

GLOBAL SECURITY & NONPROLIFERATION PROGRAMS MISSION STATEMENT AND FACT SHEET

MISSION

The Oak Ridge National Laboratory (ORNL) Global Security & Nonproliferation Programs (GS&N) develop, coordinate, and assist in implementing domestic and international policy aimed at reducing threats—internal and external—to the United States from weapons of mass destruction (WMD). The primary focus is reducing the proliferation of nuclear materials and nuclear weapons and radioactive materials that could be used in radiological dispersal devices (RDD).

BACKGROUND

The proliferation of nuclear materials and nuclear weapons poses a strategic threat to the United States. Through its nonproliferation programs, the ORNL GS&N is a primary contributor to policy efforts to detect, prevent, and reverse the proliferation of WMD and RDD. The GS&N supports a range of activities related to national security, spanning research and development activities through technology deployment and technical assessments. Activities include work related to chemical sciences and technology; metals and ceramics; instrumentation and controls; engineering technology; biology and health sciences; computational physics and mathematics; energy, robotics, and process systems; solid state physics; physical security assessments; and system analysis and deployment.

ROLE

ORNL is actively involved in several programs to reduce proliferation and radiological threats. These programs cover a broad spectrum of activities from weapons dismantlement to physical protection upgrades, all with the goal of preventing proliferation and reducing the global risk posed by inadequately secured nuclear and radiological materials. The overall goal of the GS&N is to open channels of communication among organizational structures and coordinate and focus efforts to enhance ORNL's role in nonproliferation and threat reduction.

Dismantlement and Transparency (D&T)

The Dismantlement and Transparency Program focuses on two main areas. U.S. and Russian scientists work together under laboratory-to-laboratory contracts to better understand and enhance the safety and security of nuclear weapon dismantlement in both countries. This effort also supports development of new technologies to counter nuclear terrorism. The other area involves the monitoring of blenddown operations as agreed to in the US/RF Highly Enriched Uranium Purchase agreement.

Warhead Dismantlement Transparency

In the programmatic area of Warhead Dismantlement Transparency, ORNL provides scientific expertise primarily to support the National Nuclear Security Administration's (NNSA's) Future Nuclear Initiatives (FNI) and the Warhead Safety and Security Exchange Agreement (WSSX). FNI focuses on the safe and secure storage of fissile materials and transparent monitoring of nuclear warheads for future bilateral treaties, and WSSX provides advanced technologies to detect, prevent, and mitigate the effects of unauthorized or terrorists' use of nuclear, radiological, or high explosive weapons. The WSSX agreement allows U.S. and Russian scientists who have expertise to design and produce nuclear weapons to work together under laboratory-to-laboratory contracts to better understand and enhance the safety and security of nuclear weapon

dismantlement in both countries as well as to identify new technologies to counter nuclear terrorism. ORNL's expertise in advanced active and passive radiation detection methods supports both of NNSA's FNI and WSSX nonproliferation policies.

Highly Enriched Uranium (HEU) Transparency

This program supports the Highly Enriched Uranium (HEU) Purchase Agreement between the United States and the Russian Federation. The agreement currently calls for the United States to purchase 500 metric tons (MT) of HEU (as low-enriched uranium [LEU]) from dismantled nuclear weapons. These purchases span a 20-year period with the product being used to fuel light-water reactors in the United States. Through calendar year 2005, approximately 260 MT has been converted and shipped to the United States. The program participants are able to assure themselves that both sides are abiding by the terms of the agreement through on-site monitoring, data exchanges, and the use of continuous nonintrusive monitoring equipment, ensuring that the U.S. nonproliferation goals are met.

Export Control (EC)

The EC Program, whose history spans three decades in the U.S. Department of Energy (DOE) Oak Ridge facilities, focuses on technical support for national and international export control as a key part of U.S. national security and foreign policy. Primary emphasis is on nuclear and nuclear dual-use materials, equipment, and technologies. However, the technical base of the Oak Ridge facilities is also applied to establish technical definition and advice for national and international actions pertaining to risks from all WMD, including nuclear, chemical, and biological, along with their associate delivery means. GS&N expertise is also used to identify high-proliferation-risk equipment being removed in the dismantlement of DOE and NNSA nuclear weapons and other sensitive nuclear process facilities to avoid inadvertent release to malevolent parties. The EC Program also provides technical assessments to the interagency review process involving transit of proliferation-sensitive commodities and technical reachback support to the U.S. export enforcement community. The EC Program regularly shares its expertise through the training it carries out at DOE's or NNSA's direction for personnel from the United States and from friendly foreign governments.

International Safeguards

The International Safeguards Program supports U.S. initiatives to increase the effectiveness and efficiency of the international verification regimes, which provide the international community independent assurances that countries are in compliance with their own nonproliferation commitments. The program (1) provides technical expertise in implementing international safeguards at nuclear-related facilities in the United States; (2) supports DOE's cooperation agreements with key foreign safeguards organizations; (3) assists with the implementation of more effective materials accounting and physical protection systems at foreign installations and (4) develops, tests, and evaluates strengthened safeguards measures to be applied globally by the International Atomic Energy Agency (IAEA). Additional technical support is provided directly to the IAEA via the U.S. Program for Technical Assistance to IAEA Safeguards funded by the U.S. Department of State.

Material Protection, Control, and Accounting (MPC&A)

ORNL's MPC&A Program teams with Russian facilities to secure the weapons-usable nuclear materials, help improve safeguards and security systems at the facilities, and improve their nuclear material accounting systems. ORNL provides technical support in an effort to supply the Russian nuclear facilities with safe and secure transportation, both truck and rail, to carry weapons-usable nuclear materials and

nuclear weapons. ORNL supports to the Material Consolidation and Conversion project by monitoring the down blending of HEU to LEU. ORNL staff provides technical oversight by serving as project leads at multiple Russian defense and civilian nuclear facilities. These project leads oversee the physical protection and material control and accounting upgrades at the respective Russian facilities. The MPC&A Program is considered the first line of defense in preventing Russian weapons and weapons-usable nuclear material from leaking to rogue nations and terrorist groups.

Nonproliferation Research & Development Program

The Nonproliferation R&D Program, sponsored by the Office of Defense Nuclear Nonproliferation (NA-20) Office of Research and Engineering (NA-22) develops tools, technologies, and techniques to reduce threats to national security and world peace posed by nuclear weapons proliferation and to assist in fulfilling U.S. commitments for treaty monitoring. For example, the program demonstrates and validates fieldable prototypes for radiation detection systems that detect proliferation. Most of the technologies developed are intended to support the operational needs of other U.S. government agencies. This program fills the critical middle ground between fundamental research and near-term acquisition.

Russian Plutonium Disposition Program (RPDP)

This program supports the 2000 U.S.-Russian agreement for the disposition of weapons-grade plutonium no longer needed for defense purposes. Under the now-expired 1998 agreement, this program focused initially on the development of enabling technologies in Russia to irradiate plutonium-bearing fuel in nuclear power plants. The current longer-term focus is on the implementation of the 2000 agreement through construction of Russian fuel fabrication facilities and the modification of Russian nuclear power plants to carry out the plutonium disposition mission. ORNL's major roles are supporting NNSA in the areas of (1) fuel design, qualification, and fabrication and (2) reactor design, safety, and modifications. ORNL also supports the program in the development of (1) Russian nuclear safety regulatory infrastructure, (2) a regime for monitoring and inspection, (3) cost analyses, and (4) the technology for a possible longer-term usage of the Gas-Turbine Modular Helium Reactor in the disposition of additional plutonium withdrawn in the future from defense purposes.

Second Line of Defense (SLD)

SLD is a worldwide national security activity of DOE to strengthen the capabilities of partner countries to deter, detect, and interdict illicit trafficking in special nuclear materials and other radiological materials at international border crossings, seaports, and airports. ORNL has been tasked by DOE since the inception of cooperation with the Russian Federal Customs Service in 1998. Responsibilities have included strengthening of training of personnel by the Russian Service and analysis of equipment and operations in other worldwide locations. ORNL is the technical lead for worldwide efforts to assess operational effectiveness of monitoring systems in partner countries that invite DOE assistance.

Security Technology Development and Deployment

Faced with increasing security threats while having limited resources available to address those threats, the DOE and NNSA are implementing several technology-based initiatives to effectively fulfill security missions. ORNL works jointly with DOE and NNSA sites to identify, evaluate, procure, develop, and deploy security technologies that enhance the capabilities and responsiveness of protective forces and improve site-wide security systems. Improving the core capabilities of the protective force—including mobility, lethality, command and control, and survivability—will avoid significant manpower increases that would otherwise be required to conform to DOE's Design Basis Threat (DBT) Policy. ORNL successfully leverages projects with other government agencies and works cooperatively with private industry to ensure the economical deployment of security technologies. ORNL also supports DOE's

national security mission by providing security expertise to assist field elements in planning site protection strategies. ORNL has long been recognized for its ability to provide technology solutions and lessons learned across DOE, resulting in cost effective deployments that improve the security posture at DOE and NNSA sites.

United States Plutonium (USPu) Disposition

This program supports the 1998 and 2000 U.S.-Russian agreements for the disposition of weapons-grade plutonium no longer needed for defense purposes. A dual-option program was initiated in 1998 to immobilize part of the plutonium inventory and to burn part of the plutonium inventory as reactor fuel. An implementation consortium was contracted in 1999 to process the powdered plutonium feed material into reactor fuel assemblies for disposition in U.S. commercial reactors. In 2001, the immobilization option was dropped to concentrate on the reactor option. The major Oak Ridge facilities' roles include support for DOE in (1) fuel design and qualification; (2) fuel fabrication facility design and licensing; (3) reactor modification design, safety, and relicensing; and (4) fresh fuel packaging and transportation. Post-irradiation examination of the mixed-oxide lead test assemblies will be performed at ORNL in 2008 and 2010. ORNL also supports DOE in the nuclear safety regulatory infrastructure, the technology for conversion of plutonium metal into oxide, impurity removal of plutonium oxide feed, and economic analyses of various options for these tasks.

Defense Threat Reduction Agency (DTRA) Support

ORNL is directly and indirectly supporting the DTRA mission, primarily to the Cooperative Threat Reduction (CTR) directorate that is responsible for the implementation of the Department of Defense's Cooperative Threat Reduction Program. The mission of the CTR Program is to prevent the proliferation of WMD and related materials, technologies and expertise from former Soviet Union (FSU) states, complementary to the goals of the NNSA's MPC&A Program. Two major programs utilize unique ORNL expertise and knowledge in disciplines such as physical protection, risk assessment, operational sustainability, and transportation security. The Nuclear Weapons Storage Security (NWSS) Program supports U.S. proliferation prevention objectives by increasing the security of nuclear weapons during storage in Russia at Ministry of Defense sites. The Nuclear Weapons Transportation Security (NWTS) Program supports proliferation prevention objectives by enhancing the security of nuclear weapons by the Russian Federation Ministry of Defense during shipment across Russia. ORNL involvement includes provision of unique expertise and technologies, procurement of Russian-designed and -fabricated equipment, and program enhancements through approved Work for Others agreements.

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