edge research into candidate materials which could replace existing nuclear detectors used for gamma spectroscopy and neutron detection. ORNL will continue investigation of small portable mass spectroscopy units and the application of micro-fluidics systems for “lab-on-a-chip” concepts. ORNL will continue development of an advanced mass spectrometer for real-time detection and identification of biological pathogens.

## **Pacific Northwest National Laboratory**

The Pacific Northwest National Laboratory (PNNL) will continue the development of laboratory methods and hand-held detection technologies in support of strategic arms control and National Security applications. The laboratory will support efforts to detect and characterize signatures from nuclear test monitoring systems. The laboratory will be a strong participant in the development of advanced forensics methods that are necessary to address WMD contaminated evidence analysis by Law Enforcement. PNNL will provide collaborative statistical support to other DOE National Laboratories conducting research and development for the CTBT program. Areas of research include discrimination algorithms to support geographical regional models; and overall statistical assessments to increase confidence in the CTBT monitoring system. PNNL will continue developing a heterodyne technique to increase the detection sensitivity of laser chemical-detection systems and algorithms for processing hyperspectral, ultraspectral and laser data for chemical detection, identification, and quantification.

## **Remote Sensing Laboratory**

The Remote Sensing Laboratory will lead a consortium of universities to develop research tools which will enhance the capability of multispectral and hyperspectral sensors and data processing to detect proliferation activities.

## **Sandia National Laboratories**

The Sandia National Laboratories (SNL) will develop, demonstrate, and validate improvements to existing and planned information system technologies to provide capabilities for highly automated, high confidence data processing and analysis in support of nuclear explosion monitoring. SNL will support the U.S. program to detect nuclear detonations from satellites by providing systems engineering, the optical sensors and the on-orbit processing and power conditioning technologies. In partnership with U.S. Law Enforcement, the laboratory will develop nuclear detection systems to interdict smuggled nuclear materials in transit across U.S. borders. SNL will participate in a multilaboratory effort to develop CZT as a room temperature spectrometer and in a consortium of national labs and academic institutions to develop micro-technologies for detection and analysis of chemicals. SNL will continue development of advanced Synthetic Aperture Radars and analysis methods for mapping, and the detection of proliferation events. SNL will continue development of an ultraviolet lidar system for remote detection of chemicals. SNL will continue managing, integrating, assisting in launch, and operation of the MTI satellite for measurements of surface temperatures. SNL will continue developing a “chemistry laboratory on a chip,” a technology that will bring the power of an analytical laboratory down to a hand-held format. In addition, SNL will continue development of environmentally friendly CBW decontaminations foams.

## **Savannah River Technology Center**

The Savannah River Technology Center (SRTC) will provide ground-based monitoring systems to analyze data collected by the MTI satellite in order to validate atmospheric and facility models based on ground-truth information. SRTC will support development of methods to exploit environmental sampling and provide advisory services for testing of new concepts to detect undeclared nuclear reprocessing.

## **Washington Headquarters**

The DOE Headquarters transfers funding as required to the SBIR and STTR programs. In addition, DOE Headquarters manages funding transfers to other government agencies such as the Departments of the Navy, Air Force, and the Health and Human Services to provide their expertise to the Nonproliferation and Verification R&D Program.

# **Proliferation Detection**

## **Mission Supporting Goals and Objectives**

Develop and demonstrate innovative proliferation detection technologies including active (lidar-based) and passive hyperspectral electro-optical remote chemical effluent detection, space-based multispectral and thermal imagery, and advanced data analysis.

The multilaboratory and joint interagency projects within this activity area are comprised of comprehensive, end-to-end research and development efforts that (1) examine the nature of proliferation targets to determine remotely observable signatures, (2) conduct phenomena modeling to understand the environment's effects on observables and how these effects can be taken into account, (3) develop sensor systems to remotely detect and measure the observable, and (4) develop techniques to interpret the data and produce meaningful information.

These activities are closely coordinated with other Government agencies and, beginning FY 1999 and continuing in FY 2000, the methodology and experience that have resulted in significant advances in the nuclear proliferation detection mission area, are applied to the chemical and biological weapons proliferation arena. Many of the sensor systems and base technology designed to detect chemical signatures from nuclear weapons activities can be used to detect chemical signatures from chemical and potentially biological weapons activities.

Research to apply lidar for remote chemical detection will continue with ground and aircraft-based field tests of prototype detection systems to evaluate performance and to investigate concepts to extend designs to operate beyond their current limitations. Experimentation will continue to enhance analytical performance to distinguish nuclear proliferation signatures from background noise and to define the performance envelope of remote chemical detection systems developed by DOE as well as other agencies. Development of a short-range chemical effluent detection lidar system for use onboard an unmanned aerial vehicle (UAV) will accelerate, with plans to complete and test the system in FY 2001.

Following launch of the MTI small satellite in early FY 2000, operational testing and data collection will begin. MTI satellite data will demonstrate and evaluate multispectral and thermal imaging technologies for the passive, noncooperative detection and characterization of nuclear proliferant activities. Coordination with arms control, military, and other users of MTI data to refine test plans and operation concepts will continue.

In the area of hyperspectral remote chemical detection technology, field testing and development of exploitation techniques of an airborne, high spectral resolution imaging spectroradiometer for passive detection of nuclear proliferation chemical effluents will continue. This is part of an interagency effort to develop this technology. Particular emphasis will be given to developing computer tools to assist an analyst in extracting key information from the voluminous data supplied by the sensor. Chemical effluent

signature analysis research conducted for lidar development activities will be applied to passive imaging detection problems.

In FY 2000, activities will shift to begin to leverage the best capabilities of lidar and passive spectral sensing technologies into an integrated system. Based on extensive ongoing research and testing, the limitations of each technology may be compensated by the unique capabilities of the other, thereby producing a significant breakthrough and a national capability to collect chemical effluent information from great distances.

Synthetic aperture radar (SAR) algorithm development will be continued. This effort produces new methods of exploiting existing SAR systems to detect underground nuclear testing, and has resulted in many spin-off applications to other Government agencies.

The proliferation detection area is developing “onboard intelligence” methods that enable sensors to transmit “information” vice raw data back to the user. As a result, sensors can act more autonomously and will require less time and resources to provide the desired information to the end user.

### Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Proliferation Detection . . . . .	64,789	67,416	67,500	+84	0%
Total, Proliferation Detection . . . . .	64,789	67,416	67,500	+84	0%

### Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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#### Proliferation Detection

#	Provide innovative and unconventional algorithms in order to reduce, in real time, voluminous quantities of remote sensing (radar, passive/active optical and radio-frequency) data into the specific information required by decision makers . . . . .	8,309	8,583	9,263
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Other Defense Activities/  
 Nonproliferation and National Security/  
 Nonproliferation and Verification R&D/  
 Proliferation Detection

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
# Important technical issues will be resolved through laboratory and field testing of next generation systems. These issues have major impacts on implementing lidar or a hybrid lidar into a fully operational system. Several laboratories are tasked to work cooperatively because this technical area is very challenging. An intermediate UAV based prototype will provide immediate limited utility to users, as well as identify technical challenges that require further development . . . . .	24,160	26,266	27,070
# The MTI small satellite will demonstrate absolute temperature measurement from space for the passive, noncooperative detection and characterization of proliferant activities. Satellite sensor data will become available in FY 2000 and will be analyzed by numerous organizations throughout the Government and academia	23,080	17,324	13,100
# Continued emphasis will be placed on hyperspectral imaging technology. This area will work extensively with data taken by an airborne system and will develop new analysis techniques that will fully utilize the information available in a spectral image. Key enabling technologies will be identified and pursued . . . . .	9,240	15,243	14,643
# The evaluation of a remote chemical sensor system that leverages the capabilities of both passive hyperspectral and active lidar technology will be initiated to demonstrate, on a limited basis, all operational characteristics of a future world-wide proliferation monitoring sensor system . . . . .	0	0	3,424
Total, Proliferation Detection . . . . .	64,789	67,416	67,500

**Explanation of Funding Changes from FY 1999 to FY 2000**

**Other Defense Activities/  
Nonproliferation and National Security/  
Nonproliferation and Verification R&D/  
Proliferation Detection**

**FY2000 Congressional Budget**

FY 2000 vs. FY 1999 (\$000)
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**Proliferation Detection**

#	Increase in lidar activities due to laser and component purchases for a UAV system .....	+804
#	Increase in synthetic aperture radar activities .....	+837
#	Decrease due to completion of MTI satellite construction costs in FY 1999 with only satellite launch and operations in FY 2000 .....	-4,224
#	Small decrease in hyperspectral work as focus shifts to integrated lidar/hyperspectral system development .....	-600
#	Activities shift to exploit capabilities of hyperspectral and lidar remote chemical detection techniques in a common system architecture .....	+3,267
	<b>Total Funding Change, Proliferation Detection .....</b>	<b>+84</b>

Other Defense Activities/  
Nonproliferation and National Security/  
Nonproliferation and Verification R&D/  
Proliferation Detection

# Treaty Monitoring

## Mission Supporting Goals and Objectives

Develop and demonstrate technologies for monitoring international treaties banning the explosive testing of nuclear devices. Develop and field sensors and algorithms, which will, in a timely manner detect, locate, identify, and characterize nuclear explosions which occur in the atmosphere, in space, underground, and underwater. Address requirements for both international and independent U.S. national monitoring.

The Treaty Monitoring program is one of the DOE's longest standing nonproliferation initiatives. The concept of a U.S. national capability using satellite-borne nuclear explosion surveillance came about during interagency discussions from 1959 to 1962, leading to deployment of the original satellite explosion detection sensors. During the 39 years of this program, more than 100 DOE satellite payloads have been launched, using U.S. Air Force and National Aeronautics and Space Administration boosters. The national need for worldwide cognizance of nuclear explosions is as important as ever in this time of high nuclear proliferation concern.

National responsibility for executing CTBT R&D was consolidated within this DOE program in 1993. The R&D goal is to develop and demonstrate technologies for monitoring existing test ban treaties and the CTBT. Building on the delivery of radionuclide and infrasound prototypes to the U.S. National Data Center for commercialization, the DOE program is shifting toward calibration for the seismic, radionuclide, hydroacoustic and infrasound stations which enable treaty monitoring. This research and development program addresses both international and U.S. national monitoring requirements of a CTBT. Detection technologies are developed to detect nuclear explosions underground, underwater, in the atmosphere, and in space.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Treaty Monitoring .....	78,034	77,499	73,500	-3,999	-5.2%
Total, Treaty Monitoring .....	78,034	77,499	73,500	-3,999	-5.2%

Other Defense Activities/  
Nonproliferation and National Security/  
Nonproliferation and Verification R&D/  
Treaty Monitoring

FY 2000 Congressional Budget

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Treaty Monitoring</b>			
# Produce, deliver, and operationally support three (3) Global Positioning System (GPS) satellite nuclear explosion detection flight systems per year, to maintain continuous, worldwide, monitoring capability as on-orbit GPS satellites age and are replaced. Develop and demonstrate the next generation of satellite-based optical, electromagnetic pulse, and radiation sensor systems to detect nuclear explosions in Earth's atmosphere and in space . . . . .	48,995	49,940	48,920
# Characterize explosion-like signals from natural and industrial sources to increase the reliability of analysis to distinguish natural events and industrial activity from nuclear weapons testing. Transfer enhanced regional data evaluation and explosion identification capabilities including calibration data, when possible, to the CTBT U.S. National Data Center (NDC). Provide NDC with operational support for its seismic, radionuclide, hydroacoustic, and infrasound sensor systems to enable the NDC to perform its nuclear treaty monitoring mission and to make verification assessments . . . . .	29,039	27,559	24,580
<b>Total, Treaty Monitoring . . . . .</b>	<b>78,034</b>	<b>77,499</b>	<b>73,500</b>

## Explanation of Funding Changes from FY 1999 to FY 2000

FY 2000 vs.  
FY 1999  
(\$000)

### Treaty Monitoring

#	Delivery of the second installment of the operational and seismic part of the U.S. National Data Center's Knowledge Base moves to FY 2001 from FY 2000. This funding decrease will be used as an offset to the growing priorities of the Chemical and Biological Nonproliferation program and the new construction of the Nonproliferation and International Security Center at LANL . . . . .	-3,999
Total Funding Change, Treaty Monitoring . . . . .		-3,999

# Deterrence and Detection Technologies

## Mission Supporting Goals and Objectives

Our goals in this area are: (1) the development of enabling technologies to inhibit nuclear materials diversion in nonproliferation, arms reduction and counter terrorism applications, and (2) the development of advanced technologies to dramatically improve early detection capabilities, and preparation and response capabilities in general, to address the terrorist use of chemical or biological agents.

The technology development activities supported under this area are broadly aimed at deterring the terrorist use of WMD. The initiatives in the nuclear areas focus on the development of technology to safeguard nuclear materials, to provide intelligence and warning of illicit nuclear materials, on detection of the transit of nuclear material, and on the materials analysis required to support Law Enforcement. In FY 2000, the nuclear R&D activities will focus on the development of technologies to counter nuclear smuggling and terrorism threats. Developed systems will enhance the U.S. capability to: conduct wide area searches; remotely monitor the storage of nuclear material placed under IAEA safeguards or under bilateral agreements with Russia; develop collection and analysis tools to detect proliferation activities associated with WMD production and military operations; and develop a new generation of cost-effective detection systems based on micro technologies. A closer partnership with U.S. Law Enforcement agencies will be constructed during FY 2000 to share field and laboratory systems. Ongoing research on technologies which can be exploited by the intelligence and Law Enforcement agencies will be accelerated.

The goal of the chemical and biological nonproliferation research and development program is to reduce the U.S. vulnerability to the use of chemical or biological agents through the development of advanced technologies and capabilities. A key element of the program is the formulation of architectures that bring together operational and technological components to develop systems that address key elements of the chemical and biological threat. This program builds upon ongoing activities in other agencies, and addresses key areas in which DOE has expertise.

Preparing and ultimately responding to the use of chemical or biological agents is a complex problem to which there is no "silver bullet". Because of these challenges, chemical and biological terrorism is most effectively addressed in an end-to-end, layered approach. Such a layered approach must involve deterring the use of such weapons, preparing key facilities and cities for the possible use of such agents, having systems in place to rapidly detect the use, and should use be detected, being able to effectively respond. Technology is a key component of all of these areas-our initiative focuses on the development of enabling technology to dramatically improve the U.S. ability to prepare for and respond to the use of such weapons, and on a close linkage between technology development and systems analysis and integration efforts.

The chemical and biological nonproliferation R&D initiative builds upon over \$1 billion per year that DOE invests in related technologies and the chemical and biological sciences in areas that range from genomic sequences, to the development of new DNA diagnostics, to advances computer simulation tools. The DOE efforts are complementary to, and closely linked (via formal coordination mechanisms) to those of the DoD and other agencies.

## Funding Schedules

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Deterrence and Detection Technologies .....	62,036	62,085	74,000	+8,915	13.7%
Total, Deterrence and Detection Technologies .....	62,036	65,085	74,000	+8,915	13.7%

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Deterrence and Detection Technologies</b>			
# Radiation Detection: Develop and maintain the technology base for key radiation detection and characterization technologies and systems which underpin U.S. national security capabilities in the areas of safeguarding nuclear material, combating terrorism, nonproliferation, and arms control. Develop innovative concepts to increase sensitivity, resolution, range, fieldability, and simplify system operations and interpretation of data. Develop, integrate, and demonstrate high resolution radiation detection systems which operate at room temperature or with compact coolers, systems with the capability to detect special nuclear material at long ranges, and detectors with novel hardware and software information barriers to protect sensitive weapons information for systems used with international organizations or international agreements.	16,768	16,151	14,975

Other Defense Activities/  
 Nonproliferation and National Security/  
 Nonproliferation and Verification R&D/  
 Deterrence and Detection Technologies

FY 2000 Congressional Budget

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
# Materials Analysis: Develop advanced field and laboratory capabilities for the detection and analysis of proliferation-related activities primarily in support of the law enforcement, intelligence, and arms control communities. Advance the state of technology in both field and laboratory forensics analysis applied to weapons of mass destruction and other threats to national security. Develop automated gaseous and particulate collection systems and integrate with automated in-field analysis capability for possible remote, unattended operation. Develop novel approaches to enhance the capability of new sensor systems to discriminate between proliferation chemicals of interest and “normal” background. Develop innovative ways to reduce the per sample cost for laboratory analysis. . . . .	12,405	12,763	11,600
# Micro Technologies: Develop micro technologies which will enable the miniaturization of detection and analysis systems that can be readily deployed with a human operator or can be operated remotely and/or unattended in support of law enforcement, intelligence, and arms control missions. Develop and demonstrate prototype miniature chemical sensors, arrays of micro-sensors, and “smart” networks which will reduce false alarms and enhance the probability of detecting activities of concern. . . . .	14,865	12,955	11,500
# Chemical and Biological Nonproliferation: Development of advanced technologies to respond to the chemical and biological threat. Critical research to develop and test fast and selective detection technologies, predictive plume transport models suitable for urban areas, new recovery and restoration concepts, and advanced biological forensics methods for proliferation detection and attribution. . . . .	17,998	18,497	31,152
# SBIR/STTR: Funding for the SBIR and STTR programs are contained in the Detection and Deterrence Technology subprogram. In FY 1998, \$5,141,000 was transferred to the DOE SBIR and STTR programs. The FY 1999 and FY 2000 amounts are the estimated requirement for the continuation of these programs . . .	0	4,719	4,773
Total, Deterrence and Detection Technologies . . . . .	62,036	65,085	74,000

Other Defense Activities/  
Nonproliferation and National Security/  
Nonproliferation and Verification R&D/  
Deterrence and Detection Technologies

FY 2000 Congressional Budget

## Explanation of Funding Changes from FY 1999 to FY 2000

 FY 2000 vs.  
 FY 1999  
 (\$000)

### Deterrence and Detection Technologies

#	Chemical and Biological Nonproliferation: Due to the increased threat of potential terrorist use of chemical and biological weapons, the Nonproliferation and Verification R&D program has refocused priorities . . . . .	+12,655
#	The Materials Analysis, Micro Technologies, and Radiation Detection activities have been reduced to offset the priorities of the Chemical and Biological Nonproliferation program and the construction of the Nonproliferation and International Security Center at LANL . . . . .	-3,794
#	SBIR/STTR . . . . .	+54
Total Funding Change, Deterrence and Detection Technologies . . . . .		+8,915

## Capital Operating Expenses and Construction Summary

### Capital Operating Expenses

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Capital Equipment . . . . .	2,971	4,411	4,300	-111	-2.5%
Total, Capital Operating Expense . . . . .	2,971	4,411	4,300	-111	-2.5%

### Construction Projects

(dollars in thousands)

	Total Estimated Cost (TEC)	Prior Year Appropriations	FY 1998	FY 1999	FY 2000	Unappropriated Balance
00-D-192, Nonproliferation & International Security Center, LANL . . . . .	58,769	0	0	0	6,000	52,769
Total, Construction . . . . .		0	0	0	6,000	52,769

# 00-D-192, Nonproliferation and International Security Center (NISC), Los Alamos National Laboratory, Los Alamos, New Mexico

(Changes from FY 1999 Congressional Budget Request are denoted with a vertical line [ | ] in the left margin.)

## 1. Construction Schedule History

	Fiscal Quarter				Total Estimated Cost (\$000)	Total Project Cost (\$000)
	A-E Work Initiated	A-E Work Completed	Physical Construction Start	Physical Construction Complete		
FY 2000 Budget Request (Preliminary Estimate) . . . . .	1Q 2000	1Q 2001	4Q 2001	2Q 2003	58,769	62,656

## 2. Financial Schedule

(dollars in thousands)

Fiscal Year	Appropriation	Obligations	Costs
<b>Design</b>			
2000	6,000	6,000	3,198
<b>Construction</b>			
2001	7,000	7,000	6,724
2002	36,000	36,000	30,312
2003	9,769	9,769	18,464
2004	0	0	71

## 3. Project Description, Justification and Scope

Proposed construction project - We live in a rapidly changing world in which threats involving the proliferation of weapons of mass destruction (NBC - nuclear, biological and chemical) and their potential use by rogue states or terrorists loom over all of us. The Department of Energy Office of Nonproliferation and National Security (DOE-NN) and the Office of Intelligence (DOE-IN) have the responsibility for major programs to counter these threats. Most are time urgent and have sensitive national security implications. For example, controlling nuclear materials in states of the Former Soviet Union, verifying the Comprehensive Test Ban Treaty (CTBT), countering nuclear smuggling, safeguarding nuclear materials and weapons and, most recently, countering threats involving chemical and

biological agents and helping enable the START process to continue downsizing nuclear weapon stockpiles. These programs are truly important to the security of the United States and the world, and the national laboratories through DOE-NN and DOE-IN are the major agents responsible for carrying out this work.

Los Alamos supports these DOE-NN and DOE-IN programs through: 1) a diverse and robust R&D program to develop detection systems and technology; 2) assessing foreign nuclear weapon capabilities and responding to nuclear-related emergencies; and 3) for many years, providing much of the technology and expertise needed to verify treaties and implement various safeguards regimes to ensure compliance with terms and conditions of treaties and agreements. In 1993 the Laboratory consolidated major programs and capabilities in detection R&D, intelligence, nuclear safeguards and emergency response into a new organization called Nonproliferation and International Security (NIS). This organization is the laboratory's prime responder to DOE-NN and DOE-IN programmatic needs, including approximately \$100 million per year in funded effort for DOE plus about \$25 million in related work for other federal agencies. Unfortunately, the full benefit of this synergistic organization has been handicapped by being located in facilities scattered across the 43-square-mile Los Alamos site. Many NIS operations are performed in substandard facilities. The Laboratory Capital Assets Management Plan (CAMP) ranks the quality of all Laboratory space using six Condition Assessment Survey codes ranging from "Excellent" down to "Fail". Of the groups proposed for consolidation in the new facility, 74% are currently in space classified as "Poor", "Fail", or "Fair". The 50 buildings housing NIS personnel include many "temporary" trailers and transportables. These old and substandard structures are energy inefficient, and they are a negative factor in recruiting top scientific staff as we try to maintain our status as a world-class laboratory and division.

Based on a recent study of a similar R&D organization (Kraut, Robert E., Carmen Egido, and Jolene Galegher, "Patterns of Contact and Communication in Scientific Research Collaborations," Intellectual Teamwork - Social and Technological Foundations of Cooperative Work (Lawrence Erlbaum Associates, Inc., New Jersey, 1990), Chap.6.) the following improvements in scientific collaborations and technical communications are projected:

- # Increases in number of scientific collaborations - Collaboration rate strongly facilitated. Upper speculative bound is 87% increase. Likely increase is at least 10%.
- # Increase in frequency of technical communications - Collaboration increase exponentially with proximity. Internal communications will at least double and very likely will increase by much more than double.

In addition, the study provided a preliminary estimate of the following less dramatic but quantifiable productivity improvements in addition to the non-quantifiable but very significant scientific creativity and productivity gains:

- # Savings in support-function consolidation - 0.85% of NIS labor budget (about \$0.5 million per year).
- # Savings of intra-division travel time - 2.0% of NIS labor budget (about \$1.2 million per year).

Los Alamos proposes to consolidate this unique national resource physically as well as organizationally near the Laboratory hub by co-locating all NIS activities in new and existing facilities within convenient

**Other Defense Activities/**

**Nonproliferation and National Security/**

**Nonproliferation and Verification R&D/**

**00-D-192 — Nonproliferation and International Security Center (NISC)**

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walking distance in TA-3 (except for the high-security nuclear activities in TA-18/36 and the Center for International Security Affairs in TA-66, neither of which would be desirable or practical to move). The CAT I nuclear operations at TA18/36 have special security and safety requirements that would be very difficult to move. The activities at TA66 require open access by foreign nationals and can not be conducted in the secure NISC facility. To accomplish this consolidation will require the construction of a major new facility – the Nonproliferation and International Security Center (NISC). This consolidation will enhance program synergy and effectiveness by co-location of the NIS nonproliferation, arms control, treaty verification, and intelligence functions near the scientific, technological, and information sources that support these programs.

Los Alamos will initiate Title I/II design in FY2000. This schedule is necessary because of several urgent new requirements to which DOE-NN and DOE-IN must respond and to which the full capabilities of the national laboratories, especially Los Alamos, must be applied. Specific examples include:

- # Former Soviet Union (FSU), Nuclear Materials Protection, Control, and Accounting (MPC&A) Program B - The threat to U.S. national security from the loss of significant quantities of FSU nuclear material has been reduced but is far from eliminated. Until these vast amounts of material are safeguarded fully, this threat remains grave.
- # Helsinki Agreements - Agreements reached recently by Presidents Clinton and Yeltsin in Helsinki, including preliminary START III treaty parameters, add significantly to the technical challenges facing DOE-NN and DOE-IN.
- # Comprehensive Test Ban Treaty (CTBT) Verification - The U.S. Senate soon will consider ratification of the treaty. Verification of international compliance with the terms of this treaty will be the major issue in the debate. Assuring the President and Congress that DOE can develop technologies to adequately verify the treaty is a political as well as a daunting technical challenge facing DOE-NN and DOE-IN.
- # Nuclear, Biological, and Chemical (NBC) Proliferation and Terrorism - DOE-NN and DOE-IN are now responsible for developing and providing detection, assessment, and response technologies across the entire NBC spectrum. Reducing the NBC threat requires timely warning (intelligence) and advanced detection technology (monitoring). Adequate intelligence and monitoring require the application of leading-edge science and technology across a broad spectrum.

Los Alamos recently launched major efforts aimed at countering nuclear smuggling and chemical or biological weapons and is prepared to launch a major effort in support of the recent Helsinki Accords to continue the START process. NISC will give an appropriate focus and stature to Los Alamos efforts in nonproliferation, arms control, and national security commensurate with the contributions the Laboratory is making and on an equal footing with the Laboratory's historic nuclear weapons mission.

The NISC facility will be a new structure rising four stories above a one-level basement. A one-story high-bay area and basement will be provided on the west end of the structure. The high-bay area will be used to support the development of special equipment and instruments. About 465 people will be housed in this 164,000 square foot facility. The second, third, and fourth floors each contain approximately 30,000 square feet. The ground floor includes about 36,000 square feet while the basement is around 37,000 square feet. The roof is accessible by stairs and freight elevator and this area is about 1,000 square

**Other Defense Activities/**

**Nonproliferation and National Security/**

**Nonproliferation and Verification R&D/**

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feet. The fourth floor, housing intelligence activities, will be an accredited SCIF. Access to the SCIF will be limited to one location that will be controlled by a guard during normal operating hours. The third floor will contain program management and safeguard assessment functions. Anticipating that SCIF related activities could increase, the third floor will be constructed in such a manner that it could become an accredited SCIF in the future. Laboratories for physics, electronics, and instrumentation development along with technical work spaces and administrative functions will be distributed throughout the second and first floor, as well as the basement. Conference rooms will be provided on every floor with larger facilities being located on the first floor. A portion of the basement will be devoted to optic laboratories. In addition, the basement will house nuclear safeguard technology activities. These activities will be classified as radiological because of the use of sealed radioactive sources to execute their mission. The basement also will contain vaults to store the sealed sources including special nuclear materials (SNM). Two specially shielded rooms will be included for high radioactive research activities. These "special rooms" will require 5-ton bridge cranes. Because of the classified nature of many of the activities in this facility, the building, with the exception of the high bay area and machine shop, will be accessible to cleared personnel only.

A structural steel framing system of construction utilizing cost-effective design concepts will be employed to provide maximum open space, flexibility and economy for the upper floors of NISC. A 30 ft. x 30 ft. structural module was selected to accommodate a 10 ft. x 12 ft. office typical element. Floors will be concrete over metal deck supported by steel beams and girders. A 16 ft. floor to floor height was selected for the upper floors while the basement with its heavier industrial occupancy will be 20 ft., floor to floor. The basement walls will be constructed of reinforced concrete. Passenger and elevators service all floors. In addition to these elevators, an industrial type (10,000 lb.) elevator will service the basement from the loading dock outside the high-bay entrance. The high-bay also will contain a 10-ton bridge crane to accommodate the loading and unloading of heavy instrumentation. This bridge crane will extend outside the building and be able to operate on the loading dock. The building will be heated, cooled and ventilated from modular indoor air handling units on each floor. Chilled water will be provided for cooling while heating will be accomplished by hot water. Variable air volume (VAV) air conditioning units will deliver conditioned air to the occupied spaces. Units will provide a minimum amount of outside air at all times. When outdoor ambient conditions are favorable, an economizer cycle will provide "free" cooling with outside air. The same type of system will be included in the high bay and machine shop, but will be roof mounted. The main building chillers will also be located on the roof of the high bay structure. Temperature control will be from room thermostats. A complete packaged direct digital control (DDC) automatic temperature control system will be included. Roof drains will be connected to site storm drain system. Roof drains will be de-coupled as they penetrate the roof, fourth floor, and third floor. An automatic wet-pipe fire protection system will be extended throughout the building. The system will be hydraulically designed and conform to NFPA 13 for Ordinary Hazard Group II as a minimum or as determined PHA. Plumbing fixtures including electrical water coolers will be selected to provide access to individuals with disabilities. The building will require the installation of a 3-phase outdoor unit substation that will include walk-in switchboard. Power will run to each electrical room where it will be distributed. Isolation power will be available for sensitive electronic equipment and computer loads. Power will be distributed throughout the building at 480Y/277V and 208Y/120V. Motors one horsepower or greater will be supplied with power at 480V. Generally, lighting will be fluorescent and powered at 277V. The building will be equipped with communication systems that include telephone,

**Other Defense Activities/**

**Nonproliferation and National Security/**

**Nonproliferation and Verification R&D/**

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open data communications, and a protected transmission system. The SCIF will require an internal warning light signaling system as well as an intrusion alarming system.

Site improvements will include a new service drive to access the high bay assembly area and machine shop functions as well as normal deliveries. A concrete walk with steps will provide pedestrian access to the main entrance to the building. Disabled access will be provided by means of a concrete walk with appropriate ramps. Existing surface drainage and new building roof drainage will be conveyed to existing storm drainage systems. The site, which is a one square block parking area, contains three office-transportable structures as well as a vacated gasoline refueling and service facility. Removal of these facilities will enable parking facilities to be expanded. Gasoline storage tanks, fuel lines, and pumps were removed by the Laboratory in 1997 and will not be part of NISC construction project. Existing asphalt paving will be removed and the site will be regraded. Access drives and parking areas will receive base course and asphaltic concrete paving. The parking areas will be stripped to accommodate approximately 956 cars. The NISC will be built on a current shared parking lot. The parking lot will be restored to accommodate approximately the original number of cars. Non-paved areas surrounding the building will be landscaped. Landscaping will consist of ground cover and trees similar to those on site. All landscaped areas will be irrigated by an automatic underground system.

Water service for both portable and fire protection will consist of an 8-inch pipe construction, approximately 320 feet long, into an existing 10-inch water main that lies adjacent to the site. A new 6-inch sewer line approximately 320 feet long will convey sanitary waste from the new building to an existing manhole. An existing 8-inch steam line with a 4-inch condensation line is located across the street from the building site. These lines will be connected together at a steam pit south of the building from which a 4-inch steam line and 3-inch condensation line will be extended into the building. A 2500-kVA, 13.2KV-480Y/277V, 3-phase outdoor unit substation, which will include a walk-in switchboard with secondary feeders routed to each of the basement electrical rooms, will be located along the north side of the building in the area of the electronics equipment lab. Power to this unit substation will be an underground feed from 13.2KV circuit. The primary feeder cable to the new unit substation will be 3-#4/0 15KV shielded, type MV90 conductors approximately 200 ft. in length and run in a concrete encased ductbank to switchgear unit.

NISC will vacate space in all or parts of seven permanent structures at both the TA-35 and TA-3 Technical Areas. The vacated space will be available for use by other DOE projects at Los Alamos. In addition, about 24 trailers and transportables, representing about 27,096 square feet will be removed and salvaged. Buildings in the TA-3 Technical Area to be demolished include SM-36 and SM-224. Demolition totals about 5,482 square feet.

Related Construction Project - The Strategic Computing Complex (SCC), an FY 2000 Line Item project, is designed to be constructed directly to the north of the proposed NISC project. The Laboratory's SCC and NISC teams will coordinate design of facility and site features to assure optimum configuration and compatibility of the two facilities as the designs are developed. In addition, construction execution issues will be addressed.

## 4. Details of Cost Estimate<sup>a</sup>

(dollars in thousands)		
	Current Estimate	Previous Estimate
Design Phase		
Preliminary and Final Design costs, (Design, Drawings, and Specifications) .....	4,318	0
Design Management costs (0.52% of TEC) .....	304	0
Project Management costs (1.37% of TEC) .....	805	0
Total Engineering design inspection and administration of construction costs (9.23% of TEC) .....	5,427	0
Construction Phase		
Improvements to Land .....	2,588	0
Buildings .....	30,775	0
Special Equipment .....	2,030	0
Other Structures .....	0	0
Utilities .....	482	0
Standard equipment .....	3,483	0
Major computer items .....	0	0
Removal cost less salvage .....	418	0
Inspection, design and project liaison, testing checkout and acceptance .....	1,947	0
Construction Management (2.70% of TEC) .....	1,585	0
Project Management (2.41% of TEC) .....	1,419	0
Total Construction Costs .....	44,727	0
Contingencies		
Design Phase (1.33% of TEC) .....	781	0
Construction Phase (13.33% of TEC) .....	7,834	0
Total contingencies on NISC (14.66% of TEC) .....	8,615	0
Total, Line Item Costs (TEC) .....	58,769	0

## 5. Methods of Performance

Design and inspection will be performed under a negotiated architect-engineer contract. Construction and procurement will be accomplished by a fixed price contract awarded on the basis of competitive bidding.

## 6. Schedule of Project Funding

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<sup>a</sup>Cost estimate is based on Conceptual Design Report of July 1, 1998. Escalation is applied according to DOE approved escalation rates (FY98-2.4%, FY99-2.5%, FY00-2.6%, -FY01-2.6%, FY02-2.5%, FY03-2.6%, FY04-2.9%).

	Prior Years	FY 1998	FY 1999	FY 2000	Outyears	Total
Project cost						
Facility cost						
Design .....	0	0	0	3,198	2,990	6,188
Construction .....	0	0	0	0	52,581	52,581
Total line item TEC .....	0	0	0	3,198	55,571	58,769
Total Facility Costs (Federal and Non-Federal) .....	0	0	0	3,198	55,571	58,769
Other Project Costs						
R&D necessary to complete construction .	0	0	0	0	0	0
Conceptual design costs .....	619	0	0	0	0	619
Project execution plan .....	91	0	0	0	0	91
Decontamination and decommissioning ..	0	0	0	0	0	0
NEPA documentation costs .....	92	0	0	0	0	92
Other ES&H costs .....	98	0	0	21	71	190
Other project related costs .....	1,319	0	0	59	1,517	2,895
Total Other Project Costs .....	2,219	0	0	80	1,588	3,887
Total Project Cost .....	2,219	0	0	3,278	57,159	62,656
Less: Non-Agency Contribution .....	0	0	0	0	0	0
Total project cost (TPC) .....	2,219	0	0	3,278	57,159	62,656

## 7. Related Annual Funding Requirements<sup>a</sup>

(FY 2003 dollars in thousands )

	Current Estimate	Previous Estimate
Facility maintenance and repair costs .....	4,345	N/A
Programmatic operating expenses directly related to facility .....	61,065	N/A
Total operating costs (operating from FY 2003 through FY 2007) .....	65,410	N/A

<sup>a</sup>Estimated life of project - - 20 years

# **Arms Control & Nonproliferation**

## **Program Mission**

Arms Control and Nonproliferation is the focal point within the Department for activities which support the President's arms control and nonproliferation policies, goals and objectives, as well as statutorily-mandated activities. The major functional areas of the program include: Policy and Analysis; Reduced Enrichment Research and Test Reactor (RERTR); International Safeguards; Export Control Operations; Treaties and Agreements; International Security; and International Materials Protection, Control, and Accounting (MPC&A). The program provides leadership and representation for the Department in the international arms control and nonproliferation community and the U.S. Government's interagency process, as well as for the U.S. Government in national and international arms control and nonproliferation negotiations, agreements and interactions.

## **Program Goal**

Reduce the threat of nuclear proliferation by integrating and orchestrating the Department's assets and efforts, including those of its national laboratories and contractors, by providing major policy and technical support to the U.S. Government's foreign policy and national security objectives in the areas of arms control and nonproliferation, and to the international arms control and nonproliferation community. The Department provides policy and technical leadership for national and global nonproliferation efforts to reduce the continuing and new global nuclear dangers.

## **Program Objectives**

- # Secure Nuclear Materials and Expertise in Russia, the Newly Independent States (NIS), and the Baltics.
- # Limit Weapons-Usable Fissile Materials.
- # Promote Transparent and Irreversible Nuclear Reductions.
- # Strengthen the Nuclear Nonproliferation Regime.
- # Control Nuclear Exports.

## **Performance Measures**

- # For Russia, the NIS and the Baltics, continue International MPC&A upgrades at the 50-plus sites (including transportation systems) that use or store weapons-usable nuclear materials and maintain the original schedule to complete installation of all upgraded materials protection, control and accounting systems on 80-100 most vulnerable buildings by the end of calendar year 2002, including training and operation arrangements of protection systems with the Russian Ministry of Interior (MVD).

- # Replace unilateral nuclear export controls with multilateral controls. Initiate negotiations for the adoption of upgrades to multilateral export controls for nuclear propulsion and nuclear weapons codes.
- # Continue efforts to ensure transparent and irreversible nuclear reductions by supporting analysis and technology development for transparency activities related to START III and other initiatives focused on verified warhead dismantlement.
- # Under Initiatives for Proliferation Prevention (IPP), engage weapons scientists, engineers and technicians in peaceful projects at their institutes.
- # Complete ratification and implementation of U.S. protocol for International Atomic Energy Agency (IAEA) "Strengthened Safeguards System," including supporting U.S. responsibilities for declarations and on-site inspections at DOE facilities.
- # Maintain integrity of long-term storage of the spent fuel canisters at Nyongbyon nuclear site prior to their removal from North Korea.
- # Place additional U.S. excess nuclear weapons material under IAEA inspection under the "Trilateral Initiative;" develop IAEA verification regime for U.S. excess materials and Russian excess material to be placed in the Mayak Fissile Material Storage Facility.
- # Transfer responsibility for all non-Russian nuclear facilities where material protection, control, and accounting upgrades have been completed to International Safeguards for continuing activities to sustain achievements.
- # Complete the ratification and implementation of the Comprehensive Test Ban Treaty (CTBT), including supporting U.S. responsibilities for on-site inspections at DOE facilities.
- # Maintain core competency as technical experts to U.S. Government (USG) agencies in nuclear export control discussions, through workshops and exchanges.
- # Continue technical exchanges with China, consistent with USG policy.
- # Engage the Baltics, Caucasus and Central Asia in nuclear export control initiatives.
- # Continue leadership to reduce and limit the use of highly enriched uranium (HEU) and plutonium in civil energy fuel cycles, and especially those in regions or countries of proliferation concerns.
- # Expand applications of cooperative monitoring as a methodology to reduce regional or bilateral tensions.
- # Under the Nuclear Cities Initiative (NCI) assist in the development of suitable and gainful civilian employment for skilled scientific personnel in the 10 nuclear cities as Minatom begins to down size its nuclear weapons facilities.
- # Complete canning operations for the Spent Fuel Activities in Kazakhstan by securing entire in-pool spent fuel inventory at the BN-350 reactor in Aktau, Kazakhstan. The in-pool inventory of 2000 assemblies will be secured in 400 welded stainless steel canisters and returned to in-pool storage under improved physical security and IAEA safeguards.

## **Significant Accomplishments and Program Shifts**

- # Rapidly expanded DOE's efforts to secure the hundreds of tons of nuclear material in Russia, the NIS and the Baltics in order to implement systematic and rapid MPC&A upgrades. Accelerated effort in the naval and transportation sectors. Also provided leadership to improve export control systems in these states.
- # Implement IAEA verification on U.S. excess material to promote international confidence in irreversible removal of such material from weapons. Facilities under IAEA inspection include those for plutonium storage, HEU storage and HEU downblending. Increasing focus is being placed on developing international verification approaches for fissile material disposition programs.
- # Broaden IPP engagement of institutes formerly engaged in development and production of biological and chemical weapons.
- # After the completion of the canning of the spent nuclear fuel at Yongbyon, activities will shift to minimize the corrosion of the spent fuel and maintain the integrity of the storage canisters prior to removal from North Korea.
- # Continue activities that strengthen the international nonproliferation regime by supporting such global treaties as the Nuclear Non-Proliferation Treaty (NPT) and the CTBT; advancing a negotiating mandate for the Fissile Material Cutoff Treaty (FMCT); promoting full compliance with the IAEA strengthened safeguards protocol; and progressing on START III and regional arms control programs in areas of high tension.
- # Prepare U.S. facilities for transparent nuclear warhead reductions and assist Russian technical experts to develop methods and techniques for commensurate activities.
- # Assist the CTBT Organization in development and refinement of the verification and on-site inspection regime to include conducting trial inspections at DOE facilities and cooperative activities with Russia and other key states.
- # Spent Fuel Activities in Kazakhstan will complete canning operations at the BN-350 reactor in Aktau and activities will shift to completing system development and procurement of the cask transportation system to transport fuel canisters to the storage facility.

## Funding Profile

(dollars in thousands)

	FY 1998 Current Appropriation	FY 1999 Original Appropriation	FY 1999 Adjustments	FY 1999 Current Appropriation	FY 2000 Request
Arms Control & Nonproliferation					
Policy and Analysis . . . . .	19,571	24,071	0	24,071	27,521
Reduced Enrichment Research and Test Reactor (RERTR) . . . .	6,222	6,000	0	6,000	5,822
International Safeguards . . . . .	18,751	21,391	0	21,391	21,851
Export Control Operations . . . . .	14,952	14,215	0	14,215	14,052
International Materials Protection, Control, and Accounting . . . . .	137,008	140,082	0	140,082	145,000
Treaties and Agreements . . . . .	3,528	3,813	0	3,813	3,583
International Security . . . . .	34,568	47,328	0	47,328	78,171
<b>Total, Arms Control &amp; Nonproliferation</b>	<b>234,600</b>	<b>256,900</b>	<b>0</b>	<b>256,900</b>	<b>296,000</b>

**Public Law Authorization:**

Public Law 95-91, "Department of Energy Organization Act"

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Albuquerque Operations Office	851	360	360	0	0.0%
Los Alamos National Laboratory . . . . .	49,540	54,790	58,541	+3,751	+6.8%
Pantex . . . . .	825	1,825	2,875	+1,050	+57.5%
Kansas City Plant . . . . .	929	1,133	971	-162	-14.3%
National Renewable Energy Laboratory .	2,322	1,837	1,677	-160	-8.7%
Sandia National Laboratory . . . . .	47,749	48,316	52,452	+4,136	+8.6%
Total, Albuquerque Operations Office . . . . .	102,216	108,261	116,876	+8,615	+8.0%
Chicago Operations Office					
Argonne National Laboratory . . . . .	12,916	11,767	12,319	+552	+4.7%
Brookhaven National Laboratory . . . . .	15,100	14,181	14,767	+586	+4.1%
New Brunswick Laboratory . . . . .	260	260	260	0	0.0%
Total, Chicago Operations Office . . . . .	28,276	26,208	27,346	+1,138	+4.3%
Oakland Operations Office	1,218	1,218	11,918	+10,700	878.5%
Lawrence Berkeley National Laboratory .	2,074	1,662	1,551	-111	-6.7%
Lawrence Livermore National Laboratory	36,959	39,162	40,325	+1,163	+3.0%
Total, Oakland Operations Office . . . . .	40,251	42,042	53,794	+11,752	+30.0%
Oak Ridge Operations Office					
Oak Ridge National Laboratory . . . . .	28,866	31,204	33,230	+2,026	+6.5%
Richland Operations Office					
Pacific Northwest Laboratory . . . . .	27,466	29,305	31,317	+2,012	+6.9%
Idaho Operations Office					
Idaho National Engineering Laboratory ..	1,153	759	1,134	+375	+49.4%
Savannah River Operations Office . . . . .	4,575	4,839	6,881	+2,042	+42.2%
Nevada Operations Office . . . . .	290	290	220	-70	-24.1%
Washington Headquarters . . . . .	1,507	13,992	25,202	+11,210	+80.1%
Total, Arms Control & Nonproliferation . . . . .	234,600	256,900	296,000	+39,100	+15.2%

## Site Description

### Argonne National Laboratory

In support of Export Control Operations, provides unique technical support in the areas of nuclear and nuclear-related dual-use export license evaluations, particularly those related to the fuel cycle; training and assistance to Ukraine on export controls; and administers the Nonproliferation Graduate Program. In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the Ukraine. In support of RERTR objectives, develops low-enriched uranium (LEU) fuels to convert research and test reactors; conducts safety analysis of reactors; expedites return of U.S.-origin research reactor spent nuclear fuel from overseas; develops processes for producing molybdenum-99; and develops advanced high-density LEU fuels for Russian/Chinese designed reactor. In support of International Safeguards, promotes peaceful use of atomic energy and bilateral nuclear cooperation efforts through “sister lab” arrangements. In support of IPP, creates nuclear/chemical/biological projects in the NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out NCI program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

### Brookhaven National Laboratory

In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union, particularly at the Luch Site, and maintains the database of MPC&A site data and progress. In support of Policy and Analysis efforts, supports the control and elimination of nuclear weapons material by assisting in the implementation of the U.S.-Russian agreement to shutdown production reactors, developing nuclear monitoring technology, and working with foreign nuclear programs to reduce all civilian use of plutonium and HEU; provides analytical and technical support to ongoing negotiations and in preparation for the implementation of agreements and treaties, such as the FMCT negotiations, by providing technical support related to safeguards/verification of fissile material processing, and hosts workshops to move negotiations forward in the Conference on Disarmament; and negotiates the implementation of HEU transparent and irreversible nuclear reductions to confirm that Russian nuclear weapons are being dismantled and the excess fissile materials removed are not reused for military purposes. In support of International Safeguards, improves the cost-effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material by: implementing an IAEA verification experiment on excess HEU downblending operation at Portsmouth Gaseous Diffusion Plant; and supporting DOE involvement in U.S. policy formulation for IAEA safeguards. In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology

for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

### **Idaho National Engineering Laboratory**

In the area of Policy and Analysis, supports START III efforts by maintaining the development of radiation signatures from U.S.-weapon systems based on enhancements to INEL-developed inspection technologies. In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

### **Kansas City Plant**

In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

### **Lawrence Berkeley National Laboratory**

In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

## **Lawrence Livermore National Laboratory**

In support of Export Control Operations, provides unique technical support in the areas of nuclear and nuclear-related dual-use export license evaluation, in particular, end user analyses and specific weaponization technologies; multilateral negotiation within the Nuclear Suppliers Group (NSG); and training and assistance to potential nuclear suppliers on export controls, with special emphasis on Russia and the Southern Tier States. In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union, especially for some Navy projects and large defense sites. In support of Policy and Analysis efforts, supports the control and elimination of nuclear weapons material by assisting in the implementation of the U.S.-Russia agreement to shutdown production reactors, developing nuclear monitoring technology, and working with foreign nuclear programs to reduce all civilian use of plutonium and HEU; provides analytical and technical support to ongoing negotiations and in preparation for the implementation of agreements and treaties, specifically providing conference and technical support to the Biological Weapons Convention (BWC) compliance protocol; supports bilateral negotiations with Russia to implement transparent and irreversible nuclear reductions which would confirm that Russian nuclear weapons are being dismantled and the excess fissile materials that are removed are not reused for military purposes by providing technical and non-technical input on Warhead Dismantlement Regime Protocol for START III and Radiation Measurements technical input for the Laboratory-to-Laboratory and Mayak Transparency programs; provides detailed technical expertise on the nuclear weapons and nuclear power programs in states of proliferation concern and helps to formulate strategies in arms control, cooperative monitoring, and energy security used by the U.S. to prevent nuclear weapons testing and a nuclear arms race; promotes effective implementation of On-Site Inspections (OSI) under the CTBT by providing technical expertise in the areas of monitoring, development of equipment specification, procurement, and the conduct of inspection simulations; supports the interagency and U.S. delegations to the CTBT Preparatory Commission (PrepCom) and its verification Working Group; provides in expertise seismic monitoring, geophysical phenomena associated with nuclear testing, and nuclear weapons testing issues; participates in U.S. scientific cooperative programs with Russian and Chinese counterparts on non-weapons programs including exchanges in such areas as nonproliferation, arms control, and verification technology. In support of International Safeguards, improves the cost effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material by: supporting DOE representation on the U.S./Russia/IAEA Joint Working Group; identifying U.S. excess fissile material vulnerabilities; and operating the Information Tracking and Analysis (ITA) Program (consisting of ITA, Nuclear Materials Management and Safeguards System (NMMSS), and ITA-International) which tracks and analyzes U.S. and foreign nuclear activity to satisfy statutory requirements and international obligations and to support U.S. nonproliferation policy. In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent "brain drain," facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

## **Los Alamos National Laboratory**

In support of Export Control Operations, provides unique technical support in the areas of nuclear and nuclear-related dual-use export license evaluations, in particular the weaponization technologies; multilateral negotiation within the NSG; training and assistance to Kazakhstan and other NIS on export control laws; and provides for development and implementation of the Proliferation Information Network System (PINS) and the NSG Information Sharing System. In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union. In support of RERTR objectives, provides technical support in the development of LEU targets, as an alternative to HEU targets, for use in the production of medical isotopes. In support of Policy and Analysis efforts, supports the control and elimination of nuclear weapons material by assisting in the implementation of U.S.-Russian agreements to shutdown production reactors by providing staff for U.S. monitoring teams and technical support on monitoring plutonium; supports the DOE position for FMCT negotiations, by providing technical support related to Hanford site facilities and safeguards/verification of plutonium reprocessing; promotes effective implementation of OSI under the CTBT by providing technical expertise in visual (ground and air) inspections and geographic data integration; provides expertise in monitoring and nuclear weapons testing issues in support of the interagency and U.S. delegations to the CTBT PrepCom and its verification Working Group; participates in U.S. scientific cooperative programs with Russian and Chinese counterparts on non-weapons programs, including exchanges on such subjects as nonproliferation, arms control, and verification technology; as a design laboratory, supports the Warhead Dismantlement and Transparency program, specifically focusing on Mayak Transparency efforts in the development of radiation signatures. In support of International Safeguards, improves the cost-effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material by: serving as the leading contributor for strengthening of nuclear safeguards in Asia and the Pacific Rim countries; participating in “sister lab” arrangements; assisting DOE in providing support to the IAEA for development and implementation of environmental sampling, unattended nondestructive assay systems, and remote monitoring systems; and developing technologies for safeguarding of nuclear materials declared excess to the U.S. and Russian weapons programs. In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

## **National Renewable Energy Laboratory**

In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons

scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

## **New Brunswick Laboratory**

In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union.

## **Nevada Operations Office**

In support of Policy and Analysis efforts, supports the interagency and U.S. delegations to the CTBT PrepCom and its verification Working Group for the implementation of the CTBT verification system and U.S. ratification of the Treaty; provides expertise and analysis during OSI and in the development of equipment specifications; and manages the conduct of inspections at the test site.

## **Oak Ridge National Laboratory**

In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union, particularly with a lead on some Navy projects. In support of International Safeguards, improves the cost-effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material by: encouraging safeguards technology development through cooperation agreements with Latin American countries; participating in "sister lab" arrangements; improving techniques for analyzing environmental samples; providing technical support for the Subcommittee on Technical Program and Cooperation; and implementing IAEA safeguards at Oak Ridge. In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent "brain drain," facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of Policy and Analysis efforts, the Oak Ridge Y-12 facility, provides analytical and technical support to ongoing FMCT negotiations and preparation for the implementation of such agreements and treaties; provides technical support related to safeguards/verification measures and/or uranium enrichment processes and facilities; supports work with Russia to negotiate and implement transparent and irreversible nuclear reductions, to confirm that Russian nuclear weapons are being dismantled and the excess fissile materials that are removed are not reused by demonstrating various transparency techniques, to analyze START III monitoring options at OR Y-12, and to manage all Laboratory-to-Laboratory program contracts focusing on analytical impacts on monitoring plants; provides detailed technical expertise on the nuclear weapons and nuclear power programs in states of proliferation concern and helps to formulate strategies in arms control, cooperative monitoring, and energy security used by the U.S. to prevent nuclear weapons testing and a nuclear arms race. In support of Export Control Operations, the Oak Ridge Y-12 facility provides unique technical support in the areas of nuclear and nuclear-related dual-use export license evaluations, particularly fuel cycle technologies; multilateral negotiations within the NPT Exporters Committee; training and assistance

to Russia on export controls and illicit trafficking; and to the interagency Nuclear Export Violations Working Group. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

## **Oakland Operations Office**

In support of the Democratic Peoples Republic of Korea (DPRK) Spent Fuel Activities, works to minimize corrosion of spent fuel and maintain integrity of storage canisters, prior to the spent fuel's ultimate disposition, in accordance with the October 1994 "Agreed Framework" signed by the U.S. and DPRK governments. In support of Policy and Analysis efforts, supports the control and elimination of nuclear weapons material by assisting in the implementation of the U.S.-Russian agreement to shutdown production reactors, developing nuclear monitoring technology, working with foreign nuclear programs to reduce all civilian use of plutonium and HEU, and periodically reporting on nuclear materials in the U.S. that are subject to agreements; provides detailed technical expertise on the nuclear weapons and nuclear power programs in states of proliferation concern and helps to formulate strategies in arms control, cooperative monitoring, and energy security used by the U.S. to prevent nuclear weapons testing and a nuclear arms race. In support of International Safeguards, manages the ITA Program which tracks and analyzes U.S. and foreign nuclear activity to satisfy statutory requirements and international obligations and to support U.S. nonproliferation policy.

## **Pacific Northwest National Laboratory**

In support of Export Control Operations, provides unique technical support in the areas of nuclear and nuclear-related dual-use export license evaluations, in particular those requiring DOE Part 810 authorization; training and assistance to potential nuclear suppliers on export controls and illicit trafficking, in particular Ukraine and Russia; and technology security. In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union, with emphasis on material control and accounting at various civilian sites and coordination with Russian Ministry of Interior (MVD) and Ministry of Atomic Energy (MINATOM). In support of the DPRK Spent Fuel Activities, provides fuel canning technical support, working in accordance with the "Agreed Framework" signed by the U.S. and DPRK governments. In support of Policy and Analysis efforts, supports the control and elimination of nuclear weapons by assisting in the implementation of the U.S.-Russian agreement to shutdown Russian plutonium production reactors and storage sites, and by providing staff support during monitoring visits to shutdown U.S. production reactors at the Hanford site; provides analytical and technical support to ongoing negotiations and in preparation for the implementation of such agreements and treaties as the BWC Compliance Protocol and related technical papers, and for support to FMCT negotiations related to Hanford site facilities, safeguards/verification of plutonium reprocessing, and utilization of Hanford facilities to demonstrate such approaches for fissile material reprocessing; supports U.S.-Russian bilateral negotiations for implementation of transparent and irreversible nuclear reductions in order to confirm that Russian nuclear weapons are being dismantled, and to ensure that excess fissile materials removed are not reused by providing a weapons design expert and Executive Secretary to the Mayak Transparency

negotiations; provides detailed technical expertise on the nuclear weapons and nuclear power programs in states of proliferation concern and helps to formulate strategies in arms control, cooperative monitoring, and energy security used by the U.S. to prevent nuclear weapons testing and a nuclear arms race; promotes effective implementation of the CTBT verification system by providing technical expertise in the area of radionuclide monitoring. In support of International Safeguards, improves the cost-effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material by: conducting technical consultations on information analysis software and hardware tools and expertise in environmental sampling and analysis; promoting the effective safeguarding of nuclear materials through bilateral safeguards agreements with Argentina, Brazil, European Atomic Energy Community (EURATOM), South Korea, and Japan, emphasizing information management and environmental sampling; and supporting the further implementation of IAEA safeguards at DOE facilities in the U.S. through the development of approaches, technical consultation to sites, trilateral discussions with the Russian Federation, and policy analysis. In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent “brain drain,” facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

## **Pantex**

In support of International MPC&A, installs equipment and inventories nuclear materials, particularly at former nuclear weapons facilities. In support of Policy and Analysis efforts, supports Russian negotiation and implementation of transparent and irreversible nuclear reductions to confirm that Russian nuclear weapons are being dismantled and the excess fissile materials that are removed are not reused for military purposes by specifically supporting Mayak Transparency Program efforts.

## **Sandia National Laboratory**

In support of Export Control Operations, provides unique technical support in the areas of nuclear and nuclear-related dual-use export license evaluations, in particular, certain weaponization technologies; and training and assistance to potential nuclear suppliers on export controls, both domestically and abroad. In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union, with an emphasis on physical protection at various defense and civilian sites. In support of the DPRK Spent Fuel Activities, provides inspection tools and support to minimize corrosion of spent fuel and maintain integrity of storage canisters, prior to the spent fuel’s ultimate disposition, in accordance with the “Agreed Framework” signed by the U.S. and DPRK governments. In support of Policy and Analysis efforts, provides analytical and technical support to ongoing FMCT negotiations by providing technical physical protection support related to nuclear material safeguards/verification; supports U.S.-Russian negotiations to implement transparent and irreversible nuclear reductions, in order to confirm that Russian nuclear weapons are being dismantled and excess fissile materials removed are not reused for military purposes, specifically focusing on the

Laboratory-to-Laboratory Dismantlement Transparency Program efforts; provides detailed technical expertise on the nuclear weapons and nuclear power programs in states of proliferation concern and helps to formulate strategies in arms control, cooperative monitoring, and energy security used by the U.S. to prevent nuclear weapons testing and nuclear arms race; provides technical expertise in the areas of inspections, data surety and authentication, and training programs; supports the interagency and U.S. delegations to the CTBT PrepCom and its verification Working Group; provides OSI expertise in key areas of the development of the CTBT International Data Center, protection of data transmitted, and verifiable assessments; participates in U.S. scientific cooperative programs with Russian and Chinese counterparts on non-weapons programs, including such subjects as nonproliferation, arms control, and verification technology. In support of International Safeguards, improves the cost-effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material by: providing technical support for IAEA and United Nations Special Commission (UNSCOM) inspections in Iraq; assisting DOE when it leads U.S. interagency physical protection visits; participating in International Physical Protection Advisory Service (IPPAS) mission of implementing physical protection improvement; and providing assistance to the IAEA in implementing remote monitoring systems to streamline nuclear safeguards. In support of IPP, creates nuclear/chemical/biological projects with NIS institutes to prevent "brain drain," facilitate broad access to former weapons facilities and openness between DOE laboratory scientists and their NIS colleagues, provide long-term commercial employment at NIS institutes, involve other USG agencies with similar interests, and enhance technology for environmental safety of nuclear materials. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

## **Savannah River Operations Office**

In support of Export Control Operations, provides unique technical support in the areas of nuclear and nuclear-related dual-use export license evaluations within its area of expertise (e.g., tritium production); and technology security and nonproliferation domestic training. In support of International MPC&A, installs equipment, inventories nuclear materials, and establishes a self-sustaining security infrastructure in the former Soviet Union, including the training of inspectors. In support of the DPRK Spent Fuel Activities, provides fuel canning site contractor to minimize corrosion of spent fuel and maintain integrity of storage canisters, prior to the spent fuel's ultimate disposition, in accordance with the "Agreed Framework" signed by the U.S. and DPRK governments. In support of Policy and Analysis efforts, supports the control and elimination of nuclear weapons by assisting in the implementation of the U.S.-Russia Plutonium Production Reactor Agreement (PPRA) by providing staff for U.S. monitoring teams to shutdown Russian plutonium production reactors and subject storage sites, supporting monitoring visits to shutdown U.S. production reactors at the Savannah River Site, developing nuclear monitoring technology, and working with foreign nuclear programs to reduce all civilian use of plutonium and HEU. In support of International Safeguards, improves the cost-effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material by: developing verification techniques for excess fissile material storage and disposition options at the Savannah River Site; and supporting UNSCOM and IAEA Action Team by providing technical experts, analyses, equipment and training. In support of NCI, creates permanent commercial jobs to employ displaced nuclear weapons scientists and to carry out program objective of creating economic opportunities in the closed nuclear cities of the Russian Federation.

# Policy and Analysis

## Mission Supporting Goals and Objectives

Policy and Analysis provides technical expertise and analytical support for arms control and nonproliferation treaty and agreement policy formulation, negotiation, and implementation at DOE facilities and in regional security. Assistance is provided to the State Department for increased contact with potential proliferant states to explore motives driving proliferation aspirations, and to engage DOE technical resources for training, confidence-building measures, implementation and verification of treaties, cooperative monitoring, and application of technology to facilitate proliferation prevention and reversal of nuclear weapons buildup. Resources are applied for global and regional arms control and nonproliferation treaties (NPT, CTBT, FMCT) and cooperative analysis of nuclear fuel cycles that can destabilize international relations and threaten regional security. Analysis is performed on measures and verification options for a multilateral fissile material production cutoff convention and bilateral cutoff with Russia; implementing a reciprocal monitoring regime for U.S./Russian nuclear weapon dismantlement and fissile material disposition; developing and refining procedures for confirming stockpiles of materials removed from weapons, and alternative cost-effective dismantlement transparency, verification, and chain of custody measures. In addition, analysis is performed on verification of nuclear-weapon-free zones, securing HEU in the former Soviet Union (FSU), and regional confidence-building. Assistance is also provided for implementation of the U.S./Russian agreement for exchange of technical information on nuclear warhead safety and support of projects for continued employment of FSU scientists in non-weapon activities.

## Performance Measures

- # Limit weapons-usable fissile materials through worldwide stockpile reductions of plutonium and HEU, the shutdown of production reactors, focus on proliferation implications of and solutions for key nuclear fuel cycle decisions, and development and implementation obligations under Agreements for Cooperation with other states.
- # Provide analytical and technical support to ongoing negotiations and in preparation for implementation of agreements and treaties on such issues as transparency, inspection of sensitive DOE facilities, and verification.
- # Work with Russia to negotiate and implement transparent and irreversible nuclear reductions, to confirm that Russian nuclear weapons are being dismantled and to ensure that excess fissile materials removed from dismantled Russian nuclear weapons are not reused in new nuclear weapons. Core elements of this program include the Laboratory-to-Laboratory Warhead Dismantlement Transparency Program, HEU Purchase Agreement Transparency, Mayak Fissile Material Storage Facility Transparency, and START III.
- # Continue to support technical programs on regional nonproliferation and security exchanges, involving such concerns as cooperative monitoring, verification, arms control and nonproliferation

training, and trans-border environmental impacts that erode regional stability in the Middle East, South Asia and Northeast Asia.

- # Support CTBT implementation, including support for ratification, U.S. responsibilities in the PrepCom, and development of procedures for OSI both internationally and at DOE facilities.
- # Continue U.S. scientific cooperative programs with Russian and Chinese scientific counterparts on non-weapons programs, including exchanges on such subjects as nonproliferation, arms control, and verification technology. Expand program to include other areas of concern consistent with USG policy.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Policy and Analysis .....	19,571	24,071	27,521	+3,450	+14.3%
<b>Total, Policy and Analysis .....</b>	<b>19,571</b>	<b>24,071</b>	<b>27,521</b>	<b>+3,450</b>	<b>+14.3%</b>

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### Program Objective—Limit Weapons-Usable Fissile Materials

Under the direction of the U.S.-Russian PPRA, conduct seven monitoring visits to shutdown Russian and U.S. reactors, operating Russian reactors, and Russian Plutonium oxide storage facilities, and participate in two meetings of the Joint Implementation and Compliance Commission. Implement agreements for cooperation and peaceful uses of nuclear energy to include, exchanges of nuclear material accounting records, and international consultations. ....

1,520      1,520      1,520

Conduct eight weeks of negotiations, consultations anticipated to last several weeks, and maintain technical experts to support deliberations, studies, and domestic and international exercises and/or conduct multilateral verification workshops. ....

750      750      750

### Program Objective—Promote Transparent and Irreversible Nuclear Reductions

Promote transparent and irreversible nuclear reductions by working with the Russian Federation to negotiate treaty and other legally binding agreements which allows confirmation that Russian nuclear weapons are being dismantled and that excess fissile materials removed from dismantled Russian nuclear weapons are not reused in the production of new nuclear weapons. The core elements of this program include the negotiation of a START III Treaty, currently planned to begin immediately following ratification of START II by the Russian Duma, which will actually mandate the elimination of quantities of nuclear weapons in addition to further reductions in nuclear delivery systems. Through the Laboratory-to-Laboratory Warhead Dismantlement Transparency Program maintain a technical dialog with Russian scientific and technical organizations. ....

6,110      11,110      16,010

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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**Program Objective—Strengthen the Nuclear Nonproliferation Regime**

Support technical and policy analysis efforts in nuclear weapons arms control, confidence building, and other regional security actions, and support activities such as the Cooperative Monitoring Center and other programs that promote regional stability, security, and nonproliferation efforts in South Asia, Northeast Asia, and Middle East regions consistent with USG policy. . . . .	6,550	6,200	5,500
Support CTBT ratification (testimony, Q&A's, briefings), provide technical experts to domestic and international meetings of the CTBT PrepCom and Working Group B, draft and refine procedures for OSI, conduct trial inspections and table top exercises, and continue cooperative CTBT related projects with Russia, China, France, and Israel. . . . .	2,196	2,196	1,846
Support scientific cooperative programs and exchanges with Russian and Chinese scientific counterparts on nonproliferation, arms control and verification technology, and continue to expand the program to include other countries and areas of concern. . . . .	2,445	2,295	1,895
Total, Policy and Analysis . . . . .	<u>19,571</u>	<u>24,071</u>	<u>27,521</u>

## Explanation of Funding Changes from FY 1999 to FY 2000

FY 2000 vs. FY 1999 (\$000)
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Additional funds increase and expand U.S. access at Russian facilities under additional HEU Purchase Agreement transparency measures; provide for the evaluation and testing of START III radiation measurement technologies to ensure no release of classified information; and provide for lab-to-lab contracts with the Russians that require demonstration of their transparency technologies to the U.S. . . . .	+4,900
Reduce policy and technical support for arms control and nonproliferation cooperative monitoring and security exchange programs promoting regional stability in the Middle East, South and Northeast Asia; and limit cooperative monitoring and arms control training and information exchange workshops and conferences. . . . .	-700
Reduce CTBT support to the interagency preparatory committee and development of the on-site inspection teams. . . . .	\$-350
Reduce support to U.S. scientific cooperative non-weapons programs. . . . .	-400
Total Funding Change, Policy and Analysis . . . . .	<hr style="border: 1px solid black;"/> +3,450

# Reduced Enrichment Research and Test Reactor (RERTR)

## Mission Supporting Goals and Objectives

RERTR supports development of LEU fuels to further LEU conversion of research and test reactors; expedited return of U.S. origin research reactor spent fuel from overseas; and development of targets and chemical processes for producing molybdenum-99 using LEU.

## Performance Measures

- # Continue cooperative activities with Russian laboratories on implementation of Russian agreements and the development of LEU fuels for Russia.
- # Support the return of U.S.-origin spent nuclear research reactor fuel from abroad under the Environmental Impact Statement and the conduct of IAEA laboratory cooperation to facilitate receipt of U.S.-origin spent nuclear fuel.
- # Conduct exchange visits with Chinese laboratories and cooperative exchanges with China on RERTR, as well as development of a joint plan for reactor conversion with China.
- # Initiate development of high density LEU fuels for research reactors, and continue development of LEU targets for molybdenum-99 production, beginning with U.S.- Korean, and U.S.-Argentine cooperation on production using LEU.
- # Continue conversion efforts of U.S. reactors and pursue cooperation on reactor conversion with Eastern Europe and South Africa.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
RERTR .....	6,222	6,000	5,822	-178	-3.0%
<b>Total, RERTR .....</b>	<b>6,222</b>	<b>6,000</b>	<b>5,822</b>	<b>-178</b>	<b>-3.0%</b>

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Program Objective—Limit Weapons-Usable Fissile Materials</b>			
Maintain the program’s computational database, develop analytical capabilities, study foreign research and test reactors conversion of U.S. origin HEU, and study U.S. reactor conversion. ....	850	700	850
Develop fabrication techniques for research and test reactor fuels of very-high-density, low-enrichment uranium for use in research reactors unable to use current technology LEU fuels. Program is progressing from sample-size to full-size fabrication and testing to qualify new LEU fuels, and demonstrate the same performance with the new LEU fuels as achieved with current HEU fuels. ....	2,472	3,022	3,500
Provide alternative targets and chemical processes to allow use of LEU to produce molybdenum-99, fission-product for use in medical applications including develop target fabrication technology, chemical process technology for recovery and purification, and/or adapt technology for disposing of radioactive waste, and obtain FDA approval to market the drug using LEU instead of HEU. ....	800	800	800
Provide the Executive Branch with a technical/economic evaluation of each significant request for export of HEU, and support implementation of the U.S. Government’s Foreign Research Reactor Spent Fuel Return policy. ....	150	150	150
Enable Russia to complete the Soviet Union RERTR program, established in 1978, by supporting Russian institutes participating in the program, providing reactor analyses and fuel expertise from U.S. experts, and jointly assessing the feasibility of converting Soviet-designed reactors, (e.g., in the Czech Republic, Hungary, Poland, Kazakhstan, Uzbekistan, Ukraine, etc.). ....	1,750	1,028	322

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
Encourage establishment of a Chinese RERTR program by supporting the design and operation of research and test reactors that would use LEU fuel, supporting the development and fabrication of LEU fuels for Chinese-designed reactors, and converting from HEU to LEU fuels. . . . .	200	300	200
Total, RERTR . . . . .	<u>6,222</u>	<u>6,000</u>	<u>5,822</u>

**Explanation of Funding Changes from FY 1999 to FY 2000**

	FY 2000 vs. FY 1999 (\$000)
Program scope regarding the conversion of Soviet-designed reactors is reduced. . . . .	<u>-178</u>
Total Funding Change, RERTR . . . . .	<u>-178</u>

# International Safeguards

## Mission Supporting Goals and Objectives

International Safeguards provides policy and technical leadership and funds efforts to strengthen the nuclear nonproliferation regime, particularly with respect to global nuclear material security. These efforts improve the cost-effectiveness of the IAEA in detecting clandestine nuclear activities and safeguarding declared nuclear material. New approaches, such as environmental monitoring, remote monitoring, and information management tools are addressed. Policy and technical support is provided to DOE program offices and sites for the implementation of IAEA inspection of U.S. excess material at DOE sites under bilateral and trilateral (with Russia) arrangements. Verification measures are developed, in coordination with the international Policy and Analysis activity and the DOE Office of Research and Development, for implementing the FMCT. IAEA technical assistance programs that promote peaceful use of atomic energy and bilateral nuclear cooperation efforts through "sister lab" arrangements are supported. Agreements for safeguards cooperation are negotiated and implemented for improved material protection, control, accountancy, and transparency with other countries, regions, and international organizations, including Argentina, Australia, Brazil, Brazilian-Argentine Agency for Nuclear Material Control and Accounting (ABACC), China, EURATOM, France, IAEA, Japan, South Africa, and South Korea. Manage the physical protection program to ensure that all countries that possess U.S.-origin nuclear materials are adequately protecting them against, theft, sabotage, and nuclear smuggling. Manage and operate the ITA Program (consisting of ITA, NMMSS, and ITA-International) which tracks and analyzes U.S. and foreign nuclear activity to satisfy statutory requirements and international obligations and to support U.S. nonproliferation policy. Transfer non-Russian facilities, where security upgrades have been completed under the International MPC&A program, to International Safeguards.

## Performance Measures

- # Provide technical experts, training and/or equipment to IAEA and UNSCOM for inspections in Iraq and/or North Korea.
- # Provide technical advice, support, and technologies (e.g., environmental monitoring, remote monitoring, and information management tools) to IAEA for development of new strengthened safeguards policies and methods.
- # Per the Nuclear Non-Proliferation Act (NNPA) of 1978, Section 202, provide training on safeguards and physical protection to nationals of nuclear developing countries, and lead USG teams on visits to countries with U.S.-origin nuclear material to ensure adequate physical protection.
- # Analyze and implement policy on U.S., IAEA and Russian trilateral verification program to develop and apply IAEA measures on U.S. and Russian excess nuclear weapons material.

- # Per Presidential Decision Directive (PDD) 41, continue IAEA inspections on current U.S. nuclear material under IAEA safeguards, and make additional excess fissile material available for IAEA inspections.
- # Promote peaceful use of atomic energy through support to IAEA technical cooperation activities, sister laboratory arrangements, and promotion of NPT.
- # Continue cooperation with South American, African, Asian, and European partners to strengthen safeguards on nuclear material.
- # Provide physical protection technical assistance to countries with which DOE has bilateral agreements and to the IPPAS in order to prevent nuclear smuggling.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
International Safeguards . . . . .	18,751	21,391	21,851	+460	+2.2%
<b>Total, International Safeguards . . . . .</b>	<b>18,751</b>	<b>21,391</b>	<b>21,851</b>	<b>+460</b>	<b>+2.2%</b>

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### Program Objective—Strengthen the Nuclear Nonproliferation Regime

Provide technical assistance to IAEA and UNSCOM for inspections in Iraq and North Korea through September 2000. . . . .	1,100	1,100	1,100
Provide remote monitoring systems in ten countries; conduct two strengthened safeguards workshops; support analysis of up to 250 Network of Analytical Laboratories samples; conduct tutorials and red team exercise; prepare Protocol declarations for 15 DOE sites; establish information management system for U.S. Strengthened Safeguards Protocol declarations; conduct security reviews at all 15 DOE sites. . . . .	3,700	4,740	4,900
Provide safeguards training to 30-plus participants from 20-plus countries; conduct two physical protection courses. . . . .	500	500	500
Implement U.S./Russian/IAEA Trilateral Initiative by representing DOE, on a quarterly basis, to the Joint Working Group; identifying excess fissile material attributes verifiable by IAEA; selecting, testing, and evaluating verification measurement technologies; developing information barrier technology to prevent disclosure of sensitive data to IAEA inspectors; developing, testing, and evaluating IAEA methods to monitor excess fissile material; and identifying U.S. excess fissile material vulnerabilities. . . . .	400	2,500	2,600
Implement the President’s Excess Fissile Material Policy by maintaining the implementation plan, developing and negotiating techniques for excess fissile material storage and disposition options, and making additional excess fissile material available for IAEA inspection; implement U.S./IAEA Safeguards Agreement; establish safeguards approaches for three DOE sites, implement IAEA safeguards (36 inspections) at three DOE sites, implement IAEA inspection activities on HEU downblending operations at two facilities, and conduct three outreach tutorials and activities. .	2,700	2,500	2,600

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
Chair monthly IAEA meetings; develop four technical training courses; develop five action sheets for sister laboratory agreements; establish one additional technology exchange arrangement. . . . .	550	550	550
Conduct Nondestructive Assay (NDA) course in China; conduct four safeguards meetings in China; conduct workshops for South American safeguards inspectors; complete five Japan safeguards tasks; complete NDA projects with Republic of Korea; complete construction of Japanese clean chemistry laboratory; evaluate two fuel transfer campaigns at Embalse; complete one site visit to each of five NIS countries. . . . .	3,401	3,101	3,201
Lead USG teams on visits to countries with USG-origin nuclear material and host visits by physical protection officials from four new countries. . . . .	400	400	400
Expand IPPAS missions to include one Latin American and one NIS country; provide four additional countries with physical protection assistance. . . . .	1,000	1,000	1,000
Operate ITA Program including NMMSS; develop new nuclear waste material accounting software; maintain minimal level of activity at NIS facilities. . . . .	5,000	5,000	5,000
<b>Total, International Safeguards . . . . .</b>	<b>18,751</b>	<b>21,391</b>	<b>21,851</b>

**Explanation of Funding Changes from FY 1999 to FY 2000**

FY 2000 vs. FY 1999 (\$000)
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Additional funds for developing verification techniques needed at Savannah River; preparing for stabilization of Pu under safeguards at Hanford and Rocky Flats Environmental Technology Site (RFETS); implementing of strengthened safeguards support work with Korea; and implementing remote monitoring systems. . . . .	+460
<b>Total Funding Change, International Safeguards . . . . .</b>	<b>+460</b>

# Export Control Operations

## Mission Supporting Goals and Objectives

Export Control Operations advance U.S. nonproliferation export control objectives by developing and implementing policies, regulations, and procedures to halt the spread of weapons of mass destruction and their related technologies; promote and extend multilateral-bilateral nuclear supply arrangements in support of U.S. nonproliferation policy; control the export of nuclear and nuclear-related equipment, materials, and technologies as mandated by law and in accordance with national security objectives; and provide leadership, unique technical expertise, and training for the U.S. and international nonproliferation communities.

## Performance Measures

- # Continue government-to-government export control initiatives and on-going lab-to-lab cooperative agreements to develop the necessary infrastructure to ensure control over nuclear and nuclear-related dual-use equipment, material, and technology in Russia and the NIS.
- # Participate in DOE, USG, and multilateral initiatives to combat nuclear smuggling and the illicit transfer of technologies for the production and utilization of special nuclear material as well as dual-use technologies in Russia and the NIS.
- # Review and provide recommendations to the Nuclear Regulatory Commission and the Department of Commerce on nuclear and nuclear-related dual-use export licenses, representing DOE on all interagency fora (e.g., the Advisory Committee on Export Policy and the Interagency Working Group on Nonproliferation and Export Controls) in support of mandated licensing policy responsibilities.
- # Administer, for the Department, the controls on the transfer of technology and assistance under 10 CFR Part 810.
- # Ensure the viability of PINS to support the DOE export license processing system. Continue development of analytical tools which support implementation of DOE's export licensing review responsibilities under the NNPA.
- # Ensure that DOE surplus equipment and technology is disposed of in a responsible manner and that technology transfers are consistent with regard to U.S. nonproliferation policy.
- # Establish a program to support U.S. Customs domestically with technical evaluations of nuclear and nuclear-related shipments; and U.S. Customs and the NSG through an NSG/Customs hotline to help aid in the interdiction of illicit transfers.
- # Conduct technology security reviews for DOE-funded foreign travel, visits and assignments to DOE facilities, technical exchanges, and export of DOE-controlled technology.
- # Serve as the principal U.S. agency in negotiating controls over nuclear and nuclear-related dual-use materials, equipment, and technologies, especially within the NSG and the NPT Exporter's

Committee (Zangger Committee). Includes ongoing activities to harmonize unilateral and multilateral controls as mandated by PDD-13.

- # Upgrade, implement and support a computerized information sharing system in the NSG for the timely sharing of export denials among the 35 subscribing governments of the dual-use regime.
- # Serve as principal technical agency responsible for continued dialogue with China to develop an effective export control system.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Export Control Operations . . . . .	14,952	14,215	14,052	-163	-1.1%
<b>Total, Export Control Operations . . . . .</b>	<b>14,952</b>	<b>14,215</b>	<b>14,052</b>	<b>-163</b>	<b>-1.1%</b>

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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**Program Objective—Secure Nuclear Materials and Expertise in Russia, the Newly Independent States (NIS), and the Baltics**

Conduct two to three export control workshops for government and technical officials in Russia, Ukraine, and Kazakhstan. . . . .	400	300	300
Initiate three technical studies on nuclear proliferation to strengthen export control practices in Russia, Ukraine, and Kazakhstan. . . . .	300	200	200
Ensure that three jointly-developed nuclear export control databases are operating and assisting authorities in export control license reviews in Russia and Ukraine; and develop a system for Kazakhstan. . . . .	400	300	300
Implement plans to educate nuclear producers and exporters on national and international norms of export control in Russia, Ukraine, and Kazakhstan. . . . .	400	300	300
Work with multilateral players via two seminars to engage export control officials in the Baltics and Southern Tier to familiarize them with export control procedures. . . . .	415	415	415
Implement a training program for 100-200 Russian border and custom officials. . . . .	400	400	400
Develop indigenous training courses that Russian technical experts and MINATOM officials can use in training 1,000-2,000 border and custom officials. . . . .	200	200	200
Identify and install appropriate customs/border equipment needed to help prevent illicit transfers from leaving Russia. . . . .	400	400	400

**Program Objective—Strengthen the Nuclear Nonproliferation Regime**

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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Participate in negotiations to control conversion technology associated with plutonium, uranium, and thorium (add six new controls to multilateral list). Also, investigate, via two technical studies, the likelihood to adding nuclear propulsion technologies to the control list. Technologies such as weapons simulation codes, which may be significant under stockpile stewardship programs, also will be considered for control on a multilateral level, resulting in up to 10 new controls for the multilateral list . . . . .	1,885	1,848	1,885
In FY 1998, conducted two seminars in support of regional export control/NPT transparency seminars within the Western Hemisphere. . . . .	100	0	0
Support activities associated with the USG implementation of the Enhanced Safeguards Protocol (93+2). . . . .	200	200	0
Continue development and dissemination of technical training tools (three new commodities guides) to support the multilateral regimes, as well as UNSCOM/IAEA Action Team's activities associated with the monitoring and control of exports and imports of nuclear and nuclear-related materials, equipment, and technologies. . . . .	100	0	0
Upgrade the NSG Information Sharing System to meet current industry standards and expand its capabilities to allow subscribing governments (35 terminals) to share information documents with others. . . . .	575	575	575
<b>Program Objective—Control Nuclear Exports</b>			
Review and provide more than 2,500 recommendations to the Department of Commerce on the dual-use commodities related to the non-nuclear weapons of mass destruction (WMD), which include chemical and biological warfare (CBW) and missile items, representing DOE on all the interagency fora, including the SHIELD for CBW and the Missile Technology Advisory Committee (MTAC). . . . .	6,282	6,282	6,282
Ensure that the downsizing and dismantlement efforts throughout the DOE complex and disposal of excess materials, equipment, and technology at multiple DOE sites proceed responsibly, in strict adherence to U.S. nonproliferation policy and without inadvertent support to proliferants. . . . .	1,105	1,105	1,105
Serve as the principal USG technical agency in continuing dialogue with China to develop an effective export control system within, including nonproliferation cooperation under the DOE/China agreement now being negotiated and three joint workshops of DOE laboratories and Chinese institutes. . . . .	100	0	0

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
Administer the Department's export control licenses (up to 50) on nuclear technology and services required by Section 57b of the Atomic Energy Act and implemented under DOE regulations 10CFR Part 810. . . . .	685	685	685
Implement an outreach program with five DOE weapons laboratories and contractors, providing guidance regarding export-controlled technology and U.S. export control regulations to DOE and the national laboratories. . . . .	1,005	1,005	1,005
<b>Total, Export Control Operations. . . . .</b>	<b>14,952</b>	<b>14,215</b>	<b>14,052</b>

**Explanation of Funding Changes from FY 1999 to FY 2000**

	FY 2000 vs. FY 1999 (\$000)
Terminate support activities associated with the USG implementation of the Enhanced Safeguards Protocol (93+2). . . . .	-163
<b>Total Funding Change, Export Control . . . . .</b>	<b>-163</b>

# **International Materials Protection, Control, and Accounting**

## **Mission Supporting Goals and Objectives**

International MPC&A activities are designed to support cooperation under agreements established with Russia, the NIS, and the Baltics for the protection of “direct use” nuclear materials. The focus is on key facilities and institutions that possess or process significant quantities of nuclear weapons-usable materials that are of nonproliferation concern. Expertise in the planning and implementation of systems and procedures to enhance protection of such materials is provided. These activities support the integration of nuclear materials security equipment and procedures into systems that are effective and are maintainable and sustainable by the cooperating countries. Efforts also promote the diffusion of nuclear materials security technologies, concepts, and expertise to different types of operating facilities where systems will be implemented. International MPC&A activities enhance U.S. national security and reduce the threat of nuclear proliferation and nuclear terrorism by improving the security of all weapons-usable nuclear materials (not in weapons) in the FSU. The International MPC&A priority is to rapidly secure all material where it currently is kept. Goals include installing MPC&A equipment, beginning nuclear material inventorying, beginning to change the Soviet security culture and beginning to establish a self-sustaining security infrastructure. Funding provides for MPC&A upgrades for defense related sites in Russia including uranium and plutonium cities, the nuclear weapons complex, maritime fuel locations, and transportation vehicles. MPC&A upgrades for civilian and regulatory related sites in Russia including large fuel facilities, reactor-type facilities, regulatory systems and organizations, and training programs and centers are also funded. MPC&A upgrades in Kazakhstan, Ukraine, Belarus, Uzbekistan, Latvia, Georgia, and Lithuania were completed in FY 1998.

## **Performance Measures**

- # Continue International MPC&A upgrades at the 50-plus sites that use or store weapons-usable nuclear materials and maintain the original schedule to complete installation of upgraded materials protection, control and accounting systems on 80-100 most vulnerable buildings by the end of calendar year 2002.
- # Complete installation of MPC&A upgrades at Russian Navy Sites including one Northern Fleet Site, one Pacific Site, three floating platforms, and two Navy regulations and training programs.
- # Continue to sustain the MPC&A upgrades at the 12 completed reactor-type facilities to ensure successful operation.
- # Complete railcar and truck transportation projects to secure material transport for at least 10 major nuclear weapons, naval, and large fuel facilities.
- # Continue cooperation with the Russian Ministry of Interior (MVD) to ensure successful operation of completed physical protection systems, including approval and implementation of a joint DOE-MVD work plan.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
International MPC&A .....	137,008	140,082	145,000	+4,918	+3.5%
<b>Total, International MPC&amp;A .....</b>	<b>137,008</b>	<b>140,082</b>	<b>145,000</b>	<b>+4,918</b>	<b>+3.5%</b>

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Program Objective—Secure Nuclear Materials and Expertise in Russia, the Newly Independent States (NIS), and the Baltics</b>			
Continue to install MPC&A upgrades for defense-related sites in Russia, including five major uranium and plutonium cities, three nuclear weapons complex sites, 10 Russian Navy projects, and security upgrades for 31 railcars and 50 trucks used for transporting nuclear material. ....	63,504	82,280	78,028
Continue to install MPC&A upgrades for civilian and regulatory-related sites in Russia, including six large fuel facilities, 14 reactor-type facilities, 10 nuclear regulatory projects, and six training and education projects. ....	63,900	54,802	41,668
Completed MPC&A upgrades at four sites in Kazakhstan, four sites in Ukraine, and five sites in the NIS, one each at Belarus, Uzbekistan, Latvia, Georgia, and Lithuania. ....	9,604	0	0
Install MPC&A upgrades at Russian Navy sites including one Northern Fleet site, one Pacific site, three floating platforms, and two Navy regulations and training programs. Cooperate with the Russian Ministry of Interior (MVD) in the operation of U.S.-installed physical protections systems at 80-100 facilities/buildings and continue infrastructure projects to sustain security upgrades over the long-term, including two in-country equipment manufacturing projects, three training projects, and two transportation systems projects. ....	0	3,000	25,304
<b>Total, International MPC&amp;A .....</b>	<b>137,008</b>	<b>140,082</b>	<b>145,000</b>

## Explanation of Funding Changes from FY 1999 to FY 2000

FY 2000
vs.
FY 1999 (\$000)

MPC&A upgrades for defense-related sites in Russia: decrease is a result of rapid upgrades being completed on all 31 Russian railcars used to transport nuclear materials. . .	-4,252
MPC&A upgrades for civilian and regulatory-related sites in Russia: decrease is a result of rapid upgrades being completed at 10 reactor-type facilities. . . . .	-13,134
Increase required to complete rapid security upgrades and cooperation on projects not foreseen in 1996 resulting from unprecedented programmatic successes in other areas of International MPC&A cooperation, as well as emerging new high priority opportunities. . .	+22,304
<b>Total Funding Change, International MPC&amp;A . . . . .</b>	<b><u>+4,918</u></b>

# Treaties and Agreements

## Mission Supporting Goals and Objectives

The Treaties and Agreements subprogram supports implementation of bilateral or multilateral, Presidentially-directed or Congressionally-mandated arms control and nonproliferation initiatives, agreements and treaties. In addition, it provides for unexpected, unbudgeted responses to arms control and nonproliferation requirements of an immediate nature based on urgent U.S. national security needs, as well as preparations to meet new transparency or verification requirements arising out of ongoing negotiations that are consistent with U.S. national security and without compromising proliferation sensitive information.

## Performance Measures

- # Continue support for Russian and other FSU activities related to specific agreements such as those resulting from the Gore/Chernomyrdin and Gore/Kiriyenko Commissions; the HEU Purchase Agreement, and other opportunities to secure through purchase at-risk weapons-usable materials; and activities related to bilateral and trilateral excess fissile materials inspections among Russia, the IAEA, and the U.S.
- # Support the Year 2000 NPT Review Conference and achieve the CTBT, the Chemical Weapons Convention (CWC), and the BWC; address unexpected requirements concerning treaty or agreement negotiations; and support activities in response to urgent U.S. national security requirements.
- # Provide technical support and personnel to UNSCOM to ensure no re-initiation of WMD programs in Iraq.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Treaties and Agreements .....	3,528	3,813	3,583	-230	-6.0%
Total, Treaties and Agreements .....	3,528	3,813	3,583	-230	-6.0%

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Program Objective—Secure Nuclear Materials and Expertise in Russia, the Newly Independent States (NIS), and the Baltics</b>			
Provide support for Russian and other FSU activities, including work on converting three plutonium production reactors in Russia and other activities under the Gore/Chernomyrdin and Gore/Kiriyenko Commissions. . . . .	300	300	300
<b>Program Objective—Limit Weapons-Usable Fissile Materials</b>			
Support HEU purchase agreement (buying 500 metric tons of weapons-origin HEU), and other opportunities. Secure at-risk nuclear materials in the 15 former Soviet Republics. . . . .	500	500	500
Provide support to bilateral and trilateral activities to inspect 30 metric tons of excess plutonium and hundreds of tons of excess HEU. . . . .	1,000	1,000	900
<b>Program Objective—Strengthen the Nuclear Nonproliferation Regime</b>			
Support U.S. participation in the Year 2000 NPT Review Conference and PrepCom Conferences. Additional support for the CTBT Organization, the BWC and CWC. . . . .	1,500	1,785	1,655
Continue technical support to UNSCOM on Iraq. . . . .	228	228	228
<b>Total, Treaties and Agreements . . . . .</b>	<b>3,528</b>	<b>3,813</b>	<b>3,583</b>

### Explanation of Funding Changes from FY 1999 to FY 2000

	FY 2000 vs. FY 1999 (\$000)
Reflects minor reductions across the board to address shifts in priorities. . . . .	-230
<b>Total Funding Change, Treaties and Agreements . . . . .</b>	<b>-230</b>

# International Security

## Mission Supporting Goals and Objectives

International Security supports the implementation of security commitments made by the Administration regarding the NIS of the FSU and the DPRK. Specific efforts are:

Spent fuel activities in the DPRK include arresting the corrosion of the spent fuel from the 5MW research reactor in Nyongbyon, North Korea; and safely canning and storing spent fuel prior to its ultimate disposition in accordance with the "Agreed Framework" signed by the governments of the U.S. and DPRK.

Spent Fuel Activities in Kazakhstan support the urgent security and storage requirements for plutonium-bearing spent fuel located at a reactor in Aktau, Kazakhstan. The objective of this activity is to secure approximately three tons of weapons-grade plutonium for long-term safeguard monitoring and storage.

The IPP in the NIS, transferred from Defense Programs, Weapons Activities in FY 1996, was designed to reduce the global nuclear danger through focused, cooperative projects involving the ten major DOE laboratories and science and engineering institutes in Russia, Ukraine, Kazakhstan and Belarus. Some of these projects will involve cost-sharing with U.S. industry. Major initiatives include preventing "brain drain" by engaging scientists, engineers, and technicians in non-weapons-related projects; motivating participation in proliferation prevention activities; facilitating continued access to NIS facilities through technical engagement with personnel; and establishing self-sustaining commercial linkages that will support future independent commercial projects and assure a Federal exit strategy. Cooperative, cost-sharing projects are aimed at establishing direct partnerships that will provide for long-term commercial employment of key scientists, engineers, and technicians.

The NCI contributes to nonproliferation goals and reduces the global nuclear danger in direct and concrete ways. By working closely with the Ministry of Atomic Energy of the Russian Federation (Minatom), the representatives of the government and private sectors of the United States will assist in the development of suitable and gainful employment in the commercial sector for skilled scientific personnel of the Russian nuclear complex. Of the approximately 170,000 employees who work directly at the nuclear weapons facilities in the ten nuclear cities of the Russian Federation, many are considered as potential proliferation risks due to their direct knowledge of nuclear weapons technology. These individuals will likely be among those who lose their jobs when the production of the weapons facilities is scaled back. It is in the U.S. interest to support Minatom in this undertaking to prevent the potential brain drain to countries with the means and the intention to gain access to nuclear technology.

## **Performance Measures**

### **Spent Fuel Activities in the DPRK**

- # Implement long-term maintenance of water treatment and fuel canning equipment including crane maintenance replacement equipment, materials consumed in maintenance, fuel for site power and heat for winter visits; and associated shipping costs. Conduct on-site inspections in combination with follow-up trips to repair equipment or recan spent fuel if necessary.
- # Carry out technical studies to analyze safety issues, characterize fuel, and develop disposition options. Train DPRK staff to maintain essential site equipment.
- # Provide a trained team of U.S. experts to conduct regular health physics tests and maintain necessary certifications.
- # Address and resolve problems with canister integrity, water clarity, and other issues which would impact IAEA safeguards activities.

### **Spent Fuel Activities in Kazakhstan**

- # Design and procure spent fuel cask transportation system for transporting spent fuel canisters from Aktau to Baikal-1 storage facility.
- # Complete construction of underground silo storage facility for the fuel canisters at the Baikal site.
- # Complete design and begin development and installation of the safeguards monitoring and physical protection systems for approximately 500 underground silos at the Baikal-1 storage facility.

### **Initiatives for Proliferation Prevention (IPP)**

- # Create cooperative, cost-sharing projects aimed at establishing direct partnerships which will provide for long-term commercial employment of key scientists, engineering, and technicians.
- # Carry out other IPP project and support activities to keep NIS institutes viable as stable places of peaceful employment; to engage NIS weapons scientists, engineers and technicians in peaceful, commercial activities to prevent “brain drain;” to facilitate broad access to NIS chemical, biological and nuclear weapons facilities in order to achieve close 1/1 working relationships of DOE laboratory scientists and engineers with their NIS colleagues to promote openness and transparency; and to focus on “closed cities.”
- # Involve other agencies having similar technological interest, such as NIH, USDA, and Department of State in IPP projects.
- # Conduct specific projects involving technologies, the development of which supports enhanced safety, security and accountability of nuclear materials (for example, neutron emission technology to counter nuclear smuggling).

### **Nuclear Cities Initiative (NCI)**

- # Create jobs in the civilian sector in each of the target nuclear cities for nuclear scientists, engineers and technicians.

- # Work with Minatom in the diversification of the economy of the nuclear cities and in creating an environment for further business development.
- # Carry out of a number of social initiatives including exchanges in medical, educational, and woman's leadership training programs undertaken in support of NCI job creation efforts.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Spent Fuel Activities in the DPRK . . . . .	4,968	2,328	2,171	-157	-6.7%
Spent Fuel Activities in Kazakhstan <sup>a</sup> . . . . .	0	15,000	16,000	+1,000	+6.7%
Initiatives for Proliferation Prevention (IPP) <sup>b</sup> . . . . .	29,600	22,500	30,000	+7,500	+33.3%
Nuclear Cities Initiative (NCI) <sup>c</sup> . . . . .	0	7,500	30,000	+22,500	+300.0%
<b>Total, International Security . . . . .</b>	<b>34,568</b>	<b>47,328</b>	<b>78,171</b>	<b>+30,843</b>	<b>+65.2%</b>

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<sup>a</sup> FY 1998 efforts funded at \$10M from a combination of prior year balances and FY 1998 budget authority available to the Arms Control and Nonproliferation Program.

<sup>b</sup> FY 1999 efforts funded at \$25M from a combination of prior year balances and \$22.5M in FY 1999 budget authority, including \$15M as requested, \$4.5M from funding for International MPC&A, and \$3.0M from funding for other Arms Control and Nonproliferation functional areas (RERTR, International Safeguards, and Export Control Operations).

<sup>c</sup> FY 1999 efforts funded at \$15M from a combination of prior year balances and \$7.5M in FY 1999 budget authority from funding for International MPC&A.

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Program Objective—Strengthen the Nuclear Nonproliferation Regime</b>			
<b>Spent Fuel Activities in the DPRK</b>			
Provide equipment replacement and maintenance, and purchase fuel sources for equipment operation in the DPRK . . . . .	2,468	1,028	1,028
Conduct two, two-week visits to perform on-site inspections, prepare for two additional follow-up visits to repair equipment, and perform several technical analyses on safety, fuel composition, and disposition . . . . .	1,100	700	650
Provide two DPRK personnel maintenance training sessions, one refresher training course for U.S. experts, and up to three health physics tests . . . . .	400	100	50
Resolve eight weeks of technical problems impacting IAEA activities . . . . .	1,000	500	443
<b>Total, Spent Fuel Activities in the DPRK . . . . .</b>	<b>4,968</b>	<b>2,328</b>	<b>2,171</b>
<b>Program Objective—Secure Nuclear Materials and Expertise in Russia, the NIS, and the Baltics</b>			
<b>Spent Fuel Activities in Kazakhstan</b>			
At the BN-350 Aktau reactor, secure 350 tons of spent fuel (3,000 individual assemblies) containing three tons of plutonium in 500 welded stainless steel canisters (six assemblies per canister). The 350 tons of spent fuel will be placed in a facility containing underground silos for long-term dry storage. Each of the underground silos will be instrumented with nuclear material safeguards technology in order to detect with continuous, unattended monitoring from a remote location, any diversion of the spent fuel material. . . . .	0 <sup>a</sup>	15,000	16,000
<b>Total, Spent Fuel Activities in Kazakhstan . . . . .</b>	<b>0</b>	<b>15,000</b>	<b>16,000</b>

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<sup>a</sup> FY 1998 efforts funded at \$10M from a combination of prior year balances and FY 1998 budget authority available to the Arms Control and Nonproliferation Program.

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Initiatives for Proliferation Prevention (IPP)</b>			
Under IPP, engage about 1,000 scientists, engineers, and technicians in 50 projects to provide long-term commercial employment at nuclear (MINATOM/Academy of Science) NIS institutes. . . . .	13,100	10,125	13,500
Engage about 200 scientists, engineers and technicians in 10 projects to provide long-term commercial employment at chemical/biological NIS institutes. . . . .	2,000	1,500	2,000
Engage about 700 scientists, engineers and technicians in 50 projects to prevent “brain drain” and promote openness between DOE laboratory scientists and their NIS colleagues at nuclear (MINATOM/Academy of Science) institutes. . . . .	7,100	5,325	7,100
Engage about 200 scientists, engineers and technicians in 10 projects to prevent “brain drain” and promote openness between DOE laboratory scientists and their NIS colleagues at chemical/biological institutes. . . . .	5,000	3,750	5,000
Create five projects involving other USG agencies with similar interests. . . . .	1,000	750	1,000
Create five projects involving technology to enhance environmental safety, security and accountability of nuclear materials. . . . .	1,400	1,050	1,400
Total, Initiatives for Proliferation Prevention (IPP) . . . . .	29,600	22,500 <sup>a</sup>	30,000
<b>Nuclear Cities Initiative (NCI)</b>			
Create approximately 1,000 permanent commercial jobs employing displaced nuclear weapons scientists and engineers. . . . .	0	5,000	20,000
Carry out program objective of creating commercial economic opportunities in the closed, nuclear cities of Russia. . . . .	0	2,500	10,000
Total, Nuclear Cities Initiative (NCI) . . . . .	0	7,500 <sup>b</sup>	30,000
Total, International Security . . . . .	34,568	47,328	78,171

<sup>a</sup> FY 1999 efforts funded at \$25M from a combination of prior year balances and \$22.5M in FY 1999 budget authority, including \$15M as requested, \$4.5M from funding for International MPC&A, and \$3.0M from funding for other Arms Control and Nonproliferation functional areas (RERTR, International Safeguards, and Export Control Operations).

<sup>b</sup> FY 1999 efforts funded at \$15M from a combination of prior year balances and \$7.5M in FY 1999 budget authority from funding for International MPC&A.

# Explanation of Funding Changes from FY 1999 to FY 2000

FY 2000 vs. FY 1999 (\$000)
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**Spent Fuel Activities in the DPRK**

Reduce the number of technical analysis because technical data/information has been analyzed prior and during canning. . . . .	-50
Reduce training courses to half since DPRK and U.S. technical experts will have gained the skills need to performed the needed tasks during the four years of canning and the first year of implementing the long-term maintenance program. . . . .	-50
Reduce time spent on resolving problems impacting IAEA by one week because the main activities during long-term maintenance have been discussed and IAEA's position and comments will have been integrated into the long-term maintenance agreement. . . . .	-57
Total, Spent Fuel Activities in the DPRK . . . . .	-157

**Spent Fuel Activities in Kazakhstan**

Additional funds for Kazakhstan Spent fuel Activities to stabilize and secure fuel canisters and emplace them in underground storage silos under safeguards monitoring and physical protection systems for long-term storage.	+1,000
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**Initiatives for Proliferation Prevention (IPP)**

Funding increase supports commercialization by adding up to three Thrust II projects with chemical and biological institutes and up to five Thrust II projects with nuclear institutes. . . . .	+7,500 <sup>c</sup>
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**Nuclear Cities Initiative (NCI)**

Additional funds support implementation of the Russian NCI to facilitate restructuring of the Russian nuclear weapons complex and expand non-weapons sector economic opportunities for Russian nuclear specialists. This effort was endorsed at the July 1998 Gore-Kiryenko Commission meeting and it supports a government-to-government agreement signed by Secretary Richardson and Minister Adomov in September 1998. . . . .	+22,500 <sup>d</sup>
Total Funding Change, International Security . . . . .	+30,843

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<sup>c</sup> FY 1999 efforts funded at \$25M from a combination of prior year balances and \$22.5M in FY 1999 budget authority, including \$15M as requested, \$4.5M from funding for International MPC&A, and \$3M from funding for other Arms Control and Nonproliferation functional areas (RERTR, International Safeguards, and Export Control Operations).

<sup>d</sup> FY 1999 efforts funded at \$15M from a combination of prior year balances and \$7.5M in FY 1999 budget authority from funding for International MPC&A.

# **Nuclear Safeguards and Security**

## **Program Mission**

The Nuclear Safeguards and Security Program provides effective policy, programmatic direction and training for the protection of the Department of Energy's (DOE) nuclear weapons, nuclear materials, classified information, and facilities. The program provides technology development and technical support to domestic safeguards and security activities as well as implementation of effective classified information and information control policies. The program will help ensure protection of certain critical national infrastructures against both physical and cyber attacks.

## **Program Goal**

Support the National Security of the United States by assuring the effective, cost-efficient protection of the DOE's nuclear weapons, nuclear materials, classified information, and facilities against theft, sabotage, espionage, and terrorist activity.

## **Program Objectives**

- # Strengthen support to field elements to facilitate implementation of cost-saving safeguards and security measures.
- # Develop Department-wide strategic and long-range planning for domestic nuclear safeguards and security.
- # Modernize safeguards and security management information systems.
- # Provide a domestic technology and systems development program to ensure the availability of state-of-the-art technical capabilities for the protection of sensitive DOE facilities, special nuclear materials, and national security interests including classified matter.
- # Ensure availability of state-of-the-art technical capabilities for accountability and control of nuclear material recovered from disassembled nuclear weapons returned from the stockpile, and storage of special nuclear materials.
- # Support the role of the Safeguards and Security Nonproliferation and National Security Institute (formerly the Central Training Academy).
- # Develop programs to support the standardization and accreditation of physical security systems.
- # Maximize public access to DOE information while protecting national security.

- # Provide leadership in jointly assessing sector vulnerabilities, recommending remedial plans, and developing systems and plans for identifying, countering, and recovering from attacks.
- # Build an effective partnership between government and infrastructure owners and operators, with increased sharing of information relating to infrastructure threats, vulnerabilities, and the interdependencies.
- # Educate and inform decision-makers and private industry, government, and the general public about infrastructure assurance, especially the importance of protecting their own information.

## **Performance Measures**

- # Through the Nonproliferation and National Security Institute, conduct 148 safeguards and security training courses with approximately 176 iterations to protect domestic safeguards and security resources.
- # Modify current technologies for safeguards and security applications or develop new technologies to reduce the backlog of documented and validated field user needs by about 50%.
- # Begin classification guidance streamlining initiative, issuing 40 guides in the new format.
- # Conduct two pilot vulnerability assessments to develop guidance for overall program direction.

## **Significant Accomplishments and Program Shifts**

- # Comprehensive continuous review and analysis of program requirements coupled with advances in safeguards and security technologies have resulted in millions of dollars in savings and cost avoidance for the Department, i.e., a heartbeat detector to automatically detect personnel hidden in vehicles, thus saving cost of protective force personnel physically searching each vehicle; portals to automatically detect the potential theft of special nuclear materials; automated information system alarms to automatically detect anomalous activities, evaluate them, and appropriately respond to prevent potential attacks to classified computer systems; continuous automated vault inventory systems to monitor and confirm the presence of special nuclear materials in storage rather than the expense and exposure from a physical inventory; and nondestructive assay measurement technologies to quantify special nuclear materials without removing materials from their containers.
- # The Safeguards and Security program has been and will be the key deterrent in preventing major incidents (i.e., theft, sabotage, terrorist activity, etc.) across the complex at 16 domestic weapons sites.
- # Enhanced training technology applications and applied a broader range of technologies to Departmental training, i.e., expanded use of interactive television, mobile training team, and televideo conferences to provide requisite training for a larger number of students without funding increases.

- # The Declassification program has played a key role in implementing the Department's Openness Initiative by maximizing public access to Departmental information while protecting our national security posture, thus rebuilding the public's trust in the Department of Energy.
- # The DOE Information Assurance program continues support in deterring major incidents involving compromise of classified information in energy information. This includes expansion of information assurance forensics analysis capabilities to support investigations and prosecutions of unauthorized disclosures of classified information, unauthorized intrusions into departmental networks, and providing input into the information systems security technology development program to develop new technology in response to new, unidentified network intrusion methods. Also reflected is the transfer of approximately \$1.3 million for activities developed under Technology and Systems Development to Operational Support in order to implement the classified information systems security program throughout the Department.
- # Reallocated funding of \$5.0 million, which supported a one-time effort in FY 1999 to eliminate vulnerabilities identified in the Department of Justice report on "Vulnerability Assessment of Federal Facilities," was transferred to the Technology Development Program primarily supporting efforts to correct vulnerabilities and evolving threats facing the Department.

### Funding Profile

(dollars in thousands)

	FY 1998 Current Appropriation	FY 1999 Original Appropriation	FY 1999 Adjustments	FY 1999 Current Appropriation	FY 2000 Request
Nuclear Safeguards and Security					
Operational Support . . . . .	21,730	28,730	0	28,730	29,634
Technology and Systems Development . . . . .	23,620	24,620	0	24,620	27,470
Classification/Declassification . . . . .	1,850	1,850	0	1,850	1,996
Subtotal, Nuclear Safeguards and Security . . . . .	47,200	55,200	0	55,200	59,100
Total, Nuclear Safeguards and Security . . . . .	47,200	55,200	0	55,200	59,100

**Public Law Authorizations:**

- P.L. 83-703, "Atomic Energy Act of 1954"
- P.L. 95-242, "Nuclear Non-Proliferation Act of 1978"
- P.L. 103.62, "Government Performance and Results Act of 1993"

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
<b>Albuquerque Operations Office</b>					
Los Alamos National Laboratory . . . . .	8,692	8,048	8,565	517	6.4%
Sandia National Laboratories . . . . .	6,534	8,135	9,300	1,165	14.3%
Albuquerque Operations Office . . . . .	7,813	7,813	9,013	1,200	15.4%
<b>Total, Albuquerque Operations Office . . . . .</b>	<b>23,039</b>	<b>23,996</b>	<b>26,878</b>	<b>2,882</b>	<b>12.0%</b>
<b>Chicago Operations Office</b>					
Argonne National Laboratory . . . . .	103	103	600	497	482.5%
Brookhaven National Laboratory . . . . .	700	800	350	-450	-56.3%
New Brunswick Laboratory . . . . .	50	0	0	0	0.0%
<b>Total, Chicago Operations Office . . . . .</b>	<b>853</b>	<b>903</b>	<b>950</b>	<b>47</b>	<b>5.2%</b>
Idaho Operations Office . . . . .	1,097	822	1,287	465	56.6%
Nevada Operations Office . . . . .	105	550	1,200	650	118.2%
<b>Oak Ridge Operations Office</b>					
Oak Ridge Operations Office . . . . .	2,748	2,056	2,563	507	24.7%
Oak Ridge Institute for Science and Education . . . . .	563	563	563	0	0.0%
<b>Total, Oak Ridge Operations Office . . . . .</b>	<b>3,311</b>	<b>2,619</b>	<b>3,126</b>	<b>507</b>	<b>19.4%</b>
Richland Operations Office . . . . .	2,437	2,237	2,892	655	29.3%
<b>Oakland Operations Office</b>					
Lawrence Livermore Laboratory . . . . .	6,447	6,137	8,539	2,402	39.1%
Rocky Flats Area Office . . . . .	0	0	200	200	100.0%
Savannah River Site . . . . .	0	600	1,400	800	133.3%
<b>Washington Headquarters</b>					
Office of Scientific and Technical Information . . . . .	40	40	0	-40	-100.0%
Washington Headquarters . . . . .	9,871	17,296	12,628	-4,668	-27.0%
<b>Total, Washington Headquarters . . . . .</b>	<b>9,911</b>	<b>17,336</b>	<b>12,628</b>	<b>-4,708</b>	<b>-27.2%</b>
<b>Total, Nuclear Safeguards and Security . . . . .</b>	<b>47,200</b>	<b>55,200</b>	<b>59,100</b>	<b>3,900</b>	<b>7.1%</b>

## **Site Description**

### **Los Alamos National Laboratory**

Work at Los Alamos National Laboratory (LANL) is designed to address current, evolving, and future needs, primarily in the areas of materials control and accounting (MC&A) and computer security. Activities in MC&A include the development of measurement technologies and instrumentation to quantify difficult-to-measure or shielded special nuclear materials. LANL also develops standards for special nuclear materials to calibrate instruments around the complex. Other activities include evaluating commercial measurement systems and the development of MC&A training. Computer security efforts are focused on developing a capability to perform classified processing across multiple platforms and participation in the tri-laboratory effort to automatically detect suspicious activities on computer networks and automatically provide a response capability. Support is also provided for the Declassification Productivity Initiative by providing automated tools that improve the efficiency of document classification/declassification reviews.

### **Sandia National Laboratory**

Sandia focuses on development of technologies and systems required to protect the Department from catastrophic consequences such as use of nuclear energy for malevolent purposes or the erosion of national security secrets through theft or diversion of classified materials or information. Technical assistance is provided for assessment of site vulnerability analysis and site safeguards and security plans. Support is also provided for the Declassification Productivity Initiative by providing automated tools that improve the efficiency of document classification/declassification reviews. The technology development program focuses on physical security technologies to secure the DOE complex. Activities include providing new detection capabilities to automatically detect unauthorized access, explosives, or other contraband. Sandia will develop advanced barrier technologies to prevent or substantially delay attacks. Technological solutions will also be provided to address new threats, such as chemical and biological weapons. In addition, Sandia will continue to maintain a core technical capability in interior and exterior sensors, alarm communications, access delay, and entry control. Computer security activities include participation in the tri-laboratory effort to automatically detect suspicious activities on computer networks and automatically provide a response capability. Assistance is also provided in developing comprehensive classification guidance for nuclear safety, ES&H, and dismantlement/reuse; reviewing declassification proposals and field office classification appraisals; and updating nuclear weapon guides.

### **Argonne National Laboratory**

Argonne provides technical and programmatic development assistance in support of DOE's initiative to establish an effective national infrastructure assurance program that is supportive of, and harmonized, with national infrastructure assurance efforts.

### **Brookhaven National Laboratory**

Brookhaven supports the technology development program in the area of material control and accounting to increase assurance regarding special nuclear materials and other fissile materials by developing measurement capabilities for fuel.

### **Idaho National Engineering and Environmental Laboratory (INEL)**

INEL provides Idaho-based field expertise, technical assistance, and engineering support for the development, review, evaluation, and implementation of security-related requirements to effectively meet DOE's goals. This includes review and evaluation of security design requirements to support nonproliferation; engineering support for validation, justification, and site safeguards and security plan reviews; and development and refinement of security design criteria.

### **Nevada Operations Office**

Activities will be conducted at the Remote Sensing Laboratory and the Special Technologies Laboratory. Activities will focus on evaluating existing and new measurement technologies to determine their feasibility at DOE sites. Efforts also include developing technologies to assist protective force personnel, including night vision goggles and investigating the use of ultraviolet tags to differentiate between the adversary and site personnel.

### **Oak Ridge, Lockheed Marietta Energy Systems**

At Oak Ridge, technical assistance is provided for the development, maintenance, and conducting of courses and workshops that evaluate and ensure Information Systems Security certification; Master S&S Agreement/Site S&S Plan verification/validation; and physical protection systems. The technology development program support in physical security and material control and accounting addresses needs for protecting nuclear weapons, nuclear material, classified information, and other vital DOE assets (nonnuclear and unclassified). Expertise is provided in the document classification/declassification initiative and for classification guidance update and streamlining. The Declassification Productivity Initiative is supported by providing automated tools that improve the efficiency of document classification/declassification reviews.

### **Oak Ridge Institute for Science & Education/Oak Ridge Associated Universities**

At Oak Ridge, technical support provides implementation, training, operation, and quality assurance of the Personnel Security Assurance Program, and a variety of research and analysis activities in support of the personnel security function. Technical assistance supports the classification/declassification program in the verification for review of classified and historical information for accuracy and compliance with DOE's openness policy.

### **Richland, Battelle Memorial Institute/Pacific Northwest Laboratory (PNL)**

PNL provides technical expertise, assistance, training, and awareness in support of information security. This includes the identification, inquiry, and resolution of security problems across DOE; and analysis of incidents and facility survey information. They also assist with the implementation of the Department's information assurance initiative and related activities to ensure effective and efficient identification of threats and vulnerabilities to DOE's distributed information and telecommunication systems. Technical assistance is provided that supports special nuclear material consolidation, Master S&S Agreement, Site S&S Plan support, and vulnerability assessment reviews and performance testing.

### **Richland, Fluor-Daniel Hanford**

Provides Hanford-based field expertise, technical support and assistance for the review, update and consolidation of safeguards and security orders and policies and field guidance to cost effectively meet department goals and objectives. Support is provided for the classification/declassification initiative by improving the access capability to DOE's OpenNet data base.

### **Lawrence Livermore Laboratory (LLNL)**

Technical support is provided for DOE's Information Systems Security Program for analysis and recommendations for policies, guidance, and information assurance tool development for all aspects of information systems security. The technology development program at LLNL is concentrated in computer security, physical security, and materials control and accounting (MC&A). LLNL provides the Department with many tools to detect and respond to attacks to information system networks. The laboratory is also a participant in the tri-laboratory effort to automatically detect suspicious activities on computer networks and automatically provide a response capability. Physical security activities focus on providing software and interface upgrades to the Department's standardized access control system and evaluating low cost access control technologies for implementation throughout the DOE. In MC&A, measurement solutions for heterogeneous materials are being developed and implemented around the complex. Classification/declassification is supported through development of operational tools to improve the productivity of document reviewers.

### **Savannah River Site**

Work at Savannah River supports materials control and accounting through the development, deployment and operation of a fully developed, ready to use, software application for nuclear materials accounting throughout the DOE complex. This technology will allow for greater reliability, efficiency, and cost savings through increased standardization and use of advanced software technologies. The classification/declassification program is supported through the development and streamlining of classification guidance.

# Operational Support

## Mission Supporting Goals and Objectives

Safeguards and Security Operational Support provides essential technical and analytical expertise to ensure effective and efficient security; a protective force for Headquarters operations; reviews which ensure cost-saving measures in safeguards and security throughout the Department; and standardized training responsive to the challenges of the changing post-cold war era. This support provides for the overall improvement of safeguards and security activities.

Subprogram activities in this section of the budget include the following:

- P Nonproliferation and National Security Institute (NNSI) (formerly Central Training Academy)** is the Center of Excellence for safeguards and security training and training development. NNSI uses both traditional and distance learning technologies to provide onsite and facility training for safeguards and security personnel ensuring that DOE maintains a well-trained workforce to protect the nation's vital nuclear and energy interests against espionage, sabotage or theft. NNSI assesses safeguards and security field training needs and site training program performance and develops training courses to meet those needs. Distance Learning Training includes satellite transmission of NNSI training to multiple DOE sites and, through the use of modern interactive technology, allows each student to be part of the instructional process. Computer-based training, interactive audio/video training and correspondence courses are also provided.
- P Information Security** provides support across the department in the areas of classified matter protection and control, technical security, information systems security (information assurance), operations security, and foreign ownership, control or influence. The accelerated information assurance program will provide a capability for ensuring that the resources and methods necessary to identify and prosecute unauthorized intruders of departmental networks are effective and available. The information assurance activities will also provide a capability to evaluate proposed security measures within the Department's complex network environment. The Information Security Resource Center (ISRC) incorporates technical expertise and professional development training to ensure that the five disciplines of information security function in an integrated, cohesive manner. The Technical Surveillance Countermeasures (TSCM) program, one of the five disciplines, ensures and enhances the security provided for Departmental facilities and programs in the greater Washington, D.C. area. The Information Assurance Outreach Program provides a vehicle for providing technical expertise, assistance, and awareness training in information security disciplines to energy sector companies, particularly in the area of information assurance (information systems security). The information security program provides matrix support to various Departmental programs, such as the critical infrastructure program and the counterterrorism/counterintelligence programs.
- P Security Education Briefing and Awareness** provides support for Security Education Briefing and Awareness to reflect changing policies and procedures. Coordinates and participates in security education workshops and meetings for the exchange of resources and dissemination of security education information and assists contractors in establishing supporting briefing materials.

- P Personnel Security** evaluates, reviews, and develops guidance and documents for use in evaluating the Personnel Security Assurance Program (PSAP) as it relates to medical, psychological, legal, security, and management components. Researches and prepares technical documents to support the Personnel Security activities. Provides technical assistance and operational support to the Personnel Security program manager to determine current status of science and technology in the component areas.
- P Additional Support** provides Headquarters and field elements with support to implement cost-saving safeguards and security measures. This support includes technical assessments, risk management/vulnerability assessment expertise, engineering assistance, surveys, and performance testing. Enhancements to the DOE safeguards and security risk management process were necessary in FY 1998 to address changes in Departmental priorities, changes in technology, and increased emphasis on the application of appropriate technologies. FY 1999 will continue the established program as a phased process within the Department. FY 2000 activities and funding levels are formulated to incorporate enhanced risk management tools currently under development and to assist/train all Departmental elements in their correct use. Additional Support also provides for technical background on policy issues, administrative and technical guidance in the development of computer security policy for systems possessing national security interest data (unclassified and classified), and the security alarm system at Headquarters.

The Safeguards and Security Information Management System (SSIMS) tracks and reports classified safeguards and security issues from all DOE field sites. SSIMS allows OSS to conduct continuous reviews of the security measures in place at DOE/contractor facilities, ensuring compliance with DOE policy requirements and monitoring the effectiveness of Departmental policy involving the protection of national security assets. SSIMS funding will maintain a database information system detailing facility findings, ratings, and general operational status; assist in technical performance review of system software; provide training support for data base users and document and course material update; provide additional system and development support; and computer software and hardware, including minor upgrades to existing system.

The Headquarters Guard Contract provides security for the protection of Government property, classified matter, and personnel at headquarters buildings.

- # Critical Infrastructure Protection Program** will carry out the national mandates of the Critical Infrastructure Protection directive and Presidential Decision Directive 63 regarding critical infrastructure protection. These mandates obligate DOE to partner with the private sector in ensuring the viability of the energy sector infrastructures nationwide. In addition to responsibilities for its own critical infrastructure, the Department is primarily responsible for ensuring that the DOE national laboratories' capabilities are fully utilized in regards to developing flexible, evolutionary approaches that span both public and private sectors, and protect both domestic and international security.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Nonproliferation and National Security Institute (NNSI) .....	7,813	7,813	8,813	+1,000	+12.8%
Information Security .....	2,770	3,814	6,464	+2,650	+69.5%
Security Education Briefing and Awareness .....	181	181	181	0	0
Personnel Security .....	485	485	485	0	0
Additional Support					
Headquarters Guard Contract .....	7,000	7,000	7,654	+654	+9.3%
Other .....	3,481	9,437	3,937	-5,500	-58.3%
Total Additional Support .....	10,481	16,437	11,591	-4,846	-29.5%
Critical Infrastructure Protection Program .....	0	0	2,100	+2,100	+100.0%
<b>Total, Operational Support .....</b>	<b>21,730</b>	<b>28,730</b>	<b>29,634</b>	<b>+904</b>	<b>+3.1%</b>

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### Nonproliferation and National Security Institute

<p># Conduct approximately 148 courses with 176 classroom iterations, emphasizing "Online Training." Funding increase in FY 2000 allows the development of approximately 30 new courses to meet identified field site training needs for chemical/biological equipment, response to weapons of mass destruction, and advanced physical security systems. Funding will also reduce accumulated, deferred infrastructure maintenance/replacement backlog by 25%, including such things as required fire alarms, mandatory "Americans with Disability Act" (ADA) upgrades, lighting, and required fire sprinklers. ....</p>	7,750	7,750	8,750
<p># Provides funding to support NNSI's equipment-related needs such as replacement of outdated interactive television technology equipment .....</p>	63	63	63
<p><b>Total, Nonproliferation and National Security Institute .....</b></p>	<b>7,813</b>	<b>7,813</b>	<b>8,813</b>

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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**Information Security**

<p># The Information Security Resource Center (ISRC) in FY 2000 continues to provide technical expertise, assistance, training, and awareness in an integrated manner across the five disciplines of information security. Activities support the identification, investigation, and resolution of security problems across the department, especially in the area of unauthorized disclosures and compromises of classified information; analysis of incidents and facility survey information to identify problems within the information security program; and analysis of foreign ownership, control or influence (FOCI) in determinations of contracts within the various program elements of DOE dealing in classified information. Increase in funding is based on the continuing, increasing trend of unauthorized disclosures or compromises of classified information throughout DOE and the increasing complexity of FOCI issues. ....</p>	1,152	1,152	1,602
<p># The Information Assurance Outreach Program (IAOP) in FY 2000 continues to provide technical advice and awareness to energy sector elements in support of the Presidential Decision Directive (PDD 63) on Critical Infrastructure Protection. The IAOP provides unbiased capability to energy sector companies in the areas of information assurance including vulnerability testing, design reviews, independent verification and validation of information system security measures, and awareness of emerging information assurance issues. IAOP activities provide basic level of assurance that key energy sector assets are protected in a reasonable manner that ensures that national and economic security concerns of the country are not adversely affected by terrorist activities. Funding levels are based on industry requests for support activities and ensures support is provided to systems and areas that would have a high impact on national and economic security missions. ....</p>	1,500	1,500	1,450

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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# The Information Assurance Program provides continuation of the accelerated development and deployment of capabilities within the information systems security (information assurance program) in FY 2000, supporting various departmental programs and missions including counterintelligence, counterterrorism, and internal critical infrastructure protection. Activities include expansion of information assurance forensics analysis capabilities to support investigations and prosecutions of unauthorized disclosures of classified information, unauthorized intrusions into departmental networks, and providing input into the information systems security technology development program to develop new technology in response to new network intrusion methods.

Activities also include developing and verifying unique, trusted solutions to the next generation of departmental specialty networks such as the control systems for the National Ignition Facility (NIF) and the Accelerated Strategic Computing Initiative (ASCI); and enhancements to commercially available information systems security products to ensure classified information is appropriately protected from unauthorized access or disclosure. Funding levels have been determined based on the rate of technological advances and, in the case of forensics, based on similar activities within the Department of Defense. . . . .

0 1,000 2,000

# Reflects a transfer of activities for implementation of the Information Systems Security Program (Information Assurance) in FY 2000 which were previously developed under the Technology Development program. These elements include Baseline Skills Evaluation and Certification (training and education), the Computer Incident Advisory Capability (CIAC), the internal Advice and Assessment Program, and the operation of the DOE Information Systems Security Server. This funding level provides the basic architecture and baseline support in the effective implementation of the classified information systems security program throughout DOE. Funding levels were derived based on past activity levels. . . . .

0 0 1,250

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
# Provides for continuation of on-site technical support for information security in the areas of technical reviews of technology transfer issues and the conduct of inquiries into unauthorized disclosures of classified information, emphasizing computer forensics. ....	118	162	162
Total, Information Security .....	2,770	3,814	6,464
<b>Security Education Briefing and Awareness</b>			
# Provide security awareness throughout the DOE complex through education programs			
# Support security awareness and education through information exchange by planning and conducting a Security Education Special Interest Group (SE/SIG) workshop			
# Maintain the SE/SIG electronic bulletin board .....	181	181	181
<b>Personnel Security</b>			
# Operate Center for Human Reliability Studies			
# Support personnel security activities through guidance and product development, update and revise personnel security materials			
# Serve as technical liaison with Department of Defense (DOD) Personnel Security Research Center, DOD Polygraph Institute and similar agencies and institutions			
# Upgrade and maintain Personnel Security Assurance Program (PSAP) electronic bulletin board; evaluate and modify PSAP training materials .....	485	485	485
<b>Additional Support</b>			
# Headquarters Guard Contract - Ensure a sound protection program is offered to Headquarters employees and facilities through use of 41 static posts and roving patrols, 16 supervisors, 4 managers, and 13 instructors, receptionists and administrative assistants. FY 2000 increase is required to cover normal escalation and inflation along with marginal flexibility in adjusting to technological changes and a follow-on contract .....	7,000	7,000	7,654
# Support operational, maintenance, and enhancement costs for SSIMS .....	300	300	300

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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# Provides for installation and maintenance of residential alarm systems for senior level DOE management, and support and corrective/preventative maintenance of alarm systems and metal detectors at both headquarters facilities. Provides for engineering support, minor enhancements, and modifications to the headquarters access control systems. Increased funding in FY 2000 is for maintenance of new alarm system and vehicle barrier systems whose installation began in FY 1999 in response to eliminating/mitigating vulnerabilities identified in the Department of Justice Report on "Vulnerability Assessment of Federal Facilities." . . . . .	753	753	883
# Support the headquarters protective force radio system maintenance at the 90% operational level. Increased funding is due to past shared funding effort of system with Office of Human Resources and Administration which will now be sole responsibility of the Office of Safeguards and Security.	50	50	85
# Perform physical security system reviews. In FY 2000, additional field evaluations are necessary to support enhanced vulnerability assessment process. . . . .	676	654	821
# Provide risk management/vulnerability assessment program verifications and validation. In FY 2000, additional field evaluations are necessary to support enhanced vulnerability assessment process. . . . .	819	797	965
# Assist in the development of DOE Orders and program policies on security requirements; develop database of electronic security systems components that will help users identify and manage system component lifecycle replacement issues; provide technical support in reviewing and validating assessment of security system requirements at DOE sites; supports expertise required for development of explosive detection support procedures; and provides for development of training course outlines for security system implementation and development of a certification process for security systems for determining how certified systems are meeting user needs versus their protection requirements.	387	387	387

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
# In FY 1999, provided for the procurement and replacement of security locks meeting Federal Specification FF-L-2740A for containers holding sensitive classified material . . . . .	0	1,000	0
# Supports capitalized computer equipment requirements and modification and/or replacement parts to the Headquarters alarm and access control system. In FY 1999 work was initiated to begin alarm system replacement and installation of vehicle barrier systems at Headquarters for compliance with the Department of Justice Report on "Vulnerability Assessment of Federal Facilities." . . . . .	496	5,496	496
<b>Total, Additional Support . . . . .</b>	<b>10,481</b>	<b>16,437</b>	<b>11,591</b>
<b>Critical Infrastructure Protection Program (CIPP)</b>			
# Provides expert technical assistance to the Energy Sector Coordinator in establishing collaborative working relationships between the government and the energy industry, facilitates development of information collection and sharing, and assists in the validation of industry-led vulnerability analyses . . . . .	0	0	1,500
# Supports implementation of a vulnerability assessment capability and a CIPP implementation tracking system . . . .	0	0	600
<b>Total, Critical Infrastructure Protection Program . . . . .</b>	<b>0</b>	<b>0</b>	<b>2,100</b>
<b>Total, Operational Support . . . . .</b>	<b>21,730</b>	<b>28,730</b>	<b>29,634</b>

## Explanation of Funding Changes from FY 1999 to FY 2000

FY 2000 vs. FY 1999 (\$ 000)
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### Nonproliferation and National Security Institute

# Nonproliferation and National Security Institute increase supports the development of 30 new courses meeting identified training needs for chemical/biological equipment, response to weapons of mass destruction, and advanced physical security systems and maintenance or replacement upgrades of existing infrastructure . . . . .	+1,000
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### Information Security

# The Information Security Resource Center has increased emphasis in support of activities that identify and resolve security problems, particularly unauthorized disclosures and compromises of classified information and those associated with foreign ownership, control, and influence determinations . . . . .	+450
# Small decrease to the Information Assurance Outreach Program based on reduced industry requests for support activities . . . . .	-50
# Information Assurance Program provides for continuation of accelerated development and deployment of capabilities within the information systems security, supporting various departmental programs including counterintelligence, counterterrorism, and internal protection . . . . .	+1,000
# Reflects a transfer of activities that were developed under the Technology and Systems Development program to an implementation effort for the classified information systems security program throughout the Department . . . . .	+1,250

### Additional Support

# Headquarters Guard Contract provides for escalation associated with a follow-on contract . . . . .	+654
# Increased costs for maintenance of new alarm system and vehicle barrier systems in response to report on "Vulnerability Assessment of Federal Facilities" . . . . .	+130
# Reflects shift of shared funding responsibility totally to the Office of Safeguards and Security for maintenance of the Headquarters protective force radio system . . . . .	+35
# Supports requirement for additional field evaluations and physical security system reviews for enhanced vulnerability assessment process . . . . .	+335
# Reflects reduction for the FY 1999 funding for procurement of security locks that meet Federal Specification FF-L-2740A . . . . .	-1,000
# Reflects reduction to Headquarters facility upgrades. This upgrade was an FY 1999 activity that should be completed by year end . . . . .	-5,000

### Critical Infrastructure Protection Program (CIPP)

# Provides technical assistance to the Energy Sector Coordinator in establishing collaborative working relationships between the government and the energy sector . . .	+1,500
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FY 2000 vs. FY 1999 (\$ 000)
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# Supports implementation of a vulnerability assessment capability and a CIPP implementation tracking system .....	+600
Total Funding Change, Operational Support .....	<u>+904</u>

# Technology and Systems Development

## Mission Supporting Goals and Objectives

The Technology and Systems Development program's mission is to develop new technologies or modify commercial systems to protect the National nuclear complex, special nuclear materials, classified information and other critical assets. The threats facing DOE facilities and sites continue to evolve and present many challenges to the Department. Traditionally, the Technology and Systems Development Program was concerned with nuclear material control and accounting, but now is faced with other threats including weapons of mass destruction, terrorism, cyber attacks and the insider. Although the Department is no longer in a production mode, it is disassembling nuclear weapons and has received weapons grade materials from other countries. All of these weapons grade components and materials have resulted in increased nuclear material inventories which the Department must properly protect and account for. Technology continues to be the key to protect and secure the Department's facilities and assets. Safeguards and Security deficiencies requiring technical solutions have been identified and validated from safeguards and security managers around the DOE complex. Currently, the Domestic Safeguards and Security program can partially address approximately 50% of its domestic requirements. The program continues to provide technical solutions to meet our customers' needs. A few past accomplishments include the Enclosed Space Detection System to detect persons hidden inside vehicles; an Integrated Physical Security System (ARGUS); a Network Intrusion Detector that is implemented not only throughout the DOE, but DOD as well to detect unauthorized access to computer networks; and nondestructive assay systems that accurately quantify nuclear materials without exposing personnel to radiation. The program will continue to strive to sustain and utilize core security technologies and expertise, but also provide technical defenses against chemical and biological terrorism, cyber attacks, large bombs, and other contraband.

The Technology and Systems Development program is divided into the following subprograms:

**Science and Technology Development Projects** includes all activities ranging from basic research to full scale development and activities necessary to modify a proved technology for safeguards and security applications.

**Technology Application** includes site implementation of a technology or system that will address a safeguards and security deficiency and technology transfer to a qualified manufacturer.

**Technology Support, Assistance, and Consultation Tasks** includes technical training, technical support to Headquarters, technical workshops and seminars, and technical support and assistance to the DOE complex.

Each subprogram is concentrated in the following disciplines:

**Physical Security:** Activities are focused in detection, access control, alarm control and display, alarm assessment, adversary barriers/delay, and protective force subsystems.

**Other Defense Activities/Nonproliferation and National Security/  
Nuclear Safeguards and Security/Technology and Systems  
Development**

**FY 2000 Congressional Budget**

Material Control and Accounting: Efforts are focuses in nuclear material measurements, material accounting, material control, training, and statistical methods.

Information Security: Projects are focused on advice and assessment, education and awareness, incident response, detection tools, technical assistance, and system integration, and information assurance.

### Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Science and Technology Development Projects . . . . .	17,975	19,877	24,154	+4,277	+21.5%
Technology Application . . . . .	2,523	1,417	1,066	-351	-24.8%
Technology Support, Assistance, and Consultation Tasks . . . . .	3,122	3,326	2,250	-1,076	-32.4%
<b>Total, Technology and Systems Development . . . . .</b>	<b>23,620</b>	<b>24,620</b>	<b>27,470</b>	<b>+2,850</b>	<b>+11.6%</b>
Crosswalk of Disciplines					
Physical Security . . . . .	7,419	9,318	11,128	+1,810	+19.4%
Material Control and Accountability . . . . .	10,296	9,796	10,072	+276	+3.8%
Information Security . . . . .	5,905	5,506	6,270	+764	+13.9%
<b>Total . . . . .</b>	<b>23,620</b>	<b>24,620</b>	<b>27,470</b>	<b>+2,850</b>	<b>+11.6%</b>

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### Physical Security

# Correct vulnerabilities at DOE sites to protect DOE sites and assets from outside attacks, such as terrorists, and also from insider collaboration. In FY 2000, funds have been increased in this area to develop solutions to address the evolving threats that the Department faces. (SNLA, LLNL, Remote Sensing Lab/NV, and OR/LMES) . . . . .	3,976	4,735	5,420
# Provide required upgrades to the Department's standardized integrated access control system. These upgrades include replacing the obsolete database interface and software, as well as testing the system against new DOE performance requirements (LLNL) . . . . .	300	950	1,450
# Explosives Detection. Evaluate commercial explosives detection systems to determine applicability to the Department. FY 2000 will focus on developing a low cost capability to detect explosives hidden in vehicles. (SNLA) . .	530	680	980
# Test and evaluate physical security equipment to characterize their performance and determine their applicability to DOE sites. (SNLA) . . . . .	1,205	1,365	1,340
# Prevent/delay attacks to DOE sites by developing robust barriers that resist known penetration attacks. Current barriers have proven to be inadequate. Increase in funding supports additional efforts focused on testing and implementing effective barriers to decrease potential vulnerabilities to the DOE complex. (SNLA) . . . . .	470	450	650
# Develop tools to assess the Department's risk to chemical and biological weapons. Increased funding allows the evaluation of detectors to determine their best configuration for application to DOE sites to provide early detection of a possible terrorist attack. (SNLA) . . . . .	400	500	750
# Develop tools to simulate DOE sites and perform risk analyses to determine the optimum security needs within current constraints. (SNLA) . . . . .	150	250	150
# Capital Equipment . . . . .	388	388	388
Total, Physical Security . . . . .	7,419	9,318	11,128

### Material Control and Accounting (MC&A)

Other Defense Activities/Nonproliferation and National Security/  
Nuclear Safeguards and Security/Technology and Systems  
Development

FY 2000 Congressional Budget

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
# Extend measurement capabilities to account for 100% of the DOE's special nuclear materials inventory. i.e., scrap and residues. (LANL, LLNL) . . . . .	6,472	4,427	4,542
# Provide contraband detection technologies to detect materials hidden or shielded within packages or vehicles. (LANL) . . .	500	650	350
# Evaluate commercial MC&A systems and technologies to determine their applicability to DOE. (LANL) . . . . .	250	460	535
# Develop special nuclear material standards to calibrate instruments. Efforts are reduced due to completion of a set of standards. (LANL) . . . . .	250	800	650
# Provide required modules to the Department's standard material control and accounting system. Increase permits system to be integrated into other safeguards and security systems. (SRS) . . . . .	800	800	1,200
# Develop DOE courses to keep personnel abreast of latest MC&A technologies and issues impacting the DOE complex. (LANL) . . . . .	850	855	900
# Provide technical assistance and maintenance to DOE sites for fielded MC&A systems. (LANL, LLNL, & Science & Tech Lab/NV) . . . . .	810	1,440	1,531
# Capital Equipment . . . . .	364	364	364
Total, Material Control and Accounting . . . . .	10,296	9,796	10,072
<b>Information Security</b>			
# Complete Phase II of Automated Information Systems Alarms Project (LANL, Science & Tech Lab/NV, LLNL) . . . . .	2,325	2,325	2,325
# Develop advanced tools and technologies to detect/prevent penetrations to computer networks. Increased funds will be used to provide advanced tools to respond to the dynamic threats facing computer system networks. (LLNL, LANL) . .	2,745	2,321	3,085
# Provide technical assistance on current threats to DOE information networks and determine mitigation strategies. (LLNL) . . . . .	450	450	450
# Provide low cost experience-based training for network system administrators. (LLNL) . . . . .	200	225	225
# Capital Equipment . . . . .	185	185	185
Total, Information Security . . . . .	5,905	5,506	6,270
Total, Technology and Systems Development . . . . .	23,620	24,620	27,470

Other Defense Activities/Nonproliferation and National Security/  
Nuclear Safeguards and Security/Technology and Systems  
Development

FY 2000 Congressional Budget

## Explanation of Funding Changes from FY 1999 to FY 2000

FY 2000  
vs.  
FY 1999  
(\$ 000)

### Science and Technology Development Projects

# The increase provides for additional support to physical security (+1,810) to correct vulnerabilities at DOE sites by developing solutions to address evolving threats from terrorist and insider collaboration, provide required upgrades to DOE's standardized integrated access control system, develop robust barriers to better resist penetration attacks and evaluate technologies to protect DOE facilities and personnel from chemical and biological weapons. In MC&A, additional efforts will focus on advanced measurement technologies (+\$276) and developing additional modules for the Department's standardized material control and accounting system (+\$375). Activities will also be accelerated to ensure the integrity of classified computer systems within the Department (+\$1,052) including the development of advanced computer security tools (+\$764) . . . . . +4,277

### Technology Application

# Efforts to assist sites with implementation of material control and accounting technologies will be completed and activities will shift to developing technical solution to address vulnerabilities . . . . . -351

### Technology Support, Assistance, and Consultation Tasks

# Efforts will be redirected from providing technical support to Headquarters on MC&A, computer security, and physical security issues to developing solutions to correct deficiencies at DOE sites . . . . . -1,076

Total Funding Change, Technology and Systems Development . . . . . +2,850

# Classification/Declassification

## Mission Supporting Goals and Objectives

The majority of the Classification/Declassification program is now funded in the Nonproliferation and National Security Program Direction budget. The portion of the Classification/Declassification program funded here is primarily provided by Management and Operating contractors in the field in support of the ongoing base program as well as support of the declassification initiative. The ongoing base classification program includes the routine review and development of classification guidance. The declassification initiative program includes development and utilization of advanced technologies to improve the efficiency and productivity of the document declassification review process. Also, included in the declassification initiative is the development of specific guidance to implement approved Fundamental Classification Policy Review recommendations, while undertaking a restructuring and streamlining of the entire classification guide system, ultimately improving classification and declassification efficiency. These efforts under the Classification/Declassification program will maximize public access to the Department's information, consistent with nonproliferation and national security objectives.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Classification/Declassification .....	1,850	1,850	1,996	+146	+7.9%
Total, Classification/Declassification .....	1,850	1,850	1,996	+146	+7.9%

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### Classification/Declassification

Development of state-of-the-art technology for document declassification to improve efficiency and effectiveness of declassification

# Test and evaluate prototype declassification technology in FY 1998 .....	775	0	0
# Limited expansion of electronic document declassification system and testing the application of the declassification tools against a set of documents in FY 1999 .....	0	625	0
# Set up test capability at one field location in FY 2000 .....	0	0	771
Development of guidance to implement Fundamental Classification Policy Review (FCPR) recommendations under streamlined system, improving overall effectiveness of the classification guidance system			
# Continue effort to develop specific classification guidance implementing FCPR using page change method through mid-FY 1999 .....	1,075	612	0
# In late FY 1999, transition into classification guidance streamlining method to implement FCPR. In FY 2000 continue classification guidance streamlining, issuing in the streamlined format 40 guides containing updated guidance .....	0	613	1,225
Total, Classification/Declassification .....	1,850	1,850	1,996

## Explanation of Funding Changes from FY 1999 to FY 2000

	FY 2000 vs. FY 1999 (\$ 000)
# Allows for testing the application of declassification tools at one field location . . . .	+146
Total Funding Change, Classification/Declassification . . . . .	+146

## Capital Operating Expenses and Construction Summary

### Capital Operating Expenses

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Capital Equipment . . . . .	1,496	6,496	1,496	-5,000	-77%
Total, Capital Equipment . . . . .	1,496	6,496	1,496	-5,000	-77%

# **International Nuclear Safety**

## **Program Mission**

The International Nuclear Safety and Cooperation activity is a major component of the Department's nuclear safety and national security mission. It is designed to reduce the national security and environmental threats posed by the operation of unsafe nuclear facilities worldwide, especially Soviet-designed plants, and assists the host countries to implement a self-sustaining nuclear safety improvement program capable of reaching internationally accepted safety practices. The activity supports international nuclear safety cooperation, including participation with international nuclear safety organizations. In this context, it addresses safety and environmental protection issues associated with nuclear materials facilities in the former Soviet Union. This activity originated from U.S. commitments made at the 1992 G-7 Summit to help reduce the risks associated with the continued operation of Soviet-designed reactors.

The 1986 disaster at the Chernobyl nuclear power plant revealed many flaws in the Soviet approach to nuclear power. The reactors and nuclear infrastructures left behind by the Soviet government continue to operate in nine countries. These reactors, including one that still operates at the Chernobyl site, suffer from deficiencies in training, safety procedures, and safety infrastructure. Some problems have been exacerbated by the breakup of the Soviet Union--equipment shortages are commonplace and many nuclear professionals suffer from low or erratic pay. These conditions are in addition to and exacerbated by serious flaws in the designs of some of the reactors. If not corrected, these conditions pose a continued risk of a reactor accident in Ukraine, Russia, Armenia, Kazakhstan, Lithuania, Slovakia, Czech Republic, Hungary and Bulgaria.

If another major nuclear accident occurred, the United States and the international community would be forced to deal with the political, economic and environmental destabilization of politically sensitive regions. This concern led the U. S. Government to conclude that enhancing the safety of Soviet-era nuclear reactors and establishing improved safety infrastructures in the countries that operate them is a vital national security interest of the United States. The U. S. and other Western countries have the technologies and skills to work with these nations to address nuclear safety challenges with a relatively modest investment. Rather than providing billions of dollars in foreign aid to correct all of the problems directly, the safety program helps the host countries structure their nuclear industry to address safety issues, to prevent accidents, and, as their economies improve, to increase their own funding for nuclear safety. These activities are essential to preserving these emerging, democratic, free market economies.

While serving an immediate, national security need, the program also: (1) provides an entry for U.S. industry into the economies of the host countries, which could lead to significant business opportunities in the future; and (2) addresses nuclear safety issues which, if not dealt with, could further erode public confidence in nuclear energy in the United States and other countries. In addition, the program reduces the likelihood of a nuclear accident that could adversely affect our allies and friendly countries in Europe, as well as U.S. military and civilian personnel in these countries.

Nuclear cooperation also provides opportunities for U.S. corporations to make their expertise and capabilities known to other countries, both those needing to upgrade their level of safety and those advanced countries that have their own international nuclear safety programs. Finally, the nuclear cooperation program provides opportunities to encourage other countries to support U.S. nuclear nonproliferation objectives and policies.

## **Program Goal**

# The goal is to reduce the national security and environmental risks of nuclear power plants and nuclear facilities worldwide, especially Soviet-designed reactors, and to assist the host countries to implement self-sustaining nuclear safety improvement programs capable of reaching internationally accepted safety practices. The program supports international nuclear safety cooperation through project activities in host countries and through participation with international nuclear safety organizations. Project activities are focused to address the most significant safety issues in selected countries, including primarily those with Soviet-designed reactors.

## **Program Objectives**

- # A primary objective is to reduce risks at the 65 remaining Soviet-designed nuclear power plants and to assist the 9 host countries to implement self-sustaining nuclear safety improvement programs capable of reaching internationally accepted safety practices without encouraging long-term operation of RBMK and VVER-440/230 type plants.
- # A complementary objective is to facilitate cooperation in nuclear safety worldwide. This includes participation with international nuclear safety organizations such as the International Atomic Energy Agency (IAEA), the European Bank for Reconstruction and Development (EBRD) (Nuclear Safety Account) and the Nuclear Energy Agency (NEA) of the Organization of Economic Cooperation and Development (OECD). Activities emphasize improving safety, including multi-lateral cooperation on the safety of Soviet-designed reactors, the socioeconomic aspects of reactor shutdown, and the environmental aspects associated with nuclear materials, including the effects of the Chernobyl accident, and establishing safety-based nuclear infrastructures, including bilateral cooperation on nuclear safety and environmental centers.
- # Another complementary objective is to reduce the nuclear danger associated with the facilities for the treatment, storage and disposition of highly enriched uranium and plutonium derived from various origins, including dismantled warheads, as directed in the FY 1999 National Defense Authorization Act.
- # The program also assists other Federal agencies that carry out related activities such as the cessation of weapons grade plutonium production in Russia and a variety of projects supporting shutdown of the Chernobyl nuclear power plant and improvement of the nuclear power infrastructure in Ukraine.

## Performance Measures

Activities are divided into key technical areas as follows: management and operational safety projects, engineering and technology projects, plant safety assessments, fuel cycle safety projects, nuclear regulatory and institutional framework projects, and Chernobyl initiatives. Advancements are needed in each of these areas to improve safety in the host countries. The technical areas were selected based upon the results of IAEA studies that summarize and prioritize hazards at Soviet-designed plants. The selection criteria for projects in these technical areas address: priority of safety needs; cost-effectiveness; and host-country commitment to ensure sustainability after U.S. support ends. In addition, work is selected in coordination with other bilateral and internationally sponsored safety programs to ensure U.S. projects complement activities undertaken by others. End point criteria for each specific technical area have been established to ensure that program activities are aimed toward a defined and successful completion.

The following significant accomplishments are planned for completion in FY2000 and will be used to measure performance:

- # Complete full-scope simulator for Russia's Kalinin plant unit 1, and Ukraine's South Ukraine unit 3. Complete Slovakia's Trnava Training Center full scope simulator upgrade.
- # Complete safety parameter display system at Russia's Kursk plant unit 3, and at Ukraine's South Ukraine plant unit 2, Rivne plant unit 3, Zaporizhzhya plant unit 3, and Armenia's plant unit 2.
- # Complete in-depth safety assessment at Russia's Novovoronezh plant.
- # Complete implementation of a configuration management program at Russia's Balakovo plant and at Ukraine's Zaporizhzhya plant.
- # Complete implementation of event analysis and reporting program at Ukraine's Zaporizhzhya plant.
- # Complete transferring training methodology, including implementation of highest priority courses, at all plants in Russia, Ukraine, Lithuania, Bulgaria, and Armenia.
- # Complete improvements in nondestructive examination in-service inspection and safety maintenance technology transfer to the Armenia plant and to plants in Russia and Ukraine.
- # Complete implementation of a reliability database in Russia and Ukraine for use by all plants in those countries.
- # Complete control and protection system upgrade at Lithuania's Ignalina plant unit 2.
- # Complete first safety analysis joint projects with international nuclear safety center in Russia.

- # Identify and initiate technology transfer and cooperative project activities at environmental centers in the U.S. and Russia.
- # Conduct initial nuclear materials safety activities in Russia: training, joint program plan, materials safety masters degree program, and initial safety assessments.
- # Complete an in-depth safety assessment at Russia's Leningrad plant.

## **Significant Accomplishments and Program Shifts**

- # In October 1998, the Department of Energy transferred the Office of International Nuclear Safety and Cooperation to the Office of Nonproliferation and National Security (NN).
- # The Office has the same mission, and also addresses the safety of Russian materials facilities, and coordinates and cooperates on nuclear safety worldwide.
- # Numerous projects have been completed and safety has been improved at plants in eight countries with Soviet-designed nuclear power plants. Many of the projects have reduced risks immediately by decreasing the likelihood of equipment malfunction and operator error. Others promote safety in the long-term by improving technical skills and fostering a culture in which safety is the top priority. Specific accomplishments include:
  - Nuclear training centers were established at the Balakovo site in Russia and the Khmelnytsky plant in Ukraine. U.S.-trained instructors have in turn trained more than 3,000 workers on maintenance, operations, and employee safety.
  - Simulator projects have been completed for training reactor operators: Khmelnytsky unit 1 full scope simulator; Novovoronezh unit 3 analytical simulator; Chernobyl unit 3 analytical simulator. These simulators are critical for training plant personnel to operate the reactors safely.
  - Projects have been completed to improve safety procedures and practices for quality assurance, configuration management, event analysis and reporting, emergency operating instructions, safety maintenance, and nondestructive examination. More than 200 staff members from 14 nuclear reactor sites in Russia, Ukraine, Armenia, Lithuania, Slovakia, Czech Republic, Hungary and Bulgaria have worked with personnel at 12 U.S. nuclear power plants. U.S. specialists transferred technology for developing symptom-based emergency operating instructions to pilot plants in these countries. Symptom-based instructions enable control room operators to stabilize a reactor quickly during an abnormal event. Pipe lathe/weld preparation machines were provided to the five plants with RBMK reactors, enabling workers to cut and replace flawed pipes with precision. Previously, workers cut pipes by hand, increasing the difficulty of welding in a new pipe and thus the risk of subsequent leaks that could lead to a loss-of-coolant accident. Equipment for valve-seat resurfacing, vibration monitoring and shaft alignment, and nondestructive examination was provided also.

- Fire safety equipment was provided to plants in Armenia, Ukraine, Russia and Bulgaria. Russia's Kola and Kursk plants and Bulgaria's Kozloduy plant received backup power systems for emergency shutdowns. Russia's Kursk and Novovoronezh plants have received a mobile pumping unit for emergency water supplies. With U.S. support, Kola personnel have reduced leaks in the radiation confinement system. Bulgaria's Kozloduy plant received thermal imaging hardware that identifies "hot spots" in the plant's electrical system. U.S. and host country experts have defined methodologies for conducting fire hazards analysis at Soviet-designed reactors, and pilot analyses are under way at Russia's Smolensk plant and Ukraine's Zaporizhzhya plant. After U.S. training, companies in Ukraine and in Russia developed the capability to manufacture fire doors that meet international standards.
- Safety Parameter Display Systems (SPDS) enable control room operators to assess abnormal conditions rapidly and take corrective actions. SPDS projects have been completed at Kursk unit 2; Novovoronezh units 3 and 4; Chornobyl unit 3; Khmelnytsky unit 1, Zaporizhzhya unit 5, and South Ukraine unit 1.
- Computer analysis codes and methodologies were transferred to host-country specialists to assess plant safety and set priorities for safety upgrades. Plant analyzers were provided for Bulgaria's Kozloduy plant and for Lithuania's Ignalina plant. International nuclear safety centers in the U.S. and Russia have been established to sponsor projects to improve information sharing and safety improvement.
- At Ukraine's Zaporizhzhya plant, cooling ponds for storing spent fuel rods are nearly full. The Program delivered equipment and trained personnel to build and regulate a safe, modern dry-cask storage system. The system will reduce the need to send spent fuel to Russia for reprocessing, which will alleviate national security concerns, and still allow the plant to operate.
- U.S. and Ukrainian specialists established the International Chornobyl Center for Nuclear Safety, Radioactive Waste and Radioecology in the town of Slavutich, near Chornobyl, to support projects in data analysis, spent fuel management, and reactor closure. Projects have been completed at Chornobyl's operational unit 3 reactor to improve training, safety maintenance, fire protection, and procedures for safer operations.

## Funding Profile

(dollars in thousands)

	FY 1998 Appropriation	FY 1999 Appropriation	FY 2000 Request
International Nuclear Safety .....	70,000	30,000	34,000
<b>Total, International Nuclear Safety <sup>a</sup> .....</b>	<b>70,000</b>	<b>30,000</b>	<b>34,000</b>

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Richland Operations Office					
Pacific Northwest National Laboratory ...	61,500	23,000	25,450	2,450	10.6%
Chicago Operations Office					
Argonne National Laboratory .....	5,100	4,600	6,050	1,450	31.5%
Brookhaven National Laboratory	2,400	1,400	1,500	100	7.1%
<b>Total, Chicago Operations Office .....</b>	<b>7,500</b>	<b>6,000</b>	<b>7,550</b>	<b>1,550</b>	<b>25.8%</b>
All Other Sites <sup>b</sup> .....	1,000	1,000	1,000	0	0.0%
<b>Total, International Nuclear Safety .....</b>	<b>70,000</b>	<b>30,000</b>	<b>34,000</b>	<b>4,000</b>	<b>13.3%</b>

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<sup>a</sup> Total includes funding that the program received from AID for nuclear safety and cooperation activities for Ukraine and Armenia in FY1998 (\$35 million). Total excludes funding that the program may receive from AID for nuclear safety and cooperation activities in Ukraine and Armenia in FY 1999 and FY 2000.

<sup>b</sup> Funding provided to Department of Energy Headquarters, support offices in Paris and Tokyo, other laboratories and miscellaneous contractors.

## **Site Description**

### **Pacific Northwest National Laboratory**

The Pacific Northwest National Laboratory (PNNL) is one of the U.S. Department of Energy's multi-program national laboratories. PNNL is the lead laboratory for the Soviet-designed reactor safety activities. Staff at PNNL provides management, technical, contracting, and administrative support to the program in the areas of Soviet-designed reactor safety and international cooperation.

### **Argonne National Laboratory**

Argonne National Laboratory (ANL) is one of DOE's largest research centers. It is also the nation's first national laboratory chartered in 1946. Argonne occupies two sites. The Illinois site is surrounded by forest preserve about 25 miles southwest of Chicago's Loop. The Argonne West site occupies about 900 acres about 50 miles west of Idaho Falls in the Snake River Valley. Argonne also maintains offices in the Washington, D.C. metropolitan area. ANL oversees the nuclear plant in-depth safety analyses and international nuclear safety center portions of the program.

### **Brookhaven National Laboratory**

Brookhaven National Laboratory (BNL) is a DOE scientific research laboratory located on Long Island, New York. BNL oversees simulator installation and training program implementation.

# **International Nuclear Safety**

## **Mission Supporting Goals and Objectives**

Specific activities at Soviet-designed nuclear power plants and facilities supporting the goals and objectives are described below.

Objectives will be achieved through completion of a series of joint U.S./host country projects in which U.S. technology, equipment, methods and experience are transferred in the areas of training and simulators, operating and emergency procedures, safety maintenance, safety system upgrades, fire safety, reactor safety analysis, and regulatory improvement. U.S. studies show that operator error is a significant factor in nuclear accidents. Most of the projects, especially emergency operating instructions, training, simulators, and safety parameter display systems (SPDS), directly support improving the capability of operators. More than 200 individual projects have been initiated with the participation of 20 Soviet-designed plant sites and include the participation of 46 U.S. commercial companies to provide equipment and technical expertise.

Nuclear training centers have been established at the Balakovo site in Russia and the Khmelnytsky plant in Ukraine. U.S.-trained instructors have trained more than 3,000 workers. Instructors developed and conducted job-specific maintenance and operations courses, along with courses in employee safety and supervisory skills. These instructors will work with U.S. experts to transfer the training methodology and materials to other plants in Russia, Ukraine, and other countries with Soviet-designed reactors.

Simulator projects have been completed for training reactor operators: Khmelnytsky unit 1 full scope simulator; and Novovoronezh unit 3 and Chornobyl unit 3 analytical simulators. Additional simulator projects are in progress at:

- ▶ Kola unit 4 full scope simulator; Balakovo unit 4 analytical simulator and full scope simulator upgrade; Kalinin unit 2 full scope simulator; Bilibino analytical simulator
- ▶ South Ukraine units 1 and 3 full scope simulators; Rivne unit 3 full scope simulator; Zaporizhzhya unit 1 full scope simulator and unit 5 full scope simulator upgrade
- ▶ Trnava training center full scope simulator upgrade

Follow-on activities after completion of simulators include: maintenance and support for initial simulator operations; modification of a simulator to include SPDS capability; and provision of simulator training materials.

Management and operational safety is improved by projects at pilot plants to develop modern safety procedures and practices for quality assurance, configuration management, event analysis and reporting, emergency operating instructions, safety maintenance, nondestructive examination, and use of a reliability database to prioritize activities. More than 200 staff members from 14 nuclear reactor sites in Russia, Ukraine, and Central and Eastern European countries have worked with personnel at 12 U.S. nuclear power plants. U.S. specialists transferred skills for developing symptom-based emergency operating instructions to pilot plants in Ukraine, Russia, and Central and Eastern Europe. Symptom-based

instructions enable control room operators to stabilize a reactor quickly during an abnormal event. Pipe lathe/weld preparation machines were provided to the five plants with RBMK reactors. Previously, workers cut pipes by hand, increasing the difficulty of welding in a new pipe and thus the risk of subsequent leaks that could lead to a loss-of-coolant accident. Valve-seat resurfacing equipment, vibration monitoring and shaft alignment systems and nondestructive examination equipment also were provided

SPDS's enable control room operators to assess abnormal conditions rapidly and take corrective actions. SPDS projects have been completed: Kursk unit 2; Novovoronezh units 3 and 4; Chornobyl unit 3; Khmelnytsky unit 1; Zaporizhzhya unit 5; South Ukraine unit 1. SPDS projects are underway at:

- ▶ Kursk units 3 and 4; Leningrad units 3 and 4; Smolensk units 2 and 3
- ▶ South Ukraine unit 2; Zaporizhzhya units 1, 2, 3, 4 and 6
- ▶ Armenia unit 2.

SPDS projects are planned for South Ukraine unit 3; Rivne unit 3; Leningrad unit 2; and Smolensk unit 1.

Fire safety and other hardware upgrades are provided to selected plants. Equipment was provided to plants in Armenia, Ukraine, Russia and Bulgaria. Russia's Kola and Kursk plants and Bulgaria's Kozloduy plant received backup power systems to supply electricity during emergency shutdowns. Russia's Kursk plant and Novovoronezh plant received mobile pumping units for emergency water supplies. With U.S. support, Kola personnel substantially reduced leaks in the radiation confinement system. Bulgaria's Kozloduy plant received thermal imaging hardware that identifies "hot spots" in the plant's electrical system. U.S. and host country experts have defined methodologies for conducting fire hazards analyses at Soviet-designed reactors, and pilot analyses are under way at Russia's Smolensk plant and Ukraine's Zaporizhzhya plant. After U.S. training, companies in Ukraine and in Russia have manufactured more than 800 fire doors that meet international standards. The doors are for four plants. Safety upgrades are planned for the three Russian plutonium production reactors once they are converted to civilian operations.

Safety analysis activities and safety assessment infrastructure projects will be provided to selected plants. In-depth safety assessments (ISA) are conducted to determine the most significant risks and set priorities for safety upgrades. ISA projects are in progress at:

- ▶ Kola units 1, 2 and 4; Kursk unit 1; Leningrad unit 2; Novovoronezh units 3 and 4
- ▶ Zaporizhzhya plant; Rivne plant; Khmelnytsky plant; South Ukraine plant

Computer analysis codes and methodologies are transferred to host-country specialists to assess plant safety, identify risks, and set priorities for safety upgrades. Plant analyzers were provided to Bulgaria's Kozloduy plant and to Lithuania's Ignalina plant. International nuclear safety centers were established in the U.S. and Russia to sponsor projects to improve information sharing and safety improvements through prompt analysis of potential safety problems. The centers provide a repository of nuclear safety information and maintain a core knowledge base through shared information and leveraged funding

through joint projects. Several projects are underway. Companion centers are planned in other countries, such as Kazakhstan.

At the Zaporizhzhya plant in Ukraine, cooling ponds for storing spent fuel rods are nearly full. The U.S. has delivered equipment and trained Ukrainian personnel to build and regulate a safe, modern dry-cask storage system. The system will reduce the need to send spent fuel to Russia for reprocessing, which will alleviate national security concerns, while still allowing the plant to operate.

The program has reduced risks at Chernobyl's operational unit 3 reactor with projects on training, safety maintenance, and fire protection. U.S. and Ukrainian specialists established the Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology in the town of Slavutich, near Chernobyl. The Center provides technical support to the Ukrainian nuclear power industry and serves as a focal point for international cooperation at Chernobyl. Joint projects in data analysis, spent fuel management, and reactor closure are under way. The plan is for the Center to continue operations on its own after it is fully established.

Nuclear safety regulatory and legislative support is planned for several countries, including Russia and Ukraine, in order to develop a strong and independent regulatory infrastructure in the area of nuclear facilities. Support includes topical workshops and development of technical standards.

Projects are planned to support the restructuring and commercialization of the nuclear industries so that, as economies improve, there will be increased revenues available for nuclear safety upgrades.

The Office supports representation at IAEA, EBRD, and NEA activities. Activities include representation at coordinating committees (e.g., Japan, European Commission, Korea, China), workshops, student exchanges, and support of cooperation offices for U.S. personnel in Paris and Tokyo. Activities will provide technical cooperation and support on a variety of nuclear safety topics to improve safety or to address the environmental aspects associated with nuclear materials from power plants, submarines, and other nuclear facilities. Activities address decommissioning and the effects of the Chernobyl accident.

Activities include establishing international environmental safety centers in the U.S. and Russia. The centers will develop and maintain the infrastructure necessary to manage nuclear facility cleanup, facility conversion to other uses, and waste disposition; and to develop and implement specific environmental safety projects. The centers will be established based on the existing DOE-supported international nuclear safety center model. The centers will focus on cooperative activities to mitigate the environmental effects of our respective defense and civil nuclear programs while contributing to the redeployment of Russian scientists. Addressing critical nuclear-related environmental issues will reduce the risk that they will lead to significant threats to human health or the environment. The centers would also serve as a means for U.S. companies to develop and demonstrate environmental technologies for use at U.S. sites and to demonstrate their capabilities in foreign markets.

Activities also address safety infrastructure. This support will help prevent a repeat of safety problems which developed in the former Soviet Union.

Project activities include conducting a series of workshops on nuclear materials safety management; conducting joint facility safety research, university advanced degree programs and on-site safety management training, and conducting lab-to-site comparative technical studies of safety processes and procedures involving plutonium storage, conversion and transportation.

### Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Total, International Nuclear Safety <sup>a</sup> .....	70,000	30,000	34,000	4,000	13%

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<sup>a</sup> Total includes funding that the program received from AID for nuclear safety and cooperation activities for Ukraine and Armenia in FY1998 (\$35 million). Total excludes funding that the program may receive from AID for nuclear safety and cooperation activities in Ukraine and Armenia in FY 1999 and FY 2000.

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
# Operational safety. Conduct projects at pilot plants to improve quality assurance, configuration management, event analysis and reporting, emergency operating instructions, safety maintenance, nondestructive examination, and reliability database . . . . .	7,185	3,974	4,450
# Training and simulators. Transfer training methodology and highest priority training courses from training centers to other plants at all countries with Soviet-designed plants. Provide simulators or simulator support to selected plants, including simulator training, engineering support, and spare parts for Russia, Ukraine, Slovakia, and Bulgaria. Full scope simulators for Rivne units 2 and 3, South Ukraine units 1 and 3, and Zaporizhzhya units 1 and 5 . . . . .	19,486	880	1,400
# Engineering and technology. SPDSs for Leningrad unit 2, Smolensk units 2 and 3, and Novovoronezh units 3 and 4. Fire safety and other hardware upgrades for Russia and Ukraine: Smolensk, Seversk units 1-2, South Ukraine units 1-3. Battery supply for Ignalina, Balakovo. Ignalina control and protection system upgrade units 1-2. Ignalina electronic module replacement unit 2. Upgrades to Armenia plant: fire safety, cooling ponds, steam isolation valves, and feedwater system . . . . .	15,192	11,026	12,700
# Safety assessment infrastructure. Provide and train in use of U.S. safety codes to evaluate safety issues in all countries with Soviet-designed plants. Kola, Kursk, Leningrad and Novovoronezh safety evaluations. In depth safety assessments for Khmel'nitsky unit 1, South Ukraine unit 1, and Rivne unit 1 . . . . .	12,987	4,500	4,500
# Nuclear safety regulatory and legislative support. Develop an independent regulatory infrastructure for nuclear facilities, including topical workshops and development of technical standards . . . . .	1,150	450	450
# International nuclear safety centers. Complete selected analytical projects and maintain a safety database of nuclear data . . . . .	1,500	1,320	1,650

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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# International nuclear safety activities support and infrastructure. Support Department of Energy representative in Paris at the U.S. Mission to the Organization for Economic Cooperation and Development and the U.S. Embassy in Tokyo to maintain constructive engagement in promoting nuclear safety and curbing nuclear proliferation. Infrastructure support activities, including IAEA, EBRD, and NEA activities; coordinating committees, workshops, student exchanges . . . . .	1,000	1,100	1,200
# Program management and administration. Senior technical management, foreign support offices, financial management, quality assurance, contracts administration, and information and communications products and services . . . . .	5,000	5,000	4,800
# Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology and it's technical branch Slavutich Laboratory for International Research and Technology; project and infrastructure support, monitoring of Chernobyl shelter implementation plan . . . .	0	1,100	1,200
# Kazakhstan safety infrastructure and nuclear safety center, address fuel transfer issues, shutdown and decommissioning planning . . . .	0	500	350
# Chernobyl heat plant . . . . .	3,000	0	0
# International environmental safety centers. Initiate technology transfer and cooperative projects in the U.S. and Russia . . . . .	0	100	800
# Nuclear materials safety. Complete advanced workshops and training on nuclear materials safety, and curriculum for nuclear materials safety graduate degree program in Russia. Complete initial assessment of safety management systems at Russian nuclear materials facilities. . . . .	0	50	500
# Nuclear Fuels Qualification. Project will provide Ukraine the capability to obtain fuel from a qualified U.S. Vendor . . . . .	3,500	0	0
Total, International Nuclear Safety <sup>a</sup> . . . . .	<u>70,000</u>	<u>30,000</u>	<u>34,000</u>

<sup>a</sup> Total includes funding that the program received from AID for the nuclear safety and cooperation activities for Ukraine and Armenia in FY1998 (\$35 million). Total excludes funding that the program may receive from AID for nuclear safety and cooperation activities in Ukraine and Armenia in FY 1999 and FY 2000.

## Explanation of Funding Changes from FY 1999 to FY 2000

	FY 2000 vs. FY 1999 (\$000)
# Engineering and technology. Project to implement safety parameter display system at Leningrad plant unit 2. . . . .	2,350
# Training and simulators. Project to integrate the safety parameter display system capability into the Leningrad plant full-scope simulator. . . . .	500
# International environmental safety centers. Centers will support timely and economic mitigation of several of the world's most unstable environmental sites, and lower the risk of further environmental disasters . . . . .	700
# Nuclear materials safety. Project to reduce the nuclear danger associated with the facilities for the treatment, storage and disposition of highly enriched uranium and plutonium derived from various origins, including dismantled warheads as directed in the FY 1999 National Defense Authorization Act . . . . .	450
Total Funding Change, International Nuclear Safety . . . . .	+4,000

# Security Investigations

## Program Mission

The Security Investigations Program funds background investigations for all DOE federal staff and all Headquarters contractors, who, in the performance of their official duties, require access authorizations for Restricted Data, National Security Information, or special nuclear material. User programs will fund field office requests for background investigations for contractors and non-federal employees who are not included in the Security Investigations Program budget.

## Program Goal

Support the common defense and security of the United States by ensuring that only appropriate personnel are authorized access to classified information, special nuclear material, or occupy sensitive positions.

## Program Objectives

- Ensure the timely and efficient processing and adjudication of initial access authorization requests and reinvestigations.
- Reduce the types and numbers of access authorizations, consistent with DOE mission changes, the downsizing of the nuclear weapons complex, and other classified programs and activities.
- Support development and implementation of an electronic network among DOE field offices, DOE contractors, the Office of Personnel Management (OPM) and other Federal agencies to reduce the overall access authorization processing time.

## Performance Measures

- Conduct approximately 17,379 personnel security investigations and reinvestigations for the total DOE-wide program.
- Reduce the numbers and levels of access authorizations as the programmatic need for them diminishes.

## Significant Accomplishments and Program Shifts

The FY 1998 appropriation for this program was \$30 million - paid through a single decision unit: Security Investigations.

In order to encourage further reductions in the number of security clearances, the cost of investigations requested by the field offices for all contractors and non-federal employees will be allocated to four user

programs. The cost of investigations for all federal employees (DOE-wide) and Headquarters requirements will continue to be allocated to the Security Investigations Program.

### Funding Profile

(dollars in thousands)

	FY 1998 Current Appropriation	FY 1999 Original Appropriation	FY 1999 Adjustments	FY 1999 Current Appropriation	FY 2000 Request
Security Investigations					
Security Investigations . . . . .	30,000	30,000	0	30,000	30,000
Off-sets from Program Organizations . . . . .	0	-20,000	0	-20,000 <sup>a</sup>	-20,000
<b>Total, Security Investigations . . . . .</b>	<b>30,000</b>	<b>10,000</b>	<b>0</b>	<b>10,000</b>	<b>10,000</b>

**Public Law Authorization:**  
Public Law 83-703, "Atomic Energy Act of 1954"

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<sup>a</sup>The Controller's Office notified the Congress that the Department may allocate up to \$35 Million from Program Organizations to fund security investigations. It is not known at this time what will actually be spent by each program.

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Albuquerque Operations Office .....	13,195	9,013	8,429	-584	-6.5%
Chicago Operations Office .....	365	409	246	-163	-39.9%
Idaho Operations Office .....	384	498	476	-22	-4.4%
Nevada Operations Office .....	1,275	506	564	+58	+11.5%
Oak Ridge Operations Office					
Oak Ridge Operations Office .....	2,000	3,083	2,993	-90	-2.9%
Oak Ridge Institute of Sci. & Ed.. .....	250	300	300	0	0.0%
Total, Oak Ridge Operations Office .....	2,250	3,383	3,293	-90	-2.7%
Pittsburgh Naval Reactors Office .....	1,000	1,002	1,234	+232	+23.2%
Richland Operations Office .....	671	826	725	-101	-12.2%
Oakland Operations Office .....	3,750	2,386	2,885	+499	+20.9%
Savannah River Operations Office .....	1,300	2,241	2,387	+146	+6.5%
Schenectady Naval Reactors Office .....	421	436	461	+25	+5.7%
Washington Headquarters .....	5,389	9,300	9,300	0	0.0%
Subtotal, Security Investigations .....	30,000	30,000	30,000	0	0.0%
Off-sets from Program Organizations ..	0	-20,000 <sup>a</sup>	-20,000	0	0.0%
Total, Security Investigations .....	30,000	10,000	10,000	0	0.0%

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<sup>a</sup>The Controller's Office notified the Congress that the Department may allocate up to \$35 Million from Program Organizations to fund security investigations. It is not known at this time what will actually be spent by each program.

## **Site Description**

### **Oak Ridge Institute of Science and Education**

The Oak Ridge Institute for Science and Education (ORISE) located in Oak Ridge, Tennessee, carries out national and international programs in science and engineering education, training, and management systems, energy and environment systems, and medical sciences. ORISE conducts these programs for the U.S. Department of Energy through a management and operating contract with Oak Ridge Associated Universities (ORAU). Established in 1946, ORAU is a not-for-profit consortium of 62 colleges and universities. ORISE supports the personnel security research and analysis activities of the Office of Safeguards and Security. They provide DOE with technical support for implementation, training, operation, and quality assurance of the personnel security process, and a variety of research and analysis activities in support of personnel security function. They also develop and distribute briefing materials as required by the refresher briefing provisions in DOE O 470.1, Chapter 4, "Safeguards and Security Awareness Program. Materials are delivered to all DOE and DOE contractor sites required to provide refresher briefings to employees.

# Security Investigations

## Mission Supporting Goals and Objectives

The Security Investigations Program funds background investigations for DOE federal staff and Headquarters contractors who, in the performance of their official duties, require access authorizations for Restricted Data, National Security Information, or special nuclear material. Security Investigations are required in order to be in compliance with Section 145 of the Atomic Energy Act of 1954, as amended, Title 10, Code of Federal Regulations, Part 710, and Executive Order 12968, which mandate that access authorizations (security clearances) are required for access to classified information or special nuclear material. The Department utilizes the services of the Office of Personnel Management (OPM) to conduct security investigations which serve as the basis for these access authorizations. The cost of security investigations is set by OPM depending on the type and level of investigation needed.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Federal Bureau of Investigations Background Investigations .....	49	49	66	+17	+34.7%
Office of Personnel Management					
Initial Background Investigations .....	4,989	4,940	9,926	+4,986	+100.9%
Reinvestigations .....	21,726	21,666	16,454	-5,212	-24.1%
National Agency Checks .....	576	635	444	-191	-30.1%
Total, Office of Personnel Management .....	27,291	27,241	26,824	-417	-1.5%
Related Security Investigations Activities .....	2,660	2,710	3,110	+400	+14.8%
Subtotal, Security Investigations .....	30,000	30,000	30,000	0	0.0%
Off-sets from Program Organizations .....	0	-20,000 <sup>a</sup>	-20,000	0	0.0%
Total, Security Investigations .....	30,000	10,000	10,000	0	0.0%

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<sup>a</sup>The Controller's Office notified the Congress that the Department may allocate up to \$35 Million from Program Organizations to fund security investigations. It is not known at this time what will actually be spent by each program.

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### Federal Bureau of Investigations (FBI)

<ul style="list-style-type: none"> <li>■ Conduct up to 12 initial FBI background investigations and reimburse the FBI for fingerprint cards and name checks. This represents an increase of 3 cases over FY 1998 and FY 1999 estimates, and allows for gradual cost increases for fingerprint cards and name checks . . . . .</li> </ul>	49	49	66
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### Office of Personnel Management

<ul style="list-style-type: none"> <li>■ Anticipate 3,214 OPM initial (Single Scope Background) investigations in FY 2000. Increase is necessary to meet field office requirements such as the accelerated closure plan at Rocky Flats Environmental Technology Site, accelerated cleanup efforts at Oak Ridge's K-25, Y-12 and Oak Ridge National Laboratory, and the removal of spent fuel in the 100K Basins at Richland. The 1,607 cases projected in FY 1999 and 1,623 cases funded in FY 1998 have proven inadequate to meet program requirements due to developing programs, accelerated cleanup efforts, and an increase in the number of "L" initial upgrades from National Agency Checks to full-field background investigations based on derogatory information uncovered in the initial review of security forms .</li> </ul>	4,989	4,940	9,926
<ul style="list-style-type: none"> <li>■ Perform 10,300 OPM periodic reinvestigations (for Single Scope Background Investigations) in FY 2000. Project 13,800 cases in FY 1999 and conducted 13,848 cases in FY 1998 . .</li> </ul>	21,726	21,666	16,454
<ul style="list-style-type: none"> <li>■ Conduct 3,865 National Agency Checks (NAC's) in FY 2000. Plan to support 5,518 NAC's in FY 1999 and 5,013 NAC's in FY 1998. . . . .</li> </ul>	576	635	444
<b>Total, Office of Personnel Management . . . . .</b>	<b>27,291</b>	<b>27,241</b>	<b>26,824</b>

### Related Security Investigations Activities

<ul style="list-style-type: none"> <li>■ Continue operation and maintenance of the Electronic Transfer Program throughout DOE . . . . .</li> </ul>	2,000	2,000	2,400
<ul style="list-style-type: none"> <li>■ Continue to support Accelerated Access Authorization Program (AAAP) . . . . .</li> </ul>	400	400	400
<ul style="list-style-type: none"> <li>■ Provide support for miscellaneous costs involved in maintaining a viable personnel security program . . . . .</li> </ul>	260	310	310

Other Defense Activities/Nonproliferation and National Security/  
Security Investigations

FY 2000 Congressional Budget

Total, Related Security Investigations Activities . . . . .	2,660	2,710	3,110
Subtotal, Security Investigations . . . . .	30,000	30,000	30,000
Off-sets from Program Organizations . . . . .	0	-20,000 <sup>a</sup>	-20,000
Total, Security Investigations . . . . .	<u>10,000</u>	<u>10,000</u>	<u>10,000</u>

**Explanation of Funding Changes from FY 1999 to FY 2000**

FY 2000 vs. FY 1999 (\$000)
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**Federal Bureau of Investigations (FBI)**

- Federal Bureau of Investigations funding level reflects price increases for provided services . . . . . +17

**Office of Personnel Management**

- Initial Office of Personnel Management (OPM) background investigation estimates are based on specific site and contractor needs. Increase is necessary to meet field office requirements, such as the accelerated closure plan at Rocky Flats Environmental Technology Site, accelerated cleanup efforts at Oak Ridge’s K-25, Y-12, and Oak Ridge National Laboratory, and the removal of spent fuel in the 100K Basins at Richland . . . . . +4,986
- OPM reinvestigation activities have been reduced in order to meet increased initial investigation requirements. A \$20 million off-set from program organizations would be inadequate and additional backlogs could be anticipated . . . . . -5,212
- National Agency Checks are now budgeted for initial "L" clearances only. Changes in the Executive Order 12968 Investigative Standards have revised the reinvestigation requirements for "L" clearances from 5 years to 10 years . . . . . -191

**Related Security Investigations Activities**

- Enhance the Electronic Transfer Program to support additional functionality and security features . . . . . +400
- Total, Security Investigations . . . . . 0

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<sup>a</sup>The Controller’s Office notified the Congress that the Department may allocate up to \$35 Million from Program Organizations to fund security investigations. It is not known at this time what will actually be spent by each program.

# **Emergency Management**

## **Program Mission**

The Office of Emergency Management serves as the point of contact and control for all Departmental emergency management and threat assessment related activities and ensures an integrated response to emergencies affecting Departmental operations and activities or requiring Departmental assistance. The principal mission of the Office is to provide comprehensive, integrated emergency planning, preparedness, and response programs throughout the Department and to provide threat assessment support to the Department's Headquarter and field operations. The Office operates the Headquarters Emergency Operations Center, Communications Center and the Department's emergency communications network; develops and operates reliable capabilities to detect and assess developing emergency situations and threats; provides rapid credibility assessment of nuclear threats and potential smuggling activities; responds to emergencies; and issues all policy and guidance for the Department's emergency programs. This program also operates the HAZMAT Spill Center, which supports the formulation of emergency management policy for hazardous materials and conducts research in partnership with government and industry.

## **Program Goal**

Support the National Security of the United States by ensuring an integrated Departmental response to all emergencies and assessing the credibility of threats and smuggling activities.

## **Program Objectives**

- # Maintain national security and ensure protection of workers, the public, and environment.
- # Execute an integrated Departmental program in support of other U.S. Government agencies for combating terrorism and supporting crisis and consequence management to any terrorist act.
- # Maintain the capability to provide technical advice and assistance to Departmental elements for cost effective implementation of emergency management programs.
- # Develop, maintain, and promulgate policy; planning and preparedness guidance; and readiness assurance activities.

- # Assess threats to DOE personnel, operations, and facilities from foreign and domestic adversaries and provide timely reports.
- # Assess the credibility of nuclear threats received worldwide as well as support efforts for the prevention of illicit nuclear materials trafficking.
- # Operate and maintain the Headquarters Emergency Operations Center, Communications Center and the Department's emergency communications network.
- # Provide program management for operations of the HAZMAT Spill Center program.
- # Maintain emergency programs to minimize adverse impacts on national security and public safety.
- # Promote the Department's emergency policy interests in international fora.
- # Support deployment and operational capabilities of nuclear and chemical dispersal models for emergency planning, preparedness and response to situations involving Departmental operations and activities.

## **Performance Measures**

- # Demonstrate improvement of a comprehensive management system to ensure effective Departmental response to all DOE emergencies.
- # Maintain robust emergency response assets in accordance with Presidential Decision Directive 39, the Atomic Energy act, Executive Order 12656, and Federal Emergency Plans.
- # Conduct twelve (12) emergency management system training and technical assistance conferences and workshops.
- # Conduct three (3) technical threat awareness and two (2) weapons of mass destruction training courses.
- # Conduct six (6) emergency management system technical assistance visits.
- # Conduct four (4) evaluations of Department-wide drills and exercises.
- # Conduct four (4) appraisals of Departmental emergency programs.
- # Conduct thirty five (35) weeks of testing at the HAZMAT Spill Center.

- # Provide situation assessments within one (1) hour after identification of a potential emergency.
- # Support the increased role and visibility of the Department as a leader in the formulation of National Security related policies for combating terrorism and nuclear materials trafficking.
- # Conduct thirty (30) threat assessments.

## **Significant Accomplishments And Program Shifts**

### **Planning and Preparedness**

- # Conducted emergency management system appraisals and evaluated Department-wide drills and exercises.
- # Increased customer involvement in planning, preparedness, and readiness assurance activities.
- # Improved collaborative efforts with Federal, state, tribal and industry entities to prepare for and respond to emergencies involving Departmental operations and activities.
- # Continued expansion of the Headquarters emergency operations center voice, data, and video connection to include additional DOE sites and other Federal agencies.

### **Training and Outreach**

- # Improved operation of DOE's emergency management system and emergency facilities through technical assistance, and enhanced training and assistance workshops.
- # Provided training to the Counter Terrorism Community on national security activities involving weapons of mass destruction.
- # Conducted Threat Awareness seminars for DOE, industry, law enforcement, and Intelligence Community.

### **Response**

- # Provided situation reports and assessments for developing emergencies.
- # Provided assessments of threats to DOE facilities and interests and collaborated with the FBI's National Center for the Analysis of Violent Crime for joint information and data sharing.

- # Provided rapid credibility assessment of any nuclear threats involving nuclear weapons, devices or materials, and supported rapid credibility assessment of potential nuclear weapons or materials smuggling activities.
- # Provided, through the Atmospheric Release Advisory Capability Program, plume modeling and dispersion for radioactive material and chemical agent releases to the atmosphere.

**Counterterrorism**

- # Provided an annual report on illicit nuclear material transactions.
- # Improved support to other U.S. Government agencies in combating nuclear terrorism and providing crisis and consequence management to any terrorist act.
- # Continued leadership role of the Department in the formulation of national security related policies for nuclear materials trafficking.
- # Built upon and leveraged extensive DOE capabilities and assets to ensure effective emergency response to counter terrorism.

**Funding Profile**

(dollars in thousands)

	FY 1998 Current Appropriation	FY 1999 Original Appropriation	FY 1999 Adjustments	FY 1999 Current Appropriation	FY 2000 Request
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Emergency Management					
Operating Expenses.....	20,000	21,000	0	21,000	21,000
Total, Emergency Management....	<u>20,000</u>	<u>21,000</u>	<u>0</u>	<u>21,000</u>	<u>21,000</u>

**Public Law Authorization:**

P. L. 83-703, "Atomic Energy Act of 1954"

P. L. 103-62, "Government Performance Results Act of 1993"

# Capital Operating Expenses & Construction Summary

## Capital Operating Expenses

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$Change	%Change
Operation of HAZMAT Spill Center.....	1,500	1,500	1,500	0	0%
<b>Total, Capital Operating Expenses.....</b>	<b>1,500</b>	<b>1,500</b>	<b>1,500</b>	<b>0</b>	<b>0%</b>

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Chicago Operations Office					
Brookhaven National Laboratory.....	250	300	300	0	0%
Oakland Operations Office					
Lawrence Livermore National Laboratory....	850	950	950	0	0%
Idaho Operations Office					
Idaho National Engineering Laboratory.....	50	0	0	0	0%
Albuquerque Operations Office					
Los Alamos National Laboratory.....	80	30	30	0	0%
Nevada Operations Office.....	9,040	9,500	9,500	0	0%
Richland Operations Office.....	50	50	50	0	0%
Pacific Northwest Laboratory.....	300	300	300	0	0%
<b>Total, Richland Operations Office.....</b>	<b>350</b>	<b>350</b>	<b>350</b>	<b>0</b>	<b>0%</b>
Oak Ridge Operations Office.....	2,320	2,500	2,500	0	0%
Washington Headquarters.....	7,060	7,370	7,370	0	0%
<b>Total, Emergency Management.....</b>	<b>20,000</b>	<b>21,000</b>	<b>21,000</b>	<b>0</b>	<b>0%</b>

Other Defense Activities/  
Nonproliferation and National Security/  
Emergency Management

FY 2000 Congressional Budget

## **Site Description**

### **Brookhaven National Laboratory**

Funding for technical support to the Subcommittee on Consequence Assessment and Protective Actions, which provides technical recommendations on emergency response to radiological and hazardous materials to protect health and safety of workers and the public.

### **Lawrence Livermore National Laboratory**

Funding for nuclear forensics program to develop capability to determine origin of stolen/smuggled nuclear materials and for Atmospheric Release Advisory Capability which provides plume modeling for emergency events, a critical element for protection of workers and public.

### **Los Alamos National Laboratory**

Supports the Emergency Operation Center system, connecting Operations Offices, laboratories, and relevant other Federal agencies by voice, video, and data to ensure cohesive and effective response to emergencies.

### **Nevada Operations Office**

Funding for: threat assessment program, providing a national information resource and capability to assess the credibility of radiological and extortion threats; the HAZMAT Spill Center, a research and demonstration facility available on a user-fee basis to private and public sector test and training sponsors concerned with safety aspects of hazardous materials; and continuing emergency management activities including specialized training for DOE and stakeholders in subject areas such as weapons of mass destruction.

### **Richland Operations Office**

Funding to conduct emergency management training activities to ensure comprehensive response to the spectrum of possible emergencies across the DOE complex.

### **Pacific Northwest Laboratory**

Funding for SPIRE program (Spatial Paradigm for Information Retrieval and Exploration) to apply state-of-the-art analytical tools providing rapid understanding of large textual databases; and for emergency management assistance for technical reviews and appraisals of the Department's emergency management system.

## **Oak Ridge Operations Office**

Funding for technical expert assistance for emergency management system appraisals and training development; for the behavioral assessment program to determine credibility of communicated threats; and for Emergency Management Issues Special Interest Group program, which provides up to date training and information to emergency managers from across DOE complex.

## **Washington Headquarters**

Funding for Emergency Operations Center and Communications Center maintenance and support; support service contractor for Emergency Operations Center and Communications Center; and for maintenance and expansion of communications systems connecting DOE complex and selected other Federal agencies. The Emergency Operations Center and Communications Center are essential for Departmental response to emergencies that may occur at DOE facilities, elsewhere in the United States, and in foreign countries when assistance is requested.

# Operating Expenses

## Mission Supporting Goals and Objectives

The Office develops and implements specific programs, plans and systems to minimize the impact of emergencies on national security, worker and public safety, and the environment. The Office provides overall coordination and consultation regarding the Department's Emergency Management System, including emergency assistance and mobilization under the Federal Response Plan to radiological and non-radiological hazardous materials events, and in the event of malevolent threats and nuclear materials smuggling. The Office promulgates Departmental requirements and implementing guidance, and conducts readiness assurance activities to ensure an effective emergency management system is in place at Departmental facilities. The Office also coordinates inter-agency and intra-Departmental emergency planning, preparedness and exercises, and coordinates with state and local governments, international agencies, foreign governments, and industry on emergency planning, preparedness and exercise issues.

Another mission area is to identify and assess hostile threats to Departmental facilities, interests and personnel, assess the credibility of nuclear threats received world-wide, and support U.S. Government and allied nations efforts for the prevention of illicit nuclear materials trafficking worldwide. The Office operates and maintains the Headquarters 24-hour per day emergency operations facilities and 24-hour communications center for the collection and processing of information relative to emergency notifications. In addition, the Office is responsible for reporting and support of emergency management activities at the Headquarters level. The Office also implements a security program for the protection of Office information, equipment, and facilities.

To effectively implement its mission, the Office develops and maintains capabilities to efficiently integrate and coordinate a Departmental response to all emergencies. The Office provides liaison and coordination regarding operational emergency response activities, ensuring that the Department responds capably to possible emergency situations that may occur at DOE facilities, elsewhere in the United States, and in foreign countries when assistance is requested. Additionally, the HAZMAT Spill Center provides the DOE community, other governmental agencies, and private sector customers with a unique training, testing, and technical center for hazardous materials research relating to emergency management.

These activities are in support of the Atomic Energy Act of 1954, as amended, Presidential Decision Directives 39, 41, 62, 63, and 67, Executive Orders 12656 and 12919, the Defense Production Act of 1950 as amended, Presidential Review Directive 47, and environment related regulations including the Resource Conservation and Recovery Act, Superfund Amendments and Reauthorization Act of 1986, Comprehensive Environmental Response Compensation and Liability Act, and Clean Air Act Amendments of 1990.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	%Change
Emergency Management.....	16,500	17,200	17,200	0	0%
Total, Operating Expenses.....	1,500	1,500	1,500	0	0%
Emergency Operations Support Service Contract.....	2,000	2,300	2,300	0	0%
	20,000	21,000	21,000	0	0%

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY1999	FY2000
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### Emergency Management

#	Operate nation-wide voice, data, and video link-up of DOE Operations Offices and select National Laboratory emergency operation centers, and expand system to include additional laboratories, DOE sites, and selected Federal agencies. Operate the 24-hour Watch Office and Communications Center. ....	4,600	4,700	4,700
#	Conduct planning, training and readiness assurance activities to ensure effective implementation of the Department's emergency management system. Provide emergency management, assessment, and threat awareness training, and assistance workshops to Departmental elements, Federal, state, local, and tribal governments, and international community. Develop new training to meet specific needs. ....	3,300	3,500	3,500

**Other Defense Activities/Nonproliferation and National Security/  
Emergency Management/Operating Expense**

**FY 2000 Congressional Budget**

(dollars in thousands)

FY 1998	FY1999	FY2000
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#	Conduct technical assistance visits to assist Departmental elements in determining program weaknesses and cost effective means for making improvements. Evaluate tests and exercises of Departmental programs to demonstrate effective emergency response. Write after-action reports with findings and recommendations for all emergency situations and exercises involving Office of Emergency Management Staff and ensure follow-up of appropriate corrective actions to enhance the emergency management system. . . . .	1,900	2,200	2,200
#	Respond to natural and man-made disasters to provide damage assessments and technical assistance to state and local governments and industry in restoration of essential energy services and consequence management. Assist in the preparation of State energy emergency plans and prepare situation reports on energy emergencies for senior Departmental officials. . . . .	1,100	0	0
#	Continue to operate the communicated threat assessment program to provide a national capability to assess the credibility of radiological and extortion threats. Continue to strengthen the analytical data base. . . . .	3,100	4,000	4,000
#	Provide support to increase the role and visibility of the Department as a leader in the formulation of national security related policies for nuclear materials trafficking and enhance the nuclear materials trafficking hotline. In support of U.S. Government agencies, maintain data on the flow and composition of nuclear smuggling focusing on the quality of smuggled material, the source of the material, and the intended use of the smuggled material. Enhance operational capability for response to situations to obtain samples of intercepted materials. . . . .	700	900	900
#	Strengthen and expand the Department's support for crisis and consequence management in combating terrorism and nuclear material trafficking. Initiate a program in support of interagency and Departmental exercises to ensure adequate and comprehensive response to counter terrorism. . . . .	1,200	1,300	1,300

(dollars in thousands)

FY 1998	FY1999	FY2000
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#	Expand and integrate the Atmospheric Release Advisory Capability (ARAC) plume modeling for chemical and hazardous materials releases involving Departmental activities. ....	600	600	600
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(dollars in thousands)

FY 1998	FY1999	FY2000
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**HAZMAT Spill Center**

#	Continue user-sponsored spill tests for both government and industry at the HAZMAT Spill Center; provide spill test results to Departmental elements, other government agencies, industry and the general public for use in hazards mitigation and emergency responder training programs . .	1,500	1,500	1,500
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**Emergency Operations Support Service Contract**

#	Staff the 24-hour Watch Office and Communications Center. . . . .	2,000	2,300	2,300
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Total, Emergency Management . . . . .	20,000	21,000	21,000
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# HEU Transparency Implementation

## Program Mission

The Highly Enriched Uranium (HEU) Transparency Implementation program is responsible for ensuring that the nonproliferation aspects of the February 1993 agreement between the United States and the Russian Federation are met. This Agreement covers the purchase over 20 years of low enriched uranium (LEU) derived from at least 500 metric tons of HEU removed from dismantled Russian nuclear weapons. Under the Agreement, conversion of the HEU components into LEU is performed in Russian facilities. The purpose of the program is to put into place those measures agreed to by both sides, that permits the U.S. to have confidence that the Russian side is abiding by the Agreement.

## Program Goal

- # The goal of the HEU Transparency Implementation Program is to support the implementation of United States nonproliferation policy by providing confidence that Russian LEU sold to the United States Enrichment Corporation (USEC) is derived from HEU removed from dismantled Russian nuclear weapons.

## Program Objectives

- # Implement and support transparency monitoring activities in Russia and the United States at each country's uranium processing facilities subject to the Agreement.
- # Collect and analyze monitoring and other information to determine overall confidence that the Russians are converting HEU from dismantled Russian nuclear weapons into LEU.
- # Provide assistance in the development and negotiating of new transparency measures.

## Performance Measures

- # Monitor the dilution of 30 metric tons of HEU to LEU from dismantled Russian nuclear weapons for purchase by the USEC.
- # Conduct 24 special monitoring inspections in Russian facilities and maintain permanent presence offices in Russia to have confidence that the LEU being purchased by USEC has been derived from HEU removed from dismantled Russian nuclear weapons.
- # Maintain the UF<sub>6</sub> flow and enrichment measurement nondestructive assay (NDA) systems at the blend points at two Russian HEU dilution facilities. Collect and analyze resultant information from both sites where such equipment will have been installed.

- # In conjunction with interagency staff, compile and analyze collected data and information into an assessment of confidence of compliance with the nonproliferation objectives of the HEU agreement.

## **Significant Accomplishments and Program Shifts**

### **Program Shifts**

In October 1998, as part of the Office of International Nuclear Safety and Cooperation, the HEU Transparency Implementation Program was moved to the Office of Nonproliferation and National Security (NN). Additionally, the budget request for the Program was moved to Other Defense Activities for FY 2000. Previously, the Program had been funded as part of Uranium Programs. This document represents the first stand-alone funding request for the HEU Transparency Implementation Program.

### **Historical and Planned Accomplishments**

HEU Transparency Implementation activities began in FY 1993 as a result of wording contained in the February 1993 bilateral HEU Purchase Agreement. Significant historical and planned accomplishments are provided below.

- # Provided technical, logistical, and document preparation support for various bilateral negotiation meetings resulting in the bilateral signing of a Memorandum of Understanding on Transparency (1993), a Protocol on HEU Transparency Arrangements in Furtherance of the Memorandum of Understanding (1994), and 16 Annexes to the Protocol governing transparency monitoring activities in both Russia and the U.S. (1994-1997).
- # Conducted six familiarization visits (1993-1997) to four Russian sites where HEU is stored and processed into LEU for delivery to the U.S.
- # FY 1995 through FY 1997 conducted 10 special monitoring visits to three Russian sites. During FY 1998 conducted 13 special monitoring visits to four Russian sites. In FY 1999, plans are to conduct 24 special monitoring trips to four Russian sites. In FY 2000, plans are to conduct 24 special monitoring trips to four Russian sites.
- # In August 1996, opened a permanent U.S. monitoring office in Novouralsk, Russia. The office has a staff of up to four U.S. technical experts. In FY 1999, plans are to include permanent presence staff as members of special monitoring visit teams. A permanent presence office will be maintained in Russia in FY 2000..
- # FY 1995-FY 1997 developed non-intrusive NDA flow and enrichment monitoring equipment for use on process pipes in the three Russian blending facilities. During FY 1997 conducted five technical installation visits to two Russian blending facilities and installed the electronic control units at the blend points. FY 1997-FY 1998 fabricated the flow and enrichment measuring systems for the two facilities and prepared necessary documentation required to obtain a Russian license to allow the equipment to be installed in Russian facilities. During FY 1998, demonstrated at the Paducah Gaseous Diffusion Plant that the monitoring equipment will work on pipes with 1.5 percent UF<sub>6</sub> gas

flow. Plans are to install the equipment in one Russian blending facility in FY 1998-FY 1999 and a second facility in FY 1999. Installation at a third facility will be delayed until after FY 2000 due to budget constraints.

- # FY 1995 started data analysis activities to evaluate confidence that the Russians are abiding by the Agreement. During FY 1997 determined through data analysis that the contents of one container of Russian LEU shipped to USEC did not appear to be derived from Russian HEU. Subsequent discussions with the Russian Government during FY 1997 and FY 1998 led to the exclusion of this container from the HEU Purchase Agreement deliveries.
- # FY 1998 developed a centralized data base and the formation of two assessment teams to evaluate confidence that the Russians are taking HEU from dismantled nuclear weapons and converting it into LEU. Actual accountability and material transfer documents from the Russian facilities are now available for evaluation in conjunction with first-hand monitoring data. In FY 1999 expand access to centralized data base to enhance analysis of data.

## Funding Profile

(dollars in thousands)

	FY 1998 Appropriation	FY 1999 Appropriation	FY 2000 Request
HEU Transparency Implementation .....	0	0	15,750
<b>Total, HEU Transparency Implementation .....</b>	<b>0</b>	<b>0</b>	<b>15,750</b>

In FY 1998 and FY 1999, HEU Transparency Implementation activities were funded through Uranium Programs.

## Funding by Site

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
<b>Albuquerque Operations Office</b>					
Los Alamos National Laboratory .....	0	0	800	800	>999
Sandia National Laboratories .....	0	0	880	880	>999
<b>Total, Albuquerque Operations Office .....</b>	<b>0</b>	<b>0</b>	<b>1,680</b>	<b>1,680</b>	<b>&gt;999</b>
<b>Chicago Operations Office</b>					
Argonne National Lab .....	0	0	810	810	>999
Brookhaven National Laboratory .....	0	0	180	180	>999
New Brunswick Laboratory .....	0	0	610	610	>999
<b>Total, Chicago Operations Office .....</b>	<b>0</b>	<b>0</b>	<b>1,600</b>	<b>1,600</b>	<b>&gt;999</b>
<b>Nevada Operations Office</b>					
Remote Sensing Laboratory .....	0	0	595	595	>999
<b>Oakland Operations Office</b>					
Lawrence Livermore National Laboratory	0	0	7,000	7,000	>999
<b>Oak Ridge Operations Office</b>					
Lockheed Martin Energy Systems .....	0	0	2,800	2,800	>999
<b>Richland Operations Office</b>					
Pacific Northwest National Laboratory ...	0	0	25	25	>999
Washington, D.C. Headquarters .....	0	0	1,000	1,000	>999
<b>Total, HEU Transparency Implementation ....</b>	<b>0</b>	<b>0</b>	<b>15,750</b>	<b>15,750</b>	<b>&gt;999</b>

## **Site Description**

### **Argonne National Laboratory**

Argonne National Laboratory (ANL) is one of DOE's largest research centers. It is also the nation's first national laboratory chartered in 1946. Argonne occupies two sites. The Illinois site is surrounded by forest preserve about 25 miles southwest of Chicago's Loop. Argonne West site occupies about 900 acres about 50 miles west of Idaho Falls in the Snake River Valley. Argonne also maintains offices in the Washington, D.C. metropolitan area. ANL provides the HEU Transparency Implementation program with technical experts to serve as monitors on trips to Russian facilities involved in the conversion of HEU into LEU; technical assistance in the coordination of monitoring activities in Russia; and, in data analysis and confidence assessment of information gathered from monitoring activities.

### **Brookhaven National Laboratory**

Brookhaven National Laboratory (BNL) is a DOE scientific research laboratory located on Long Island, New York. BNL provides the HEU Transparency Implementation program with personnel to serve as monitors on trips to Russian facilities involved in the conversion of HEU into LEU and technical personnel to assist in the analysis of information received from monitoring activities in Russia.

### **Los Alamos National Laboratory**

Los Alamos National Laboratory (LANL) is a DOE weapons laboratory located in Los Alamos, New Mexico. LANL provides the HEU Transparency Implementation program with non-intrusive nondestructive assay equipment for measuring the enrichment of uranium hexafluoride gas in pipes. This equipment is scheduled to be installed in one Russian HEU dilution facility at the end of FY 1998, a second facility in FY 1999, and a third facility after FY 2000 at the current FY 2000 funding level. The equipment once installed will provide continuous monitoring of the enrichment flowing through the pipes. This information will provide high confidence that the Russians are diluting HEU with low enriched uranium to produce reactor grade LEU for shipment to the United States. LANL personnel are also used to prepare technical manuals related to the assembly, operation, and maintenance of the enrichment measurement equipment; training of both Russian and U.S. personnel on the installation, operation and maintenance of the equipment; and, assistance in installing the equipment on the pipes in the Russian facilities. LANL equipment experts are also used as monitors on trips to Russia to ensure that the monitoring equipment is operating properly and as special monitors at weapon component conversion facilities.

### **Lawrence Livermore National Laboratory**

Lawrence Livermore National Laboratory (LLNL) is a DOE weapons laboratory located in Livermore, California and has offices in the Washington, D.C. metropolitan area. LLNL provides to the HEU Transparency Implementation program technical personnel to serve as U.S. monitors to Russian facilities where HEU is converted into LEU; overall coordination for all U.S. monitoring trips; coordination of training courses for personnel to serve as monitors; health and safety monitoring of all

personnel serving on trips to Russia; procurement, maintenance, and technical troubleshooting for hand held nondestructive analysis equipment used for measuring the enrichment of uranium in Russian containers; and, the collection and analyses for all information obtained from monitoring activities to determine the confidence levels that the Russians are abiding by the agreement; provides logistical and technical support for the bilateral Transparency Review Committee meetings, and provides technical support at meetings dealing with transparency issues. They also provide technical support and expertise on the U.S. Portsmouth Gaseous Diffusion Plant and commercial reactor fuel fabrication facilities, subject to the Agreement.

## **Lockheed Martin Energy Systems (LMES)**

Lockheed Martin Energy Systems (LMES) is a DOE contractor with personnel at Y-12 and the Oak Ridge National Laboratory (ORNL) located in Oak Ridge, Tennessee. LMES also provides funding for Lockheed Martin Utility Services personnel at the Portsmouth Gaseous Diffusion Plant located in Piketon, Ohio, and the Paducah Gaseous Diffusion Plant located in Paducah, Kentucky. LMES/LMUS provides technical personnel to serve as U.S. monitors to Russian facilities where HEU is converted into LEU and as permanent presence monitors at the UEIE facility. LMES personnel participate in the training of personnel to serve as monitors and host and conduct training classes at the Y-12 plant. ORNL personnel developed non-intrusive nondestructive assay equipment for measuring the flow of uranium hexafluoride gas in the blending pipes. They are also responsible for the development, procurement, preparation of technical manuals, training of Russian and U.S. personnel, shipment of equipment, licensing in Russia, and installation of non-intrusive flow and enrichment measurement equipment on pipes in the Russian HEU dilution facilities; assistance in the analysis confidence assessment of information obtained from monitoring activities in Russia; and, assistance in hosting Russian monitoring visits to the Paducah and Portsmouth Gaseous Diffusion Plants. They also developed a demonstration test stand for the Flow and Enrichment measurement system and had the system licensed and installed at Paducah to demonstrate the operability and sensitivity of the equipment to be installed in the Russian facilities.

## **New Brunswick Laboratory**

New Brunswick Laboratory (NBL) is a totally owned DOE lab staffed with Federal employees. NBL provides technical experts to serve as monitors on trips to Russian facilities involved in the conversion of HEU into LEU. Being Federal employees, NBL personnel serve as Team Leaders and Heads of Delegation for groups conducting HEU Transparency monitoring activities at facilities in Russia.

## **Oakland Operations Office**

DOE's Oakland Operations Office (OAK) has offices in Berkeley and Livermore, California. Personnel at the Livermore, California office provide contract procurement and administrative oversight on contracts providing logistical and other services to U.S. monitors while conducting monitoring activities in Russia. Specifically, OAK oversees and funds a contract with the Pragma Corporation in McLean, Virginia that provides direct support through the American Business Center in Yekaterinburg, Russia, for U.S. personnel assigned to a permanent monitoring office at Novouralsk, Russia; assistance as needed for U.S. personnel serving on special monitoring visits to Russian processing facilities; and transfer of funds to Russian facilities for reimbursable expenses associated with monitoring activities, including the installation of flow and enrichment equipment on the pipes in the Russian dilution facilities.

## **Oak Ridge Operations Office**

DOE's Oak Ridge Operations Office (ORO) located in Oak Ridge, Tennessee, maintains and provides services as required under the bilateral transparency agreements for a permanent Russian monitoring office inside the secure area at the Portsmouth Gaseous Diffusion Plant and provides support to Russian monitors conducting monitoring activities at the Portsmouth plant. They also provide technical personnel to serve as U.S. monitors to Russian facilities where HEU is converted to LEU.

## **Pacific Northwest National Laboratory**

The Pacific Northwest National Laboratory (PNNL) is a DOE research laboratory located in Richland, Washington. PNNL has provided technical expertise to evaluate the applicability of advance flow technology equipment for use in Russia. PNNL also provides funding for travel costs for a PNNL employee based in Oak Ridge, Tennessee who serves as a technical expert on monitoring trips to Russian facilities involved in HEU to LEU conversion. The PNNL expert also participates in meetings associated with the analysis and confidence assessment of information obtained from monitoring activities.

## **Remote Sensing Laboratory**

The Remote Sensing Laboratory (RSL) is a DOE laboratory located in Las Vegas, Nevada, and has offices in the Washington, DC metropolitan area. RSL provides technical experts to serve as monitors on trips to Russian facilities involved in the conversion of HEU into LEU.

## **Sandia National Laboratory New Mexico**

Sandia National Laboratory is a DOE weapons research laboratory with facilities in Livermore, California and Albuquerque, New Mexico (SNL). SNL provides technical experts to serve as monitors on trips to Russian facilities involved in the conversion of HEU into low enriched uranium (LEU); provides for the procurement, installation, replacement, and disposal of radioactive sources required for operating the flow and enrichment monitoring equipment to be installed in the Russian HEU dilution facilities; construction of secure housings for the enrichment monitoring equipment developed by the LANL; acts as an adviser on appropriate tamper indicating devices to ensure U.S. equipment, in Russian facilities, is not unknowingly compromised; and, coordinates Russian visits to the United States for discussions related to use of U.S. monitoring equipment in Russian facilities and Russian visits to U.S. facilities subject to Russian monitoring activities.

# Highly Enriched Uranium (HEU) Transparency Implementation

## Mission Supporting Goals and Objectives

- # *Provide support to U.S. facilities subject to Russian monitoring* - Under the terms of the Transparency agreements the Russian Federation may conduct monitoring visits to the Portsmouth Gaseous Diffusion Plant (PGDP) and to the five U.S. nuclear fuel fabricators that process material received from Russia subject to the Agreement. Support includes conducting pre-Russian visit trips; preparation of summary reports tracking HEU from Russia through U.S. facilities; providing interpreters for the visits; and maintaining a permanent Russian monitoring office at the Portsmouth plant.
- # *Assist Russian personnel while in the U.S.* - Russia has the right to conduct up to 10 five-day monitoring trips to the U.S. nuclear fuel fabricators each year and up to six visits to the Portsmouth Gaseous Diffusion Plant each year. Additionally, Russia may have up to four individuals staff a permanent monitoring office at the Portsmouth plant. Support includes providing escorts while the Russians are in the U.S. to answer questions, and provide miscellaneous assistance as requested.
- # *Conducting both special and permanent monitoring activities in Russian facilities* - Russian processing of HEU into LEU is being conducted at five processing plants located at four sites. Existing agreements permit the U.S. to conduct up to six special monitoring visits at each site and to have a permanent presence office at three Russian facilities. During FY 1998, one U.S. permanent presence office was maintained at the Ural Electrochemical Integrated Enterprise (UEIE) in Novouralsk, Russia. Activities include maintaining a pool of 200 technical experts that can serve as monitors; training of U.S. personnel serving as monitors, team leaders, and technical installers; coordinating trips to Russia; monitoring personnel's health; and providing necessary monitoring equipment.
- # *Perform analysis and confidence assessments* - Collect, analyze, and evaluate all monitoring information and information from other sources to a confidence assessment of Russian compliance with the Agreement.
- # *Develop new transparency measures* - Evaluate the effectiveness of existing monitoring activities, develop improved measures, and implement improvements as appropriate. Develop, fabricate, and install and use special monitoring nondestructive assay instruments to fulfill monitoring objectives.
- # *Provide support in the development and negotiation of Transparency agreements including providing representation activities* - The addition of new Russian facilities requires the development and negotiation of facility specific agreements governing monitoring activities at those facilities. Problems and differences of opinion in existing monitoring agreements necessitate development of new language and negotiation strategies. The Transparency program personnel provide recommendations on draft language, proposes negotiation strategies, and provide technical and logistical support at bilateral meetings. Interagency coordination of strategies and implementing details is included in this activity.

## Funding Schedule

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Russian Monitoring in the U.S. ....	0	0	1,000	1,000	>999
Technical Support, Management, Health, Data Analysis, Confidence Assessment .....	0	0	3,500	3,500	>999
Permanent Monitoring Office in Russia .....	0	0	4,265	4,265	>999
Special Monitoring Visits to Russia .....	0	0	4,135	4,135	>999
Monitoring Equipment .....	0	0	2,850	2,850	>999
<b>Total, HEU Transparency Implementation .....</b>	<b>0<sup>1</sup></b>	<b>0<sup>a</sup></b>	<b>15,750</b>	<b>15,750</b>	<b>&gt;999</b>

## Detailed Program Justification

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Russian Monitoring in the U.S.</b>			
# Portsmouth PPO Support .....	0	0	500
# U.S. Nuclear Fuel Fabricator Support .....	0	0	250
# Assistance to Russians during monitoring visit .....	0	0	250
<b>Total, Russian Monitoring in the U.S. ....</b>	<b>0</b>	<b>0</b>	<b>1,000</b>
<b>Technical Support, Management, Health, Data Analysis, Confidence Assessment, and Negotiation Support</b>			
# Management .....	0	0	1,200
# Health Monitoring and Analysis .....	0	0	500
# Data Analysis and confidence Assessment .....	0	0	1,000
# Negotiation Support .....	0	0	800
<b>Total, Technical Support, Management, Health, Data Analysis, Confidence Assessment, and Negotiation Support .....</b>	<b>0</b>	<b>0</b>	<b>3,500</b>

<sup>a</sup> In FY 1998 and FY 1999, HEU Transparency Implementation activities were funded through Uranium Programs.

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
<b>Permanent Monitoring Office in Russia</b>			
# Office in Novouralsk, Russia . . . . .	0	0	1,715
# Establish second office in Russia . . . . .	0	0	500
# Local logistical support . . . . .	0	0	500
# Russian facilities' reimbursements . . . . .	0	0	650
# Coordination . . . . .	0	0	500
# Monitoring Training . . . . .	0	0	400
Total, Permanent Monitoring Office in Russia . . . . .	0	0	4,265
<b>Special Monitoring Visits to Russia</b>			
# Plant visits (13 in FY98, 24 in FY99, and 24 in FY00) . . . . .	0	0	2,485
# Russian facilities' reimbursements . . . . .	0	0	250
# Coordination . . . . .	0	0	700
# Monitoring Training . . . . .	0	0	700
Total, Special Monitoring Visits to Russia . . . . .	0	0	4,135
<b>Monitoring Equipment</b>			
# Hand held portable nondestructive assay units . . . . .	0	0	600
# Installation of flow and enrichment units . . . . .	0	0	1,000
# Equipment maintenance and sources . . . . .	0	0	1,250
Total, Monitoring Equipment . . . . .	0	0	2,850
Total HEU Transparency . . . . .	0	0	15,750

## Explanation of Funding Changes from FY 1999 to FY 2000

	FY 2000 vs. FY 1999 (\$000)
Program transferred from the Uranium Programs budget .....	13,600
Increased permanent presence office staff .....	940
Develop equipment for SCH .....	560
Increased cost of Russian monitoring visits .....	650
Total Funding Change, HEU Transparency Implementation .....	15,750

# Nonproliferation and National Security Program Direction

## Mission Supporting Goals and Objectives

The Nonproliferation and National Security (NN) program direction budget provides for all Federal personnel required at DOE Headquarters, and three field offices to carry out the program's mission in a cost effective and efficient manner.

### Program Goal

Provides the salaries and benefits, travel, support service contracts, and other related expenses associated with the overall management, direction, and administration of the following programs:

Verification and Control Technology

- Nonproliferation and Verification Research and Development
- Arms Control and Nonproliferation

Nuclear Safeguards and Security

Security Investigations

Emergency Management

International Nuclear Safety (FY 2000 only)

Highly Enriched Uranium Transparency Implementation Program (FY 2000 only)

Intelligence (FY 1998 and FY 1999 only)

### Program Objectives

- To provide Salaries and Benefits for NN Federal compensation including overtime, awards, lump sum leave payments, transit subsidy, contributions to employee benefits, and associated escalation.
- To provide travel funds that are required to carry out program mission while away from official duty stations, per diem allowances as well as local travel, and to fund the Executive Protection Security Program travel which has been realigned in FY 2000 from the Office of the Secretary of Energy to the Office of Nonproliferation and National Security. Travel is an essential part of staff duties in order to conduct hands-on operations both domestically and internationally, participate in highly technical agency and interagency committees, and to ensure appropriate Government representation in policy meetings.
- To provide Support Services contracts funding for multiple program areas:
  - provide Support Services contracting funding for the Classification/Declassification mission at DOE. Supports review of documents under Executive Order 12958 and Public Law 105-261 and provides funds dedicated to declassification/litigation support review activities to avoid contempt and monetary sanctions under the Freedom of Information Act.

- provide technical, analytical, administrative, and operational support in multiple program areas such as arms control; safeguards and security; emergency management; and research and development. The daily operation and associated technical direction of the contracts remain with Federal program managers in each organization.
- beginning in FY 2000 also provides Support Services for the Department's Critical Infrastructure Protection (CIP) Program.
- To provide Other Related Expenses, including the working capital fund (space, utilities, general printing, graphics, copying, supplies, telephones, etc.), general office automation support, operation and maintenance of equipment, and other miscellaneous services.

### **Performance Measures**

The principle objective of Program Direction is to provide the appropriate level of funding in the four categories supported in this budget: Federal salaries and benefits, travel, support services, and other related expenses.

- The ultimate measure for success in the Program Direction subprogram is whether the Federal personnel in the various programs in Nonproliferation and National Security have their salaries and benefits provided, travel funding is adequate to allow the appropriate amount of onsite supervision by the Federal staff, and the level of support services provided to the Federal staff is adequate to allow NN to perform its programmatic goals and objectives.
- The performance measure for the support of the business line activities funded under the Working Capital Fund (WCF) is to control costs associated with these business lines where possible and to adequately fund these activities through the budget process. NN regularly monitors all business lines funded in the WCF and has reduced, to the extent possible, utilization of services provided through this fund. Further per capita reductions, in keeping with good business practices, in utilization of the services provided through this fund is a performance measure NN sets for itself in this account.

## Funding Schedule

(dollars in thousands, whole FTEs)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
<b>Chicago</b>					
Salaries and Benefits .....	3,803	3,894	4,069	+175	+4.5%
Travel .....	150	150	153	+3	+2.0%
Support Services .....	0	0	0	0	0.0%
Other Related Expenses .....	1,551	1,593	1,627	+34	+2.1%
<b>Total, Chicago .....</b>	<b>5,504</b>	<b>5,637</b>	<b>5,849</b>	<b>+212</b>	<b>+3.8%</b>
Full Time Equivalents .....	54	56	56	0	0.0%
<b>Nevada</b>					
Salaries and Benefits .....	682	621	450	-171	-27.5%
Travel .....	46	46	46	0	0.0%
Support Services .....	352	400	379	-21	-5.3%
Other Related Expenses .....	4	4	4	0	0.0%
<b>Total, Nevada .....</b>	<b>1,084</b>	<b>1,071</b>	<b>879</b>	<b>-192</b>	<b>-17.9%</b>
Full Time Equivalents .....	6	5	5	0	0.0%
<b>Oakland</b>					
Salaries and Benefits .....	0	0	110	+110	+100.0%
Travel .....	0	0	0	0	0.0%
Support Services .....	0	0	0	0	0.0%
Other Related Expenses .....	0	0	20	+20	+100.0%
<b>Total, Oakland .....</b>	<b>0</b>	<b>0</b>	<b>130</b>	<b>+130</b>	<b>+100.0%</b>
Full Time Equivalents .....	0	0	1	+1	+100.0%
<b>Headquarters</b>					
Salaries and Benefits .....	36,825	36,806	34,852	-1,954	-5.3%
Travel .....	2,010	2,048	2,501	+453	+22.1%
Support Services					
Support Services - Other .....	14,170	17,317	15,041	-2,276	-13.1%
Support Services - Declassification ..	7,805	8,509	15,888	+7,379	+86.7%
Support Services - CIP .....	0	0	900	+900	+100.0%
<b>Total, Support Services .....</b>	<b>21,975</b>	<b>25,826</b>	<b>31,829</b>	<b>+6,003</b>	<b>+23.2%</b>
Other Related Expenses .....	15,502	15,512	14,410	-1,102	-7.1%
<b>Total, Headquarters .....</b>	<b>76,312</b>	<b>80,192</b>	<b>83,592</b>	<b>+3,400</b>	<b>+4.2%</b>
Full Time Equivalents .....	338	347	312	-35	-10.1%

(dollars in thousands, whole FTEs)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Total Nonproliferation and National Security					
Salaries and Benefits .....	41,310	41,321	39,481	-1,840	-4.5%
Travel .....	2,206	2,244	2,700	+456	+20.3%
Support Services					
Support Services - Other .....	14,522	17,717	15,420	-2,297	-13.0%
Support Services - Declassification ..	7,805	8,509	15,888	+7,379	+86.7%
Support Services - CIP .....	0	0	900	+900	+100.0%
Total, Support Services .....	22,327	26,226	32,208	+5,982	+22.8%
Other Related Expenses .....	17,057	17,109	16,061	-1,048	-6.1%
Total, Program Direction .....	82,900	86,900 <sup>a</sup>	90,450 <sup>b</sup>	+3,550	+4.1%
Full Time Equivalents .....	398	408	374	-34	-8.3%

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<sup>a</sup> FY 1998 and FY 1999 Appropriation included Intelligence program funding.

<sup>b</sup> In FY 2000 the International Nuclear Safety Program and Highly Enriched Uranium (HEU) Transparency Programs were transferred into the Nonproliferation and National Security Program. Funding for the HEU program was formerly in the Energy Supply Research and Development appropriation.

## Detailed Program Justification

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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### Salaries and Benefits

Headquarters federal staffing is driven by specific functional responsibilities as well as management and direction requirements.

- NN is the focal point within the Department for activities that support the President’s nonproliferation policy, goals and objectives, and activities which assist other Departmental and field elements achieve their missions.
  - The Intelligence program was budgeted for in this account in FY 1998 and FY 1999. The program is transferred out of NN in the FY 2000 budget.
  - Staff directs and manages multiple technology and research and development tasks.
  - NN staff serves as the Headquarters operational element for activities such as emergency management, security, and declassification and classification operations.
  - Staff develops department-wide policy and plans for national security programs such as safeguards and security, declassification and classification. NN is directly responsible for management of the New Brunswick National Laboratory, the Nonproliferation and National Security Institute in Albuquerque, New Mexico, and the HAZMAT Spills Test Facility at the Nevada Test Site.
  - The International Nuclear Safety staff and program, were combined with the NN program in FY 2000. The staff directs and manages multiple projects designed to reduce risks at nuclear power plants worldwide. . . . .
- |  |        |        |        |
|--|--------|--------|--------|
|  | 41,310 | 41,321 | 39,481 |
|--|--------|--------|--------|

### Travel

- Includes domestic and foreign trips necessary to conduct nonproliferation and national security business.

(dollars in thousands)

FY 1998	FY 1999	FY 2000
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- International travel is necessary due to the continuous work with international agencies and the Former Soviet Union republics. Domestic travel includes national security assistance and interface with field offices, laboratories and local governments.
- Nonproliferation issues and program interface also require domestic travel.
- FY 2000 provides travel for the Executive Protection Security personnel. This activity has been realigned from the Office of the Secretary of Energy to the Office of Nonproliferation and National Security (\$366). . . . .

2,206                      2,244                      2,700

**Support Services**

- Provides an invaluable resource of highly specialized and analytical expertise required to meet critical nonproliferation and national security issues.
- Provides support to declassification objectives while ensuring that national security is not jeopardized through inadvertent release of classified nuclear related design information.
- Provides implementation of cost-saving safeguards and security measures, technical, analytical and support expertise essential to a balanced safeguards and security program. Provides technical expertise capable of addressing technology advancements and the dynamic changing environment associated with weapons returns, arms control, and nonproliferation.
- Provides support to objectives of the arms control materials protection, control and accounting program and to provide technical assistance appraisals, emergency response tests and exercises.
- Provides technical analyses and support of future proliferation detection and treaty verification; and to review and assess technology and program status.

(dollars in thousands)

	FY 1998	FY 1999	FY 2000
■ Provides a proactive program that interfaces with the private sector, other government agencies, and the executive branch in establishing mutual support arrangements in the furtherance of the DOE Critical Infrastructure Protection Program. ....	22,327	26,226	32,208
<b>Other Related Expenses</b>			
■ Includes Headquarters space, utilities, general printing, graphics, copying, supplies, telephones, general automation support, payroll outsourcing, postage, and other miscellaneous expenses associated with office operations.			
■ Similar support is provided to the Federally staffed New Brunswick Laboratory.			
■ NN funding for the Working Capital Fund is included in this subprogram. ....	17,057	17,109	16,061
Total, Program Direction .....	82,900	86,900	90,450

## Explanation of Funding Changes from FY 1999 to FY 2000

FY 2000 vs  
FY 1999  
(\$000)

### Salaries and Benefits

- The Intelligence program is not included in the FY 2000 request but was included in the FY 1999 and FY 1998 appropriations. The International Nuclear Safety Program and the Highly Enriched Uranium Transparency Program is budgeted for in the FY 2000 request but not in NN's FY 1999 appropriation. The change is a net reduction in Salaries and Benefits following the transfer out of the Intelligence program, the addition of the International Nuclear Safety Program and the Highly Enriched Uranium Transparency Implementation Program, and some escalation. . . . .
 -1,840

### Travel

- Travel increase is the net result of transfer out of the Intelligence Program and the transfer in of the International Nuclear Safety Program and the Highly Enriched Uranium Transparency Implementation Program, the realignment of the Executive Protection Security personnel travel costs, and a small increase for escalation . . . . .
 +456

### Support Services

- Support Services - Other is a net reduction resulting from the transfer out of the Intelligence program, a reduction to partially fund escalation for federal salaries and benefits, and to fund Executive Protection Security Program travel that has been realigned into the NN program. . . . .
 -2,297
- Support Services - Declassification have been increased to fund implementation of Public Law 105-261 and to support halting the growth of the FOIA backlog.
 +7,379
- Support Services - CIP is an increase to fund the Critical Infrastructure Protection Program. . . . .
 +900

### Related Expenses

- Other Related Expenses have been reduced to partially fund escalation for Federal salaries and benefits, transfer out of Intelligence, and transfer in of HEU and International Nuclear Safety Program. . . . .
 -1,048

Total Funding Changes, Program Direction. . . . .	+3,550
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## Support Services

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Technical Support Services					
Other Support Services . . . . .	12,344	15,059	13,107	-1,952	-13.0%
Declassification and Classification . . . . .	6,634	7,233	13,505	+6,272	+86.7%
Critical Infrastructure Program . . . . .	0	0	700	+700	+100.0%
<b>Total Technical Support Services . . . . .</b>	<b>18,978</b>	<b>22,292</b>	<b>27,312</b>	<b>+5,020</b>	<b>+22.5%</b>
Management Support Services					
Other Support Services . . . . .	2,178	2,658	2,313	-345	-13.0%
Declassification and Classification . . . . .	1,171	1,276	2,383	+1,107	+86.8%
Critical Infrastructure Program . . . . .	0	0	200	+200	+100.0%
<b>Total, Management Support Services . . . . .</b>	<b>3,349</b>	<b>3,934</b>	<b>4,896</b>	<b>+962</b>	<b>+24.5%</b>
<b>Total Support Services . . . . .</b>	<b>22,327</b>	<b>26,226</b>	<b>32,208</b>	<b>+5,982</b>	<b>+22.8%</b>

## Other Related Expenses

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
Working Capital Fund <sup>a</sup> .....	7,308	7,803	7,813	+10	+0.1%
Training .....	291	332	332	0	0.0%
Other <sup>b</sup> .....	9,458	8,974	7,916	-1,058	-11.8%
<b>Total, Other Related Expenses .....</b>	<b>17,057</b>	<b>17,109</b>	<b>16,061</b>	<b>-1,048</b>	<b>-6.1%</b>

<sup>a</sup>The Working Capital Fund is composed of the following sub-parts:

(dollars in thousands)

	FY 1998	FY 1999	FY 2000	\$ Change	% Change
<b>Working Capital Fund</b>					
Rental Space .....	5,437	5,864	5,874	+10	+0.2%
Telecommunications, Utilities and Miscellaneous Charges .....	764	784	784	0	0.0%
Printing and Reproduction .....	295	308	308	0	0.0%
Purchase of Goods & Services and Supplies & Materials .....	291	267	267	0	0.0%
Other Working Capital Fund (includes such business lines as Networking, Electronic Services, Mail Services, Contract Closeouts, and Payroll) .....	521	580	580	0	0.0%
<b>Total, Working Capital Fund .....</b>	<b>7,308</b>	<b>7,803</b>	<b>7,813</b>	<b>+10</b>	<b>+0.1%</b>

<sup>b</sup>Other includes equipment and the operation and maintenance of equipment.