4—Security

4.0 National Security: DOE Mission and Strategic Intent

PNNL will be a leader in national security and homeland defense, applying fundamental sciences to prevent the proliferation of weapons of mass destruction, ensure compliance with international arms control treaties, and protect the nation's critical infrastructures.

The State of Security

In the broadest sense, the strategic objectives of homeland security are to prevent terrorist attacks within the United States, reduce the nation's vulnerability to terrorism, and minimize the damage and recover from attacks that do occur. With those goals in mind, we will concentrate our efforts toward developing and deploying technologies to counter terrorist threats. These efforts include growth in sensor technologies for the detection of chemical, biological, radiological, and nuclear threats (Module 4.2) as well as providing capabilities for protecting cyber and other critical infrastructures. We also will support the DHS and their mission to enhance the security, safety, and reliability of borders and surface transportation systems, and support development of technical standards from detection to assessment to operational requirements. Coupled with growth in the DHS area will be the opportunity for advanced collaboration with the intelligence community.

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The Foundation for National Security S&T Breakthroughs

The foundation of our R&D program in support of DOE's national security mission is through our Defense Nuclear Nonproliferation work, conducted primarily for DOE's National Nuclear Security Administration (NNSA). The Defense Nuclear Nonproliferation mission is vital to the President's high-priority strategic objectives—such as the war on terror, national security, homeland security, and nonproliferation—and will remain so indefinitely. Congressional support for Defense Nuclear Nonproliferation, as reflected in significantly increased appropriations and authority, appears robust and on the rise, though with a few persistent concerns (e.g., percentage of spending in the United States versus Russia; open competition). Our nuclear scientists are leading design enhancements and providing technical oversight for the NNSA tritium production program, while expanding into challenges associated with our aging nuclear stockpile and measuring and detecting nuclear explosions.

Solving Real-World Issues

Significant challenges we are undertaking will help DOE expand its successful Materials Protection, Control, and Accounting (MPC&A) Program and International Nuclear Safety and Cooperation Program to other countries. Our core scientific capabilities have allowed us to expand our leadership role in growing NNSA programs related to radiological dispersal devices, reactor safety upgrades, weapons safety and security exchange, pit disassembly and conversion, and U.S. and Russian metal oxide fuel disposition.

Using PNNL's Capabilities to Counter Terrorism

Our Homeland Security Initiative is a prime example of how the Laboratory's broad scientific and technical capabilities provide value across all DOE mission areas. Working through the DHS's Science and Technology Directorate, we are focusing our technical expertise on developing and deploying the next generation of tools for early detection and prevention of terrorism. We are concentrating on sensors for weapons of mass destruction detection systems, information sciences related to protecting cyber and other critical infrastructures, and enhancing the security of our borders and surface transportation systems (Module 4.5). In support of our S&T agenda with DHS, our Homeland Security Initiative is pursuing a multiyear roadmap focused on technological advancements in detection of chemical, biological, radiological, and nuclear materials, and dynamic analysis of massive, diverse information streams (Module 4.5.1). Building on our homeland security capabilities, we will become a regional focal point of security technologies for the Pacific Northwest.

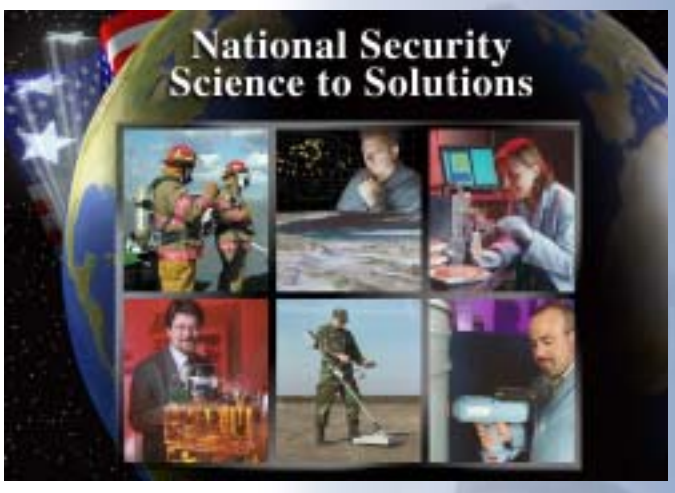
Discovering the Unexpected

Through our programs supporting DOE's Office of Intelligence (IN), we are providing leadership in intelligence assessments surrounding the nuclear fuel cycle and nuclear weapons proliferation and non-nuclear energy security. Our Work for Others (WFO) Program is focused on intelligence analysis of all sources—nuclear, chemical, and biological—and includes information operations intelligence; methods development for integrating information, imagery, and multimedia sources; environmental forensics methodology development; infrared signatures applications; biometrics; small power sources; underground facility detection and characterization; and signatures intelligence in coastal regions (Module 4.6).

Supporting the U.S. Government

Basic and applied research projects within our National Security WFO Program are advancing our fundamental science capabilities in advanced materials and coatings, new sensors, biological and chemical detection and characterization tools, and molecular processes. Our clients include the Defense Advanced Research Projects Agency (DARPA) and the Defense Threat Reduction Agency, as well as the Air Force, Navy, and Army research laboratories (Module 4.6.1).

Our national security mission provides services to the Laboratory, the Hanford Site, and within DOE related to Safeguards and Security (Module 4.2) and Counterintelligence (CI, Module 4.3). Through our relationships with the Departments of State, Justice, and Treasury, we also bring reciprocal value to the Laboratory and DOE missions (Module 4.7).



PNNL is applying fundamental sciences to create innovative solutions in the areas of weapons nonproliferation, compliance with arms control treaties, and infrastructure protection.

4.0.1 National Security Mission Funding and Staff

The National Security Mission area will realize new growth in the intelligence and homeland security business areas.

The recently formed DHS is a significant new client for the Laboratory. New sales growth is expected, beginning in FY 2004, of approximately $50 million. Out-year growth could range from $100 to $150 million per year, contingent upon availability of staff and other resources.

Analytical technology products and R&D services for the U.S. intelligence community will result in 7 to 10 percent growth annually, over FY 2003 actual, reaching an estimated $70 million in revenue in 2010. By taking advantage of our core science and engineering capabilities, our all-source intelligence analyses, insightful scientific investigations, and innovative technology developments are recognized nationally as contributing solutions to gaps in critical national security challenges of concern to DOE's Senior Intelligence Officer, the IN, NNSA, and the other 13 members of the intelligence community.

Some clear pathways for programmatic growth are:

- information sciences related to network forensics and development of network forensic information technology tools
- automated analysis of massive, dynamic data sets and streaming data; military electronics products across the spectrum of needs as utilized by intelligence and special operations forces
- a major DOE-based program for energy security related to non-nuclear energy intelligence
- advanced software systems for automatic registration and calibration of remote sensing imagery, including fusion of diverse image sources as unmanned aerial vehicles and satellite image sources
- specific contributions to radioisotope and conventional small power sources technologies, including continued development of methods for fabrication of extremely high-energy density batteries
- novel "smart" or "functional" materials that aid in fielding highly selective and accurate chemical, biological, and nuclear sensors and networks of sensors.

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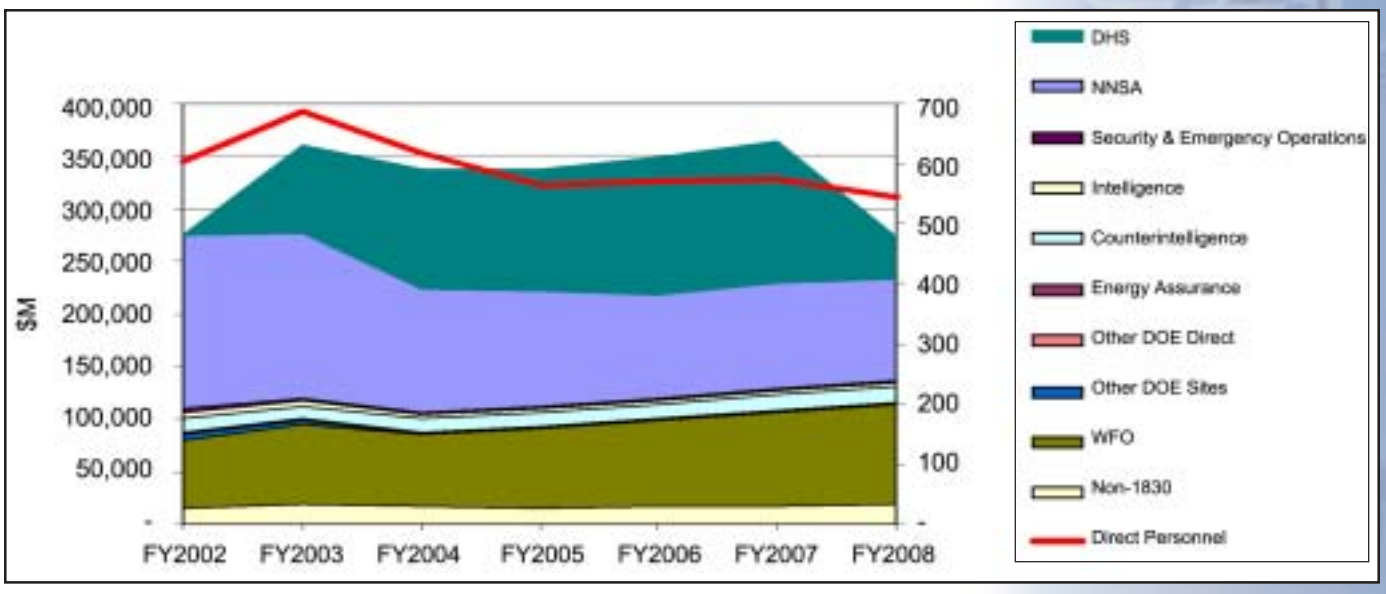
Major Programs Offset Flat Budgets

The DOE Office of Defense Nuclear Nonproliferation (DNN) business will remain flat to slightly declining, with reductions in the International Nuclear Safety Program. This decline, however, will be offset with growth in the MPC&A and Radiological Dispersal Devices (RDD) Program areas. DNN received $1.1 billion for FY 2003 as compared to $3 billion for the previous year, and has requested $1.3 billion for FY 2004. Along with these increased dollar amounts, Congress

recently provided DNN with future work for laboratory support, including authorities for the Elimination of Weapons-Grade Plutonium Program, MPC&A activities outside the former Soviet Union, and international nuclear safety and security cooperation activities worldwide. In addition, DNN appears interested in leveraging additional funds for such programs by implementing recently legislated authority to exchange Russian debt for Russian investment in nonproliferation activities.

Supporting U.S. Armed Forces

Prospects for the DoD business area are stable, but with growth sufficient to offset inflation. Due to the present funding shift to operations from development, DoD business is expecting moderate near-term growth. In the mid-term, transformation and reorganization activities are expected to create strong growth opportunities across our DoD portfolio. Good near-term growth is anticipated in the basic and applied R&D area, driven by long-range needs for new weapons detection technologies, advanced materials, and interest in nanotechnology applications. Moderate growth is expected in the environmental and energy sectors of our DoD clients, driven by regional management issues, range remediation, and base energy efficiency needs. Dramatic growth potential exists in advanced power systems, including fuel cells, small nuclear systems, and advanced solar technology. Defense systems work is fairly flat despite strong growth in logistics systems, as some older long-term programs have ended. Programs related to military applications have the same present trend driven by a switch of funding from development to operations. However, the R&D needs of transformation to a new type of military are starting to impact DoD R&D agendas; strong growth is expected in that area in the next few years.



PNNL National Security mission area funding profile. Declines are projected as funding source changes to DHS.

4.1 Defense Nuclear Nonproliferation Program

PNNL is leading the application of fundamental science, environmental, and energy capabilities to critical U.S. national security challenges of detecting and preventing proliferation of weapons of mass destruction.

Partnering for Peace

Through NNSA sponsorship as well as nongovernment organizations, nonprofit foundations, conferences, and other private venues, we significantly contribute to furthering the nation's goals related to nonproliferation and weapons of mass destruction. Our Defense Nuclear Nonproliferation Program will continue using traditional and nontraditional means to apply its strong S&T base to resolving international nonproliferation problems.

Our scientists and engineers provide leadership in nonproliferation research and engineering, particularly in the area of environmental sensor development for detecting proliferation of weapons. Our core competency in environmental monitoring is now being directed toward nonproliferation and environmental restoration involving development of technologies to monitor and measure all aspects of the plutonium pathway as it relates to nuclear weapons development.

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Reactor Safety

We are carrying out nuclear safety improvements worldwide that reduce risks of terrorism directed against nuclear plants, stimulate the economy of emerging democratic nations, and stabilize host governments. This work contributes to fulfillment of a major international commitment of the United States. Using lessons learned from the successful reactor safety program in the former Soviet Union, we will expand nuclear safety activities into other nations whose nuclear production capabilities are of national security concern.

Warhead Dismantlement

We provide leadership in nonproliferation and international security S&T, particularly in the area of warhead safety and security and international nuclear fuel cycle projects. Through the Weapons Safety and Security Exchange program, we will continue to provide technical leadership in the areas of non-nuclear signatures, information barriers, tags and seals, emergency response, and adaptation of nuclear detection systems to antiterrorism applications. Through partnerships with universities and other laboratories, we will continue to develop new technologies to address treaty verification and transparency (i.e., ensuring that the United States and former Soviet Union nations each have access to the same information about each other for materials under treaty jurisdiction), export control concerns, and arms control verification issues.

S&T Transfer

We provide leadership in international nuclear MPC&A. We will continue to excel at transferring S&T to foreign entities in the areas of material inspection and oversight, training for safeguarding of nuclear facilities, and enhanced regulatory control

of nuclear materials. In particular, we will provide leadership in the development of detection and protection technologies for radioactive materials that could be used for radiation dispersal devices.

Fissile Materials Disposition

We provide significant contributions to fissile materials disposition activities related to plutonium materials. We will provide technical support for the Pit Disassembly and Conversion project through final design and construction. This project involves a unique, first-of-a-kind facility in this country for processing the pit of a nuclear weapon at DOE's Savannah River Site to recover the plutonium for final disposition in the mixed oxide fuel facility. In addition, we will partner with other organizations to address technical issues associated with U.S. and Russian mixed oxide fuel facilities, help develop a strong regulatory framework under which to carry out fissile materials disposition activities, and continue to lead the formulation of international technical agreements associated with plutonium disposition.

Infrastructure Needs

Our leadership role in support of the nuclear nonproliferation mission relies, in part, upon critical infrastructure resources, including a number of radiochemistry facilities and specialized radiation detection and analysis equipment and instrumentation. Our plan for modernizing the PNNL research campus includes two new facilities with state-of-the-art radiochemistry, detection, and analysis capabilities.

Sponsored by DOE's Office of Nonproliferation Research and Engineering, PNNL has developed a highly portable detector using neutron-sensitive scintillating glass fibers. These new detectors can be easily transported by a single person and rapidly deployed to establish a radiation detection capability for nuclear materials and radiological weapons of mass destruction. The ease of use allows simple and fast establishment of detection perimeters around special events at short notice.

4.1.1 Nonproliferation Research and Engineering

PNNL's unique perspective on the "plutonium pathway" will help DOE detect and prevent the proliferation of weapons of mass destruction.

Laboratory Investments Lead to New Opportunities

Our initiatives in infrared sensors, nanotechnology, and nuclear, biological, and computational sciences are providing critical new capabilities to address challenging nonproliferation needs. These investments are a critical element of the nonproliferation research and engineering growth strategy. Returns from investments in the infrared sensor initiative have resulted in a major new program (Remote Spectroscopy); exploiting the capabilities developed through the now completed Imaging Science and Technology Initiative is a key element of the nonproliferation research and engineering growth strategy.

The Next Generation of Scientists and Engineers

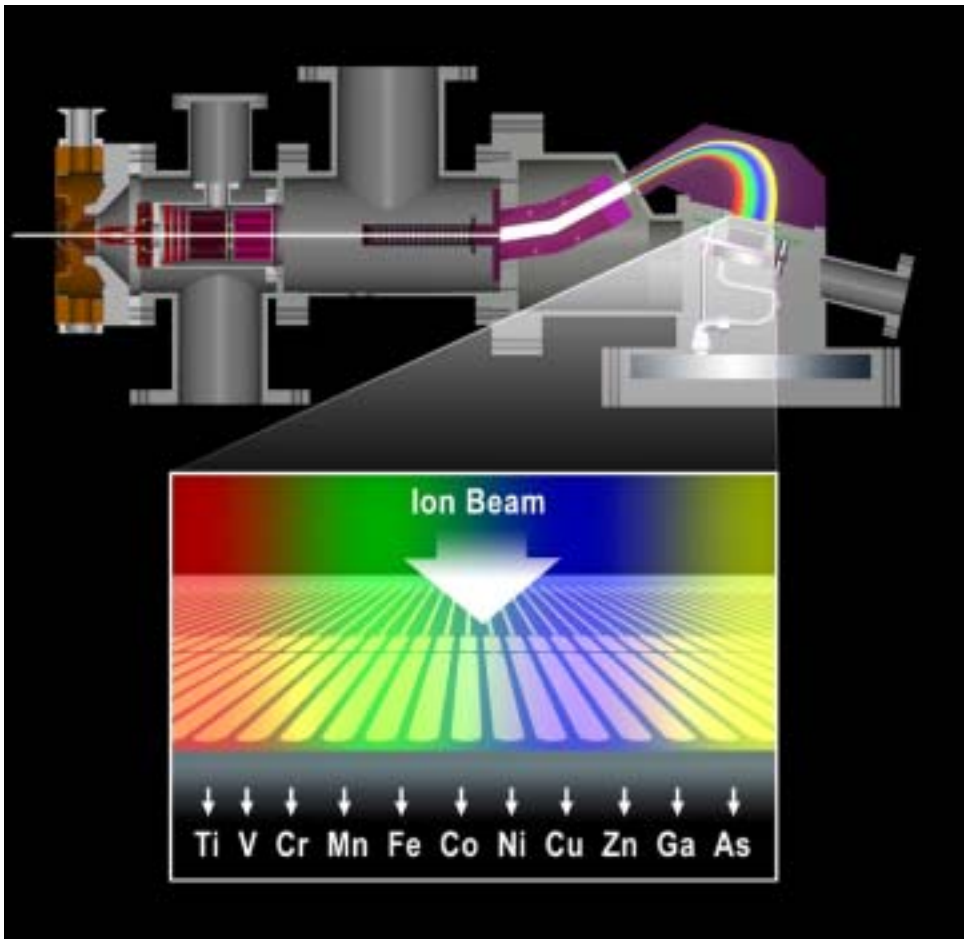
We are partnering with regional universities, such as the University of Washington, to address critical S&T requirements for national security. In addition, working with the universities is critical to developing the next generation of policymakers, scientists, and engineers to work on national security problems and in offsetting the "graying of the workforce" by bringing in new capabilities, insights, and enthusiasm to meet future U.S. nonproliferation needs.

Security

Drawing Upon the Hanford Legacy

Our contributions to resolving Hanford Site legacy issues provide a unique perspective with respect to the plutonium pathway. Plutonium production processes—including fuel fabrication, reactor technology, reprocessing, metal production, and component fabrication—are critical steps in the weapons development pathway and represent the historical mission of the Hanford Site. The legacy of this mission and knowledge of the plutonium production process and signatures is critical to U.S. nonproliferation efforts, as it provides the definitive model for plutonium pathway to nuclear weapons development.

Our core competency in environmental monitoring, a direct outgrowth of the plutonium production mission, is now being directed at nonproliferation and environmental restoration. Expertise in monitoring nuclear processes, developed as part of the Laboratory's plutonium production responsibilities, remains one of our longest standing missions and core competencies. This expertise is brought together to provide an integrated approach for sample collection and analysis, which is based on modeling, sample collection, preconcentration, separations, ultrasensitive measurements, and interpretation of results.



All of the Signal All of the Time (ASAT) is a focal plane detector that can detect and measure a broad range of ion masses simultaneously and rapidly from a small sample. The first significant advance in mass spectrometry detector technology in several decades, the ASAT detector maximizes data retrieval and efficiency. While traditional mass spectrometers provide a keyhole view of a small portion of the spectrum, the ASAT detector opens the door to the entire spectrum.

4.1.2 Nuclear Safety Cooperation Program

By extending its international nuclear safety expertise to a broad worldwide arena, PNNL is furthering the nation's national security goals.

Eliminating Consequences of Terrorist Attacks

Enhanced nuclear power plant safety is reducing the potential for significant consequences from terrorist attacks at nuclear plants, promoting international business development and stimulating local economies, supporting global environmental goals, and helping stabilize host governments. Our researchers are making significant contributions to this effort by developing nuclear power plant safety improvements that directly reduce the risk of significant consequences from a terrorist attack.

Robust safety systems that incorporate state-of-the-art nuclear S&T ensure that an act of terrorism will have minimal impact on a reactor. A key to building a strong, stable, market-based economy is the establishment of a secure business climate. A nuclear power plant with questionable safety risks discourages international investment, thereby slowing the growth into a free market economy for a young democratic nation. The link between economic development and nuclear safety can be shown by the European Union's demand that every former Soviet Union nation operating a nuclear power plant close their unsafe reactors before being allowed to join the European Union.

Security

Nuclear power is a viable large-scale power source that can meet growing energy demands while supporting antipollution goals. However, a major nuclear accident anywhere in the world would affect the future viability of nuclear power everywhere, potentially eliminating this practical solution to one of the earth's most challenging environmental problems. Political analysts cite the Chornobyl crisis as a key destabilizing factor that helped lead to the collapse of the former Soviet Union. A severe nuclear accident anywhere could destabilize the affected country and the surrounding region, causing severe human and economic suffering, just as in Ukraine.

In most countries with growing nuclear power programs, the organizations and professionals that support nuclear power are the same ones who develop nuclear weapons programs. To take advantage of the close organizational, personal, and professional links between nuclear power and nuclear weapons development in most nations, we are establishing a dialogue on nuclear power plant safety that is opening the door for cooperation on nonproliferation activities. The resulting relationships developed within a country's nuclear power infrastructure will enhance our ability to monitor weapons development activities and to influence nonproliferation issues.

Applying Lessons Learned Worldwide

Engagement in nuclear power safety in many regions is vital to the our national security interests because of the presence in those regions of large, unsophisticated nuclear power programs, proliferation threats, and regional instabilities. We are addressing this need by making available to Asian nations the lessons learned from our highly successful reactor safety program in the former Soviet Union (see the figure). In addition to the ongoing work in the former Soviet Union, expansion of nuclear safety activities into China, Pakistan, India, and other nuclear-capable nations will help further the antiterrorism, foreign policy, environmental, and nonproliferation goals set by the United States. These nations must be provided modern nuclear S&T solutions to address the critical problem of nuclear facility safety to ensure that a global nuclear accident never occurs again.

At reactors in Russia and Ukraine, the frequency of minor safety events—a precursor to nuclear accidents—has declined sharply since DOE and PNNL began upgrading nuclear safety in these countries in 1992.

4.1.3 Nonproliferation and International Security S&T Program

By leading the assessment of technical policy options in a wide variety of nonproliferation and arms control problems, PNNL is enhancing global security.

Promoting Safe and Secure Storage of Nuclear Materials

Strengthening international nuclear safeguards is one of DOE's critical program priorities. We provide leadership for international nuclear fuel cycle projects such as the canning and movement of BN-350 reactor spent fuel in Kazakhstan, and the canning and possible disposition of damaged North Korean spent fuel. We are also promoting solutions for maintaining weapons-usable nuclear materials in safe and secure locations, out of reach of possible terrorists or rogue states. Our extensive experience in nuclear materials production, handling, storage, and disposition is being applied to this effort. Application of innovative technical solutions to emerging problems, such as illicit trafficking of nuclear materials and regional security concerns, is contributing to the prevention of proliferation of nuclear weapons.

Solutions Intersecting Policy and Technology

Through contributions to the nuclear Warhead Safety and Security Exchange program, we provide technical leadership in the areas of non-nuclear signatures, information barriers, tags and seals, emergency response, and adaptation of nuclear detection systems to antiterrorism applications. We are building on our partnerships with universities and other laboratories to develop new ideas for verification and transparency while protecting sensitive information.

Security

Science Contributes Solutions to Export Control Problems

The technological capabilities we used in developing nuclear and dual-use export controls are also applicable to export control problems involving chemical and biological proliferation. Work is continuing on expansion of capabilities to prevent proliferation of weapons of mass destruction. On behalf of our government clients, we are engaging in training and capacity building of export control officials worldwide.

Helping Weapons Inspectors Around the Globe

We are providing leadership to important programs of the International Atomic Energy Agency (IAEA), including ongoing programs in Iraq. Our staff are using their experience in nuclear material management and computer applications to continue to develop technological solutions to the problems of an expanding IAEA mandate and a growing international safeguards environment.

Putting Scientific Skills to New Uses

Our scientists are helping economic diversification in the nuclear cities of Russia through the Russian Transition Initiatives program. In one part of this program, former Soviet biological warfare scientists have switched to producing commercial agriculture and pharmaceutical products. We will expand our support of economic diversification by engaging additional scientists who are looking for alternatives to the design and production of weapons of mass destruction.

The Warhead Safety and Security Exchange program at PNNL promotes the exchange of unclassified technical information relating to the safety and security of nuclear warheads and their components during dismantlement, as well as technical information relating to nuclear and radiological counterterrorism. The exchanges under this program strengthen global security by reducing nuclear threats and fostering U.S.-Russian cooperation.

4.1.4 International Nuclear Material Protection, Control, and Accounting Program

Through its management of infrastructure and security projects, PNNL will help DOE develop and implement a strategy encompassing a broad range of activities to ensure the protection of nuclear materials worldwide.

Material Protection, Control, and Accounting

We are applying 50 years of nuclear materials handling experience at the Hanford Site to the challenges created by the nation's heightened concern for terrorism, especially to the potential diversion of weapons-usable nuclear materials. Our innovative thinking and agenda-setting leadership will help ensure international protection, control, and accountability of nuclear materials. In addition, our world-class staff, fundamental S&T capabilities, and facilities are providing a wide range of technical expertise to the safeguarding and protection of nuclear materials in Russia, including physical protection, protective force, and material control and accounting upgrades.

Training the Trainers

We are leading the development of training activities for safeguarding and protecting nuclear facilities in Russia. Building upon our development of training related to the Russian Methodological and Training Center for Material Control and Accounting, and the Interdepartmental Special Training Center for Physical Protection, we provide regional and distance learning capabilities to the Russian nuclear materials complex. Our goal is to create Russian training programs that are robust and self-sustaining.

Security

Developing Inspection Oversight Systems

We are assisting the Russian nuclear regulatory authorities in the development of an enhanced inspection oversight system. Russia also is being assisted in its development of a comprehensive regulatory system, relying on rule of law, and with adequate enforcement capability to ensure that the advances the nation has achieved in material control and accounting and physical protection will be bolstered by an improved, robust regulatory structure. Our contributions to the program include computer systems development skills, project management skills, and extensive regulatory development experience.

Leadership Management

We are training MPC&A program managers in management concepts and principles. Building upon our strength in integration and project management, we will continue to provide expertise to help DOE clients enhance their management of the complex programs of MPC&A, Second Line of Defense, and radiation dispersal device (RDD) protection and consolidation, as a closely coordinated, effective set of nonproliferation programs.

Detecting Radiation Dispersal Devices

We are helping DOE clients integrate and implement a worldwide program to limit the risk of terrorists developing RDDs. Assistance includes applying of S&T to the detection and protection of radioactive materials that could be used for RDDs, and providing expertise to national and international standards development organizations. We manage the development of guidelines to limit the risk of development of RDDs through establishing priorities and methods for protecting and eliminating the hazards of orphaned radioactive materials.

With the Institute of Physics and Power Engineering in Obninsk, PNNL is helping Russia develop the infrastructure to manage its nuclear materials.

4.1.5 Nuclear Nonproliferation's Fissile Materials Disposition Program

PNNL's core capabilities in nuclear science and engineering, process technology, policy and regulatory analyses, and nonproliferation and arms control will enable execution of critical U.S.-Russia plutonium management and disposition agreements in the coming decade.

Treaty Verification

Our technical expertise in process technology, nuclear science and engineering, and nonproliferation and arms control enables us to lead the development of strategies and provide technological solutions to ensure that high-profile international agreements on plutonium disposition will be met. We are the lead author on a multilaboratory paper that outlines how the U.S. government will verify the disposition of 34 metric tons of weapons-grade plutonium in Russia. Similar technologies will have to be deployed in the U.S. plutonium disposition facility. We will support DOE and other government agencies to obtain agreement on the technical approaches for these verification activities. We will lead the development of a suite of technologies that can make the needed measurements—providing life-cycle support from final development to field deployment.

Security

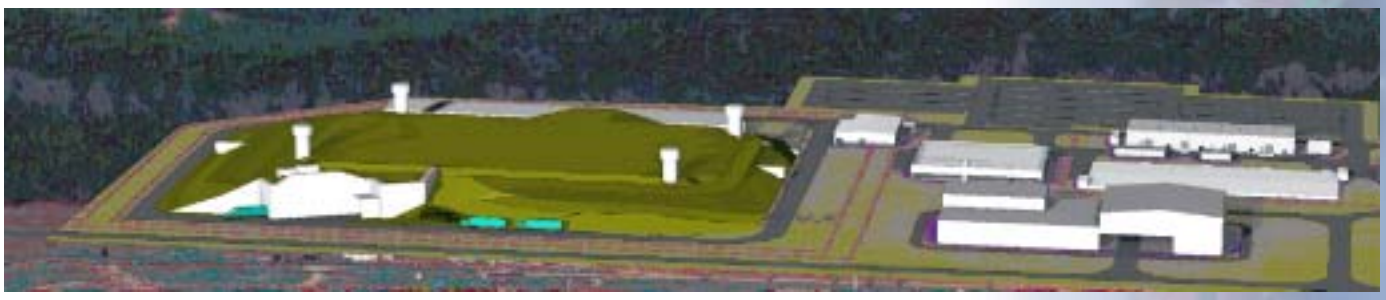
Critical Partnerships

We will provide innovative and flexible approaches in supporting the fissile materials disposition mission via key partnerships with the private sector (primarily architect/engineering firms) and other national laboratories. An example is the partnership with Washington Group International on the Pit Disassembly and Conversion Project. We will continue to provide technical support to the design of this project through final design and construction, including support to the technology maturity evaluations of the Pit Disassembly and Conversion Facility (see the figure) design and providing additional technical support to address maturity issues or gaps in the technology. We will partner with other organizations to address technical issues associated with processing the diverse feed streams scheduled for mixed oxide fuel facilities here and in Russia. We will continue to use our process expertise to identify technology options for waste streams that are not candidates for mixed oxide fuel processing, but that require final disposition.

Regulatory Support

Through our expertise in policy and regulation analysis and nonproliferation and arms control, we are leading joint work with other national laboratories, DOE, NRC, and critical Russian organizations to successfully execute plutonium management and disposition agreements. With the declining infrastructure in Russia and the

need to construct and operate new nuclear facilities to meet the disposition agreements, there is concern related to the environmental, safety, and health regulations that apply or will apply to construction and operation of these facilities. Building on extensive experience with NRC and the safe operation of nuclear facilities in the United States, we will assist DOE with developing the regulatory framework for safe and efficient operation of these facilities, thus ensuring mission success while minimizing additional expense.



In partnership with Washington Group International, PNNL is providing expertise in criticality safety, process chemistry, and nuclear design for the Pit Disassembly and Conversion Facility.

4.1.6 NNSA Office of Defense Programs

We expect future roles in the DOE Defense Program stockpile stewardship mission building on our proven leadership in tritium production and our ability to apply our nuclear capabilities to ensure the safety and reliability of the nation's nuclear weapons stockpile.

Tritium Production Leadership

Building on the success of the tritium production development program, we will continue to provide technical leadership expertise to the program. We will seek to retain the role of design authority for DOE and provide technical oversight for the production program. We will continue to provide design enhancements that reduce costs or improve production of this strategic nuclear material.

Defense Complex Partnerships

We are establishing partnerships within the defense complex to provide technology solutions to problems associated with the need to inspect, test, and certify the aging nuclear weapons stockpile. With the need to continue to certify the stockpile, the aging workforce and infrastructure is a significant DOE Office of Defense Programs (DP) issue. We will team with the defense complex management and operations contractors to provide technologies for inspecting or analyzing weapons and weapons components to assist with the stockpile certification, thus filling gaps created by the loss of critical resources during the past decade.

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Weapons Stockpile Outlook

As DOE manages the nation's aging weapons stockpile, needs may be identified for unique materials or for test monitoring and measurement. We have technological expertise that is well positioned for responding to future DP missions.

Infrastructure Needs

We have been working with DOE on a facility strategy that supports Hanford Site cleanup, maintains the Laboratory's needed radiochemical processing capabilities, and provides the blueprint for our research campus of the future. Examples of the relevance of this effort to our DP work include the following:

- We are currently the technology arm of the Tritium Readiness campaign for DP. We perform all testing on tritium-containing, high-gamma dose materials. This is unique in the DOE complex, as most tritium handling is performed in glove boxes, and most high-level facilities do not handle tritium. With first-of-a-kind production starting this year, it is reasonable to expect some need for testing, particularly since the Tritium Extraction Facility will not begin operating before 2008. This facility is not designed for R&D work, and cannot handle individual tritium rods for examination. If this function is needed, this capability will have

to be maintained or created somewhere at considerable cost to the government. DP is also maintaining the ability to return to testing if so directed by the President. Our considerable expertise with environmental monitoring and trace radiochemical analytical work is directly relevant to this new mission. These capabilities, which we are proposing to maintain in our facility strategy to support other missions, would be available to support testing if needed.

World-class capabilities in nuclear design and materials and process development resulted in the successful deployment of the Tritium-Producing Burnable Absorber Rod.

4.2 Safeguarding and Securing National Security Assets and Government Resources

PNNL topical area expertise in safeguards and security and core technical capabilities in nuclear science and engineering, environmental sciences, and large-scale information integration and management technology will enable the Office of Security to solve national security challenges related to threat identification and mitigation measures for special materials and critical information.

Improving the Reliability and Effectiveness of Threat Identification

Our ability to integrate vulnerability methodologies and technologies will improve the reliability and effectiveness of threat identification and assets characterization to prevent theft of materials associated with weapons of mass destruction and radiological and/or toxicological sabotage. With our extensive domain expertise, we will provide leadership in computer systems design and project management to develop robust systems approaches to emerging threat scenarios.

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Securing Our Critical Infrastructures and Information

We will continue to provide innovative technology solutions for improved and efficient information security and physical protection measures of critical national assets. Building on demonstrated technologies and strong initiatives in infrared sensors and imaging S&T, we will promote solutions to labor-intensive protection measures. Cost-effective technological solutions for maintaining information integrity and asset protection will meet national and international objectives in the changing world.

We will continue to advance state-of-the-art technologies for collection, protection, and use of information critical to the DOE Office of Security mission. We will deploy our expertise in collecting and managing extremely large data sets to provide an integrated approach to the use of readily available information that currently represents an untapped resource. Resulting data will be analyzed to address difficult problems related to policy development and technology deployment.

World Leaders in Training Programs

We are providing topical area expertise in the management, control, and accounting of nuclear materials through successful training, policy analysis, technology, and site assistance programs. Our highly regarded international and domestic control and accountability training development experience will enhance domestic program effectiveness. Our core competency in environmental monitoring will be directed toward detection and monitoring movements of nuclear material through operating facilities or attempts at removal.

Developed by researchers at PNNL, optically stimulated luminescence-based radiation detectors can be used to detect special nuclear materials being smuggled into the country via sea containers. Also known as “smart sensors,” these battery-operated detectors are strategically located inside sea containers and information is collected via wireless personal digital assistants.

4.3 Office of Counterintelligence Support

PNNL will develop an effective counterintelligence program that provides demonstrable value to the strategic missions of DOE, NNSA, and the U.S. intelligence community.

Protecting Freedom

The objective of the DOE national counterintelligence mission is to protect DOE personnel, assets, and programs from hostile foreign intelligence collection, espionage, and international terrorist activities. In support of these goals, we draw from our diverse resources to identify, assess, and neutralize hostile foreign intelligence services and terrorist organizations that are targeting national interests. The following three strategic goals have been defined as essential to the counterintelligence mission:

- Identify hostile foreign intelligence collection and international terrorist activities to address their respective threats against Laboratory staff and programs.
- Identify and eliminate risks of espionage (both traditional and economic).
- Educate staff to recognize hostile foreign intelligence collection and terrorist activities.

It is fundamental to the success of this program that measures be developed and deployed to safeguard DOE classified and sensitive programs, personnel, information, and critical assets from such hostile activities, and that trusted insiders acting on behalf of a foreign intelligence service or terrorist organization be detected and deterred.

Security

A Three-Tiered Approach

Our counterintelligence program uses three distinct organizational elements to execute its commitment in support of DOE's counterintelligence effort. One element consists of an operational group whose primary function is to perform essential counterintelligence responsibilities included in our contract with DOE. A second element consists of nationally based projects that support counterintellegence, specifically, the Inquiry Management and Analysis Capability and its Operational Analysis Center, which provides operational analysis of cyber threats across the DOE complex. The third element within our counterintelligence program provides special support to the DOE Polygraph and Inspection Programs. These three elements are fully funded by the Office of Counterintelligence; their combined annual budget is approximately $15 million. In keeping with national goals to grow a "workforce of excellence," we will continue to staff these activities with highly qualified professionals empowered with up-to-date knowledge and state-of-the-art tools to ensure that the program maintains a focus on the future.

Collectively, this program will meet its strategic objectives by performing counterintelligence investigations, assessments, awareness training, and analysis. We will continue to explore every opportunity for collaboration across the DOE complex and with other agencies in the intelligence community to maximize the success of the program. Further, the counterintelligence program staff realize that trust, confidence, and mutual commitment from all Laboratory staff are vital ingredients in fulfilling these objectives. Consequently, program operational activities emphasize development of effective program awareness initiatives that will result in timely and issue-relevant incident reporting.

New Analytical Processes

Our counterintelligence elements will continue to develop technologies and implement new analytical processes that will aid the DOE complex in the formulation of timely and effective counterintelligence measures. Capitalizing on our experience in supporting the development of the DOE Information and Special Technology Program and Polygraph and Inspection Programs, these activities will be especially directed into the areas of information systems and personnel and program assessments. Advanced analysis capabilities and anomaly detection, particularly with respect to counterterrorism support, emerging cyber threats, homeland security, and critical technology identification, will continue to be priority areas of attention.

We also will regularly provide specially tailored counterintelligence analysis products to DOE and the intelligence community. In preparing these deliverables, our counterintelligence staff will be forward-looking, flexible, and responsive to changing threats. Counterintelligence staff conducting such research will exploit a number of strategic advantages to accomplish their objectives. They will use a wide variety of classified and unclassified databases and systems and work closely with our Field Intelligence Element and Safeguards and Security Services. Through these partnerships and proven capabilities, our counterintelligence program will have access to some of our nation's most advanced intelligence information systems, visualization software, and network intrusion technology.

An effective counterintelligence program leverages the full technical and intellectual capital available at the Laboratory, such as the Operational Analysis Center, which conducts network traffic analysis across the DOE complex. This center capitalizes on technical and analytical expertise from six technical groups across three PNNL directorates.

4.4 Intelligence Mission

PNNL's all-source intelligence analyses, insightful scientific investigations, and innovative technologies will continue to contribute solutions to gaps in critical national security challenges for DOE's IN, NNSA, and the other 13 members of the intelligence community.

DOE's IN, NNSA, and the other 13 members of U.S. intelligence community have growing and urgent needs for all-source technical intelligence analyses and information science tools for analysis, specialized scientific investigations, and a variety of innovative technologies. Our unique capabilities in selected topical areas will contribute to meeting client needs in these and other areas.

Focus On All-Source Analyses

We will broaden our contributions to all-source intelligence analyses. Our core areas of analytical expertise include the nuclear fuel cycle, non-nuclear energy security, and information operations of intelligence interest.

Nuclear Fuel Cycle Assessments

With expertise in nuclear science and engineering, we will continue to fulfill our role as the leading technical analytical group for IN and others for intelligence assessments surrounding the nuclear fuel cycle and associated nuclear weapons proliferation. We are the principal provider of highly technical intelligence assessments for nonweapons intelligence issues; we plan to expand our leadership role with the IN and other federal agencies as the primary expert for such matters.

Security

Information Operations Intelligence

During the past three years, we have expanded our intelligence analysis capabilities to meet the challenges of information networks and related network forensic issues for classified and unclassified sources. Our depth of skills in information S&T has enabled a natural transition from developing information technology tools to applying these and other tools to challenging information operations problems. Building on the success of this capability, three small analytical groups have been established with various agencies in and around Washington, D.C., where massive data visualization tools are being integrated into analytical working groups dealing with intelligence analysis in information operations. We are positioned to:

- Begin establishing a technical support organization for these software systems centered in the Washington, D.C., area.
- Expand the use of these visualization tools to build models of social networks that serve the needs of our diverse set of clients concerned with countering terrorism in all of its manifestations.

Non-Nuclear Energy Security

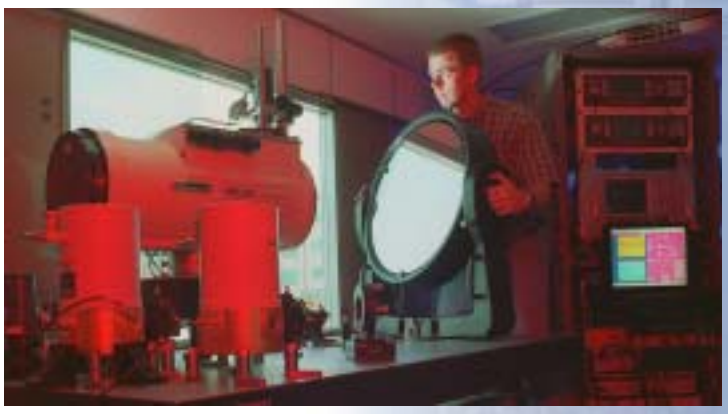
Through close coordination with IN, we will continue leadership of an early-stage multilaboratory program to address growing national concerns over non-nuclear energy issues affecting our secure energy future.

Specialized R&D

- **Development of Methods for Integration of Information, Imagery, and Multimedia Resources** – We develop and apply mathematical algorithms for automatic calibration and registration of geospatial intelligence information and massive data sets associated with information operations, exploitation, and warfare. Such methods are essential for automating registration of imagery from multiple sources and time periods to generate maps and imagery products for use by the intelligence analyst and the soldier.
- **Environmental Forensics Methods Development** – We will continue development of highly accurate laboratory methods for detecting and measuring radionuclides in the environment. Through application of statistical analysis, analytical radiochemistry, and related technologies, we enhance the nation's ability to monitor and respond to nuclear events anywhere. This unique capability provides the U.S. government with an unparalleled radionuclide collection and analysis capability needed to monitor other nations' compliance with nuclear explosion monitoring agreements.
- **Infrared Signatures Research** – Through internal investment, we are growing a new fundamental research capability to develop infrared spectral signatures for a wide variety of chemicals of concern to weapons proliferation, and for use in developing improved sensors and detectors for chemicals of concern.
- **Emerging Technical Challenges in Biometrics, Underground Facilities Detection and Characterization, and Small Power Source Needs** – A broadening cross section of our technical staff are providing innovative solutions to technical challenges related to small power sources for a wide variety of needs, advanced biometrics methods for security of assets, and development of new techniques for detecting and characterizing underground facilities.
- **Signatures in Coastal Regions** – Through a five-year congressionally directed funding supplement, we will expand our role as a developer of signatures intelligence capabilities in littoral or coastal regions at our Marine Sciences Laboratory in Sequim, Washington (Module 5.7).

Resource Requirements

Commensurate with proposed programmatic growth, we have begun internal planning to identify requirements and funding for enhanced secure laboratory facilities, communications, and computing resources to support an expanding classified program base in intelligence, defense, and homeland security mission areas between now and FY 2010.



PNNL researchers are developing advanced infrared sensors for detecting and identifying chemicals related to national security concerns. Spectroscopic techniques are of interest because they can be used for either remote or in situ monitoring. A Cavity Ring Down Spectrometer makes use of an optical cavity composed of two or more high-reflectivity mirrors. The portable spectrometer shown here is designed to detect chemicals at ultratrace levels and will be used in airports and at border crossings for real-time monitoring.

4.5 Department of Homeland Security

PNNL will be the government's most effective national laboratory for bringing advanced S&T to bear on homeland security missions.

Harnessing the Laboratory's Science Base

Achieving the needed levels of security to safeguard our homeland from terrorism without adverse impacts on the economy or individual rights poses enormous scientific and technical challenges. Our scientists and engineers are tackling the most daunting homeland security issues by using our capabilities in advanced chemical, nuclear, and biological detection; analysis and visualization of massive data streams; high-performance computing; and simulation and modeling of complex systems. Our portfolio of R&D initiatives also is providing significant, enabling contributions in many of these areas. We are providing the longer-term science and technology needed for continuous and evolving improvements to homeland security. The S&T are in the following four primary categories:

1. information analysis (early warning)
2. infrastructure protection
3. borders and transportation security
4. emergency management.

We will partner with end-users to apply our science base to counter threats and enhance mission operations. We will engage government, academia, and private sectors in the R&D needed for rapid prototyping and systems developments.

Security

The Next Generation of Tools

DHS clients are turning to us to help create the next generation of tools that will be used by federal and regional agencies for early detection and prevention of terrorism. In response, we are focusing on analyzing complex streams of diverse information using our capabilities in information analysis and visualization with high-performance computing and advanced statistical methods. In the critical infrastructure arena—telecommunications, transportation, oil, gas, banking, and power grids—clients rely on us to ensure the continued operations of physical and cyber-based systems essential to the flow of commerce and government operations. As leaders in the cyber security field, our scientists are developing tools that focus on threat, vulnerability, risk, consequences, and recovery issues. Novel new tools also are being developed to provide simulation and modeling of complex critical infrastructures and their interdependencies.

Protecting our nation's borders as well as air and seaports without impeding the flow of commerce is one of the most pressing issues facing the DHS. Our scientists and engineers are leading two efforts: 1) developing simple and robust, yet sensitive detections systems based on advanced nanomaterials technologies, and 2) leading the development, application, and integration of cost-effective solutions for efficient and effective detection of evolving threats to our borders, such as nuclear, chemical, or biological weapons or devices, or terrorists.

We also are teaming with DOE's Hazardous Materials Management and Emergency Response facility to provide highly effective training for domestic and international border enforcement officials on methods to thwart the smuggling of materials around the world and in our homeland.

Resources

Exceptional programmatic growth in homeland security during the next five years requires critical infrastructure needs for secure computing and communication and a biosafety-level 3 (BSL3) laboratory capability. The application of secure computing to information sciences, modeling, and radionuclide data interpretation enables us to be a leader in each of these areas. State-of-the-art secure communications also allows us to maintain linkages with our various homeland security clients. To expand our leadership position in biosensors, we are proposing to operate a BSL3 laboratory, which permits breakthrough science with specific agents (see the proposed construction project table, Appendix B).

Scientists working in the Homeland Security Initiative at PNNL are developing highly selective adsorbent materials based on target analyte recognition to enable next-generation sampling, preconcentration, separation, and early detection capabilities for trace detection of chemical, biological, and nuclear threats.

4.5.1 Homeland Security Initiative

PNNL's novel "sensors-to-decisions" approach to detecting and preventing tactical and strategic terrorist threats and actions will result in the development of next-generation tools and methods to aid homeland security efforts.

S&T Roadmap

The Homeland Security Initiative is pursuing a multiyear roadmap of scientific and technological advancements leading to next-generation methods and tools for early detection and prevention of terrorism. The technical focus areas leading to these advancements are detection of chemical, biological, radiological, and nuclear materials and the dynamic analysis of massive, diverse information streams. In FY 2004 the scope of the Homeland Security Initiative will expand to include the development of bench-scale prototypes and initial software tools leading to a series of demonstrations. These demonstrations will bring together the results of all the initiative's projects to address three scenarios: 1) attacks on the electric power infrastructure, 2) nuclear or biological contamination in drinking water and marine environments, and 3) early threat detection in a massive stream of intelligence information.

Sensing and Electronic Systems

Security

The sensing and electronic systems aspect of the Homeland Security Initiative is focused on creating greatly improved detection and characterization systems for chemical, nuclear, biological, and radiological materials in geographically large and complex areas such as harbors, airports, sports arenas, and other buildings and structures. In collaboration with the Nanoscience and Technology Initiative and capability development efforts in nuclear S&T, techniques being investigated for material collection and preconcentration include supercritical fluid extraction, molecular imprinted polymers, and carbon nanotubes. Concepts being investigated for collection and sensing mechanisms include immobilized enzymes in porous nanostructures, sorbant nanosurfaces, single-chain antibodies, molecular-imprinted polymers, and single-enzyme nanoparticles. In FY 2004, these collection and capture mechanisms will be combined with optical and mechanical transduction mechanisms to create bench-scale sensing devices.

In parallel with these materials development and sensor creation projects, our staff are developing statistical analysis methods that integrate and exploit the data from multiple sensors. By exploiting differences in the collection and sensing mechanisms at the sensor-physics level and combining that information with information about how hazardous materials might be shipped or disguised, improvements can be made in both probability of detection and reduction of false alarm rates. Eventually, the resulting measurement capabilities will be combined with wireless communication electronics to create robust, field-ready measurement systems.

Predictive Analysis and Decision-Support Tools

The second focus area of the Homeland Security Initiative addresses capabilities needed to create a next-generation suite of predictive-analysis and decision-support tools for early detection of terrorist activities. Creation of these tools requires

pioneering advancements in methods for acquiring and analyzing dynamic information streams of unprecedented scale and complexity. These information streams may contain e-mails, documents, financial transactions, intelligence reports, images, and other information sources. Furthermore, the analysis process itself must change. Next-generation analysis must be done in new ways that engage human analysts and their computer-information-space tools in an interactive, dynamic dialog and investigative discovery process.

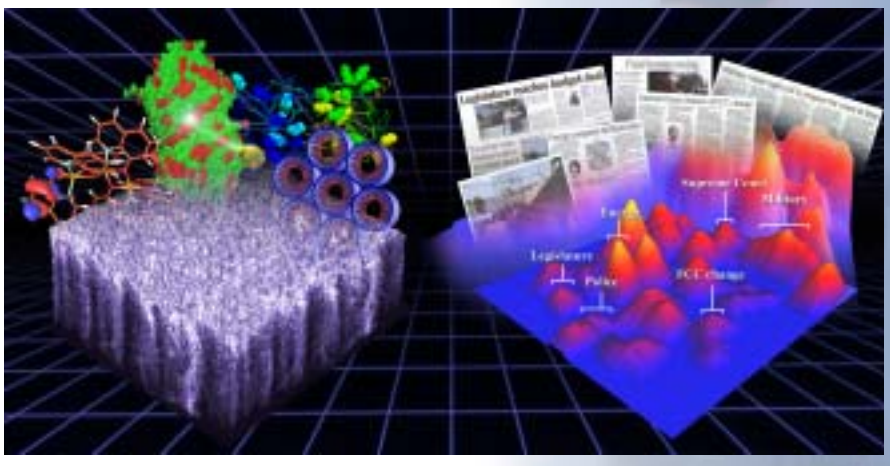
Research supporting these objectives is organized around four scientific themes: 1) automated data ingestion, 2) mathematical signatures and relationship discovery across diverse information types, 3) context and scenario analysis, and 4) visualization and human-information discourse. Portions of the research performed by the Computational Science and Engineering Initiative supports these objectives.

Information Analysis Tools

We are using this investment and a rich legacy of information science achievements to team with government agencies to develop a powerful, next-generation information analysis tool suite for use by federal, state, and local intelligence groups, and security and law enforcement agencies. To ensure that the tool suite can be easily adapted to a wide range of potential applications and end-users, a component software architecture is being used for all software tools. This approach ensures that the tool suite will be open, flexible, and easily adapted to the most complex or to more basic analysis requirements.

While the development of these next-generation information analysis tools and methods is an extraordinary challenge, creating a test bed where the performance of such tools can be evaluated poses an enormous scientific and technical challenge in its own right. As it becomes fully functional over the next one to two years, the Dynamic Information Analysis Laboratory (established in FY 2003 under this initiative) will provide a unique national resource for generating realistic threat information streams and evaluating threat detection algorithms.

In addition to their mission focus, the capabilities resulting from this initiative will have far-reaching impacts and benefits. The achievements in smart materials, sensors, and sensor-fusion methods are expected to benefit programs in environmental characterization, nuclear nonproliferation, intelligence, and process control. The investments in dynamic information analysis, visualization, and knowledge discovery will greatly strengthen our recognized national leadership in these areas and substantially increase our international recognition as well. In an information-rich, but often knowledge-starved age, the potential benefits and impacts of these advancements outside their original application domain are ubiquitous. Many diverse areas, including information-intensive scientific investigations, social sciences, human health and disease control, and commercial requirements could all benefit greatly from the advancements made by this initiative.



From clusters of atoms to clusters of information, the Homeland Security Initiative is developing breakthrough information analysis capabilities that will enable federal, state, and local agencies to more effectively detect and prevent terrorism.

4.6 National Security Work for Others

PNNL will be a leader in development and application of fundamental sciences to detect, identify, interdict, and investigate chemical, biological, radiological, and nuclear threats smuggled across international borders, and to characterize, respond to, and recover from incidents involving weapons of mass destruction that occur outside the United States. We also will be the preferred source of criminal forensics and investigative support technologies for the U.S. law enforcement community.

Expanding Our Global Visibility

For the past several years, the U.S. Department of State has relied on us to:

- Develop and deploy advanced sensor technologies to detect weapons of mass destruction.
- Equip and train border enforcement officials from central and eastern Europe and the former Soviet Union to interdict and investigate those threats.
- Instruct first responders from five countries—The Philippines, India, Israel, Uzbekistan, and Kazakhstan—on the identification and mitigation of chemical, biological, and radiological threats.

We intend to increase the offerings from these successful programs, making the equipment and training accessible to a greater number of enforcement officials and first responders within more countries.

Security

To accomplish these objectives, we will actively participate on international standards committees, at conferences and forums, and with intergovernmental organizations, such as the IAEA. We will offer enforcement officials and first responders the latest knowledge, more effective techniques, and innovative technologies. We also will use delivery and learning approaches that will increase student access to training, ensure consistency of training content, add value to the learning experience, and reduce the cost of training delivery. For example, a cognitive approach to "e-learning" will exploit computer-based and distance-learning technologies. Through interactive, experiential learning, a student's performance is improved by facilitating the acquisition and retention of knowledge, skills, and capabilities.

Forensic Tools

The successful investigation and prosecution of crimes require, in most cases, the collection, preservation, and forensic analysis of physical, trace, and digital evidence. We will continue to tap into our fundamental science base to provide the law enforcement community with unique or specialized scientific analytical capabilities and investigative support tools and techniques. For example, we are drawing on our core competencies in the chemical sciences and statistics to identify diesel fuel

fraudulently adulterated with nontaxable materials. The approach uses gas chromatography and pattern-matching algorithms to interpret assays of diesel samples. The results provide sufficient evidence for the U.S. Department of Treasury's Internal Revenue Service to thwart related criminal activities designed to avoid the payment of excise taxes. This work is being performed in partnership with the Laboratory for Chemometrics at the University of Washington.

We will continue to develop new scientific techniques, protocols, and equipment for performing analyses of forensic evidence with greater speed, sensitivity, and selectivity. We also will investigate ways to more clearly express statistics that often accompany evidence in trials. The statistical complexities are generally confusing and misunderstood by judges, jurors, and sometimes even by the experts themselves. Our intent is to enable federal, state, county, and city agencies with law enforcement responsibilities to perform their duties more effectively and efficiently, and to increase their solved crime and prosecution rates.

Partnering for Success

By applying the capabilities of multiple scientific disciplines and collaborating with scientists at other institutions, we will encourage our research staff to think creatively and pursue more innovative approaches. We also will establish industrial and market partnerships early in the development process to ensure that the resulting technology is rapidly prototyped, appropriately packaged and supported, and made commercially available to the law enforcement community in a timely and cost-effective manner.

The majority of our clients are federal government entities that are aligned with our market sectors. However, a number of unaligned government entities either directly or indirectly support national security functions and missions. They include various elements and agencies within the Departments of State, Justice, and Treasury.

Scientists at PNNL are using gas chromatography and pattern-matching algorithms to interpret assays of diesel fuel samples for the U.S. Department of Treasury's Internal Revenue Service to detect evasion activities designed to illegally avoid the payment of excise taxes. The pattern-matching capabilities are being developed in partnership with the University of Washington.

4.6.1 Department of Defense WFO

PNNL's work for the broad spectrum of DoD clients enhances all of the Laboratory's S&T capabilities for DOE missions.

From Science to Solutions

Basic and applied research programs for DoD science clients employ and improve our fundamental science capabilities in areas such as advanced materials and coatings, new sensor concepts, biological and chemical detection and characterization tools, and unique research in molecular processes. Our clients include the Defense Advanced Research Projects Agency (DARPA), as well as Air Force, Navy, and Army research laboratories.

Innovative Solutions for Energy

Within the energy arena, we provide DoD clients that have infrastructure and operating force needs with innovative technology solutions in power conversion, fuel cell and micro reactors, and heating and cooling technologies that range from the size of a pencil eraser to a breadbox. We also develop unique energy systems for buildings and vehicles, and power grid analysis resources. As a DOE lead laboratory for the Federal Energy Management Program, we provide analysis and services to DoD clients involving the use of advanced cost and energy conservation technologies in their infrastructures.

Security

Solving Environmental Challenges

The pressing environmental challenges faced by DoD clients range from salmon-recovery issues and detecting and removing unexploded ordinance to characterization and remediation of sites. Our scientists and engineers perform applied environmental research under the Strategic Environmental Research and Development Program that creates new technology options for both DoD and DOE. We also define the science base for DoD clients who balance a diverse array of issues, such as environmental impacts, power generation, irrigation, military operations, and endangered species in regional watersheds and at defense sites.

There are many parallel programs between our robust national security work for DOE and for the armed forces. These areas include infrared sensors; nuclear, chemical, and biological detection and decontamination; cyber technology; information analysis systems; and meeting defense needs in homeland security and countering terrorism. Army, Navy, and Defense Threat Reduction Agency clients also draw upon our unique skills to solve problems in advanced materials, specialized sensor and electronics, radar imaging and smart radio frequency tags, logistics systems, and prognostic and diagnostics tools.

From basic research and energy to environment and national security, scientists and engineers are drawing upon capabilities in all of PNNL's mission areas to solve critical DoD issues.

4.7 Mission-Critical Infrastructure Resources

We must maintain and update our capabilities to address compelling national security challenges.

Maintaining Critical Capabilities and Facilities

To support defense nonproliferation mission objectives, we must provide critical radiological capabilities, establish classified intranet and Internet computing capabilities, invest in classified high-performance computing, and continue investments in core facility infrastructure at the Richland and Seattle, Washington, campuses.

High-Performance Computing

Efforts are under way to install and have operational by early FY 2004 a 64-gigaflop-cluster computer in the 3760 Building vault to support high-performance classified computing. This capability will allow processing of classified information at a high rate (24 hours a day, 7 days per week). To address projected growth at the Seattle campus, alternative office space leases are being considered. Several potential locations are under consideration that can enhance our proximity to strategically important private sector entities, provide long-term growth space, add improved facility infrastructure capabilities, and include appropriate space to allow establishment of limited area offices and computer laboratories to support classified program activities as business needs warrant.

Security

Supporting Growth

PNNL needs additional office and computational space to support continued growth on the Richland campus. Specifically to meet continued demands for additional classified laboratory workspace, a $2 million capital project to renovate the 329 Building C-Section is proposed for FY 2004. This project would add more limited area laboratory and office space through renovation of currently underused/inefficiently used spaces in the facility to support continued growth and expansion of current programmatic activities related to our radiation detection and analysis and radiochemistry capabilities. PNNL also proposed renovation of a 331 Building laboratory to add BSL3 capability.

Investing in Classified Facilities

To support special programs mission objectives, we will make classified facility infrastructure investments at the Sequim, Seattle, and Richland, Washington, campuses to either establish or increase limited area, Secured Compartmental Information Facility (SCIF), and classified intranet and Internet computing capabilities. Efforts are under way to install classified networking capabilities through use of the DoD Secret Internet Protocol Router Network (SIPRNet)

at the Sequim and Richland facilities. Additional SIPRNet access terminals can be added at other facility locations on both campuses as programmatic needs warrant and funding becomes available. To increase classified processing capabilities at Sequim, conceptual design efforts are under way to convert a 1100-square-foot area in the Marine Sciences Laboratory 5 building to accommodate a small SCIF, additional limited area offices, and a classified conference room. These modifications would be funded by Battelle.

PNNL needs the resources and infrastructure to continue growing, evolving, and adapting to meet a variety of national homeland security mission needs. For example, at the Marine Sciences Laboratory (shown in picture) in Sequim, Washington, PNNL is increasing its classified processing capabilities by developing a conceptual design for converting an area of one of its buildings into a Secured Compartmental Information Facility, additional limited area offices, and a classified conference room.