IMPROVING BIOLOGICAL THREAT DETECTION

LEADERSHIP PERSPECTIVE

Jonathan Miller
Exec. Director
Nat. Air Security Ops
U.S. CBP
Air and Marine Ops

Daniel Murray
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Assistant Secretary
Countering WMD
U.S. Dept. of Homeland Security

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HOLDING THE LINE

DLA Rapid Deployment Teams are partnering with U.S. Northern Command on the U.S. southern border.

By John Bell

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EXPLORING THE FILTRATION

Benefits of Synthetic Carbon

U.S. Army Combat Capabilities Development Command (CCDC) Chem Bio Center is exploring synthetic carbon as a chemical toxin filtration material.

By Gay Pinder

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LEVERAGING SYNTHETIC FOR DECONTAMINATION MATERIAL

U.S. Army Combat Capabilities Development Command (CCDC) Chemical Biological Center is developing a synthetic decontamination capability.

By Shawn Nesaw

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LEVERAGING SYNTHETIC FOR DECONTAMINATION MATERIAL

U.S. Army Combat Capabilities Development Command (CCDC) Chemical Biological Center is developing a synthetic decontamination capability.

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MULTI-LEVEL RESPONSE FOR MULTI-JURISDICTIONAL CHALLENGES

New York state’s 2nd and 24th WMD-CSTs are responsible for CBRN protection of 20 million residents.

By Lt. Col. Aron Sacchetti and Maj. Andrew Couchman

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ADVANCING VIRTUAL REALISM FOR REAL-WORLD READINESS

Mr. Daniel Murray, Director of Ft. Leonard Wood’s Chemical Defense Training Facility (CDTF), on efforts to bring advanced simulation to training.

Interview by Christian Sheehy

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Cover: U.S. Marines with Explosive Ordnance Disposal (EOD) Company, 7th Engineer Support Battalion, 1st Marine Logistics Group, prepare to breach a building suspected to have simulated chemical threats at Camp Pendleton, CA. EOD and CBRN participated in this simulated training exercise to bolster cohesion between both job fields while increasing the proficiency of being able to detect, locate, identify, and triage suspected WMDs while working in contaminated environments. (U.S. Marine Corps by Cpl. Quentarius Johnson)

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Executing Strategy for National-Level Protection

James F. McDonnell

Assistant Secretary

Countering Weapons of Mass Destruction

U.S. Department of Homeland Security

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FIELD PERSPECTIVE

Ensuring Multi-Environmental National Security

Jonathan Miller

Executive Director

National Air Security Operations

U.S. Customs and Border Protection

Air and Marine Operations

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With the free flow of information interconnecting our world, so exists the likelihood that this information may also help those wanting to do the world harm. The threat of mass casualty terror has seen a rise in the variability of solutions targeting these dangers. Advances in biological detection are focusing more on large scale attack scenarios in major urban centers. Thankfully, there are intelligent people working for the U.S. government coupling lessons learned with an understanding of what needs improving to deter attacks.

The Summer issue of Security & Border/CST/CBRNE offers a look into current application and research in countering weapons of mass destruction (CWMD) programs and planning. From the U.S. Department of Homeland Security (DHS), James McDonnell, Assistant Secretary for CWMD, speaks to the National Biodefense Strategy and priorities driving policy under a Biological Detection for the 21st Century (BD21) framework. From biodefense implementation to critical research into new biodetection capability, the Combat Capabilities Development Command (CCDC) Chemical Biological Center (CBC), Aberdeen, MD, is testing synthetics for carbon-based filtration and chemical agent decontamination. The Biological Engineering for Applied Material Solutions (BEAMS) program may soon produce a universal method for decontaminating all manner of chemical and biological agents with higher decon rates than previously possible.

As news of illegal immigration at the southern border continues, U.S. Customs and Border Protection (CBP) is on the frontline of national defense. Challenges related to active round-the-clock surveillance in Air and Maritime Operations (AMO) are front and center for CBP’s Jonathan Miller, Executive Director, National Air Security Operations (NASO) who discusses expanding operational range in the National Airspace System, among other priorities. From a hard border, ground perspective, the Defense Logistics Agency (DLA) is employing Rapid Deployment Team (RDT) assets in coordination with U.S. Northern Command (USNORTHCOM) and CBP to ensure construction, oil, and fuel needs are met before shortages can arise.

We would be remiss in not mentioning the great work being done by the 2nd and 24th Weapons of Mass Destruction-Civil Support Teams (WMD-CSTs), New York National Guard (NYNG). This issue profiles some shared challenges and areas of readiness in ensuring mass event safety and CBRN attack response preparedness for the nearly 20 million residents of the Empire State.

Your comments and suggestions are welcome. Thank you for the continued readership!
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MUTLI-LEVEL RESPONSE FOR MULTI-JURISDICTIONAL CHALLENGES

New York State’s two Weapons of Mass Destruction-Civil Support Teams (WMD-CSTs), the 2nd and 24th, are responsible for nearly 20 million residents over an area of more than 54,000 square miles. Lt. Col. Aron Sacchetti, Commander, 2nd WMD-CST and Maj. Andrew Couchman, Commander, 24th WMD-CST, New York National Guard (NYNG), spoke about their primary concerns for sustaining current threat readiness around the clock.

Lt. Col. Aron Sacchetti
Commander
2nd WMD-CST, NYNG

My role as Commander of the 2nd WMD-CST is to ensure all members of the Team are properly trained and prepared to deploy in support of an Incident Commander. In addition, the role of the Commander is to interface with civil authorities as often as possible in order to establish and maintain positive relationships and ensure awareness and familiarity with the availability and capabilities of the CST. Given that the 2nd CST response area covers the majority of NY, with the exception of Westchester, Long Island and NYC, it is important for the Commander to spend as much time as possible interacting with civil authorities from around the state. The CST mission area is focused on events involving WMD, Chemical, Biological, Radiological, Nuclear (CBRN) agents, or hazardous materials (HAZMAT). In particular, the CST mission is to support civil authorities at the direction of NY’s Governor, identifying CBRN materials (HAZMAT). As a result of that course, the 2nd CST hosted the Joint Hazard Assessment Team (JHAT), where we work alongside bomb detection agents and canine teams, the 2nd CST hosted the associated training course called Joint CBRN Characterization, Exploitation and Mitigation (JCCEM). As a result of that course, the 2nd CST received a request to support the city of Rochester during its St. Patrick’s Day parade. In addition, we have already received additional requests from other agencies and will be expanding our support to the Great NY State Fair as well as the Senior PGA Golf Championship.

Maximizing Team Strengths

Over the past 18 months, the 2nd CST has undergone significant turnover of personnel. This has increased the challenges associated with maintaining readiness. In response, the 2nd CST emphasized individual and section training. We engaged our section leaders and Team members to focus on identified areas of weakness and worked together to develop training plans which would balance maintaining proficiency in those skills already at the necessary levels while working to improve and build proficiency in those tasks needing more emphasis. We worked with the leadership throughout the Team to communicate the importance of individual and section level proficiency and applied Command emphasis on limiting distractors and interruptions to individual and section level training.

In addition to the institutional, job-specific training required of all Team members, the 2nd CST engages other partner agencies such as NY State Office of Fire Prevention and Control (OFPC) to provide refresher training such as Hazardous Materials (HAZMAT) Technician level certification. We have also worked with the NY State Police’s Contaminated Crime Scene Emergency Response Team (CCSERT) as well as the NY State Department of Health’s Wadsworth Center to ensure all Team members remain proficient in the skills necessary to respond to a terrorist type event.

For the past 3 years, the 2nd CST has been involved in at least one exercise each year which has involved multiple CSTs and partner agencies. In 2017, the 2nd CST hosted an exercise at the NY State Preparedness Training Center (SPTC) in Oriskany, NY. This exercise brought together and tested members from the 2nd CST, the 21st CST (NJ), and the 3rd CST (PA). In 2018, the 2nd CST conducted a joint exercise with the 52nd CST (OH) at the Niagara Falls Air Reserve Base. In addition, Hamilton College hosted an exercise which brought together first responders local to the College in Clinton, NY as well as the 2nd CST and the 15th CST (VT). The staff at Hamilton College were so impressed and pleased with the event, they expanded the scope for 2019 which resulted in an exercise being conducted just last week which brought together members of the NY State Police, NY State OFPC, FBI, 2nd CST, 24th CST, and 21st CST.

Although we don’t specifically train on natural disaster response, much of what the members of the 2nd CST are capable of doing lends itself to natural disaster response. For example, the 2nd CST has supported the response to numerous natural disasters, including Superstorm Sandy and Hurricane Irene. More recently, we sent our Communications Section Chief to Puerto Rico to assist in the recovery from Hurricane Maria. He spent two weeks in Puerto Rico supporting the communications needs of the first responders and emergency personnel.

Based on the recent efforts of the FBI and the National Guard Bureau (NGB) to emphasize the operational model of the CST called a Joint Hazard Assessment Team (JHAT), where we work alongside bomb detection agents and canine teams, the 2nd CST hosted the associated training course called Joint CBRN Characterization, Exploitation and Mitigation (JCCEM). As a result of that course, the 2nd CST received a request to support the city of Rochester during its St. Patrick’s Day parade. In addition, we have already received additional requests from other agencies and will be expanding our support to the Great NY State Fair as well as the Senior PGA Golf Championship.
The role of the 24th WMD-CST commander is to ensure proper deployment of CST assets (survey, lab, and communications) to respond to a WMD or HAZMAT scenario in a timely and coordinated manner by request of the incident commander. Our mission is to support civil authorities to identify CBRN agents, assess the consequences, advise on response measures, and assist with any other requests by the Incident Commander. The 24th CST conducts mostly standby missions at major events or public gatherings year-round in NYC/Long Island/Mid-Hudson Valley to be able to respond in case of a CBRN incident. Standbys typically include preventive active radiation/chemical screening to ensure the public is safe. The team also conducts response missions at a HAZMAT or WMD incident to recon and sample a HAZMAT site and accomplish the incident commander objectives.

The major challenge to sustaining readiness is balancing all the different real-world requests (standby and response missions) from partner agencies, in a very busy city, while also completing all the tasks to ensure readiness, such as training, maintenance, and administration.

Partner agencies can easily access the CST through a simple phone call or text to request support for a particular event or for a HAZMAT incident. Furthermore, given there are so many requirements on individual team members, unit collectives are extremely difficult to execute with the required team members to ensure we can adequately achieve our Mission Essential Task List (METL).

The 24th CST has had extensive training regarding potential terrorist attacks but with a WMD-CBRN nexus. These courses range from advanced chemical and biological training at Edgewood Chemical and Biological Center and Dugway Proving Ground to radiological courses conducted at the Nevada Test Site. Team members also conduct explosives training in Socorro, NM as part of their required training to be able to respond to a terrorist explosive scenario pre- or post-blast.

In October 2019, NGB and USNORTHCOM will conduct an exercise with FDNY, which will specifically involve the Combined Response Enterprise (CRE) and the ability of the Homeland Response Force (HRF) to provide medical assets during an incident involving mass casualties. In 2017, FEMA spearheaded an exercise called Gotham Shield which incorporated many federal, state, and local agencies involving a nuclear detonation in Manhattan. This involved evacuating casualties to hospitals in NY and N.J. Finally, Vigilant Guard is conducted every year within the FEMA region which involves the HRF and their ability to evacuate casualties from a complex HAZMAT scene.

The 24th CST has extensively trained as a team in other parts of the U.S. only on CBRN related threats and has had members travel overseas solely to conduct CBRN related training. For natural disasters, the 24th has only had members travel as part of their required and optional individual training which has involved preparation for natural disasters, such as several communications courses, DoD Defense Support Civil Authorities, and several FEMA courses.

Our #1 goal is to continue to expand the relationship the 24th WMD-CST has with partner agencies in and around NYC/Long Island/Mid-Hudson Valley in an effort to better provide HAZMAT/CBRN support to keep the public safe. The relationships have grown extensively, especially after 100+ real world standby and response missions alongside partner agencies over the last 18 months as well as significant interagency training, which has only fostered close relationships with civil authorities.
EXECUTING STRATEGY TO ACHIEVE ADVANCED NATIONAL-LEVEL PROTECTION

Mr. James F. McDonnell serves as the Assistant Secretary for the Department of Homeland Security’s (DHS) Countering Weapons of Mass Destruction (CWMD) Office. The mission of the newly-established CWMD Office is to counter attempts by terrorists or other threat actors to carry out an attack against the U.S. or its interests using a weapon of mass destruction. Prior to this position, Mr. McDonnell was the acting Assistant Secretary of CWMD and the Director of the DHS Domestic Nuclear Detection Office.

Mr. McDonnell is a recognized expert in the area of WMD-related terrorism. He enlisted in the Navy in 1975 and retired as a commissioned officer after twenty years of service in special operations and counterterrorism. After leaving the Navy, he founded the National Security Programs business unit at Oak Ridge Associated Universities and managed a number of terrorism-related national security activities, including restructuring the technical response by the U.S. to nuclear terrorism threats.

Mr. McDonnell has senior executive experience in the federal government and the private sector, where he directed security, police, and other risk management functions. He has served in the Senior Executive Service in DHS, the Department of Energy, and the White House. Following the terrorist attacks of September 11, 2001, Mr. McDonnell became the founding director of the Department of Energy’s Office of Energy Assurance, which is responsible for the protection of the nation’s energy infrastructure.

When President George W. Bush announced the creation of DHS, Mr. McDonnell moved to the Homeland Security Transition Planning Office within the White House to begin the work of building the Department’s infrastructure protection capability. As part of the original executive leadership team at the Department, he was responsible for the initial development and management of today’s Infrastructure Protection Office. He formed and directed the development of several national programs at the Department, which included management of security activities through several high-threat periods, the development of a National Protection Plan, and the implementation of the Buffer Zone Protection Plan.

CST/CBRNE: How has the biological threat changed over the last 10-15 years?

Mr. McDonnell: The biological threat is evolving in troubling ways. As the administration highlights in the National Biodefense Strategy 2018, the acquisition or use of biological weapons by state or non-state actors presents a significant challenge to our national security.

The materials and equipment needed to produce biological weapons are now widely available and an increasing number of people around the world have the skills needed to weaponize biological agents. This is a result of rapid expansion and ground-breaking advances in the biological sciences field. The same scientific advances that hold the promise of bringing great benefits to our society also present tremendous potential dangers if adapted for malicious purposes.

The security of bio stockpiles around the world is also a matter of concern. In many countries, biological agents are stored in laboratories without adequate security measures. Some abandoned biological weapons programs run by other nations are not completely destroyed and some are buried underground and could be accessed. As the Blue
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Ribbon Study Panel on Biodefense pointed out in its National Blueprint for Biodefense (2015) this creates the risk that these materials could be obtained by terrorists or other criminals.

Along with the availability of resources, there is intent to possess these types of weapons. Again, the National Biodefense Strategy explains that a number of nations are pursuing biological weapons programs and terrorist organizations have sought to acquire them.

The consequences of a biological weapons attack could be catastrophic. This is why countering biological threats is a key priority for this administration.

CST/CBRNE: What is the current DHS program to detect biological threats?

Mr. McDonnell: The Department established our current program to monitor for biological attacks – BioWatch – in 2003. The BioWatch program was deployed with the intent of providing early warning that a bioterrorist attack has occurred. This technology has not been updated since that original deployment despite great advances in biomedicine, data analytics and communications architectures.

The BioWatch program did not include incident managers at the state and local level (first responders). In BioWatch, samples were collected and taken to a laboratory for analysis, a process that can take up to 36 hours. BioWatch will be replaced by a new system that provides near real time detection. One lasting benefit of the BioWatch program is the laboratory analysis that is conducted on samples. This capability will be preserved and become an integral part of the replacement system.

CST/CBRNE: How is DHS CWMD seeking to advance the nation’s defenses against biological threats?

Mr. McDonnell: The Blue Ribbon Study Panel brought focused attention to the fact that the nation lacked a rapid biodetection system and recommended the development of a 21st Century-worthy detection system. In line with this recommendation, DHS CWMD is exploring other technologies that can reduce capability gaps in biological detection. Bolstering our defenses against bio-threats is a top priority of DHS CWMD.

We have initiated a technology demonstration activity to evaluate biological detection equipment in support of an eventual integrated detection program. This technology demonstration is the starting point to assess the suitability and performance of representative technologies in the market. It is providing valuable data to our new biodetection program – Biological Detection for the 21st Century, or Biodetection 21 (BD21).

CST/CBRNE: What new technological advancements are you hoping to utilize in Biodetection 21?

Mr. McDonnell: The goal is to design, develop, and deploy a state-of-the-art biodetection system. BD21 builds on the lessons learned, technology tests and evaluations, operational data collected, and research and development projects conducted by DoD and other partner agency efforts. DHS is partnering with DoD and HHS in the BD21 testing and deployment.

Consider that BioWatch is an “identify to detect” method of biodetection: air samples are collected, retrieved on a cyclical basis, and analyzed in a lab for signs of specific biological warfare agents.

The BD21 program, on the other hand, will follow a “detect to respond” methodology. Near-real-time detection will support rapid decision making and enable the first responder network to take fast, initial actions to save lives. It will use networked equipment, data integration, and intelligence to detect anomalies. Anomalies are changes in the environment that may represent threats. BD21 will equip the first responder network with technology to preliminarily identify the threat on-site. Labs will be used to further confirm the presence of a threat and identify it.

This program envisions networked nation-wide detection systems that collect real-time data which is processed using big data analytics to identify potential bio-threats.

CST/CBRNE: What can you tell us about the technology demonstration for BD21?

Mr. McDonnell: The rapid prototyping effort now underway is a just one part of a comprehensive BD21 program strategy. The strategy comprises all aspects of a major program acquisition, to include requirements generation and validation, data analytics, modeling and simulation, and cost benefit analyses, and testing.

For the technology demonstration effort, we are fielding several detection technologies in different locations around the nation. The BD21 technology demonstration examines “trigger” technology. “Trigger” refers to a device that signals the presence of a biological anomaly, such as an unusual plume or cloud of biological particles.
This rapid prototype effort involves installing this trigger technology in 12 U.S. cities.

The technology demonstration serves two primary purposes. First, it will gather environmental data in different weather and seasonal conditions that can be used to establish a profile or pattern of naturally occurring biological agents – those that pose no threat. This data will be used to build algorithms to identify anomalies. So, for example, we need to make sure the triggers are not signaled by non-threatening anomalies such as cigarette smoke near the detector. We anticipate refining the algorithms to ensure the triggers are activated only by biological anomalies of actual concern. Second, it will evaluate how the technologies perform in the field, often in combination with other detection technologies and triggers.

This is an initial effort to evaluate currently available technology and collect data that will inform the direction and design of the larger BD21 acquisition program. It is not an end state. Nor is this an operational system. In other words, at this point in time, DHS will not receive real time alerts or use the technology to collect or process samples.

CST/CBRNE: Where are the technology demonstrations deployed?

Mr. McDonnell: DHS selected the locations based on several criteria. The 12 locations are all within existing BioWatch jurisdictions. This allowed us to make the best use of existing expertise, relationships, and resources. The locations represent a broad range of weather, environmental, geographic, and atmospheric conditions. In order to ensure Operational Security, the BD21 specific locations and operating parameters will not be publicly released.

CST/CBRNE: What is the timeline for replacing BioWatch?

Mr. McDonnell: We are working closely with partners within DHS and other federal agencies to replace the legacy BioWatch system with BD21 and to integrate BD21 with existing federal detection, surveillance, and data analytic efforts. I have directed that BD21 be fully deployed and BioWatch replaced no later than 2025. The BD21 technology demonstration effort will continue for 12-18 months – but the larger acquisition, data and network integration, and concept of operations (CONOPS) development is a multi-year effort. It will also be informed by the affordability and budget process.
DHS CWMD will continue to support partners where BioWatch is deployed to maintain the current system and daily operations. BioWatch will continue to serve as the nation’s Biothreat monitoring system until replaced.

When ready, BD21 will replace the BioWatch technology. We are working with state, local, and private sector partners to understand their operations and response plans to ensure a robust and well-coordinated national detection system. Partners’ inputs, requirements, and CONOPS have informed and will continue to inform DHS efforts to develop and deploy a technologically advanced and operationally streamlined biodetection system.

We are committed to working with our emergency managers, public health officials, and first responders to improve the nation’s defenses against bioterrorism and biological threats. Local partners are the first line of defense, protection, and response.

CST/CBRNE: What is the current status of the replacement system?

Mr. McDonnell: DHS CWMD is in the early stage of defining the formal BD21 program of record. BD21 is a multi-year acquisition program. We are working now to determine the technical specifications for BD21. Technical requirements will be informed by users, as well as the results of technology demonstrations, testing, and data provided by existing biodetection programs across the government. The ultimate selection of technologies will be based on what is possible. We expect the data analytics component of the system to continue to advance and we will advance this capability as changes are possible. We will not spend 5-6 years deploying a technology that is 5-6 years old. The deployment strategy will allow flexibility for program managers to upgrade and operate simultaneously.

CST/CBRNE: What is the ultimate goal of BD21?

Mr. McDonnell: Our focus at CWMD is to reduce the risk of terrorism by detecting and disrupting WMD threats to protect the nation against potentially catastrophic attacks. BD21 will help minimize the effects of a release of a biological threat by incorporating first responders in-the-loop.

When the technology is ready, BD21 will initially be deployed in the 30+ BioWatch jurisdictions. Nationwide coverage is our goal for this system, in keeping with the mission of the DHS CWMD.

With BD21, we will be able to detect biological threats faster and put more information into the hands of first responders so that they can respond to the incident and protect Americans. DHS will deploy an effective biodetection system to help them protect their communities and the nation.
The Defense Logistics Agency (DLA) Rapid Deployment Team (RDT) Blue worked at the southern border to help U.S. Northern Command (USNORTHCOM) and U.S. Customs and Border Protection (CBP) obtain construction materials along with fuel and oil for equipment and vehicles. The partnership also helped the U.S Army provide food rations and holiday meals to soldiers working to reinforce the barrier between the U.S. and Mexico.

Operations-Critical Logistics at the Border

DLA's contribution began last October when USNORTHCOM asked DLA to send a team to assess what the agency could provide. DLA quickly deployed RDT Blue, whose members have been providing logistical support from their base in San Antonio, led by Air Force Col. Eduardo Quero. RDT Blue is one of three RDTs that DLA Logistics Operations keeps trained and ready to send anywhere in the world to provide logistical support to other federal departments and agencies. RDTs deploy to support wildland firefighting, aid Americans affected by hurricanes and flooding, provide humanitarian assistance and perform other missions that require the specialized logistics expertise only DLA can provide.

For this mission, RDT Blue included experts from several DLA major subordinate commands — seasoned pros in obtaining construction materials, fuel and food through contracting or interagency agreements. They were joined by a universal customer account specialist, an expert in acquiring and ensuring the proper delivery of multiple categories of supplies. Specialists in legal issues and disposal of excess materials have been supporting the effort remotely. Just as crucial as the team members on the ground are their partners working from DLA's Major Subordinate Commands, or MSCs, around the country, Quero emphasized. "Our RDT has access to the entire supply-chain enterprise to facilitate the logistics needs in the [border mission]." The team's deputy commander Eric Gray agreed. "Being embedded with the customer, knowing that the whole of the agency is behind us makes our support much more capable," he said.

Working in sync with the team from the Agency Synchronization...
Marine Corps Brig. Gen. S.D. Slenka, commanding general of the 1st Marine Logistics Group, takes notes on the status of the border operation in Nogales, AZ. DLA and Rapid Deployment Team Blue supported the effort by providing supplies to U.S. Northern Command.

( Photo by: Army Spc. Brandon Best)

Operations Center (ASOC), the DLA Distribution Logistics Operations Center and the Command and Control Centers from DLA Troop Support, as well as DLA Energy and DLA Disposition Services, has been key to the mission’s overall success, he added. In addition to supplying the usual materials and fuel, the RDT fulfilled a special request from the commander of the Army’s 4th Sustainment Brigade. After the team arrived, he asked DLA to provide a full Thanksgiving meal for the troops deployed on the border. “It’s an honor to be able to help provide the troops with a holiday meal while they’re away from home,” said Joe Cauvin, a DLA Troop Support Subsistence employee. “If they can’t be with their families, having a traditional Thanksgiving meal can give a sense of comfort and remind the troops that they are not forgotten while they’re away.”

Joining Quero, Gray and Cauvin for the RDT Blue deployment were Jamal Brooks and Rick Bulson of DLA Land and Maritime; Bryant “Jack” Jackson of DLA Distribution; Greg Stephens of DLA Troop Support; and Katherine Meadows of DLA Energy. Pete Gentry and Ron Williams from DLA Disposition Services supported remotely, along with Army Lt. Col. Patrick Vergona from the DLA Office of General Counsel. “Logistically, it was pretty smooth,” Jackson said. “We were essentially a central hub that interfaced with DLOC plus ASOC and DLA Troop Support’s Command and Control Center. We were kind of the main pivot entity between those organizations and the guys on the ground, primarily the Army’s 3rd Expeditionary Sustainment Command and 4th Sustainment Brigade and Army engineers assigned to a vast array of geographically dispersed units.”

The team worked long days, seven days a week. “The mission really didn’t stop,” he said. As Army units completed their work reinforcing physical structures, DLA’s role in the border mission shifted to helping soldiers and Marines prepare to dispose of excess barrier materials and scrap metal. DLA Disposition Services sent specialists from several locations to aid in that effort. Gray reflected on the keys to DLA’s success in supporting CBP in this mission. “We were as an RDT able to deploy on short notice with an already-formed team,” he explained. “We knew each other and our business. We could get on ground quickly and figure out how to support our customer’s requirements. Just as important was that we were co-located with leadership, as they were trying to take care of nearly 6,000 troops across a nearly 2,500-mile border,” Gray added. This meant the RDT had to work together to supply about 25 border crossings, he noted. Because U.S. Army North and the Marines were the ones interacting with CBP, the RDT personnel received their requirements from those service members. One challenge was to supply enough coiled barrier wire, known as concertina wire. “We basically cleared out DLA’s [continental U.S.-based stocks],” Gray said. “But DLA Troop Support has done a really good job setting up surge contracts.”

Delivering the wire also required all hands on deck. “DLA Distribution ensured that many of the truck drivers had two-driver teams so they could drive 24 hours a day to deliver more quickly,” Gray said. Concertina wire requires supporting pickets in heights of 8 feet, 6 feet and 32 inches, which the team also made sure was provided, along with concrete jersey barriers and 20-foot shipping containers. And they provided some military units with ramps for loading and unloading.

The result was a success in providing service members everything they needed to complete the mission. “Col. Richard Pierce of U.S. Army North told the RDT that at no point did any combat engineers run out of fortification material,” Gray recalled. That belief was shared by Marine Corps Brig. Gen. S.D. Sklenka, commanding general of the 1st Marine Logistics Group, who was temporarily assigned to the operation as deputy commanding general for sustainment. The general told Gray and Quero that nobody was yelling about logistics. “As a logistician, you know that when the customer is quiet, they’re pretty satisfied,” Gray said.

RDTs: DLA’s Ready Asset

The work illustrates the real capability of the RDTs, which many at DLA may forget exist. “We don’t get a lot of attention until something pops up,” Gray said. “And I think the RDTs are a great asset that facilitates DLA’s global posture, supports the warfighter and promotes our strong partnerships around the world.” In his everyday life, Gray is a customer account manager for the Marine Corps at DLA Headquarters. “The thing I’ve really enjoyed most is the teamwork. Each of the RDT members has a tremendous amount of experience and can do more than their individual skillsets. Seeing the team in action is really a work of art,” he said. His colleague, Jackson, worked on-site for one month for DLA Distribution. He grew accustomed to frequent deployments during his career as an Air Force logistician. “I think our DLA RDT performed exceptionally well,” he added. “We got a lot of positive feedback from the leadership and from numerous people from the Army command and subordinate units we were dealing with.”

Working on a mission for an RDT, “you find out really quickly how connected the MSCs are,” Jackson said. “It was really kind of impressive to see how we all interconnected and interfaced with the Army units.”

To dispose of excess building materials, the RDT relied on working with DLA Disposition Services out of locations near Davis-Monthan Air Force Base in Tucson, Arizona, and near San Diego, where “DLA Distribution also had a hub. DLA Distribution, Corpus Christi, Texas, provided key support as well”, Jackson said. DLA Distribution also managed the trucking contracts and oversaw the scheduling and routing of numerous carriers. “They had a special project code assigned to this mission that prioritized it in importance,” Jackson said. Even with so many MSCs working together for different military branches supporting a different federal agency, the operation “was smooth as glass,” Jackson said. “As an RDT, we all get along well. And when it’s go-time, everybody on the team knows it. You didn’t hear anybody complaining.”
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ENSURING NATIONAL SECURITY ON A MULTI-ENVIRONMENTAL LEVEL

Jonathan Miller is the Executive Director, National Air Security Operations (NASO), U.S. Customs and Border Protection (CBP), Air and Marine Operations (AMO). AMO is a federal law enforcement organization dedicated to serving and protecting the American people through advanced aeronautical and maritime capabilities.

As Executive Director of NASO, he oversees all operations requiring use of AMO's strategic air assets, including the long-range P-3 Orion maritime patrol aircraft and MQ-9 Predator B unmanned aircraft system (UAS). He oversees six National Air Security Operations Centers which operate both domestically and internationally. Executive Director Miller has over 24 years of law enforcement and leadership experience. He began his federal career in 1994 with the U.S. Border Patrol in San Diego, CA, where he served on the San Diego Sector Special Response Team and as a member of the Border Patrol National Tactical Unit. He later transferred to the Miami Sector, where he conducted maritime patrols in South Florida.

In 2007, Executive Director Miller transferred to AMO's Miami Air and Marine Branch, where he served as a vessel commander, marine instructor, helicopter rope suspension training master and standardization instructor. He went on to serve in leadership positions including Supervisory Marine Interdiction Agent; Deputy Director, Marine Operations; and Supervisory Marine Interdiction Agent, Marine Operations in the Southeast Region.

In 2013, Executive Director Miller was selected to be the Deputy Director, Training, Safety and Standards at Headquarters. In 2018, Mr. Miller was asked to serve as Acting Executive Director for NASO, and in 2019 he was selected as Executive Director.

Executive Director Miller holds a 100-ton U.S. Coast Guard Masters license. He received the U.S. Border Patrol’s Newton-Azrak Award in 2000, and the Commissioner's Award for Excellence in Mission Support in 2011. He is a graduate of the American University Key Executive Leadership Program and the DHS SES Candidate Development Program.

Security & Border had the opportunity to speak with Jonathan Miller, Executive Director, National Air Security Operations (NASO), U.S. Customs and Border Protection (CBP), Air and Marine Operations (AMO), regarding efforts that CBP is undertaking in conjunction with federal partners to secure U.S. interests in the air and maritime national security domains.

S&B: How has Air and Marine Operations (AMO) Unmanned Aircraft Systems (UAS)/National Air Security Operations (NASO) adjusted to address DHS's current border security needs?

Miller: Current national security domain awareness requirements demand the ability to provide diversified support to a variety of strategic and tactical requests. NASO has adapted to meet these requirements by increasing capabilities in reconnaissance/surveillance quality, increased abilities in intelligence and surveillance product sharing, and expanding our operational range in the National Airspace System and abroad. In addition to providing Intelligence, Surveillance, and Reconnaissance programs for national security decision makers, NASO is also routinely tasked with assisting local agencies with emergency requests, conducting surveys following natural disasters, and providing critical support to government agencies for national security contingency plans. We have worked hard over the recent years with the FAA in establishing authorizations and procedures to allow our UAS to contribute to these missions. Evolving technology of sensor and Ku band satellite communications have increased NASO’s ability to share information via real time, high definition full motion video to any requestor at short notice. These recent capabilities have proven to be invaluable in providing field commanders with timely and quality information to make informed...
decisions. NASO has also established additional deployment sites, increasing CBP’s ability to deploy CONUS and OCONUS aircraft in support of border security initiatives.

**S&B: In terms of maritime operations for national security, what are some key areas of current effort for AMO?**

**Miller:** The integration of a Detect and Avoid System (DAAS) technology package designed for the MQ-9 Predator B UAS is a current effort that will enhance our abilities executing maritime operations. The SeaVue maritime radar aboard CBP’s MQ-9s performs optimally at lower altitudes where the airspace is often times outside of air traffic control coverage. The DAAS provides a unique ability for the UAS to detect and avoid other aircraft by integrating systems that detect both cooperative (i.e. aircraft equipped with a transponder) and non-cooperative aircraft (i.e. not equipped with/utilizing a transponder). Within the DAAS, detection and tracking of cooperative aircraft is performed by the Traffic Collision Avoidance System (TCAS) and Automatic Dependent Surveillance Broadcast (ADS-B) system, while non-cooperative aircraft are detected by the Due Regard Radar (DRR). The DRR is an extremely accurate air-to-air radar that can detect aircraft at a range of approximately 10nm, depending on aircraft size. This technology will be critical in increasing use of UAS for maritime patrols over international waters and furthering UAS integration into the National Airspace.

**S&B: As the climate of southwestern cross-border immigration has heated up, how has NASO/AMO supported greater CBP efforts?**

**Miller:** This year in particular we have seen numerous events along the Southwest border and Ports of Entry requiring CBP to shift resources and quickly respond to developing crises. AMO’s ability to deliver high quality full motion high definition video over the Ku-band with a variety of aircraft has proven invaluable in providing field commanders real time information to make timely and informed decisions. Additionally, the incredible endurance of AMO’s UAS (20+ hrs.) relieves many manned aircraft from surveillance missions allowing them to be used in a more tactical response role.

**S&B: With the need for greater surveillance and intelligence gathering on an international scale, talk about NASO efforts to protect U.S. interests outside U.S. territorial limits.**
Miller: NASO’s supports CBP’s global engagement strategy with a defense-in-depth approach via multifaceted air and maritime domain law enforcement operations (mostly with the P3 Orion Long Range Tracker and Airborne Early Warning aircraft). Through AMO’s partnership with Joint Interagency Task Force South (JIATFS), NASO annually provides over 6,000 hours of maritime patrol aircraft and intelligence, surveillance and reconnaissance in support of the detection and monitoring mission combating aerial and maritime illegal drug trafficking. Between 2008 and 2018, CBP AMO’s P3 aircraft participated in the detection, disruption and seizing of over 1.8 million pounds of cocaine worth over $60 billion.

S&B: Feel free to speak to other areas of focus, goals, challenges moving forward.

Miller: As with any program that relies heavily on technology - updates, upgrades, and obsolescence are a never ending challenge. On one end of the technology spectrum NASO operates the MQ-9 Predator B UAS, a virtual flying computer that combines intelligence, surveillance, reconnaissance (ISR) aptitude with unique aviation endurance capabilities unmatched in law enforcement aviation. On the other end, NASO operates a fleet of P3 Orion Long Range Tracker and Airborne Early Warning aircraft. As the longest operating assets within CBP, these aircraft remain indispensable in terms of providing DHS with a flexible and robust aviation capability that supports a variety of mission sets. Regarding personnel, like the rest of the aviation industry, AMO has experienced pilot shortage challenges but we have made some good progress with recruitment and retention incentive programs within the last two years. Operationally, AMO’s ability to adapt and shift resources to ever-changing threats are critical to our homeland security mission. One thing is for certain, we have an extremely talented workforce that serves with professionalism, respect, and determination in fulfilling DHS’ important missions.
A research team at Edgewood’s CCDC Chemical Biological Center, Chemical, Biological & Radiological Filtration Branch, Aberdeen, MD, led by Research Chemical Engineer Gregory Peterson and funded by the U.S. Defense Advanced Research Projects Agency (DARPA), is working with a biologically-engineered material developed by researchers at the Massachusetts Institute of Technology (MIT).

Parasite-based Templating

The seed of Peterson’s idea began when DARPA, working with Dr. Angela Belcher at MIT, contacted Peterson to ask if the Center could evaluate and help optimize the material that MIT developed from templated bacteriophage. Bacteriophage is a parasitic virus that takes over its host, mimicking its DNA as the virus reproduces. This synthetic biological process lets scientists tune biological systems to produce molecules that are difficult or impossible to produce otherwise. The synthetic carbon molecule, biologically-templated carbon nanofiber (BioCNF), is lighter than natural carbon.

"In its current form, it is less than half the packing density of our traditional coal-based carbon," Peterson said. Peterson has also discovered that BioCNF has the ability to filter a broader spectrum of toxic chemicals than its mined counterpart and even other engineered sorbents or porous materials like metal organic frameworks (MOFs).

“We are systematically changing the heteroatoms - elements such as nitrogen, oxygen, etc. - to tune adsorption/reaction behavior," Peterson explained. "The carbon nanofibers are some of the best sorbents we have seen. Without being optimized, they have better broad-spectrum capacity than current filtering substances."

In other words, without further manipulation, the carbon nanoparticles have already proven themselves superior against many toxic chemicals. Peterson says that researchers can use it as a scaffold to incorporate other active metal nanoparticles for enhanced capacity and reactivity. 

Engineering Enhanced Protection

There are plans to create engineered particles by integrating the BioCNFs with additional active materials to make lighter and more efficient filters and suits, creating less encumbrance. A warfighter with superior protection and agility is more lethal on the battlefield.

Peterson foresees using BioCNF in a functioning suit and/or mask in the field within the next 10 years but says there is still a lot to learn about the nanofiber, including its scalability and suitability to further engineering. “Right now, the substance is a powder,” Peterson said. “You can’t put powder in a filter, because you can’t breathe through it. We could really ramp this up to begin putting it into filters and suits,” he shared. "Working with DARPA and involving just the right partners in the public and private sectors could advance this project more quickly."

Proof of concept has already been shown by combining the synthesized carbon with a polymer, using the electro-spinning process. "We form a composite fiber using a solution of polymer, high voltage, a needle and a collector plate," Peterson explained. "We add the BioCNFs as a suspension in the polymer solution and then electro-spin it into the composite fiber, which can then be incorporated into a textile for a protective suit or as a flexible low burden filter."

"Working on a separate program with the Defense Threat Reduction Agency (DTRA), we are looking toward a self-sealing suit that would close exposed areas, preventing spread of the agent," Peterson said. "If we can absorb an agent that has the potential to penetrate a warfighter’s protective suit, if we can react quickly enough before it seeps through to the skin, that’s a benefit to the warfighter."

EXPLORING THE FILTRATION BENEFITS OF SYNTHETIC CARBON

The U.S. Army Combat Capabilities Development Command (CCDC) Chemical Biological Center, Aberdeen Proving Ground, MD, is exploring the use of synthetic carbon as a filtration material against chemical warfare agents and toxic industrial chemicals.

By Gay Pinder, CCDC Chemical Biological Center
The U.S. Army has more than a few technologies to decontaminate chemical agents. Some work well against mustard agent, some decontaminate nerve agents more effectively, and some work well against agent in different physical forms such as aerosol. But what if Soldiers could use one universal decontamination tool against any agent threat they came in contact with?

Researchers at the U.S. Army Combat Capabilities Development Command (CCDC) Chemical Biological Center have set out to do just that – develop a universal decontamination capability through synthetic biology. Established in late 2017, the Biological Engineering for Applied Materials Solutions program or BEAMS keeps scientists hungry, striving for newer, bigger and better warfighter solutions.

Center scientist Jared DeCoste, Ph.D., is the principal investigator on the project, leading the overall research effort.

"This is an interdisciplinary effort," DeCoste explained. "No one person could have broad enough expertise to accomplish what we're trying to do."

"The BEAMS program is bringing scientists from around the Center together to collaborate and ultimately work towards creating new technologies that benefit the warfighter," said Eric L. Moore, Ph.D., director of CCDC Chemical Biological Center. "We're investing in ourselves through BEAMS."

Research for this project revolves around combinations of metal-organic frameworks (MOFs) and special organic compounds called porphyrins, which are derived from E.coli. Using synthetic biology, researchers are developing a solid decontamination material that could support any and all decontamination needs for warfighters. Center researchers chose to modify E.coli due to its simplicity as an organism and the ability to easily modify E.coli's DNA, a function necessary in order to produce an E.coli byproduct called protoporphyrin IX. Typically, scientists would synthesize new materials chemically in a classic lab setting, creating reactions through chemistry. In this case, there was no way for scientists to create protoporphyrin IX through traditional chemical means.

"For us, protoporphyrin IX is incredibly interesting," DeCoste said. "We can do things with this we can't do with other molecules."

Porphyrin molecules, including protoporphyrin IX, have the ability to absorb light and modify oxygen, creating a highly reactive oxygen -- known as singlet oxygen -- that has the ability to decontaminate mustard agent. Once the team created protoporphyrin IX, they turned to a very specific MOF known for its stability, porous makeup and ability to decontaminate chemical agents -- NU-1000. NU-1000's pores...
help increase reaction time, while its overall structure can support the addition of other molecules without compromising the MOF’s decontamination ability.

“We needed a MOF that would act as a support for protoporphyrin IX,” said DeCoste. “NU-1000 inherently decontaminates G-agents such as sarin and VX but we also knew it couldn’t decontaminate mustard well, so putting the two together resulted in a more versatile material. While the team hypothesized combining protoporphyrin IX and NU-1000 would work, they were surprised with the results. “It worked even better than we hypothesized.”

Harnessing Light

NU-1000 absorbs light, creating reactive oxygen species that can induce photocatalytic oxidation reactions under UV and blue light. While these wavelengths are a small part of white light and sunlight, researchers knew it was a head start in enhancing the reaction.

“Our team sees a lot of benefits to creating a material that absorbs light to decontaminate agent,” DeCoste said. “Light from the sun is usually present during operations in the field, so why not try to create a material that utilizes the sun’s light?”

The team is currently experimenting with other light wavelengths to determine which light works best for decontamination so when sunlight isn’t available, decontamination can still occur using artificial light. Through research, the team saw positive results when the MOF and protoporphyrin IX were combined and exposed to white light. Half decontamination, a common metric used in this type of research, occurred in 25 minutes.

Future Research

Moving forward, the team looks to perfect the decontamination of mustard agent while decreasing the decontamination time.

“Ultimately, we want to use the sun to decontaminate a Soldier’s uniform in real-time,” DeCoste said. “We know the wavelengths of light we can harness to potentially optimize toward a product for the warfighter.”

Additionally, the team is looking to optimize the biosynthetic pathway, the procedure of developing the protoporphyrin IX at the E.coli level, so they can produce the most protoporphyrin IX possible for future experimentation. The team also plans to explore other porphyrins to test in the NU-1000 MOF platform to see if any have a positive effect on improving the reactions. Beyond that, DeCoste is interested in studying the photophysics of their research so they have the highest level of control possible over the reactions.

“We proved this works but we still want to know more about how the light is interacting with matter on a basic level,” DeCoste said. “We always look to understand the basics of what we’re doing to gain the deepest understanding possible about the materials and capabilities we’re developing.”

DeCoste also noted that the research could lead to improvements on large-scale decontamination capabilities. He envisions new self-decontamination coatings for vehicles, sensors, weapons and tools that react with sunlight or artificial light source to decontaminate quickly and easily.

Beyond Mustard

Protoporphyrin IX only attaches to the ends of NU-1000 meaning mustard decontamination will occur at those points but the entire middle of the MOF still maintains the ability to react with VX and G agents. In the future, porphyrins might only be a piece of a larger, more complex material that has other molecules added to it to increase its overall impact.

DeCoste emphasized, “Our goal is to provide the warfighter the smallest amount of material that can react the most and ultimately deliver the biggest impact.”

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Lieutenant Colonel (Retired) Daniel S. Murray is the Director of the Chemical Defense Training Facility, a position he’s held since 2007. As Director of the CDTF, Mr. Murray executes CBRN defense training for Joint Force CBRN Initial Entry and Professional Military Education; as well as CBRN Defense training for all Joint Force operational units and select allied nations in pursuit of their unit-specific training objectives.

Born and raised in Naperville, IL and commissioned into the Regular Army on 16 May 1986 upon graduation from Western Illinois University, Mr. Murray earned a BS in Law Enforcement Administration and an MS in Military Arts and Science for the Strategic Defense of Ports and Airfields from the United States Army Command and General Staff College at Fort Leavenworth, Kansas 1999.

His military assignments include Director, Chemical Defense Training Facility; Chief of Staff, US Army CBRN School; S3, 3rd Chemical Brigade; Chief, Personnel Proponency, US Army CBRN School; Brigade Chemical Officer, 101st Support Group (Corps) and 1st Brigade 327th Infantry Regiment, 101st Airborne Division (Air Assault); Commander, Headquarters and Headquarters Company, 1-327th Infantry Battalion, 101st Airborne Division (Air Assault), where he deployed his unit for peace keeping duty to the Sinai Peninsula as part of the Multinational Force and Observers. His service with the 1st Infantry Division includes Chemical Officer for 2-16 Infantry and then, during Operations Desert Shield/Storm, as the Executive Officer for the 12th Chemical Company.

Mr. Murray retired from active duty in September 2007 after over 21 years of service. His awards and decorations include the Bronze Star, the Meritorious Service Medal (2 OLC), the Army Commendation Medal (4 OLC), the Army Achievement Medal (2 OLC), the National Defense Service Ribbon, the Southwest Asia Campaign Ribbon, the Saudi Arabia and Kuwait Liberation Medals, the Multi-National Force and Observers Medal, and both the Parachutist and Air Assault Badges.

CST/CBRNE had the chance to speak with Mr. Daniel Murray, Director of Ft. Leonard Wood’s Chemical Defense Training Facility (CDTF), regarding efforts to bring advanced simulation training to bear in better preparing Soldiers for real-time operations.

CST/CBRNE: Please provide some background into the need for this capability development and its development to present.

Murray: We’re talking about counter-weapons of mass destruction mission training in a toxic nerve agent environment. The need to be able to do this is entrenched in the fact that the U.S. Defense Department (DoD) has little capability to focus on this mission under realistic lethal conditions.

The Chemical Defense Training Facility (CDTF) has long been the sole training asset within DoD capable of touching on the requirement. Training to this mission under these conditions in the U.S. will not permit anything outdoors—we have to conduct training like this in a manner where we don’t risk contamination to the outside environment nor put any personnel at risk.

The CDTF is the singular asset within DoD to conduct small team and individual skill reinforcement in the Countering Weapons of Mass Destruction (CWMD) mission area under live, lethal conditions.

When you look at the threat today, you quickly realize it’s real and we need to be prepared to defend against the threat use of WMD materials. We don’t want to have to wait until we deploy into such an environment to exercise tasks and training, techniques and procedures for the first time. We have, within the DoD at the CDTF, an excellent facility in which we can leverage training opportunities for those units that expect to perform these missions.

The Training Enhancement Initiative—which is what we’ve called the project underway at the CDTF—was initiated in 2013 with
research into the threats and the missions that we expected to encounter. From that initial research, concepts for training scenarios were developed beginning in 2015 and then went through some refinement over the next few years.

Two past U.S. Army Chemical, Biological, Radiological and Nuclear School commandants supported and championed the concept to ultimately secure a funding partner in the Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO CBRND). Their portfolio of product support to the joint force would nicely accommodate what we wanted to do at the CDTF. With JPEO CBRND on board, design began in earnest in 2017 with actual work starting in 2018. The CDTF itself was decontaminated in October 2018 and work began over the ensuing six months to transform the CDTF into a realistic battlefield for deployment of WMD materials into realistic scenarios.

CST/CBRNE: From a toxic CBRN perspective, can you tell us about some of today’s challenges in dealing with real-world hazardous materials and aspects that lend to readiness through virtual training?

Murray: Virtual training is great in terms of being cost effective while offering opportunities for individuals and teams to experience limited but valuable training environments where they can learn to plan and execute missions in very resource-constrained environments.

Where hazardous materials are simply too dangerous to employ in training, then the next best thing is to conduct training virtually or through the use of simulants. There are hazardous materials that are so dangerous that setting up a program to use them in real scenarios is just too risky and too costly when it comes to programs that must be stood up to safeguard these materials and the people that would train with them.

However, the value of training in actual lethal, toxic environments cannot be underestimated. It can be compared to airborne training in that jumping from a 34-foot tower is good but jumping from an aircraft in flight is real. The real environments produce the highest levels of confidence and go a long way to reducing uncertainty and risk when you have to execute the mission for real.

CST/CBRNE: In terms of the virtual environment, talk about some of the more standard and more intricate duplications of real-world CWMD hazards scenarios this program addresses.

Murray: Until the completion of the Training Enhancement Initiative, we really had almost no scenario-driven training that was realistic and challenging for our customer base. We did things over the years to try and get to that level but those efforts were done with very limited funding.

Within the CDTF, we are replicating missions associated with large scale ground combat operations. And in the area of CBRN defense, we are focusing on individual and small-unit collective skills. For example, we’ve created a unit dismounted defense against an enemy counter-attack, a division logistics base, an enemy weapons cache,
The CDTF, specially designed for containment of toxic material, is now set up with 11 separate training, or "target" areas all accessible from one large common area which is a scenario in itself. Most targets are set up in individually-themed rooms ranging in size between 900 and 2,000 square feet. (Ft. Leonard Wood)

a dense urban ruin city, a large scale WMD production mock-up, an enemy large-scale storage facility, and a subterranean (tunnel) scenario which leads to an underground WMD storage facility.

In each of these scenarios, we deploy agent in a manner consistent with threat use of such materials. U.S. forces will then employ skills to detect, identify, decontaminate or perhaps sample and transport for laboratory analysis. In each of these scenarios, we stress aspects of the human dimension by increasing the variable controls such as lighting, sound effects, and time constraints.

CST/CBRNE: With regard to fluidity of program experience, what are some challenges to ensuring that trainees understand the difference between virtual and potential real-world scenarios to ease transition from training to field?

Murray: Training environments always seem to create a false sense of security in some regard to the task being trained. Training at the CDTF is the real deal and the reality of entering into a live, lethal toxic nerve agent environment—as a capstone exercise—is reinforced throughout initial entry training. They come to the CDTF with some trepidation but they leave with great confidence that their protective equipment worked and so did their other gear. Our senior classes and the operational units which train at the CDTF have a complete appreciation for the nature of the real-world training at the CDTF.

In terms of easing transition from training to field, the CDTF is the perfect example of how that transition is close to seamless.

CST/CBRNE: As lessons learned from the program are gained, what potential improvements do you see moving forward?

Murray: We are already embarking on a total paradigm shift in how we conduct toxic training. The CDTF, when finished, will be the global venue of choice for all live, lethal toxic CWMD mission training for dismounted reconnaissance forces. There’s not another place in the world that has what we have here.

In improving things going forward, some lessons learned about how to continue to push the envelope to always increase realism. Some of the biggest lessons learned actually center on how to better control contamination and clean the facility. We will implement some new air monitoring practices in the future to supplement our decontamination efforts so that we have greater ability and ease to make changes to the interior of the facility.

CST/CBRNE: Feel free to address other goals and challenges moving forward.

Murray: With the CDTF Training Enhancement Initiative, we are hopeful that this helps the U.S. Army CBRN School move closer to becoming the Center of Excellence for all CBRN unit training; something that several past commandants have envisioned. And I certainly hope that this project opens up a new pathway to partner with members of the CBRN enterprise to create new capability and capacity in the future.
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JUL 17 – 18
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Alexandria, VA
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JUL 23 – 25
CBRN Defense Conference & Expo
Wilmington, DE
Ndia.org/events/2019

JUL 29-31
Int’l. Fighter USA
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Internationalfighterusa.iqpc.com

AUG 5 – 7
Maritime Security West
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AUG 19 – 22
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AUG 20-22
Future Indirect Fires
Fort Sill, OK
Idga.org/events-futureindirectfires

AUG 20 – 21
AUVSI USDPS
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Thedefenseshow.org

AUG 20 – 22
Military Police & Law Enforcement Expo
Ft. Leonard Wood, MO
Mpraexpo.com

AUG 22
SNA West Coast Symposium
San Diego, CA
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AUG 22 – 25
PA Hazardous Materials Conf
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SEP 8 – 12
GSX 2019
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SEP 9 – 13
Virginia Hazmat Conference
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SEP 11 – 12
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