CHEM-BIO DEFENSE

Quarterly

Vol. 6 No. 4

Front Cover: Compilation depicting Joint Project Manager Biological Defense, created by Steve Lusher, Senior Graphic Designer, Camber Corporation.

Back Cover: U.S. Soldiers from the Georgia Army National Guard's 1st Battalion, 121st Infantry Regiment, pay their respect during a memorial ceremony for Staff Sgt. Alex French IV at Camp Clark, Afghanistan, Oct. 4, 2009. French was killed in action by an improvised explosive device on Sept. 30, 2009. DoD photo by U.S. Air Force Senior Airman Evelyn Chavez.

U.S. Army Soldiers depart an HH-60 Pave Hawk helicopter during training on Orchard Training Area, Idaho, Sept. 16, 2009. The Soldiers are assigned to the Utah Army National Guard, 19th Special Forces Group, and the helicopter crew is assigned to the 34th Weapons Squadron, United States Air Force Weapons School, Nellis Air Force Base, NV. The 34th Weapons Squadron is conducting the terminal employment phase of the Nellis Weapons School syllabus. U.S. Air Force photo by Master Sgt. Kevin J. Gruenwald.

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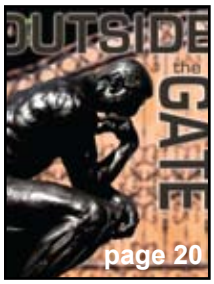

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Col. Alan Burket
Joint Project Manager
Biological Defense

"Terrorists are determined to attack us again—with weapons of mass destruction if they can (and) they are more likely to be able to obtain and use a biological weapon than a nuclear weapon."

– Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, December 2008

The office of the Joint Project Manager for Biological Defense (JPM-BD) is the Department of Defense (DoD) lead for environmental biological detection systems. We develop and field the world's most technologically advanced biological detection, identification, and warning systems and we are setting the stage for another leap in capability that will enhance the defense of our homeland and our Warfighters.

The JPM-BD is integrating our point, tactical and stand-off detection systems into sensor arrays to enable tipping and cueing of the sensors. This allows biological sensors with differing missions to play off each other's strengths producing a synergistic improvement in performance. Maj. Sylvia Farmer, our Assistant Product Manager for the Joint Biological Stand-off Detection System (JBSDS), explains the operational advantages of combining stand-off and point sensors in her article, "Integration of Two Biological Defense Systems," found in this issue.

We are teaming with our sister JPMs to integrate BD sensors with chemical, acoustic, motion and seismic sensors to create an extensive array of systems with a wide range of capabilities rolled into a common operational picture. Recently, the JPM for Contamination Avoidance demonstrated the first of this type of capability that included point, stand-off, and tactical BD sensors. This field demonstration highlighted the power of a common operational picture as well as the synergy of integrated sensors that accelerate actionable, accurate and timely information to the commander.

The JPM-BD is playing an integral role in the JPEO-CBD development of the CBRN Enterprise Architecture that will ultimately provide CBRN capabilities to the homeland as well as troops overseas. The early stages of the JPEO architecture have already yielded successes such as the National Bio-Monitoring Architecture. Their efforts with the Environmental Protection Agency, National Institute of Standards and Technology, Department of Homeland Security, Federal Bureau of Investigation, and United States Postal Service, have resulted in significant advancements in sample collection, decontamination and assay development. Successful cooperative efforts with Guardian, Bio-Watch, and Bio-Surveillance programs will pave the way to take DoD and Civilian-integrated CBD to the next generation of capability. Our JPM leads the environmental biological detection arm of the architecture effort. We are trading program information, test data and equipment with the DHS and are actively seeking opportunities for collaborative development and testing efforts on common core technologies.

Our Warfighter focus remains steadfast and clear. We continuously upgrade our fielded BD capabilities and ensure that our systems fit seamlessly within concepts of operation (CONOPS) that are comprehensive, practiced and sustained. We provide "boots-on-the-ground" in the form of technical and operational experts to assist our Warfighters with CONOPS improvements and exercise development. We work closely with the JPMs for Guardian and Information Systems to implement enterprise network upgrades that accommodate BD legacy systems, systems in the fielding process and our future systems. We ensure these upgrades meet the Warfighters' needs and have minimal impact on BD operations. Mr. Joe Hamel, our System Manager for Joint Portal Shield, discusses our support to the Warfighters on the Korean Peninsula in his article, "Enhancing Bio Preparedness in the Far East."

The JPM-BD is dedicated to our mission of providing environmental biological detection capabilities to Warfighters and our homeland. We will continue to upgrade our legacy systems, assist the troops in the field and produce the world's most advanced detection and warning systems as we move toward a BD capability nested within the CBRN Enterprise Architecture.

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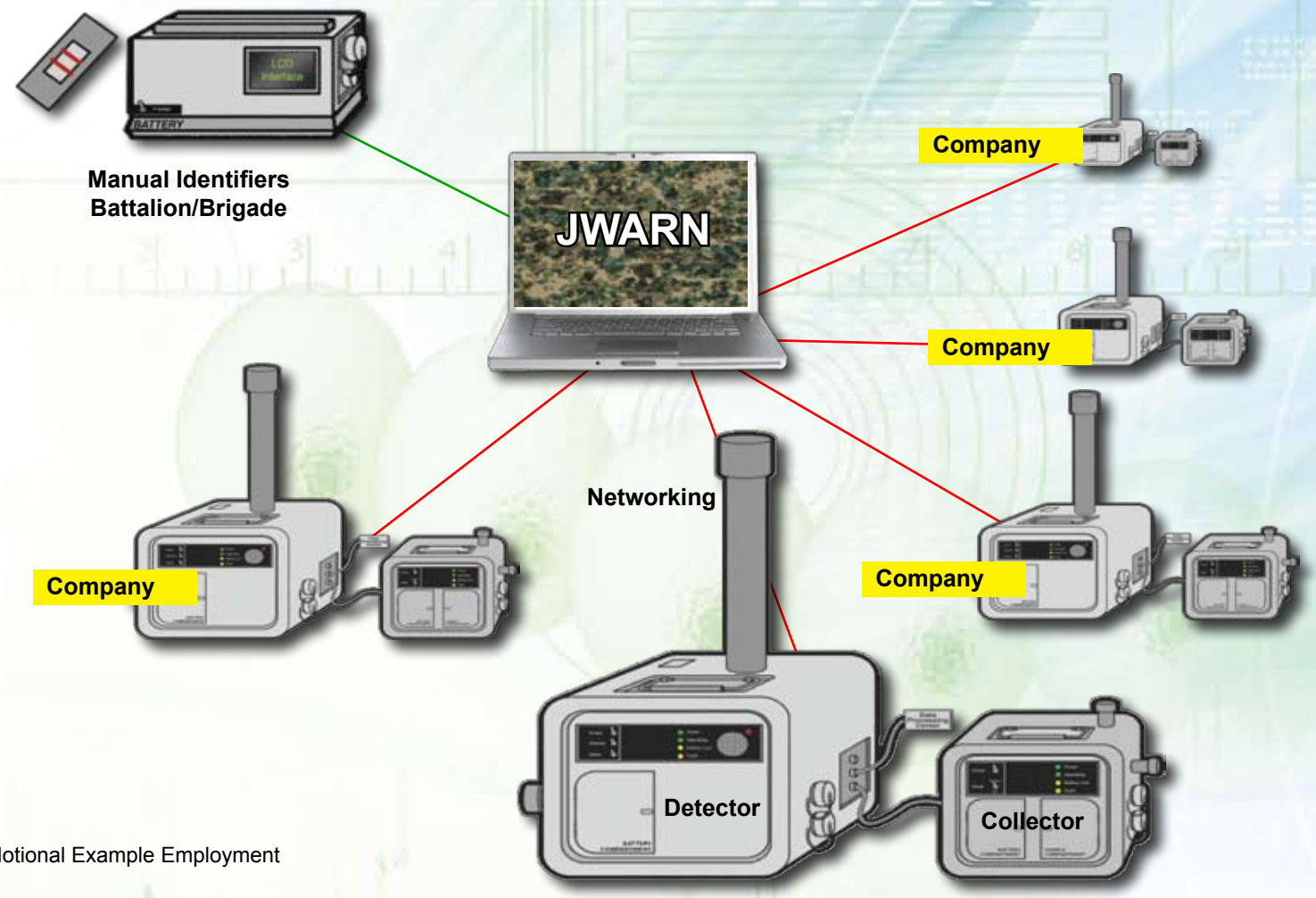
Joint Biological Tactical Detection System:

Bio Surveillance Capability for the Tactical-Level Commander

By Maj. Matt Bowler,
Assistant Product Manager, JBTDS

The Joint Biological Tactical Detection System (JBTDS) is a new start acquisition program that addresses a critical capability gap that must be filled to ensure force protection for our troops in the field, to assist in critical decision making, and to support potential homeland defense missions. The JBTDS provides unique attributes not currently provided by other systems in the field, that will greatly contribute to our force's effectiveness and ability to fight and win on the battlefield.

The JBTDS is a lightweight, man-portable system with a modular open-architecture design. Fielding is projected to start in 2014 to all Services and Special Operation Command (SOCOM). Unlike other biological surveillance systems currently fielded, the JBTDS provides a low-cost solution that can be employed by any Warfighter (non-Military Occupational Specialty (MOS) specific) with a minimal amount of training, and that can be operated by multiple power sources to include A/C, battery, and solar power.



Notional Example Employment

The JBTDS is a modular system that is leveraging commercially available technologies in order to provide capability to the Warfighter rapidly, while minimizing developmental costs. The modular approach will allow for the selection of the best performing components to be integrated in the system to be fielded, and will facilitate future upgrades as new technologies become available.

The configuration is still being refined; however, a draft notional employment concept consists of an integrated automatic detector-collector and a manual identifier. In this configuration the system is employed with an array of detector-collector nodes disbursed across the battlefield, and a manual identifier located at a centralized location. In the event of a biological attack, the detector provides a visual and audible alarm and triggers the collector to take a sample. The sample is then brought to the centralized identifier for presumptive identification.

Another potential solution the Services are examining is to employ strictly a collector and an identifier and perform continuous collection and periodic sampling to determine the presence of biological warfare agents (BWAs). Concepts of Operations (CONOPS) are still being refined by the Services and the configuration of the system will be tailored accordingly.

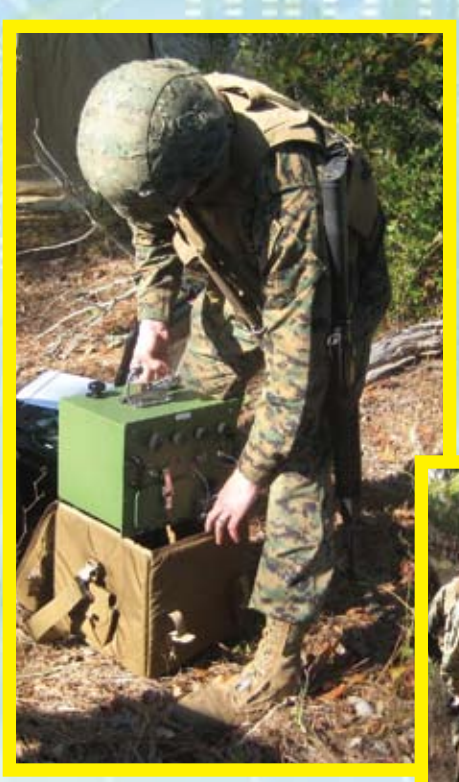
Other attributes of the system include a near real-time detection capability with rapid agent identification, archiving of all biological samples, and wireless connectivity to the Joint Warning and Reporting Network (JWARN) to ensure rapid dissemination of information in the event of a biological attack.

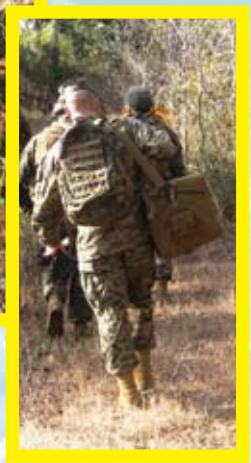
The JBTDS provides a critical biological surveillance capability to the tactical-level commander. It supports expeditionary forces and small units arriving in theater prior to the arrival of other biological defense assets, and units operating in terrain or tactical environments where other systems cannot be effectively employed. The JBTDS will provide the commander with near real-time detection capability to support critical decision-making and to take appropriate action early, and ultimately mitigate casualties.

The JBTDS is an organic capability belonging to the tactical-level commander who can then task organize its employment to meet mission needs. One possible employment scenario considered by the Army entails an array of detector/collector nodes pushed down to the company or platoon level, with a centralized identifier located at the battalion or brigade tactical operations center (TOC). Presumptive identification would be performed using the centralized identifier, after which positive samples would be forwarded to theater labs for confirmatory identification.

This represents just one potential employment option based on draft CONOPS. Other potential employment options include use as part of fixed site and forward operating base (FOB) protection systems, shipboard employment and the possible use in a homeland defense role. More options will be identified as CONOPS are refined.

The JBTDS can be employed as a





stand-alone system when other biological defense assets are not available, or as part of an integrated defense-in-depth chemical biological architecture.

Because JBTDS is a low-cost system and is MOS-independent, it can be employed across the area of responsibility in large numbers, greatly increasing sensor density on the battlefield. This increased sensor density allows U.S. Forces to better address the asymmetric threat which entails small-scale releases of BWAs in localized areas. In these instances, a high concentration plume close to the point of origin quickly dissipates as the cloud travels downwind. Such attacks are best addressed by achieving a higher sensor density on the battlefield.

Increment I JBTDS will report directly to JWARN by wireless communications. This connectivity will allow the commander to direct the employment of other biological defense assets to increase confidence that a biological attack has occurred while presumptively positive samples are directed to theater laboratories for follow-on analysis.

Future increments of JBTDS may be integrated in the chemical biological defense architecture to provide fusion of JBTDS data with other disparate sensor data. This integrated detection scheme would be ideal for protecting FOBs and other high value assets in the future.

The JBTDS will provide the Warfighter with a unique capability not currently available in fielded and developmental systems. It will fill existing capability gaps and ultimately will mitigate casualties on the battlefield. Its unique characteristics provide ease of use, portability, and modularity in a battery-operable package. It is clear that this system provides an essential capability to protect our Soldiers, Sailors, Airmen, and Marines and support mission accomplishment.

Integration of Two Biol

By Maj. Sylvia Farmer, Assistant Product Manager for the Joint Biological Standoff Detection System

The Joint Biological Point Detection System (JBPDS) provides the commanders with a biological warfare (BW) agent point detection, sampling, and presumptive identification capability along with the ability to provide samples for follow on analysis at higher level laboratories. This system provides commanders information that is used to support a detect-to-treat decision and gives them increased situational awareness of what is going on within their immediate area of operations.

The Joint Biological Standoff Detection System (JBSDS) provides commanders with real-time cloud detection, tracking capabilities and discrimination between clouds that are biological threats from those that are not. The information provided by the JBSDS can be used to support a detect-to-warn decision. When used in conjunction with each other, the JBPDS and JBSDS could provide commanders with increased biological surveillance capability not yet realized.

With the development of these two independent systems, both of which provide added capability to the overall biological surveillance plan; integrating the two will increase the operational effectiveness of both. The Joint Project Manager for Biological Defense (JPM-BD) is actively pursuing ways to integrate the two sensors in order to get the maximum effect such as greater confidence in detection, less false alarms, faster identification, improved concepts of operations, and further reduction of casualties from a biological attack.

Developing a system (or single technology) that will identify or discriminate every possible biological threat has proven quite difficult. However, integrating the two systems reduces those limitations by providing a layered, defense-in-depth approach. More specifically, forming an array that combines these differing technologies and capabilities, allows them to play off each other's strong points providing the commander with a greater degree of actionable information to increase confidence in alarms, accelerate decisions to take increased protective measures, and assist in making the decision on how long the protective measures need to stay in place. It can also improve the overall performance of the biological defense architecture.

For example, the JBSDS can be used to trigger the JBPDS to begin collecting a sample prior to the arrival of a biological threat cloud. This maximizes the JBPDS sample collection effort by ensuring samples are taken from the leading to the trailing edge of the cloud. This can reduce the time for the JBPDS to alarm because the system starts collecting a sample sooner than if the JBPDS is set on automatic trigger. It can also improve the system's identification performance because collecting the sample over the entire span of the cloud produces a sample with the highest possible agent concentration.

Utilizing a JBSDS as a trigger for JBPDS also allows the Warfighters to place JBPDS in "standby mode" when no clouds are present. This reduces the amount of consumables used by the JBPDS and in-turn reduces the operating cost of the system. To provide 24 hour protection in a high threat environment requires the JBPDS to use up one carrier

ogical Defense Systems

card every time it takes a sample. Leaving the JBPDS in a standby mode and switching to a collection mode once a threat cloud is detected by the JBSDS reduces the number of samples taken and the amount of consumables used.

The JPM-BD plans to field the point sensors in conjunction with the JBPDS. Below is a discussion of how the JBSDS/JBPDS array, as outlined in the Army draft Concept of Operations for the JBSDS, can improve commanders' situational awareness. Here, the JBSDS detects and tracks a BW aerosol cloud. Once it passes over the JBPDS systems, they identify the BW agent. Not only does the combination of both systems improve situational awareness, the cloud tracking capability and the numbers of JBPDS systems that detect the BW agent gives commanders a better read on what part of the force has been affected by the attack and where medical assets may need to be deployed to reduce the amount of casualties.

The combination of the two sensors can also assist the commander in making the decision to reduce protective posture and resume full operations following a detect and discrimination alert from the JBSDS if the JBPDS does not detect the presence of a BW agent. Given the fact that the JBSDS can track the cloud and determine how fast it moves through the area and if the JBPDS does not detect, the commander can have a higher degree of confidence that the immediate threat is no longer in the area of operations.

In order for both systems to work harmoniously, the hardware, software and information systems must be integrated and work as one. The JPM-BD and Joint Program Manager – Information Systems (JPM-IS) teams have formulated a partnership to do just that. Together we will provide Warfighters with additional and enhanced capability that neither team could bring on their own. Although integrating the JBSDS with JBPDS creates significant synergy, the JPM-BD team is not content to stop there. The JPM-BD will continue to seek ways to migrate all BD systems into the Chemical and Biological Defense enterprise architecture.

A recent demonstration for the Chemical Biological Distributed Early Warning Strategy (CBDEWS) hosted by the Joint Program Manager – Contamination Avoidance (JPM-CA), integrated multiple sensors to include bio, chemical, acoustic, visual and motion sensors, and showed the synergistic operational advantage of an integrated architecture. They demonstrated how a common operational picture from multiple sensors and differing technologies can be used to identify and track chemical and biological threat releases across the battle space. The synergistic impact has improved the probability of detection and reduced the time to detect, resulting in faster analysis and accelerated command decisions. A layered, integrated, CBD architecture is the way-ahead for chem-bio defense!

ENHANCING BIO PREPAREDNESS IN THE Far

By Joseph Hamel, System Manager – Joint Portal Shield, JPM Biological Defense

The Joint Project Manager for Biological Defense (JPM-BD) continues to field and sustain relevant, innovative technologies that provide superior protection to installations, critical assets, and personnel in the field. The current challenges posed by biological threats are in constant flux and range from isolated, asymmetric attacks to the release of quantities that could incapacitate an entire region. Too often, technology developers focus solely upon providing a protective capability, and do not account for what follows a detection event in the field. The JPM-BD continues to stay ahead of the curve, ensuring the proper use and integration of technological solutions, ensuring mission effectiveness in a time of crisis.

The JPM-BD portfolio includes the Joint Portal Shield (JPS), Joint Biological Point Detection System (JBPDS), the Joint Biological Standoff Detection System (JBSDS), and the Joint Biological Tactical Detection System (JBTDS). Out of all of these technologies, the JPS has been conducting a fully operational global biological analysis mission, 365 days a year, for more than 11 years. With this mission, comes significant challenges, including those associated with maintaining and improving reliability, improving detection capabilities, and integrating into all hazard response plans. The nature in which the Joint Portal Shield technology was evaluated and fielded allows for a dynamic interaction with the customer base, and the ability to rapidly provide solutions to meet the needs identified by the Services. The JPM-BD has partnered with the Joint Project Manager for Information Systems (JPM-IS), and has integrated the JPS platform into a real-time monitoring and automated reporting system, identified as *Signal Fire*.

The employment of this technology has significantly bolstered the capabilities of JPEO-CBD, and has created an enhanced framework that brings together data sets provided by patrols, biological, chemical, and radiological detection platforms, and medical Command groups, in order to enhance the Combatant Command's decision making capability when faced with a Chemical, Biological, or Radiological (CBR) threat.

The JPM-BD has had a significant role in the cohesion of response plans, along with members from the JPM-IS, the Joint Project Manager for Chemical Biological Medical Systems (JPM-CBMS), Johns Hopkins University Applied Physics Laboratory, 8th Army Korea, US Forces Korea (USFK), and Installation Management Command – Korea (IMCOM-K).

No central organization was assigned the responsibility for a singular, comprehensive response to CBR threats within the Republic of Korea during armistice and wartime. USFK is codifying roles and responsibilities related to CBR events during armistice and times of military escalation with IMCOM-K and the Pacific Air Force (PACAF). The standup of this process will allow for the streamlined coordination of events after a CBR threat is discovered, and provide USFK with a centralized and rapidly mobilized response capability. Additionally, the standup of this integrated operations capability will allow for 24/7 monitoring of *Signal Fire* responses generated by biological, chemical, and radiological detection systems, and real-time feedback from Medical Command groups.

Deployment of enhanced detection solutions to respond to a biological release in the Republic of Korea has been limited, and the capability may not be an enduring one, should the proper agreements for staffing and resources not be codified among the Components in the field. The JPM-BD identified this disparity and coordinated with JPM-CBMS and USFK to ensure enduring capabilities exist for the expedient confirmatory analysis of suspected biological threats. A notable success story resulting from this coordination is the continued standup of a Joint Biological Agent Identification and Diagnostic System (JBAIDS) capability at the 121st Combat Support Hospital in Seoul. The plans for the implementation of this capability have been set in conjunction with 8th Army Korea, the 65th Medical Brigade, and US Forces Korea. Standup of this capability will allow enhanced mitigation of biological detection events for specific areas under the responsibility of 8th Army and the 2nd Infantry Division, and allows for a broader base of support during times of crisis. The JPM-BD has also worked directly with elements of PACAF and JPM-CBMS to enhance confirmatory laboratory capabilities. Two in-theatre PACAF elements have been identified, and USFK has worked with JPM-BD, IMCOM-K, JPM-CBMS, and PACAF to provide the framework to ensure an enduring capability for confirmatory analysis at Osan AFB and Kunsan AFB. Ensuring the continued mission of the confirmatory laboratories at

Joint Biological Point Detection System (JBPDS) Carrier Box Assembly

Joint Biological Agent Identification and Diagnostic System (JBAIDS)

Joint Biological Tactical Detection System (JBTDS)

Joint Portal Shield (JPS)

Joint Biological Standoff Detection System (JBSDS)

Osan and Kunsan AFB greatly enhances confidence intervals for medical and combatant Command groups, and allows for a rapid deployment of solutions and enhanced protection of personnel, when faced with a biological threat.

The JPM-BD and JPM-IS offices have also taken great strides in order to further codify the employment of enhanced detection and confirmatory capabilities, as well as ensure the real-time Signal Fire monitoring and reporting framework is practiced. This has been accomplished by integrating it into the major US Forces Korea (USFK) exercises. The USFK and 8th Army Korea have worked with JPM-IS, JPM-CBMS and JPM-BD to establish assessments of all biological analytical capabilities on the Korean peninsula. Typically, two major exercise events occur on a bi-annual basis for USFK. These exercises are identified as Key Resolve and Ulchi Freedom Guardian (UFG). Recently, JPM-BD and JPM-IS took part in the UFG exercise, and provided USFK with the capability to assess end-to-end biological responses, including both presumptive field results, in addition to confirmatory laboratory capabilities. The USFK tasked JPM-BD, JPM-IS, JPM-CBMS and PACAF to employ the JPS, Biological Integrated Detection System (w/JBPDS), and JBAIDS laboratories to determine preparedness levels and response procedures during this real-world exercise. All system responses and medical Command 'injects' were reported in real-time back to USFK Commanders through the Signal Fire platform. The scenarios included biological and chemical threat agent releases at multiple sites and across multiple Services within the Republic of Korea.

These exercises initiated installation-level responses, to include cordon and decontamination activities, and integrated biological confirmation and public health responses activated by the Medical Command groups within 8th Army, the PACAF 51st and 8th Medical Groups, and the Navy Branch Health Clinic at the Chinhae Naval installation, in addition to Command and Control responses generated by USFK. U.S. Forces responsiveness was evaluated by JHU-APL, in order to improve current tactics, techniques and procedures. Feedback from these exercises has proven invaluable and continues to bolster the preparedness posture of both the Combatant Commanders and Medical Commands for USFK. Both the Key Resolve and UFG exercise events have also provided extraordinary feedback for JPM-BD, JPM-CBMS and JPM-IS, as they allow for a full evaluation and enhancement of the CONOPs that surround the employment of deployed technological solutions, and allow JPM-BD, JPM-CBMS and JPM-IS to address any system performance issues, ensuring continual improvement of products deployed to the Warfighter.

Too often, the details related to implementing an all hazards response are overlooked until an event occurs. These overlooked details can result in avoidable delays during the critical 24 hour window of opportunity after a population is exposed to a potential threat. While there are still significant challenges posed by large-scale chemical, biological, or radiological releases in the Republic of Korea, USFK is now better prepared to mitigate the hazards posed by these threats in a timely and coordinated fashion. The UFG and Key Resolve exercises have also helped to forge the framework and highlight the necessity of chemical and biological preparedness plans during armistice and wartime conditions. As a result, USFK is currently coordinating with IMCOM-K, CNFK, and the Pacific Air Force to stand up a comprehensive response for any CBRNE event occurring at US installations within the Republic of Korea. The standup of integrated operations in conjunction with an integrated CBD enterprise architecture will allow for the streamlined coordination of events after a CBRNE threat is discovered, and will provide USFK with a centralized and rapidly mobilized response capability. This mission will continue to be supported by JPM-BD, JPM-IS, and JPM-CBMS.

Biological Agent Testing Challenges of LIDAR Systems – Past and Present

By R. Michael Mays, JBSDS Increment II Systems Engineer and John B. Strawbridge, JBSDS Inc II Project Lead

Light Detection and Ranging (LIDAR) systems designed for the Joint Biological Standoff Detection System (JBSDS) program are capable of detecting and discriminating biological vs. non-biological clouds at ranges from 500m to 5 km. Testing and evaluating the discrimination requirements of these systems is severely limited due to the restrictions on the release and containment of biological warfare agent (BWA) materials. These restrictions pose a huge hurdle for the testing and evaluation of the current and future JBSDS programs.

The JBSDS Increment I (JBSDS I) program was initiated in 2002 with an approved Operational Requirements Document (ORD) based largely on the previous performance of the Short Range Biological Standoff Detection System (SR-BSDS). The original test strategy developed for JBSDS I referenced lessons learned from testing the SR-BSDS and Long Range Biological Standoff Detection System (LR-BSDS). One of the first test issues present was the lack of a test chamber that could be used to accurately measure the sensitivity of the JBSDS prototypes. The test chamber would also serve to conserve the amount of simulant used during testing and make testing less dependent on the wind conditions at Dugway Proving Ground (DPG). The second test issue, that presented itself in later years, was the lack of BWA cross section data that could be used to directly evaluate JBSDS performance versus BWAs.

The Standoff Ambient Breeze Tunnel (SABT) was designed and constructed in 2003 to support the need for a biological standoff test chamber. The SABT was utilized for several years and produced well-characterized bio simulant clouds of 200 feet in length. In 2004, the Joint Ambient Breeze Tunnel (JABT) was constructed at DPG. The JABT was a larger, hardened version of the SABT that was designed to do both bio aerosol simulants as well as chemical vapor/aerosol simulants. These test tunnels have been essential in collecting accurate simulant cross-section data to support JBSDS test and evaluation needs. The one shortfall of these test tunnels is the lack of information on BWA aerosol cross-section measurements necessary to directly evaluate the JBSDS performance versus BWAs.

Due to treaties, legal, environmental and human use considerations, biological standoff systems cannot be tested with live BWAs in any outdoor, operationally representative environment. Since existing laboratory derived cross sections of agents and simulant material could not be directly used to predict JBSDS Increment I (JBSDS I) performance, a strategy was developed in conjunction with Sandia National Lab (SNL) to develop an agent/simulant correlation.

Laser beams interrogating aerosol clouds in the JABT.

The agent/simulant correlation measured BWAs and simulants relative cross sections in a laboratory using a calibrated LIDAR and bulk biological agent materials contained in hardened cuvettes. Once the relative cross sections were established for simulants and BWAs, the absolute cross sections of the simulants were measured in aerosol form using the JABT at Dugway Proving Grounds (DPG). Calibration curves based on the laboratory measurements of simulant cross sections and the JABT aerosolized measurements of simulant cross sections were used to estimate the aerosolized measurements of BWA cross sections. After these predicted bio agent cross sections were derived, they were used to scale the JBSDS simulant signals that were then rerun into the JBSDS algorithm to predict if the actual bio agents would create a bio alarm.

The present operational and developmental testing of biological standoff has evolved significantly since the first testing of the LR-BSDS in the mid 1990's. As detailed above, the JBSDS I performance against simulants has been translated to projected performance against BWAs through an accredited agent/simulant correlation, but has some limitations. The experimental uncertainties increase the variability of the agent/simulant correlation BWA projection. Given the variability of the current methodology, several new approaches are currently being investigated to evolve the test methodology further to address the next generation of biological standoff detection technologies.

In 2006; the National Academy of Science (NAS) formed a study panel to assess bio-standoff testing. The goal of the NAS panel was to look at current and future needs for testing and evaluating biological standoff detection systems while assessing current capabilities. Ultimately, the NAS study panel provided their guidance on how to potentially meet the future needs of the JBSDS testing and evaluation program. After several months of panel meetings and discussions, the study panel developed a list of findings to support the direction of future biological standoff testing. The main findings of the NAS panel discussed areas of improvements in development, testing and evaluation of biological standoff detection systems. Other NAS findings included the future construction of new test facilities that would support direct BWA aerosol cross-section measurements and future improvements to the JBSDS I agent/simulant correlation.

The JPM, in coordination with Product Director Test Equipment, Strategy and Support (PD-TESS), has begun work on developing the test infrastructure that will support future JBSDS testing and evaluation needs. The initial collaboration between both offices is working on addressing the findings detailed in the 2006 NAS study and developing the initial test infrastructure to support the JBSDS II as it moves forward.

The current PD-TESS study is investigat-

Aerosol disseminators at DPG.

ing short-term solutions to testing BWAs in an aerosolized form within current BL3 facilities while working on a long term strategy to support future biological standoff BWA testing. The new BSL3 facility will allow direct measurements of optical cross-sections and signatures of aerosolized live BWAs in order to avoid the bulk-to-aerosol projection. This approach has the potential to make the measurements more accurate and repeatable. The optical excitation system of the BSL3 chamber will use small, laboratory size laser sources whose wavelengths are identical to those of the candidate systems.

The chamber will be designed to replicate varying environmental conditions, and allow measurements of live BWA aerosol mixtures (mixed with other BWAs and/or interferents). Care must be taken during development to ensure that the particle size distribution and the environments created in the chamber replicate what is observed during field trials and background measurements. The JABT will be used for verification, validation and accreditation (VV&A) of the BL3 aerosol chamber and modeling and simulation (M&S) methodology for JBSDS II.

The JBSDS team, in parallel with the PD-TESS study, is in the process of developing a test and evaluation strategy that addresses the long term needs of evaluating biological standoff systems with a more accurate methodology than currently used. This new methodology has been established with the development of the Agent Performance Assessment (APA) that builds on the JBSDS I agent/simulant correlation and utilizes the future PD-TESS test infrastructure. The APA will also use the cross-section measurement methodology and physics based models developed during the Joint Science and Technology (JSTO) Biological Standoff Technology Maturation Program for the JBSDS II.

The APA will be implemented under several test constraints:

- All developmental and operational field tests will use simulants.
- Open-air testing against BWAs (live or dead) will not occur
- Open-air measurements of BWA optical properties will not occur; and
- It's unlikely that a complete set of simulants or surrogates having identical optical/physical properties to all agents will be established.

As described above, there is a potential limitless scope of chamber testing due to the large number of combinations of various live BWAs, mixtures, and environmental conditions. The scope of the JBSDS II measurements must be reduced down to a manageable size, based on the most likely threat scenarios from available intelligence sources, judicious use of experimental designs, and an understanding of the system under test (SUT) performance limitations. The APA will ensure that all developmental and operational tests are designed, executed, and evaluated so that the systems are not optimized for any specific test environment, (e.g. DPG, Eglin, etc.). In addition, the APA will establish early-on the requirements for correlations, calibrations, system models, algorithms, uncertainties and errors and ensure that all parties understand the definitions, requirements for, and limitations to the APA.

BWA testing for biological standoff is a difficult task to address given the broad scope of limitations described above. There is still a lot of work to be completed for future JBSDS test and evaluation and it is the goal of the JBSDS program office to adequately address these difficult challenges as early as possible in the acquisition cycle with the support of PD-TESS and the test and evaluation community. With the hard work and dedication involved in this process – from the test community, to our academic and industry partners, we will ultimately provide the Warfighter with a system that provides a significant operational advantage versus BWA attacks.

Target S Grid at DPG.

Homeland Defense

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The magnitude of the Sept. 11, 2001 terrorist attacks on the World Trade Center and the Pentagon opened the nation's eyes to homeland defense challenges never before encountered. In the aftermath of these attacks, the difficulties experienced by first responders exposed capability gaps and vulnerabilities, especially for city fire departments.

The attacks on September 11 intensified the Government's concern over terrorists possibly using Weapons of Mass Destruction (WMD) in U.S. cities. Given the fire departments current level of readiness, major city governments identified capability shortfalls to provide emergency services before, during, and after a chemical, biological, radiological, or nuclear (CBRN) event. The Seattle Fire Department (SFD) and the Fire Department of New York City (FDNY) were the first to field capabilities to upgrade their CBRN readiness posture. Part of the solution to meet their mission requirements in the event of a CBRN attack was the acquisition of new fireboats with a collective protection system (CPS).

Shipboard CPS generally operates on a full-time basis and is seamlessly integrated with a ship's heating, ventilation, and air conditioning system. The CPS provides protected areas within airtight controlled boundaries referred to as a citadel. High-pressure fans coupled with special CBRN filters provide a continuous contaminant-free environment within the citadel. The CBRN filters capture or neutralize harmful CBRN particulates, liquids, and vapors prior to the air's entry into the citadel. Additionally, the high-pressure fans keep the citadel at an increased pressure over that of the exterior ambient conditions, which prevents contamination from entering the protected areas.

Controlled access to the citadel via airlocks and decontamination stations prevents the ingress of contamination and allows the flow of personnel in and out of the protective areas. Thus, collective protection systems allow the firefighters to perform their duties more effectively and efficiently while not being hindered by cumbersome personal protective equipment (masks, suits, gloves, and boots).

Recently, the city of Seattle received two new fireboats to upgrade their maritime fire-

Battalion Chief Jim Dalton (FDNY); Justin Smith, Eas
Limited; Chip Warder (JPM-CP Shipboard Product Di

Partnership

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t To Shipboard
tive Protection
Expertise

By Chip Warder JPM-CP Shipboard Product Director

stern Shipbuilding Group; Jody Bjerkset, Robert Allan
irector), Brian Liska (Deputy Product Director).

FDNY fireboat “343” frame assembly.

Seattle new fireboat "Leschi."

fighting capability. The new fireboats also were outfitted with a collective protection capability, the first such system fielded to a local government's fire department. The leadership realized that specialized assistance was needed to ensure the firefighters understood the proper operational and maintenance requirements for the new system. In early 2007, the SFD contacted the Joint Project Management Office for Collective Protection (JPMO-ColPro) and requested technical assistance for this new capability. The Product Director-Shipboard Collective Protection Systems (PD-SCPS) and other Navy shipboard CPS experts met with SFD's Captain Chris Dahline and Chief Engineer Dick Chester to address the fireboat's CBRN system. A working meeting in Seattle assessed the fireboat's systems and provided operational, maintenance, and performance feedback to the fire department personnel. The SFD leadership was very appreciative of the JPM-Colpro's involvement. Captain Dahline remarked, "The JPMO-ColPro folks took a hard look at our boats…the expertise provided was very beneficial." The collaboration proved mutually beneficial and both parties agreed to have follow-on discussions on how best the JPMO-ColPro can support the SFD.

Battalion Chief Ed Bergamini (FDNY), Chip Warder (JPM-CP Shipboard Product Director), Capt. Jeff Race (FDNY).

Coincidentally, in 2007 the Fire Department of New York (FDNY) was in the planning stages to acquire two new fireboats with the same CBR capability as the SFD. Aware of the challenges the SFD faced and to preempt design issues with their fireboats, the FDNY requested the advisement of the JPMO-Colpro subject matter experts. The FDNY contracted the PD-SCPS as the technical advisor for the CBRN system acquisition for their new fireboats. Battalion Chief Jim Dalton remarked after a discussion about

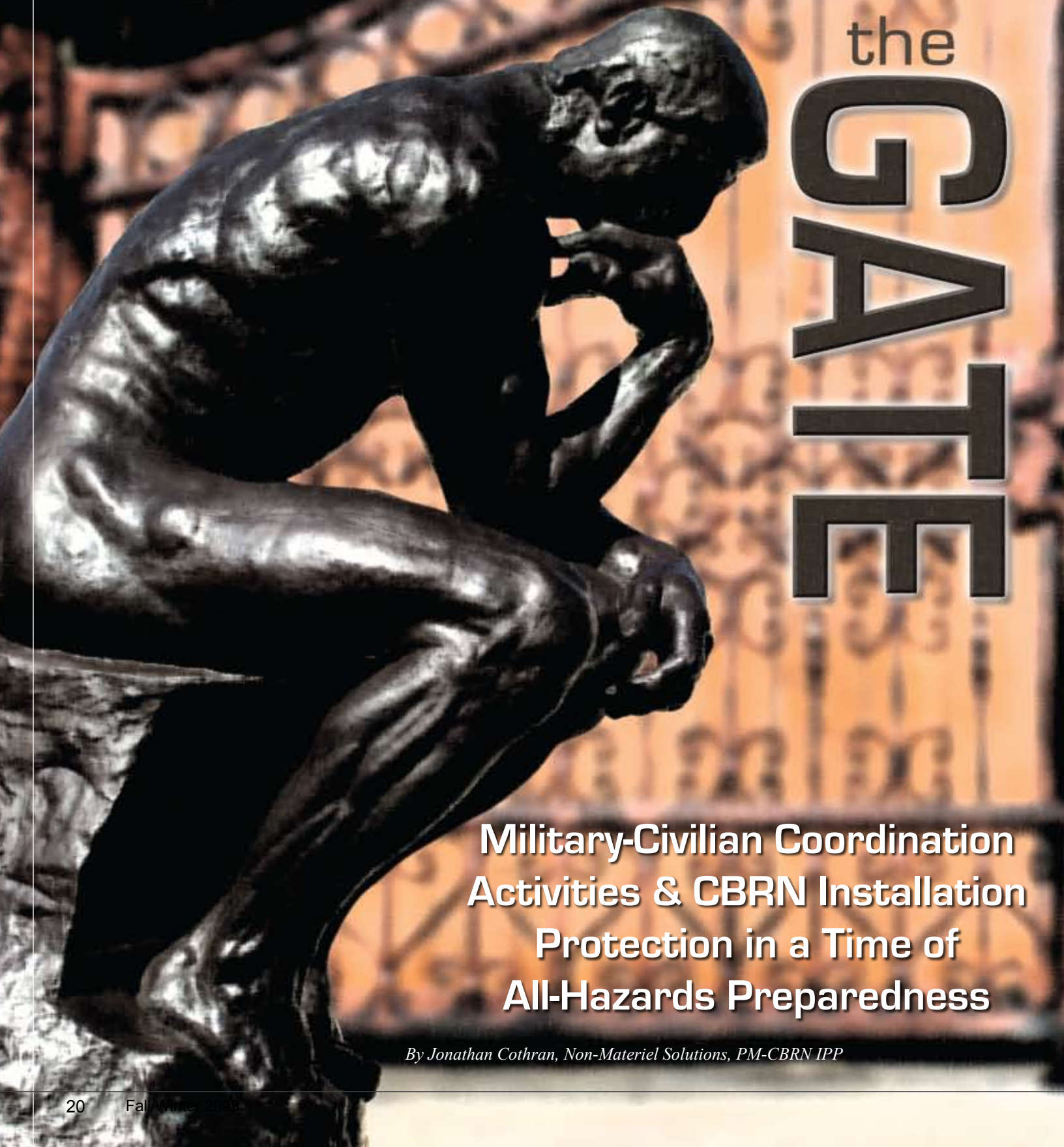
shipboard CPS, "In the future, the FDNY fireboats may encounter the same threats as the U.S. Navy…I want the same CBRN system design as the U.S. Navy on my boats." The FDNY design is near completion with the first boat's delivery scheduled for January 2010 and the follow on vessel in late summer 2010. The partnership fostered between the FDNY and JPMO-Colpro serves as a model for how the Department of Defense's expertise can complement the needs and partner along side city governments.

The new threats to homeland security require special equipment and procedures to ensure the nation's first responders are well equipped to handle any emergency. As we learned from capability gaps realized during the Sept. 11th attacks, our civilian first responders must be prepared to operate in dangerous CBRN environments. Specialized CBRN systems and organic operational knowledge is not always available to civilian emergency responders. The collaborative relationship between the Department of Defense and the civil support agencies allows local governments to field unique systems and train first responders to protect their citizenry in the event of a CBRN event.

At the 2007 Joint Chemical, Biological, Decontamination and Protection Conference and Exhibition, FDNY Battalion Chief Ed Bergamini provided the following remarks in his address to conference attendees in regards to the challenges he faced in the fireboat CBRN system acquisition, "I am a fireman but I know where we are lacking. I needed engineering and technical support to help solve my problems and for that I went to the experts at JPMO-ColPro and NSWC (Naval Surface Warfare Center) Dahlgren for their expertise and knowledge." In today's world, the challenges that our military routinely prepare for unfortunately has evolved into the reality that our nation's first responders must also face. The JPMO-ColPro's support to the SFD and the FDNY is just one instance where specialized military systems expertise helped to ensure America's first responders are prepared to meet future challenges. The cities of Seattle and New York's fire departments, equipped with the best CBRN protection systems available at their disposal, are well prepared to meet future challenges if called upon.

Chip Warder and Eric Arcement, Navy subject matter expert, survey the Leschi decontamination station.

THINK OUTSIDE the GATE



Military-Civilian Coordination Activities & CBRN Installation Protection in a Time of All-Hazards Preparedness

By Jonathan Cothran, Non-Materiel Solutions, PM-CBRN IPP

Hazards know no boundaries. The past few years have highlighted just how vulnerable populations are to natural and man-made disasters, whether they are primarily caused by meteorological phenomena or improvised explosive devices. These hazards require a holistic execution of an "all-hazards" culture of planning, prevention, response, and recovery that has been reinforced by shifts in federal policy and guidance. To address this change, PM-CBRN-IPP, a program focused on protecting installations and their populations from chemical, biological, radiological, and nuclear (CBRN) hazards began executing a series of non-materiel solutions. While making a concerted effort to enhance military-civilian coordination, these solutions not only bolster an installation's CBRN protection capability, but also supplement all-hazards response capabilities already found on the installation and in the neighboring community.

Rather than adhering to a strict top-down approach, which can discourage and inhibit a collective response when working with civilian emergency support functions, PM-CBRN IPP's focus relies upon a bottom-up strategy. This shift in execution seeks to foster local relationships and not only champion a collective response, but also build upon the local installation's and community's capacities. Thus, when a large-scale incident occurs local players are familiar with the capabilities that exist on both sides of the fence-line. They can then optimally coordinate their response as appropriate, taking advantage of the resources each entity brings to the table. This allows for the streamlining of response activities while reducing the logistical burden of duplicative or unnecessary efforts.

The newly signed Department of Defense (DoD) Instruction 6055.17, DoD Installation Emergency Management Program, institutionalizes PM-CBRN-IPP military-civilian coordination efforts by explicitly stating that it is DoD policy to, "Support and assist U.S. civil authorities...for mitigating, preventing, planning for, responding to, and recovering from a natural or manmade disaster or hazard." While this isn't a far stretch from earlier guidance, the policy also requires that the DoD, "Coordinate preparedness, response, and recovery requirements and capabilities with State, local, and tribal governments; other Military Department(s) or host-nation partners using an all-hazards approach that balances risk management (i.e., threat, vulnerability, and consequence), resources and needs."

A limiting factor to date has been the lack of "resources" necessary to foster collaborative relationships. It is in this area that PM-CBRN-IPP's military-civilian coordination efforts have helped enhance emergency preparedness activities via both materiel and non-materiel solutions. For example, using IPP-fielded mass notification and warning systems, DoD installations in southern California were able to direct the actions of installation personnel and the surrounding community during evacuation operations in response to the wildfires of 2007. Resources such as these provide a secondary level of information dissemination beyond civilian systems designed for such actions. However, the real strength in the new policy and PM-CBRN IPP's military-civilian coordination efforts extends beyond giant speakers and reverse-911.

The first significant step in the military-civilian coordination realm facilitated by PM-CBRN IPP was an initiative that utilized IPP exercises as a conduit for bringing installation personnel together with their local BioWatch colleagues (where appropriate). In 2003 the Department of Homeland Security (DHS) embarked upon a biomonitoring initiative (BioWatch) offering a "detect to treat" capability unmatched in scope, as it covers more than 30 major metropolitan areas here in the United States. A significant number of DoD installations are collocated in these same areas but were not typically part of the DHS program.

While some installations have an installation-level biomonitoring capability, most rely on temporary (if any) mobilization of systems or assays (based on threat or intelligence) that may not be very effective at detecting a large-scale release in a timely manner. Bridging the gap between these two disparate populations seemed like a logical step in the enhancement of emergency preparedness activities. In order for prophylaxis and disease containment strategies to have a significant protective effect, early detection is essential so that medical resources can be mobilized appropriately. Relationships built prior to a BioWatch event will help ensure that not only is information shared in a timely manner, but also resources on and off the installation can be mobilized in such a way as to enhance the public health intervention measures being taken to protect the population (whether military or civilian) and prevent further disease transmission.

Fostering military and civilian coordination activities also has added benefits beyond information sharing and asset visibility. Community resiliency studies have highlighted the inherently close ties to civilian populations and infrastructure

Fostering military and civilian coordination activities also has added benefits beyond information sharing and asset visibility.

that military installations have in urban areas. These close ties however, do not guarantee a close working relationship or even basic collaborative concepts of operation. The days of "just in time" mutual aid agreements must become a thing of the past.

To emphasize the necessity of pre-event coordination, three pilot sites have been selected for the execution of joint Military-Civilian Coordination Advisory Group meetings. An interagency partnership with the Defense Threat Reduction Agency (DTRA) has been developed to conduct these meetings in metropolitan areas with varying degrees of currently established military-civilian coordination activities. While not indicative of military-civilian coordination activities nationwide, Seattle/Tacoma, San Antonio, and Chicago, were all selected as sites for this burgeoning effort. Both PM-CBRN IPP and DTRA have a vested interest in compiling and applying lessons learned regarding every aspect of all-hazards emergency preparedness, and more specifically with our DTRA partners, large-scale restoration. A significant portion of emergency preparedness initiatives focus on the planning and preparation for response to an incident, but discussions surrounding recovery and restoration are typically few and far between.

These meetings become venues for open, candid discussions between colleagues that could one day be working together in the event an incident occurs. To date, these meetings have led to joint training opportunities, formal memorandums of understanding and agreement, as well as threat monitoring program expansion and augmentation.

By stepping back and allowing the local stakeholders to participate in open dialogue with their colleagues, everyone wins. Moreover, PM-CBRN IPP hopes that these discussions will not only increase the level of military-civilian coordination at the local level, but will also aid in providing additional fidelity into the systems fielded for CBRN incident response. This would provide military "customers" with the most appropriate systems that enable them to not only protect personnel and facilities (together with their surrounding community emergency response entities), but also allow for the rapid restoration of critical installation operations (see Lessons Learned Table).

RECURRING MILITARY and CIVILIAN ISSUES CAPTURED by PM-CBRN-IPP

KEY MILITARY ISSUES	KEY CIVILIAN ISSUES
• Issues of great importance include preparation for mass fatalities, medical surge operations, management of classified operations during incidents and access to local laboratory testing capability. • Better coordination with local communities in plans development is necessary. • A review of all existing MOAs/MOUs is warranted, especially those defining public health responsibilities and processes within the region (due to leadership changes, new regulations or policy, etc). • Joint base operations would enhance coordination and communication but may complicate emergency response plans/actions with the outside community.	• Issues of great importance include preparation for mass fatalities and medical surge operations. • Better coordination with local communities in plans development and participation in regular military working groups is important. • Civilian emergency support functions are often unaware as to how they can best assist installations in an emergency. Once initial contact is made, sustainment can be an issue due to personnel changeover/rotations. • Civilian support to military installations requires planning for exercising specific actions before an emergency/incident occurs, such as installation/facility access, and consistent communication strategy will only enhance the regional response.

* Both civilian and military representatives commonly indicate interest in having tactical workshops/field-days whereby military and civilian operators and first responders can be familarized with the systems being used.

* Training on the various situational awareness tools, web portals, etc., would be beneficial for all.

Common Carrier
for Biological Warfare Agent Identification

By Ernst Leschke, Joint Biological Point Detection System, Chemical Engineer

The DoD employs multiple lateral flow immunoassay (LFI) carrier products. An effort is underway to consolidate the product designs for the Joint Biological Point Detection System (JBPDS) Carrier Box Assembly (CBA) and Joint Portal Shield (JPS) Carrier into one that serves both missions. Two organizations within the JPEO-CBD, the Joint Project Manager for Biological Defense (JPM-BD) and the Joint Project Manager for Chemical and Biological Medical Systems (CBMS), Medical Identification and Treatment Systems (MITS), Critical Reagents Program (CRP), tasked the ECBC Packaging and Advanced Design and Manufacturing (ADM) team to develop a common carrier for the JPS Carrier and JBPDS CBA. The effort also involves follow-on performance testing of multiple Assay Carrier designs to characterize assay sensitivity after exposure to temperature and humidity, interface testing to assure compatibility with applicable military systems, packaging tests, and distribution of samples to users to solicit feedback. Early test results lead to one promising design that performed the most consistently among the candidates and successfully met packaging and interface requirements. Additional testing is underway to fully qualify the design for production and to reduce the number of DoD managed commodity items, optimize performance, and reduce unit cost.

For roughly the past decade, the DoD has been deploying Biological Detection Systems worldwide in support of a multitude of missions. One of the most prominent technologies utilized by the DoD for the presumptive identification of Biological Warfare Agents in the field is the LFI, commonly referred to as "Assay Strips." Using the same technology as pregnancy test kits, these assays are a sandwich of pads and membranes resembling a thick paper strip, impregnated with treatments and antibodies to facilitate the flow of liquid samples and the capture of potential biological agent. When biological agents are captured, they produce a visual response that can be read by either a machine or the human eye. Alone these strips are quite delicate; however, when packaged into a durable housing, they are suitable for military applications. Such products are commonly referred to as "Assay Carriers."

When biological agents are captured, they produce a visual response that can be read by either a machine or the human eye.

Production of assay strips and carriers for DoD applications are the responsibility of the CRP. In order to provide its customers high quality yet affordable products, they continually evaluate the product lines to identify cost reduction measures. Assay Carriers are a JBPDS and JPS consumable item and are the greatest contributor to lifecycle cost related to fielded Biological Detection and Identification equipment which uses LFI. The LFIs used in the Healthcare Industries for clinical diagnostics are produced in mass quantities, are distributed worldwide and are high profit commodities for their manufacturers. Little incentive rests with these large LFI manufacturers to produce assays for the "boutique" DoD market. Accordingly, the CRP relies upon small to mid-sized companies to support DoD's needs. So where can savings be realized for such product lines? The areas that may offer cost reduction potential lie within the Assay Carrier configurations, how these products are packaged, how they are offered to various customers, and how well they perform in the field.

Currently, DoD assay strips are housed in four types of "Carriers": the Individual HHA, the Hand Held Assay (HHA) Training/Operational Panel, Joint Portal Shield (JPS) Carrier, and the Joint Biological Point Detection System (JBPDS) Carrier Box Assemblies (CBAs). The HHA Panels consist of eight individual HHAs each targeting a specific biological agent, and housed in a clear plastic "Clam Shell." HHAs are uniquely packaged to accomplish a single identification mission and are visually read by the user. Due to the differences in operational use and requirements of the HHA as compared to the JBPDS and JPS, its mission is not planned for incorporation into a Common Carrier at this time. The JPS Carrier consists of 15 Carrier Card Assemblies (CCA) in

a cassette, with each CCA containing 10 assay strips for 10 biological agents and are machine read. The JBPDS CBA which is very similar to the JPS Carrier, is also machine read. The only differences between the two are the color of the carrier card assembly, the size of the sample well, and the position of two alignment holes on the CBA top. Both the JPS Carrier and the JBPDS CBA share identical outer dimensional envelopes and tolerances.

Other less noticeable differences exist between these Assay Carrier configurations. The processes by which the HHA, JPS Carrier, and JBPDS CCA are read after exposure tolerate varying degrees of imperfections in the Assay Carrier area where developed carriers are read. The JBPDS is the most sensitive to imperfections. A low level imperfection on the assay strip surface, or the view area above it can lead to a JBPDS false positive identification. The JPS is more forgiving in that it employs photo recognition software which has the ability to discriminate against pre-existing imperfections. The HHA is visually interpreted and thus can tolerate imperfections that do not interfere with assay strip performance. Another difference that impacts performance between these three configurations is the physical interfaces between carrier components positioning the assay strips in their carrier. Out of tolerance interfaces can lead to compromised sensitivity and a high false positive identification rate. Experience with these issues prompted the JPEO-CBD to look more closely at product designs and consider options for product improvements, cost reduction, and the development of a "Common Carrier."

Historically, the manufacture of JBPDS CBAs proved problematic due to material imperfections and cleanliness. The sensitivity of the JBPDS machine read capability forced the employment of costly manufacturing and quality assurance measures on the JBPDS CBA production line. The existing JBPDS CBA manufacturing process employs ultrasonic welding to bond the carrier top and bottom - which house the Assay Strips - and it is this process that contributes the most to the generation of false positive influencing debris. This welding technique was found to adversely affect the physical structure of the assay strips and releases fibers and chaff into the view area of the carrier where the JBPDS machine reads the Assay Strips. It appeared that the technological limit for product cleanliness of Assay Carriers may have been reached for the JBPDS. To overcome this failure mode, JPM-BD chose to research mechanical snap-fit designs which will eliminate the need for ultrasonic welding, the labor intensive processes and procedures employed, and theoretically offer significant manufacturing cost reductions.

One Carrier Box Assembly can meet the needs of both the JPS and the JBPDS. Since the JPS Carrier and JBPDS CBA share so many similarities, ECBC employed a novel tooling concept to integrate the needs of both systems, with production quality molds which accommodate rapid prototyping at minimal cost. This tooling uses "inserts" for all interfaces and critical characteristics and each are replaceable at minimal tooling cost and turn-around times. The interface features targeted by these inserts are those critical to JPS and JBPDS interfaces, and Carrier Card Assembly to Assay Strip interfaces.

As part of the common carrier effort, packaging concepts were also reviewed for cost saving potential. One important characteristic of Assay Carrier related products is that they require protection from freezing and high temperatures. The ECBC Packaging Team developed a unique packaging concept which offers thermal protection and reduces packaging cost an estimated 40% as compared to traditional Level A military packaging techniques. This packaging concept employs Polyurea sprayed Polystyrene as opposed to traditional cleated plywood exterior packaging. Testing and evaluation is complete and the design was proven significantly superior to tra-

ditional military packaging methods. It also was proven to offer significant load bearing, environmental, and thermal protection which will minimize potential for damage during transport. The ECBC Packaging Team subsequently submitted a patent application for this novel concept. The JPM-BDS is also considering a second storage bag for temporary storage of carrier card assemblies removed from their primary protective packaging and not planned for immediate use. This has the potential to extend the operational life of Carrier Box Assemblies and minimize unnecessary waste of viable Assay Carrier product.

The ECBC team effort delivered a competitive Technical Data Package (TDP) for the Common Carrier design to include Engineering Drawings, Quality Assurance Provisions and Special Packaging Instructions. Recently, the CRP placed this TDP on a competitively awarded contract for the Manufacture, Storage and Distribution of Lateral Flow Immuno Assay Products.

The JPM-CBD's Common Carrier design successfully underwent a series of tests to characterize its performance in relation to the JPS Carrier, JBPDS CBA, and the HHA. It was also compared to a contractor proposed Common Carrier design concept. The performance testing was conducted by the CRP's Conformance Test Laboratory which is responsible for acceptance testing of all LFI products in DoD inventory. The performance testing concluded that the Common Carrier design, while not the most sensitive, performed suitably and was the most consistent of the products participating in the test.

Testing is underway to characterize the decay of sensitivity of the JPM-CBD Common Carrier versus the JBPDS CBA as a function of temperature and humidity exposure. Results to date indicate that the Common Carrier is considered viable at all JBPDS and JPS operating temperatures for up to 3 days at humidity levels of <50% RH, for 24 hrs at 50% to 60% RH, and no more than 12 hrs at humidity levels over 60% RH. How this relates to the operating environment inside a JBPDS requires further analysis. Regardless, the Common Carrier design has cost savings potential for Assay Carriers used in Training, System Manufacturing, and Maintenance Support where carriers are stored and utilized in controlled environments.

Interface testing and distribution to customers for feedback is planned. Successful interface studies were performed during the mold design and fabrication phase with much success and positive feedback received from those involved in the process. The JPM-BDS plans to distribute Common Carrier Samples to multiple customers for use during training, system manufacturing support, combat vehicle integration, and maintenance to collect integration compliance data from a spectrum of Joint Service User Applications, physical locations, and hardware configurations.

LFI technology will continue to be the leading DoD qualified biological warfare agent identification technology for battlefield use for years to come, and therefore the need for Assay Carriers supporting the JPS and JBPDS missions can potentially extend until 2020. Much useful information has been learned regarding LFI technology during this process to establish a Common Carrier. Test and evaluation is not yet complete and several findings are emerging that may prove beneficial. Although some limitations are being discovered during ongoing test and evaluation, the JPM-BD and the CRP expect cost savings to be realized from this effort.

Rapid Swine Influenza Diagnostic Capab

By Ms. Jennifer McLaughlin, JBAIDS Systems Manager, CBMS-MITS

Worldwide, as of Oct. 11, 2009, there have been nearly 400,000 laboratory confirmed cases of pandemic influenza A (H1N1) 2009 reported to the World Health Organization resulting in more than 4,735 deaths. This virus is also known as swine influenza (H1N1) virus. Until recently, military medical personnel in the Middle East have lacked an effective way to rapidly diagnose the pandemic influenza A (H1N1) 2009. This quickly changed following the April 2009 declaration of a public health emergency due to the pandemic influenza A (H1N1) 2009 by the Secretary of Health and Human Services (HHS).

The day following this HHS declaration, the Centers for Disease Control and Prevention (CDC) in Atlanta, Ga., contacted the Joint Project Management Office (JPMO) for Chemical Biological Medical Systems (CBMS), to request the Department of Defense (DoD) to integrate the CDC's Real-time-PCR Swine Flu Panel on the Joint Biological Agent Identification and Diagnostic System (JBAIDS), a Food and Drug Administrative (FDA)-cleared system that provides DoD medical professionals with a means of identifying and diagnosing diseases in humans.

The JPM-CBMS office, lead by U.S. Army Col. David Williams, is home based in Frederick, Md., and reports to the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD), headed by Brig. Gen. Jess A. Scarbrough. The JPEO-CBD is headquartered in Falls Church, Va.

The Office of the Secretary of Defense immediately approved funds to pursue the pandemic influenza A (H1N1) 2009 emergency development effort as a result of the perceived emerging threat to U.S. military forces worldwide.

The formal FDA clearance of a diagnostic assay capable of detecting the pandemic influenza A (H1N1) 2009 on the JBAIDS would normally entail a rigorous development and regulatory process spanning 18-24 months. Since the pandemic influenza A (H1N1) 2009 was a perceived emerging threat to our nation's Warfighters, an Emergency Use Authorization (EUA) was requested. An EUA allows for the use of an unapproved medical product during certain types of emergencies. The JBAIDS

ility Delivered to U.S. Forces Worldwide

EUA is effective until the declaration of the emergency is terminated or the FDA revokes authorization.

The EUA was submitted by the CBMS-JPMO to the FDA following discussions between the CDC and the Armed Forces Health Surveillance Center Division of Global Emerging Infections Surveillance and Response System (AFHSC-GEIS). Just 83 days following DoD approval to proceed with integrating the CDC rRT-PCR Swine Flu Panel on JBAIDS, the Department of the Army Office of The Surgeon General received notification on August 24, 2009, that the FDA granted the CBMS-JPMO request for EUA of the Panel on the JBAIDS. As a result, a critical Warfighter capability gap is now closed and each geographic Combatant Commander has the ability to rapidly diagnose the pandemic influenza A (H1N1) 2009 in patient samples.

The U.S. Army Medical Materiel Agency (USAMMA) shipped the first increment of operational CDC rRT-PCR Swine Flu Detection assays to the JBAIDS sites in the Middle East on September 25, 2009. USAMMA will ship the CDC swine influenza rRT-PCR detection panel diagnostic kits to Navy ships in early November 2009.

As a long term solution, CBMS-JPMO is developing an influenza diagnostic panel for submission to the FDA within 18-24 months. This expanded JBAIDS panel will allow the JBAIDS instrument to rapidly identify Influenza A & B viruses, influenza A subtypes, including the common seasonal flu subtype, and pandemic influenza A (H1N1) 2009. In addition an Avian Influenza diagnostic assay was submitted to the FDA by CBMS as a full diagnostic kit in Jan. 2010.

The DoD recognizes the pandemic influenza A (H1N1) 2009 as an emerging threat to the Warfighter. Rapid diagnosis of influenza illness will help ensure rapid treatment leading to optimal military readiness. The JBAIDS H1N1 Flu (Swine Flu) diagnostic effort is just the beginning of the overall DoD plan to rapidly field influenza diagnostic capability to U.S. Forces worldwide while leveraging already fielded equipment and providing maximum payback to the taxpayer's investment in National Defense.

Non-Medical Chemical Biological Defense Facility Ground Breaking Ceremony

By Danielle Benner, Exhibits Coordinator, Camber Corporation

The Chemical and Biological Defense Community reached a significant milestone Oct. 28, 2009 at the Edgewood Area of Aberdeen Proving Ground, MD, at the ground breaking ceremony for the Non-Medical Chemical Biological Defense Facility (NMCBDF).

Members of the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD), the Defense Threat Reduction Agency (DTRA) Chemical and Biological Directorate, and the 649th Aeronautical Systems Squadron (AESS), 77th Aeronautical Systems Group will occupy the facility in the September 2011 timeframe, in support of the 2005 BRAC Commission recommendations.

Slated to become the headquarters for the three organizations, more than 200 guests gathered to celebrate the monumental event that was held on the site where the $22 million facility will be constructed by building contractor Bradley/Nason JV LLC and Ewing Cole. For the Aberdeen Proving Ground area, this facility is the pinnacle of about $1 billion in design and construction, impacting the local community with an

TOP: Artist's rendition of the future facility to house the Joint Program Executive Office for Chemical and Biological Defense, the Defense Threat Reduction Agency, and the Aeronautical Systems Squadron. BELOW: Michael B. Berardi, President of Nason Construction, Inc.; John Battle, President, Bradley Enterprises Ltd.; Jennifer Riggs, representing Rep. C.A. "Dutch" Ruppersberger; Heather Campbell, representing Sen. Ben Cardin; Lt. Col. Ronald S. Jobo, Commander, 649th Aeronautical Systems Squadron; Brig. Gen. Jess A. Scarbrough, Joint Program Executive Officer for Chemical and Biological Defense; Col. Michael O'Keefe, Deputy Director, Chemical and Biological Technologies Directorate, Defense Threat Reduction Agency; Lt. Col. John H. Osborn, Deputy District Engineer, Baltimore District, U.S. Army Corps of Engineers; Col. Orlando W. Ortiz, Garrison Commander, Aberdeen Proving Ground; and Rick Decker, Edgewood Chemical Biological Center Technical Director.

influx of more than 8,000 positions that will relocate from Brooks City, TX; Glen, Ohio; and Langley and Falls Church, VA.

In the past several months, Edgewood hosted two other ground breaking ceremonies, welcoming the U.S. Army Medical Research Institute of Chemical Defense and the U.S. Army Research Laboratory. The U.S. Army Test and Evaluation Command headquarters building will also be constructed at the Aberdeen Proving Ground Area.

"Moving to the area comes with a great deal of anticipation for many of the relocating organizations. Today marks a special occasion because it signifies the beginning of a new era for our office," said Brig. Gen. Jess A. Scarbrough, Joint Program Executive Officer for Chemical and Biological Defense.

Each speaker pledged to continue supporting our Warfighters and are enthusiastic to occupy the building.

Following the speakers' remarks, senior leaders, executives and civilian representatives donned hard hats and gathered collectively around the sandbox on the grounds of the future NMCBDF to shovel the first plot of dirt.

"This move will positively impact the work force partners as they continue to work cohesively, now under the same roof, to better affiliate the Chemical and Biological Defense enterprise," said Col. Michael O'Keefe, Defense Threat Reduction Agency Deputy Director for Chemical and Biological Technologies Director. "The collaboration and coordination that will ensue from the cohabitation of the three commands in a modern structure will enhance each one's efforts and strengthen the combat support roles they play for all the military service branches."

Scarbrough echoed those thoughts when he said, "The Air Force, the Navy, the Marine Corps and the Army are all represented through this new facility.

"Our Joint efforts ensure all Warfighter needs are collectively addressed and we vow to continue providing the best chemical and biological defense equipment and medical countermeasures to Warfighters around the nation and around the globe," he said.

"The Reason for our Success

is Our People."

Veterans Day
November 11, 2009
Remembering the Warfighter Past and Present