



International Security News

International Security Programs
Dori Ellis, Director

Focus on the DTRA-SNL Partnership

From the Director



On August 18, 2001, the Russian people commemorated the tenth anniversary of the attempted coup by renegade leaders of the Soviet Union. That failed coup accelerated the demise of the Soviet Union and plunged the world into the post-Cold War era. That same year the US Congress, led by an initiative of Senators Sam Nunn and Richard Lugar, launched a revolutionary new program of assistance to Russia and the other states of the former Soviet Union. The Nunn-Lugar Safe, Secure Dismantlement (SSD) legislation of November 1991 was intended to assist those newly formed states, then bankrupt, in meeting the obligations of the Strategic Arms Reduction Treaty (START I). The Congress tasked DOD's Defense Nuclear Agency (DNA) to execute the SSD program in Russia, Belarus, Ukraine, and Kazakhstan.

Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories quickly became key strategic partners with DNA in its mission defined by the SSD legislation. Sandia's International Security Programs group worked with DNA to enhance the safety and security of Soviet nuclear weapons and materials in storage and in transport, to improve the accident response capabilities in the new republics, and to expand interactions with our counterparts in the Russian nuclear weapons complex. Armored blankets and modified railcars for transportation of nuclear materials, new containers for materials storage, and accident response equipment and training were rapidly deployed.

During the past ten years, DNA has been renamed the Defense Threat Reduction Agency (DTRA) and the SSD program has been renamed the Cooperative Threat Reduction (CTR) program, but the objective has remained unchanged. Ten years later, Sandia's strategic partnership remains as strong as ever and has expanded beyond the original CTR charter. The partnership between Sandia and DTRA is

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so broad that this entire issue of *International Security News* is dedicated to highlighting current cooperative activities. As the articles indicate, the breadth of the partnership includes traditional CTR work and more recent collaborations in the development of warhead monitoring technologies for both US and Russian applications.

Finally, in the wake of the September 11, 2001, attacks, Sandia is exploring ways to collaborate in a broader antiterrorism mission. Twelve months ago Sandia began two efforts supporting DTRA initiatives in the biosurveillance and biosecurity arenas, both of which are expected to expand this year. Also, opportunities to conduct cooperative antiterrorism research and development efforts with key institutes in the Russian Federation are being explored under the auspices of the Warhead Safety and Security Exchange (WSSX) program. Undoubtedly, these new efforts, like those of the preceding ten years, will strengthen the ties that strategically bind Sandia's International Security Programs with DTRA's missions in the former Soviet Union.



Dori

Focus on the DTRA-SNL Partnership



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DTRA Aims to Reduce Threat of WMD

Stephen Younger
Director of the Defense Threat Reduction Agency



The Defense Threat Reduction Agency (DTRA) is an organization with a critical mission to perform for our country and indeed for the whole world. The recent terrorist attacks against our country shocked the world and demonstrated the lengths to which terrorists will go to pursue their agendas. Almost every day the news mentions the threat that weapons of mass destruction (WMD) pose to peace and freedom around the world. Many believe that we will see the use of a biological or chemical weapon within this decade. And the threat of nuclear weapons remains a specter that cannot be ignored.

DTRA exists to make sure that WMD are never used and that if they are used the consequences of their use are minimized. Each DTRA employee, whether civilian or uniformed military, has a vital role to play in this task. We will develop new means of monitoring what is going on in the world. We will find new ways of protecting our forces against the effects of WMD. And, we will ensure that our nuclear forces are safe, secure, and reliable - the ultimate deterrent of aggression against the United States and our allies.

America's relationship with Russia remains center

stage in our strategic defense. In regard to the Cooperative Threat Reduction program, it is hard to think of a defense dollar that is better spent. In the same vein, we must continue confidence measures that are part of the on-site inspection program. Arms control is a sure way of reducing the capability of our potential adversaries.

One of the themes DTRA can develop and expand upon is our tool set. A whole number of different tools are available for use by the government to reduce the threat. We must pay more attention to what motivates people and to understanding the world around us. Our job is to reduce the threat and we do that with different means, but one way is to understand what the threat is. We need to cooperate with some communities that we haven't collaborated with before, such as anthropologists, economists, and sociologists. We have to understand: Why is a terrorist doing what he is doing? What might he do next? We can apply some rigor to this process.

The DTRA team has a great task before it: one that will demand all our energy, dedication, and creativity. The world is a safer place because of the work that we do every day. America and the world depend on us.

Dr. Stephen M. Younger became the director of the Defense Threat Reduction Agency (DTRA), Fort Belvoir, Va., on September 1, 2001. DTRA safeguards America and its friends from weapons of mass destruction by reducing the present threat and preparing for future threats.

Prior to his selection to lead DTRA, Younger was the senior associate laboratory director for national security at the Los Alamos National Laboratory. In that position, he was responsible for assuring the safety, reliability, and performance of most of the nation's nuclear arsenal. Younger oversaw a directorate containing 3,000 people and an annual budget of over \$1 billion.

Younger earned a Bachelor of Arts degree in physics from the Catholic University of America and a Master of Science and Ph.D. in theoretical physics from the University of Maryland.

Younger serves on a number of government committees and has taken a leading role in stimulating the development of a new deterrence strategy for the United States in the post-Cold War era. He is a Fellow of the American Physical Society.

Opinions expressed by the Guest Editor are not necessarily the opinions of Sandia National Laboratories.

WMTP Field Trial



The Warhead Monitoring Technology Project

(WMTP) is examining a current suite of monitoring technologies and data management tools to assess their application in potential monitoring regimes and to assess the impact of monitoring systems on operational facilities. Sandia has led this effort for the last three years under the sponsorship of the Policy Division of the Nuclear and Counterproliferation Directorate of the Air Staff (USAF/XONP) and the United States Strategic Command (USSTRATCOM). WMTP is cofunded by the Defense Programs office of the National Nuclear Security Administration (NNSA/NA10) and by the Technology Applications Division of the Defense Threat Reduction Agency (DTRA/TDA).

With the successful completion of WMTP systems integration and testing at a bunker site on Kirtland Air Force Base, Sandia transferred the WMTP monitoring system to the 896th Munitions Squadron at Nellis Air Force Base, Nevada, on June 5, 2001, to conduct a 14-week field trial. No actual warheads were utilized in this field trial. Objectives of the field trial were to

- Evaluate the performance of critical system components and functions under field conditions
- Assess the impact to site operations of the WMTP concept, monitoring systems, and radiation measuring systems
- Assess the effectiveness of the monitoring concept and the measures to ensure the safety and security of site operations

From June 18 to August 3, Sandia technicians tested the monitoring equipment, evaluated equipment performance, conducted data analysis, finalized supporting procedures, and trained site support personnel.

During the weeks of August 7 and 14, the Sandia Field Trial Team and site personnel conducted dry runs of

scenario events. The exercise events included

- Simulated warhead initialization and radiation template generation
- Baseline data and data update inspections
- Simulated shipment of mock containerized warheads to a DOE site



Air Force personnel log simulated warhead containers into the WMTP monitoring system.

The WMTP Team also used this period to familiarize managers from the sponsoring, supporting, and funding agencies with the system's operation under field conditions.

The WMTP monitoring concept was formally evaluated by a multiagency Red Team and other operational and technical experts during the week of August 21. To cap off the field trial activity, the Red Team hosted a Distinguished Visitor WMTP Concept Familiarization exercise on August 24. Guests included Ron Detry 09800, Dori Ellis 05300, and representatives from DTRA, the National Nuclear Security Administration Office of Arms Control and Nonproliferation (NNSA/NA24), the

Department of Energy Albuquerque Office (DOE/AL), the US Navy, and the US Air Force. The successful completion of this field trial set the stage for WMTP Field Trial 2, which is scheduled to begin in October 2002. Source: Robert Rhoades 5326, MS 1215, 505-284-4319, fax 505-844-8814, rjrhoad@sandia.gov



Participants pause for a photo during the Distinguished Visitor WMTP Concept Familiarization Exercise August 24, 2001.

TOBOS

Safety and Security Technologies for Russian Warheads



The All-Russian
Scientific Research
Institutes of

Automatics (VNIIA) and Experimental Physics (VNIIEF) have developed the Automated Monitoring and Inventory System (AMIS) and other security related technologies that show potential for improving the safety, security, and monitoring operations at Russian Ministry of Defense (MOD) weapon storage bunkers. To validate these technologies and concepts, MOD requires these systems to be evaluated under realistic field conditions.

The field-testing program for safety, security, and monitoring technologies is called TOBOS (the Russian acronym for Safety and Security Technologies for Russian Warheads) Program. These tests will be conducted at MOD-selected locations in the St. Petersburg area. Tests will be conducted using routine MOD procedures in normal operational and storage environments. Additional testing will include extreme environmental conditions, accident environments, and threat environments.

The TOBOS Program is planned in three phases from 2001 to 2004.

- Phase 1: Feasibility study and site identification
- Phase 2: Test configuration, including equipment installation, software integration, and checkout of systems

- Phase 3: Test and evaluation

VNIIA and Sandia are developing the test program, with the MOD approving all test plans and test operations at MOD facilities. VNIIA will be the systems integrator for field testing the array of safety, security, and monitoring technologies used in MOD storage facilities and on warhead containers during transport. VNIIA will also evaluate and recommend an array of technologies, including tamper-indicating equipment, radiation monitors, container content identification devices, location technologies, and information protection technologies for use by the MOD 12th GUMO.

TOBOS is a high priority program within DTRA/TDA, and the scope of the program will expand to include the investigation of Russian-proposed antiterrorism technologies.

Larry Walker 5320 and Greg Mann 5327 recently visited the proposed TOBOS test sites outside St. Petersburg, which are configured as typical Russian weapons storage facilities. Agreements were reached on the modifications and facility improvements to be made at this site for the Phase 2 test equipment installation and configuration. The program is on schedule to begin field testing the AMIS system in FY03. Source: Greg Mann 5327, MS 1203, 505-844-6795, fax 505-844-8119, gremann@sandia.gov

Sandia Assigned to DTRA Office



Sandia is providing support to DTRA's
Technology Applications Division
(DTRA/TDA), with the temporary assignment

of Jay Spingarn 8120 to the DTRA office in Alexandria, VA. Jay is involved with the development of technologies in support of obligations of the Department of Defense (DOD) with regard to current and future treaties and agreements. This position provides an important link between DOE and DOD and enables the application of key Sandia resources in developing and maintaining the international relationships necessary to meet these important US government objectives. Source: Carolyn Pura 8120, MS 9103, 505-294-2811, fax 505-294-1377, capura@sandia.gov

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CMC Studies

Cooperative Aerial Monitoring for South Asia



Two visiting scholars at Sandia's Cooperative

Monitoring Center (CMC) are conducting an analysis of the potential for cooperative aerial monitoring between India and Pakistan. The study is being performed by Air Marshal Kodendera Cariappa (retired) of India and Air Marshal Muhammad Arshad Chaudhry (retired) of Pakistan, who are visiting scholars at the CMC for several months as part of the CMC's regional program. Air Marshal is a rank of three-star general in the air forces of both countries.

Cariappa and Chaudhry are evaluating incremental approaches for military confidence building measures that could contribute to reduced tension along the border between the two countries and in disputed territories. The introduction of nuclear weapons into the equation has created a new sense of urgency to find ways to defuse tensions between these belligerent neighbors. The emerging war on terrorism also necessitates the stabilization of border tensions between India and Pakistan.

The concept of using aerial monitoring as a confidence building measure and as a tool in implementing conventional military agreements has been discussed for over half a century. In the past decade a multinational treaty, known as the Open Skies Treaty, has been signed and is nearing entry into force. The treaty permits the 27 signatories to periodically fly aerial observation missions over the territory of the other treaty members. Much of the focus of the treaty is on Europe, but countries such as the United States and Russia are significant participants.

The responsibility for implementing US obligations under the Open Skies Treaty rests with DTRA. To fulfill this responsibility, DTRA plans missions, processes data, and operates the US Open Skies aircraft. The Open Skies Treaty offers a valuable precedent for consideration in South Asia.

In a collaborative effort between the CMC and DTRA, the South Asian study participants have been given opportunities to meet with DTRA Open Skies personnel

and to tour the Open Skies Media Processing Facility operated by DTRA at Wright Patterson Air Force Base in Dayton, Ohio. As results of this study are disseminated in South Asia, DTRA stands ready to continue to support follow-on efforts that could include South Asian military observers on scheduled missions or the possibility of demonstration missions in the South Asia subcontinent.

Sandia looks forward to continuing interactions with DTRA in applying DTRA's knowledge and capabilities to support the CMC's efforts to promote cooperative aerial monitoring in a number of regions of nuclear proliferation and strategic concern around the world.

Source: Kent Biringir 5324, MS 1371, 505-284-5048, fax 505-284-5055, klbirin@sandia.gov



Air Marshal Chaudhry and Air Marshal Cariappa study a map of potential locations for cooperative aerial monitoring between India and Pakistan.

CMC Proposes Similar Facility for Middle East



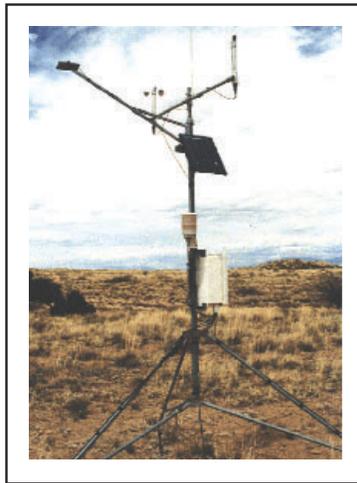
In FY01 the Cooperative Monitoring Center

(CMC) at Sandia National Laboratories performed a study for the Arms Control Technology Division of the Defense Threat Reduction Agency (DTRA) entitled Middle East Arms Control Technology Demonstration Project. The purpose of the study was to identify opportunities for deployment of arms control projects in the Middle East, projects that would improve security and promote cooperation between two or more countries.

With the help of visiting scholars from Egypt and Jordan, the feasibility of many types of projects was explored, including the deployment of antiterrorism technology at border crossings, cooperative monitoring to warn of the potential presence of weapons of mass destruction (WMD), land-mine removal, and open-skies-type overflights.

Many arms control projects are feasible for the Middle East, but the study team

concluded that the logical first step to launching new projects is to establish an arms control technology facility in the region. The CMC-like facility, situated either in Amman, Jordan, or Cairo, Egypt, would be a beachhead for arms control projects. This facility will be fashioned after Sandia's CMC and will serve as a forum for regional training on nonproliferation technologies, indigenous development of arms control technology projects, and multidisciplinary interactions among Middle Eastern technocrats, policy-makers, and security specialists.



The CMC envisions that DTRA's arms-control technologies and training expertise will become an integral part of the Middle East facility. Funding for launching this project in 2002 is being secured from the US Department of Energy. CMC personnel will soon meet with Department of State personnel to finalize the plan and to gain approval for moving forward. Plans are for the facility to be independent of the CMC and to function as a sister facility to the CMC within five years. Source: Greg Kolb 5324, MS 1373, 505-844-1887, fax 505-284-5055, gkolb@sandia.gov

Calendar Visits and Workshops

January 12-19, 2002 Albuquerque, NM: SNL and VNIIEF review International Science and Technology Center (ISTC) High Temperature Battery program and discuss follow-on IPP program. (NA24) Richard Smith 5328, 505-844-4476

January 14-16, 2002 Albuquerque, NM: Distinguished Advisory Panel for Arms Control and Nonproliferation (DAP) hosted by Roger Hagengruber 5000 and Dori Ellis 5300. (SNL) Dori Ellis 5300, 505-845-3077

February 17-23, 2002 Khatmandu, Nepal: South Asia Transboundary Water Quality Monitoring Workshop cosponsored by DOS and DOE to build a team of regional experts to collaborate on understanding and sustaining critical regional river resources by collecting and sharing reliable and comparable transboundary water-quality data in an open and timely basis. (USAID; NA241) David Betsill 5324, 505-844-9578

March 18-22, 2002 SNL, Albuquerque: CMC Training Course on Cooperative Monitoring. (NA241) George Baldwin 5324, 505-284-5054

April 18-20, 2002 Albuquerque, NM: Sandia National Laboratories' Twelfth International Arms Control Conference: *Implications of 9/11 on National Security and the Path Forward to Peace* to be held at the Sheraton Uptown Hotel. (SNL; NA241; DOS) James Brown 5302, 505-284-5047 or 972-661-3261

April 18, 2002 Albuquerque, NM: CMC hosts International Visitors Group Workshop and Arms Control Conference Workshop, part of the Twelfth International Arms Control Conference. (NA241) Martha Haines 5329, 505-284-6580

Site Security Enhancements in Russia



Sandia's technical experts have been actively involved in

the CTR Site Security Enhancement (SSE) project as DTRA program technical advisors for several years due to their expertise gained in applying physical security methodologies and techniques to other programs. Sandia experts also have extensive experience with Russian Federation programs through various DOE international activities, such as the Material Protection, Control, and Accountability (MPC&A) program.

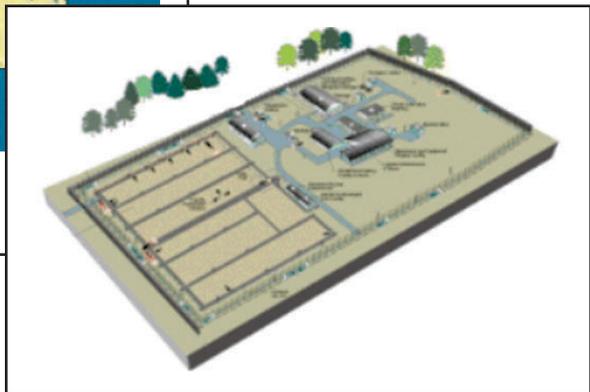
The objectives of the SSE project efforts at Sandia include providing technical support to the DTRA program manager on matters concerning physical security equipment and issues associated with use of this equipment in Russia. In addition, Sandia experts provide review, evaluation, and recommendations of MOD documents and contractor documents with respect to physical security issues.

Under the implementation agreement mentioned above, technical interchanges with the MOD identified a need to establish a Security Assessment and Training Center (SATC) as part of the larger SSE project to integrate

and test security equipment for use at MOD operational nuclear weapons storage sites in Russia. In addition, the SATC will be used to train Russian technicians to install, maintain, and operate the security equipment. On November 1, 1999, the SATC site officially opened for test and evaluation at a location 45 kilometers north-east of Moscow on a military base near the town of Sergiev-Posad.

The testing results for Russian equipment that is brought to the SATC for evaluation are reviewed by Sandia specialists, and recommendations are made to DTRA based on the performance of the equipment. Sandia provides an independent review and evaluation of all plans that include test methodologies, evaluation of equipment, and training at the SATC.

Other Sandia activity in support of the SSE program includes technical support for the DOD/DTRA Technical Team Meetings and vulnerability analysis reviews conducted at various locations in Russia. Finally, Sandia allows the DTRA program manager access to the Sandia technology base in areas associated with physical security systems. Source: Max B. Sandoval 5355, MS 0788, 505-844-6877, fax 505-844-0001, mbsando@sandia.gov



Russian MOD Railcar Maintenance



Russia's Ministry of Defense (MOD) Railcar Maintenance

project is part of the DTRA Weapons Site and Transportation Security program. The Railcar Maintenance project grew out of the Rail Transportation Security Project, part of the original Safe, Secure Dismantlement (SSD) Program. The Rail Transportation Security Project addressed the risk posed by shipping nuclear material over 90,000 km of Russian rail among approximately 25 sites spread across 11 time zones.

Beginning in 1992, DTRA issued a series of inter-agency cost reimbursement orders (IACROs) to Sandia through the Department of Energy for the purpose of designing, developing, and delivering railcar modification kits to the MOD. The modification kits were designed to improve the physical security and safety of 100 VG-124 nuclear weapons railcars and 15 guard railcars.

In 1996, the Tver Railcar Factory completed modifications on the final railcar. Subsequently, the modified railcars were placed into service by the MOD 12th GUMO. In December



Interior of CTR-modified VG-124 railcar

1998, MOD requested assistance for maintenance and certification of the CTR-modified railcars and 100 additional V-60 heated cargo railcars. Starting in April 1999, assistance was provided to MOD by DTRA through a contract issued by Sandia for the maintenance and certification of these 215 railcars by the Tver Railcar Factory.

In April 1999, MOD requested that DOD provide assistance to manufacture 15 new guard and 100 new cargo



V-60 heated railcar

railcars to replace a portion of the MOD railcar inventory that is obsolete, beyond economical repair, and reaching the end of Russian Ministry of Railways-mandated service life. The MOD requirement for new railcars was approved by DOD in September 2000. This approval was under review at the time of this writing and may be rescinded.

A contract for the procurement of new railcars was expected to be awarded in early 2002. Sandia has been actively involved in the design reviews for the new railcar procurement contract. Sandia experts have done a vulnerability analysis and design reviews for the proposed new physical security system planned for installation in the new V-60MG cargo car and the new V-60MS guard car. If approval is not rescinded, Sandia will be involved in the review of the new designs as well as monitoring the testing of the first article cars prior to full-scale production. Source: Max B. Sandoval 5355, MS 0788, 505-844-6877, fax 505-844-0001, mbsando@sandia.gov

CTR Site Upgrades



Sandia National Laboratories is currently exploring

opportunities with the DTRA Cooperative Threat Reduction (CTR) program to leverage work being done with the Russian Navy under the Material Protection, Control, and Accountability (MPC&A) program, particularly at joint Russian Navy/12th GUMO sites. This is the first joint site-upgrade project between DOE and DOD. Source: Byron Gardner 5355, MS 0788, 505-844-5300, fax 505-844-0001, bhgardn@sandia.gov

WSSX

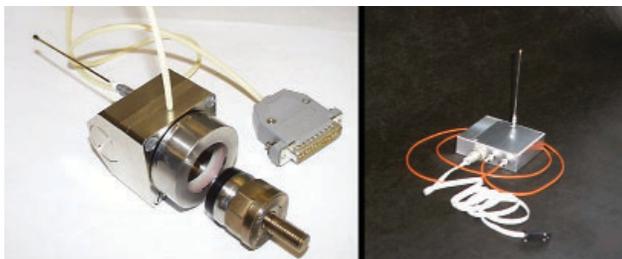
Smart Bolts and Tags



In an effort to increase the participation of the

Russian Ministry of Defense (MOD) in the Warhead Safety and Security Exchange (WSSX), Dr. Sergei Blagin of the All-Russian Scientific Research Institute of Experimental Physics (VNIIEF) has been discussing the potential for using VNIIEF-developed advanced tamper-indicating devices (TIDs) for MOD applications.

Dr. Blagin's concept is to use the Smart Bolt and the RF tag, or modifications of them, to monitor nuclear weapons during shipment and storage. Of primary importance is to work with the MOD to develop capabilities in these devices that are tuned to the MOD's particular needs and to establish a testing program to fine tune the devices for applications in the field. The work would dovetail with the DTRA-funded TOBOS program by generating Russian TIDs and tags that could be tested under TOBOS.



Smart Bolt

RF Tag

Dr. Blagin has had multiple meetings with MOD personnel in both Moscow and St. Petersburg, including Col. V.E. Belyakov, the MOD representative on the WSSX Joint Coordinating Group. A project proposal has been developed by VNIIEF and the MOD, and Dr. Blagin has stated that it has been signed off at a high level and will be submitted to the WSSX Joint Coordinating Group in the near future. Source: Tom Lockner 5327, MS 1203, 505-284-6625, fax 505-844-8119, trlockn@sandia.gov

WSSX

TID Evaluation Facility



The All-Russian Scientific Research Institute

of Automatics (VNIIA) is under contract to Sandia National Laboratories to design and develop a tamper-indicating device (TID) test and evaluation facility in Moscow. This facility will be located within the Storage Technology Demonstration Center at the Moskvorechje site.

The purpose of the evaluation facility is to provide a central testing venue for all Russian-developed TIDs that have potential application on MOD weapons systems. This activity is conducted under the Warhead Safety and Security Exchange (WSSX) Agreement of 1994, with funding provided by DTRA. Source: Greg Mann 5327, MS 1203, 505-844-6795, fax 505-844-8119, gremann@sandia.gov

Acronyms

Acronyms used repeatedly throughout this issue of *International Security News* are defined here for the convenience of the reader.

AMIS	Automated Monitoring and Inventory System
CMC	Cooperative Monitoring Center (SNL)
CTR	Cooperative Threat Reduction (DTRA)
DAP	Distinguished Advisory Panel for Arms Control and Nonproliferation
DOD	Department of Defense (US)
DOE	Department of Energy (US)
DOS	Department of State (US)
DTRA	Defense Threat Reduction Agency (DOD)
FMSF	Fissile Material Storage Facility (Mayak, RF)
GUMO	Main Directorate (MOD)
IAEA	International Atomic Energy Agency
ITIP	Integrated Technology Implementation Plan
MOD	Ministry of Defense (RF)
MPC&A	Material Protection, Control, and Accountability
NNSA	National Nuclear Security Administration (DOE)
PPRA	Plutonium Production Reactor Agreement
RF	Russian Federation
RSVP	Rapid Syndrome Validation Project

Acronyms continued on page 11

RSVP

Rapid Syndrome Validation Project

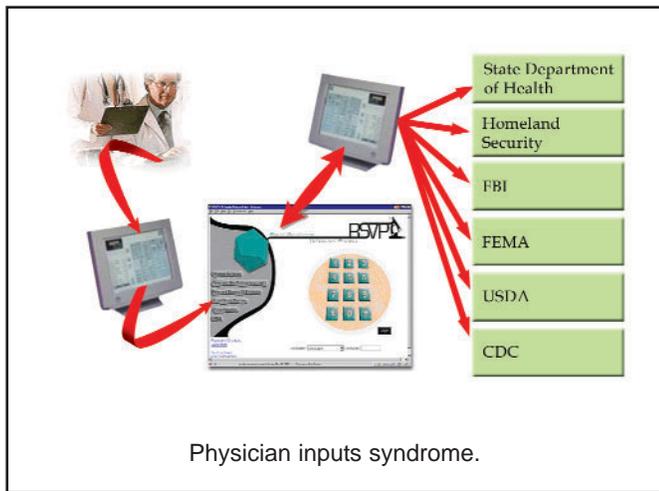


The recent anthrax scares have highlighted the problem

of understanding and dealing with apparent bioterror events. Al Zelicoff 5320 has developed a disease reporting system called the Rapid Syndrome Validation Project (RSVP™), an internet-based computer application designed to support public health monitoring and to

provide early detection of a bioterror attack. RSVP dramatically improves the two-way communication between local public health officials and practicing physicians.

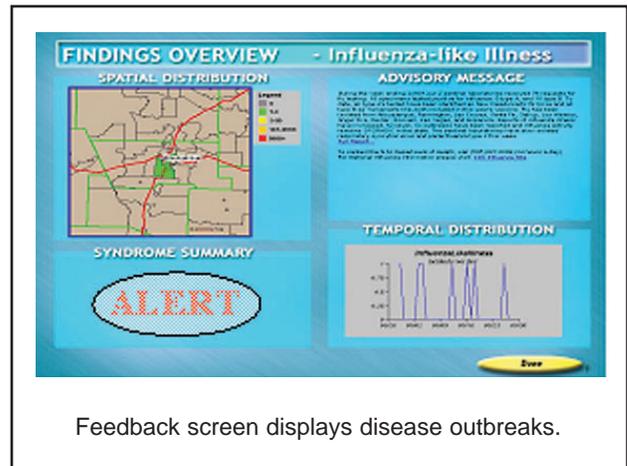
Through RSVP's simple computer interface, physicians report infectious disease symptoms and signs in real time. The network in turn provides doctors and public health officials with routine public health status information. Graphic displays present a real-time population health map that is analogous to an animated weather map: The health map displays the status and progression of infectious disease outbreaks. Against the backdrop of RSVP's continuous mapping of disease syndromes, unusual outbreaks, whether natural or caused by terrorists, can be quickly identified in the population. In the event of a bioterror attack, RSVP provides an early alert to local and national monitors and gives first responders early detection information that is not otherwise available or tracked.



DTRA provided funding for an early evaluation survey of other syndrome-based data acquisition systems. RSVP was determined to be unique in its ability to provide real-time feedback to the clinician.

Acronyms continued from page 10

- SATC Security Assessment and Training Center (Sergiev-Posad, RF)
- SSD Safe, Secure Dismantlement
- SSE Site Security Enhancement (CTR program)
- START Strategic Arms Reduction Treaty
- TDA Technology Applications Division (DTRA)
- TID tamper-indicating device
- TOBOS Safety and Security Technologies for Russian Warheads (Russian acronym)
- TSOW technical statement of work
- VNIIA All-Russian Scientific Research Institute of Automatics (Moscow, RF)
- VNIIIEF All-Russian Scientific Research Institute of Experimental Physics (Sarov, RF)
- VNIIPET All-Russian Scientific Research Institute of Complex Energetic Technology (St. Petersburg, RF)
- WMD weapons of mass destruction
- WMPW Warhead Monitoring Technology Project
- WSSX Warhead Safety and Security Exchange



RSVP was implemented at several clinics in the early months of 2001 and is scheduled to be installed in clinics across the country over the next few months. The system's simplicity, ease of use, and low cost make it a compelling technology to introduce as widely as possible to mitigate the bioterror threat. Source: Greg Mann 5327, MS 1203, 505-844-6795, fax 505-844-8119, gremann@sandia.gov

A Transparency Regime for the New Mayak FMSF



The Defense Threat Reduction Agency (DTRA) is the fund-

ing agency responsible for the Fissile Material Storage Facility (FMSF) under construction at the Mayak Production Association nuclear complex near Ozersk in the Urals region of the Russian Federation. As part of its commitment to fund this new facility, the US Congress has asked for assurance that the fissile material stored in the facility is of weapons origin, is being stored safely and securely, and has been irreversibly removed from any weapons program.

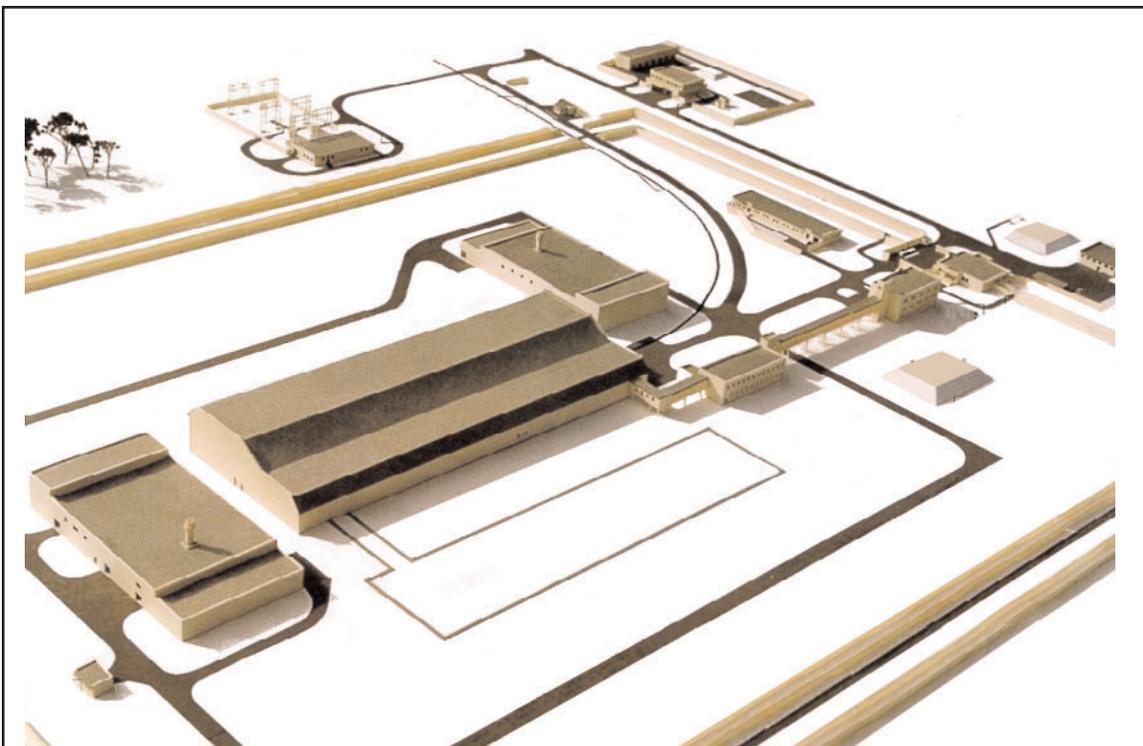
To accomplish the congressional mandate, DTRA is developing a transparency regime that will be negotiated with Russia's Ministry of Atomic Energy (MINATOM). In March 2001, DTRA engaged Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), Sandia National Laboratories (SNL), and Pacific Northwest National Laboratory (PNNL) to provide technical support in the development of the transparency regime.

The FMSF transparency regime has three major functions: 1) to provide assurance that nuclear material entering the facility is of weapons origin, 2) to provide continuity of knowledge during inspector absence that the material placed in storage remains in storage, and 3) to develop a sampling plan to provide confidence that material in storage has remained as declared. At present, the regime assumes that only weapons-grade plutonium will be stored in the FMSF, although the possibility exists that highly-enriched uranium might also be stored there.

DTRA has divided its transparency regime development effort into several parts:

- A Recording Device System (RD) to be used during nuclear material acceptance: This device will determine if the material is weapons-grade plutonium without revealing classified information. The system will run unattended and make measurements at the same time the Russian Passport system accepts the material into the facility.

FMSF continued on page 13



Site model of the Mayak Fissile Material Storage Facility

- An attribute measurement system, known as the Inventory Sampling Measurement System (ISMS), for use with the sampling plan efforts: This system will not only determine that the material is weapons-grade plutonium but will also determine the mass of the material and that the material is not an oxide. Only the US monitors will use this system, during their monitoring visits.
- A Facility Monitoring System (FMS): This system is to provide continuity of knowledge regarding the material stored in the facility.
- System authentication for the RD, the ISMS, and the FMS.
- Vulnerability assessment of the RD, the ISMS, and the FMS.
- Peer review consisting of three teams, one for each technical effort, to provide independent assessment of the RD, ISMS, and FMS technical statements of work (TSOW).
- Project coordinating team (PCT) to help manage and integrate all the teams' efforts.

The performance features of the RD, the ISMS, and the FMS are based on guidance DTRA receives from the Department of Defense Cooperative Threat Reduction policy office. Teams need to be flexible and responsive as this guidance changes. In addition, timelines to accomplish the development and implementation efforts are rather short: according to the present schedule, the facility will begin loading material in fall 2002.

The main product of the development teams' efforts is a TSOW for each of the three systems, which will be used to define the work done by the Russian Federation under contract with Bechtel Nuclear International (BNI), DTRA's prime contractor through the Army Corps of Engineers. The TSOW will be used by BNI to generate a request for proposal from the Russian Federation for a system design for each of the three systems. BNI will let a contract to the appropriate Russian entity to design, build, test, and install each system. BNI and the development team will review the Russian design at several points to assure the requirements of the TSOW are met and to negotiate the resolution of technical design issues. In addition, the teams will probably provide oversight during fabrication and installation.

Sandia is involved in several of the teams, serving as

lead for the PCT and all peer review teams. Sandia is also supporting LANL, which has the lead for the FMS.

The PCT is charged with integrating the work by the other teams and ensuring that these teams are provided the necessary funding and guidance to perform their work. The PCT is also charged with creating an integrated picture of how the transparency is designed to operate. This integrated picture covers equipment manufacture and testing, installation, and operations during the loading phase and later during more steady state operations. This integrated picture is being coordinated with DTRA's On-Site Inspection Operations (DTRA/OS) to ensure that they will be able to perform their monitoring visits.

In supporting LANL in the development of the FMS, Sandia has contributed its system engineering experience and its experience in developing and supporting monitoring systems for the International Atomic Energy Agency (IAEA). In particular, Sandia is contributing in the areas of system design, concept of operations, video surveillance systems, tamper-indicating devices, and data management systems. Under severe time constraints, Sandia contributed significantly to the development of a TSOW for an FMS, which was designed under a certain set of assumptions based on the policy guidance. A recent redirection in the policy guidance will require modifications be made to the FMS TSOW.

A peer review team is associated with each of the RD, ISMS, and FMS technical tasks. The purpose of the peer review is to generate a critique of the TSOW from an independent group of technical experts not directly involved in the technical development. Each peer review team consists of a multilaboratory group headed by a Sandia team lead. The team lead remains in contact with the technical developments of the respective efforts, provides the team members with updates, and arranges the review procedure. The review procedure has consisted of a preliminary review of the draft TSOW and a review of the final document. After each review, a round of comment resolution is undertaken with the technical group to resolve problems or concerns with the TSOW. The process has operated quite smoothly considering the short timeline that DTRA has allowed for the development of the final products.

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ITIP

Integrated Technology Implementation Plan



The Integrated Technology Implementation Plan (ITIP) is a joint endeavor of DTRA and the

NNSA program offices for Defense Nuclear Nonproliferation (NA20) and Defense Programs (NA10). ITIP comprises 18 different projects in the area of US nonproliferation technology development. These projects range from studies to assess methods for differentiating between tactical and strategic warheads to development and testing of remote monitoring hardware.

The purpose of the joint DTRA-DOE ITIP is to provide a coordinated and comprehensive framework for a program of technology development and implementation activities to support US efforts directed toward current and potential arms control and nonproliferation. In particular, the plan focuses on potential arms control/warhead dismantlement transparency regimes, Mayak FMSF transparency issues, US-Russia agreements such as the Plutonium Production Reactor Agreement (PPRA) and the Plutonium Management and Disposition Agreement, the US-Russia-IAEA Trilateral Initiative, and other appropriate activities.

The program of technology implementation activities is designed to determine those measurements that could be performed on US warheads, warhead components, fissile materials, and warhead-like objects for the purpose of establishing and exploring the limitations of criteria to provide confidence as to identification of the item. These measurements will provide the US with the relevant information needed to take a proactive role in negotiating agreements that may involve the use of measurements on nuclear warheads or nuclear warhead components in the active and retired US stockpile. Source: Joe Saloi 5327, MS 1203, 505-845-3067, fax 505-844-8119, jhsaloi@sandia.gov



Testing of T-1 sensor and remote monitoring technologies for unattended HEU component storage

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The Mayak FMSF is near completion, with an anticipated date for start of loading in September 2002. The RD effort on the US side is complete and awaiting MINATOM approval for discussions with Russian technical experts and letting of contracts. The ISMS is a redirection of the earlier attribute measurement system and as such is early in its development. This system will not be installed before the opening of the facility, because it will be used in conjunction with a sampling plan after a substantial portion of the fissile material has been loaded. The FMSF team has generated a TSOW

and is in the process of generating a new document based on recent instructions from DTRA. The FMS TSOW is anticipated to be available in February 2002.

While the construction of the Mayak FMSF is coming to a conclusion, the transparency measures remain to be negotiated. The hope is that with the technical work outlined in the TSOWs, the remaining time to implementation of the regime can be kept as short as possible. Source: Dennis Mangan 5320, MS 1213, 505-845-8710, fax 505-844-8814, dlmanga@sandia.gov

Groundbreaking Ceremony for Sandia's International Programs Building

Roger Hagengruber, Senior Vice President of National Security and Arms Control Division 5000, and Dori Ellis, Director of International Security Programs, hosted a ceremonial groundbreaking for the new International Programs Building on December 4, 2001. In July 2002, the new building, located at Research Park outside the Kirtland Air Force Base Eubank gate, will be home to the International Security Center 5300 and its Cooperative Monitoring Center (CMC).

Currently the International Security Center, which manages a broad range of international security programs, is geographically distributed, with facilities inside Sandia's Technical Area I and at Research Park. The International Programs Building will make it easier to take advantage of synergies among the programs, including

- US/Russia nuclear security
- International safeguards and security
- Regional security
- Arms control support
- Defense nuclear materials stewardship
- New initiatives, such as biosecurity

The International Programs Building will also allow all the programs to more fully utilize the CMC. The CMC is recognized nationally and internationally as a unique

facility for bringing together the international security policy and technology communities.



Rendering of the International Programs Building by architect Dekker/Perich/Sabatini

The US DOS and DOD have used the CMC as a neutral venue for interactions with representatives of foreign governments on the technical aspects of arms control, non-proliferation, and other security agreements. The DOD brought Chinese Defense Minister General Chi to the CMC to discuss the US approach to arms control and nonproliferation in 1996. The

DOS has conducted meetings at the CMC with representatives of India, Pakistan, and the multicountry South Asia Task Force.

Events of September 11, 2001, have reemphasized the relevance of the programs that comprise the International Security Center as they relate to the US national security mission. These programs can rapidly contribute to the US government's antiterrorism initiative, both through their focus on nonproliferation of weapons of mass destruction and by drawing on the CMC's established relationships and cooperative technical activities. Cooperation with states critical to an international coalition to combat terrorism or whose regional stability is a growing concern is of primary importance. As the International Security Center programs come together to reside at the new International Programs Building, objectives of the center will be accomplished more fully.

International Security Programs Unveils New Logo

At Dori Ellis' request, David Cunnington 5951 has designed a new logo for Sandia's International Security Programs (ISP). The logo represents the mission of ISP to strengthen national and international security through cooperative technical solutions. The eagle looks left to signify peace and holds a stalk of wheat to signify wisdom and prosperity, symbols of the mission to promote regional stability. The globe, signifying international cooperation, is enveloped in the eagle's wings to represent a secure world resulting from the aim to reduce the threat of WMD. Cookies bearing the logo were served at the groundbreaking ceremony for the International Programs Building.



Brooks Now NNSA's Deputy Administrator for NA20

Ambassador Linton F. Brooks was sworn in on October 30 as the Deputy Administrator for the National Nuclear Security Administration's (NNSA) Defense Nuclear Nonproliferation (NA20) Office. Ambassador Brooks was nominated by President Bush on July 19, 2001, and was confirmed by the US Senate on October 16. NNSA carries out the national security responsibilities of the US Department of Energy. Brooks comes to the post from the Center for Naval Analysis (CNA), a federally funded research and development center in Alexandria, Virginia. While at CNA, Brooks served as Vice President and Director of the Policy, Strategy, and Forces Division.

Brooks' responsibility as Deputy Administrator for NA20 is to enhance US national security by promoting nuclear nonproliferation, advancing international nuclear safeguards, reducing global danger from weapons of mass destruction, and eliminating inventories of surplus fissile material.

Specific duties of the Deputy Administrator include direction of a research and development program that provides treaty monitoring systems; providing technical leadership to implement a cooperative international program; direction of the planning, managing, and implementation of an international materials protection program; and coordination of the development of DOE policy regarding surplus fissile materials.

At the Senate Armed Services Committee hearing on his nomination, Brooks stated that his priorities as

Deputy Administrator will include "working to ensure that the many nonproliferation programs for which I will be responsible are consistent and coherent, especially with respect to Russia, and working to improve coordination and working relations within my office, with other agencies of the US government, and with the national laboratories."



Brooks was Assistant Director for Strategic and Nuclear Affairs in the US Arms Control and Disarmament Agency and head of the US Delegation on Nuclear and Space Talks under President George H. Bush. He served as the Chief Strategic Arms Reductions Negotiator and was responsible for final preparation of the Strategic Arms Reduction Treaty (START I) signed by US President George H. Bush and President Mikhail S. Gorbachev of the Soviet Union in Moscow on July 31, 1991. In December

1992, Brooks performed a similar function during the final preparation of START II.

During the Reagan administration Brooks served for over three years as Director of Defense Policy and Arms Control on the Staff of the National Security Council.

Brooks has authored numerous articles on arms control and national security. He is a graduate of Duke University and received a Master's degree from the University of Maryland.

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Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under Contract DE-AC04-94AL85000.

SAND2001-3922P

PUBLISHED BY:
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