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Utilizing Security Technology to Our Advantage

Today, the scientific community is developing new security technologies much faster than we can apply them. To allow us to get ahead of the technology curve, I have directed NNSA and SSA to establish a Blue Sky Commission charged with identifying emerging security technologies that we should invest in, or possibly modify for our use. This will be a long-term effort to complement the near-term proposals . . . and will focus on technologies that could alter security over the coming decades." Secretary Abraham, SPOTC, May 7, 2004

Overview

The Office of Security and Safety Performance Assurance (SSA) recognizes that the utilization of security technology to enhance the Department's protection strategy is our highest priority. The implementation of technology at site, facility, and Headquarters locations can result in more efficient utilization of security forces and more success in thwarting adversaries. One of Secretary Abraham's recent security initiatives calls for the creation of a Blue Sky Commission to identify promising emerging technologies that the Department can invest in or develop for implementation to enhance our protection systems. SSA is working closely with NNSA to launch that Commission so we can quickly begin identifying and implementing appropriate technologies.

Concurrent with the Blue Sky Commission, SSA is embarking on an initiative to ensure that new and recently developed technologies are rapidly deployed to serve as force multipliers to help improve the effectiveness and efficiency of our protection programs. Our future success in this initiative will depend on implementing a systematic process to identify and deploy technologies in a timely manner. Currently, we are deploying a new remotely operated weapon system and an acoustic inspection device to enhance searches of certain vehicles and cargo.

SSA is committed to developing technology that will not only improve the Department's security posture but will do so in a safe and cost-effective manner. SSA will ensure that technology solutions consider and incorporate safety early in the development and testing phase of the product so that it can be deployed with full consideration of operational and worker safety.

This issue of Inside SSA is intended to be a forerunner to the Blue Sky Commission to communicate some of the technological security solutions that are currently available or are being developed by the Department for the benefit of the sites.

Advanced Concept Armored Vehicle

The Advanced Concept Armored Vehicle (ACAV) is a prototype all-weather, day-and-night operation vehicle for response and convoy escort. It will be field tested at an NNSA site in August 2004. Additional ACAVs are being procured in FY 2005 by NNSA. The ACAV serves as a force multiplier and enhances survivability of the protective force. Based on input from DOE/NNSA protective force members, the ACAV was designed and built from the ground up. Incorporated into the design are several advancements over an Up-Armored High Mobility Multipurpose Wheeled Vehicle (HumVee), including improved armoring; standard safety

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equipment, such as anti-lock brakes and airbags; thermal imaging and CCTV for the driver; driver-adjustable suspension settings; ballistic protection for the radiator; efficient air conditioning and heating system; rapid robotic exterior weapon deployment system; 360-degree protection for the weapon operator (the gunner inside the vehicle is entirely unexposed); gunner weapon sights with thermal, pan, tilt, and zoom CCTV options; and warranties for two years on the armor and full new-vehicle warranties on the vehicle.



The ACAV

Neutralization and Denial Technologies

Several projects are under development to improve DOE site denial capabilities. In late 2004, prototype hardware will be delivered to Sandia National Laboratories (SNL) for a downsized version of a millimeter wave system that heats an adversary's skin to make it very uncomfortable to continue a mission. Unlike a similar long-range "battlefield" system being developed by the military, this effort focuses on a much shorter range version that can be deployed on the inside of facilities to provide a formidable barrier where special nuclear materials exist.

Investments continue in a remotely operated weapons system, as a means of denying access and neutralizing adversaries without exposing DOE response forces to hostile fire. SSA has partnered with NNSA to install a complete system at a field location. The site has prepared the necessary safety documentation, and received approval, including an Unreviewed Safety Question Determination. Future

"Shrinking the Protected Area will save substantial costs when a newly configured Perimeter Intrusion Detection and Assessment System is installed, and should allow us to more intelligently deploy our manpower." Secretary Abraham, SPOTC, May 7, 2004

enhancements will be made to the existing weapon by incorporating assisted targeting. Prototype assisted-targeting systems have indicated a significant increase in the probability of neutralization of the adversary.

Intrusion Detection

An advanced perimeter intrusion detection and assessment system (PIDAS) is being tested to show its effectiveness before proceeding with a substantial investment and construction effort. The new PIDAS includes a substantial physical barrier to make it more difficult for a vehicle or ground-based intrusion to penetrate. Testing was completed in March and shows increased delay benefits compared to traditional PIDAS designs.



Advanced PIDAS

Early Warning System

The Department of Defense's Technical Support Working Group (TSWG) has been developing a thermal scanning system that can provide 360 degrees of intrusion detection at ranges of up to 5 kilometers. This system provides early warning of an attack, providing additional time for the appropriate weaponry and personnel to be dispatched to the fight. While this early warning system is available, an improved version is under development. DOE will

take delivery of and test a second-generation system later in 2004. Once laboratory testing has been completed, the early warning system will be made available to DOE sites to evaluate the site-specific benefits.



Defense Department Early Warning System

Vulnerability Analysis and Simulation

The Adversary Timeline Analysis System (ATLAS) is a software tool that can be used to analyze site vulnerabilities and update the Analytic System and Software for Evaluating Safeguards and Security (ASSESS) software, commonly used by DOE sites to prepare vulnerability analyses. ATLAS provides a more accurate and comprehensive capability than ASSESS for performing site vulnerability analyses, as well as improved reporting capabilities. When fully developed, ATLAS will also allow attacks on security systems to be modeled, and will provide the ability to analyze life-cycle costs associated with various security system design alternatives. In March, Version 2.1 was released providing the ability to model insider/outsider collusion scenarios. A beta version of 3.0, which will replace the ASSESS outsider modeling capabilities, will be released later this year.

The "Next Gen" force-on-force simulation tool is in its initial phases of development, but the capabilities it will provide have been

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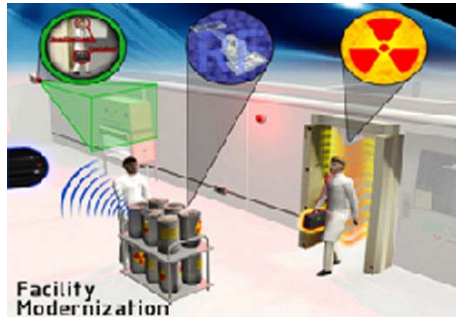
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well received. Unlike systems such as the Joint Conflict Analysis Tool (JCATS), Next Gen requires only a single analyst to operate. The final output will allow large numbers of security system design alternatives or scenarios to be considered and selected for follow-on analysis or actual force-on-force exercises.

Explosives Protection

The Explosive Defense Analysis Team (EDAT), consisting of explosives detection, vulnerability analysis, and blast mitigation experts, has been analyzing site situations and making explosive-protection recommendations for two years. The EDAT applies a performance-based approach to mitigating explosive threats and systematically optimizes detection, standoff, and blast mitigation measures. Future EDAT site visits will be used to validate a series of protocols to determine whether adequate and optimum protective measures exist. After validation is completed in FY 2005, the protocols will be incorporated into the Explosives Protection Technology Transfer Manual, forming the basis of a future analysis module for ATLAS.

operating costs. Near-, mid-, and long-term recommendations for technology development were identified to address MC&A technology needs. These include integrated safeguards, security, and safety systems; automated surveillance of nuclear activities; continuous real-time asset management; and faster inventories by use of in-process measurements and monitoring. The full MC&A Modernization Plan report will be issued in July 2004.



Three technologies that could be used at existing facilities: automated surveillance systems, RFID (radio frequency identification) tags, and radiation monitors integrated with personnel ID cards

improves overall protective force safety through a rapid alert and location of an injured or incapacitated officer. Modifications to the existing radio backbone are not required if the changes comply with applicable standards.



Sitcomm embedded in a lapel speaker and microphone that is connected to a Motorola XTS3000 radio

Identification of Friend or Foe (IFF) System

The IFF system is an identification method that can help reduce accidental fratricide among protective forces. The system is currently under development, and a field evaluation at an NNSA site is planned for FY 2005. The system can identify protective forces and differentiate them from the adversary using invisible light and optical tags. The system can be mounted on most weapons by using a variety of adapters. The light used for this system is not visible to the human eye and cannot be detected by most night vision goggles. It is designed to be fully functional in the presence of interfering light sources, including full sunlight.



The IFF system can be mounted on most weapons

"Ultimately, I believe we need to both reduce the number of sites with Special Nuclear Material to the absolute minimum, consistent with carrying out our missions, and to consolidate the material in each of those sites to better safeguard that material."
Secretary Abraham, SPOTC, May 7, 2004

MC&A Modernization Plan

A fresh examination of materials control and accountability (MC&A) requirements was needed to ensure that future MC&A technology development efforts support and are directly tied to Secretarial Initiatives for the consolidation of materials and to the Department's Strategic Security Plan. Coordination has already begun to integrate MC&A systems with safety and physical security components to provide a more robust security program. The MC&A Modernization Plan provides the roadmap to accomplish these objectives.

During the past year, MC&A modernization team members visited numerous sites to identify technology needs, including technology impacts on security and

Situation Command and Control System

Situation Command and Control System (Sitcomm) is a geographical locator and status monitor system designed for DOE protective forces. A prototype system is planned for installation at an NNSA facility in FY 2004 for evaluation, with system availability planned for FY 2005. The system is embedded into a common radio communications system used at DOE sites. The system provides real-time status and location of the protective forces, enhancing the command and control capability of the protective force commander. It can monitor and display the individual's health status and duress location without input from the protective force member, thus providing vital information in the event of an attack. It also

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Inside SSA

Upcoming Activities

Special Reviews

- Annual FISMA review of DOE classified program

Additional Protocol Exercise at INEEL

Chemical Weapons Convention (CWC) Challenge Inspection Tabletop Exercises

45th Annual Meeting of the Institute of Nuclear Materials Management

Combined S&S, Cyber, and Emergency Management Inspection

- Nevada Test Site

S&S Inspection

- Y-12

Cyber Security Reviews

- Bonneville Power Administration
- Southwest Power Administration

Emergency Management Review

- ANL-W

ES&H Inspections

- Oak Ridge National Laboratory
- Los Alamos National Laboratory
- Lawrence Livermore National Laboratory

Security Technology Symposium – FY 2005



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Chemical Defense for DOE Sites

In February 2000, the SSA Office of Security formed the Chemical Defense Assessment Team (CDAT) to perform assessments to improve the DOE-wide posture in defending against chemical attacks. This multi-dimensional program has resulted in the development of chemically hardened patrol vehicles, chemically hardened SRT response rooms, 24/7 chemical agent detectors, and chemical defense guides. Efforts undertaken to mitigate this threat to office personnel have resulted in an innovative concept to chemically harden facility stairwells for use as “safe havens.” A prototype system will be installed and evaluated in Washington, D.C., later this year. Also under development are dual-technology chemical detector

requested by name by the Department of Homeland Security and the White House. CDAT plans to work closely with the Office of Independent Oversight and Performance Assurance to develop exercises related to the chemical threat.

Moving Technology Forward

SSA is soliciting your help and support to jump-start the Department’s effort to utilize security technology to our advantage. Your assistance is needed in finding technologies with security applications that are deployable today, in implementing pilot programs to test those technologies at selected DOE sites, and in further deployment at appropriate DOE sites. SSA is looking specifically for technologies that can assist our protective forces and

“Technology can serve as a force multiplier to save protective force members from unnecessary risk in case of attack, and provide additional response time to meet and defeat an attack. I intend to use technology intelligently, and to our advantage.”
Secretary of Energy Spencer Abraham, May 7, 2004 – Remarks at the DOE Security Police Officer Training Competition (SPOTC)

modifications and expedient tactical response self-contained breathing apparatus. Benefits include the capability to detect, survive, respond, and defeat an adversary using chemical agents against facilities within the Department. Safety has been addressed with each of these components, especially when dealing with the stairwell safe haven.

Last fall, CDAT published “A Guide to Defending DOE Sites Against Chemical Attacks,” which was distributed throughout the DOE/NNSA complex and to selected security organizations outside DOE. This three-volume set has received broad acclaim throughout the government and has been

security professionals to more effectively and efficiently fulfill their mission to protect our critical national security assets.

Suggestions for all candidate technologies should be sent directly to SSA using the contact information provided at the end of this newsletter. Additionally, we will be reaching out to identify suitable sites for pilot programs and follow-on deployment of technologies as appropriate. We believe this effort has great potential to significantly enhance the robustness of the protection systems we deploy around our critical national security assets. SSA, NNSA, and ESE are committed to working together to make this a success. ■

Solicitation of Comments, Questions, and Suggestions

SSA welcomes your thoughts about our newsletter. Please send or phone comments, questions, or suggestions to:

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