Edgewood Chemical Biological Center • Engineering Directorate

LEADING EDGE

The First Stop for CB Defense Solutions

June 2012 • Issue 1, Vol. 1

ALSO IN THIS ISSUE:

ECBC CREATES IPAD APP DESIGNS TO AID IN WARFIGHTER TRAINING

ECBC ENGINEERS EARN PATENT FOR NERVE AGENT DETECTOR

MISSIONS ABROAD: ECBC SUPPORTS WARFIGHTERS IN AFGHANISTAN THROUGH RDECOM RFAST PROGRAM

EXPANDING TEST CAPABILITIES

Laboratory renovations allow ECBC to expand its testing capabilities

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We Design, Build, Test, Support Chemical Biological Defense Solutions

A MESSAGE FROM THE DIRECTOR OF ENGINEERING

On behalf of the Engineering Directorate, U.S. Army Edgewood Chemical Biological Center (ECBC), I would like to welcome you to the first issue of our new quarterly publication, The Leading Edge. Representative of our commitment to quality and continuous improvement of the support we provide to our customers, The Leading Edge serves as a tool to educate the broader chemical biological (CB) defense community about the innovative solutions the Engineering Directorate is providing in response to the CB challenges facing the Warfighter and the Homeland.

Engineers and scientists of the Engineering Directorate are passionate about the work they do. They are trained and knowledgeable about CB defense and are ready to engineer the solutions our customers require. Our organization's superior and unique capabilities to transition technology from research to engineering development, production, testing, fielding, and sustainment – all under the same roof – not only cuts costs, it improves the way tangible solutions are provided to the Warfighter. In anticipation of an increased need in areas like rapid response for urgent needs, full-service CBRN testing, tactical chemical detection and lifecycle support, the Engineering Directorate will be making additional efforts to foster our internal cross-skill collaboration and information sharing in order to further improve our products, sharpen our expertise and provide even more responsive customer service.

And so we present the June 2012 issue of The Leading Edge. In this quarter's issue, read about how Engineering's teams are leveraging that cross-skill collaboration to provide creative solutions that will leave a lasting and constructive impact on the Warfighter.

- Learn about how three Engineering branches within the Advanced Design and Manufacturing Division worked together to create two mobile training applications for the Joint Improvised Explosive Device Defeat Organization (JIEDDO).
- Follow the journey of three Engineering Directorate inventors in their efforts to patent a revolutionary nerve agent detector.
- Find out how ECBC Engineers are supporting Warfighters abroad at Bagram Airfield in Afghanistan through on-site technical equipment help, and much more.

To learn more about ECBC's Engineering Directorate or to request additional copies of The Leading Edge, please email ***usarmy.APG.ecbc.mbx.engineering-directorate@mail.mil***.

Sincerely,

Alvin D. Thornton
Director, Engineering
ECBC

MISSION

Integrate **lifecycle science**, **engineering** and **operations solutions** to counter Chemical Biological threats to U.S. forces and the nation.

VISION

To be the premier resource for **chemical**, **biological**, **radiological**, **nuclear** and **explosives solutions**, uniting and informing the national defense community.

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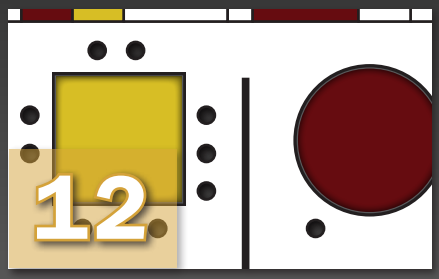

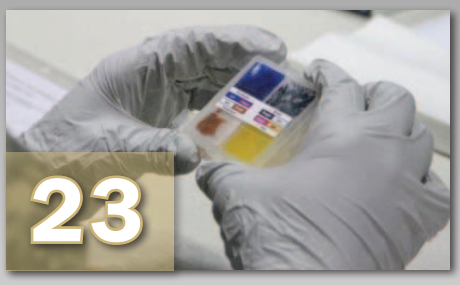

SHAPING THE FUTU

Of Our Organization in Uncertain Ti

BY WILLIAM KLEIN AND ED BOWEN

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mes through Strategy Management

Leading a DoD organization in uncertain times

Senior leaders within the Department of Defense (DoD) find themselves leading in one of the most challenging times our nation has ever seen. In addition to orchestrating the necessary defenses for our deployed Warfighters, the emergence of domestic terrorism has extended the threat to the Homeland, requiring government leaders in DoD to solve problems that are more complex within shorter timeframes. For the leadership of each subordinate organization, this means identifying where the organization fits in the new set of DoD priorities and adapting his/her organization to accomplish the evolving mission. Organizations must refocus their operating models to effectively and efficiently find the best solutions for the Warfighter and first responders.

The U.S. Army Edgewood Chemical Biological Center (ECBC) is the nation's principal research and development center for non-medical chemical and biological (CB) defense. In 2005, the leadership of the ECBC Engineering Directorate was at the front of an organization facing challenging times; while the need for the CB defense solutions that ECBC Engineering offered continued to play a key role in our nation's defense, the change in culture within DoD had fragmented the organization. ECBC Engineering senior management found itself struggling to balance the desire to support the workforce with people, learning and growth initiatives against the demands of a fee-for-service business model within the Joint Service-CB defense world. It became clear to ECBC Engineering leadership that they needed a strategy to help better define the mission of the organization and guide them into the less than certain future.

Building a strategy to shape the future of the organization

Once the need for a dynamic strategy to bring the organization into this new era became clear, leadership began a search for the right approach to building the strategy. The goal was to find a strategic management system that would meet two of ECBC Engineering's most pressing needs: people and a mission. The workforce had often complained about a lack of communication from leadership (vertical) and across the organization (horizontal), and attributed a poor understanding of the organization's capabilities to "stovepipes" that had formed in the Directorate due to this lack of communication and existing business models. Leadership wanted a strategy that was going to address these concerns by resulting in more than a static document – they wanted an ongoing strategic improvement process that would engender buy-in throughout the Directorate workforce, make strategy everyone's business and allow for the flexibility to adapt in a dynamic operating environment. With this effort, leadership also wanted to avoid the pitfalls of previous strategic planning efforts; previous plans were considered ineffective because they did not resonate with the workforce and therefore failed to change the organization's culture.

This tailored approach to change has made the workforce more comfortable with the process and led many to embrace the strategy.

In 2005, ECBC Engineering selected the Balanced Scorecard (BSC) strategy management system as the best framework for the organization's strategy development. Key individuals from all levels throughout the Directorate were brought together to form the strategic planning team. They immediately began a vigorous strategic planning process to define ECBC Engineering's mission, vision and goals; outline a plan for achieving the respective goals; manage implementation; and monitor the progress of the strategy and its impact on customer service. The approach was to keep and strengthen what was working (e.g., the organization's unique brand and capabilities), and fix the areas that would keep the Directorate from effectively providing customer solutions and remaining a key player in the CB defense community (e.g., communication). The hope was that this approach would enable the Directorate to succeed as a fee-for-service organization while still providing needed opportunities and benefits to the workforce.

Since it began in 2005, this strategy development process has engaged ECBC Engineering staff because the strategy is relevant and accessible through the BSC; the structure of a BSC strategy calls for continuous efforts to educate individuals about strategic initiatives and these initiatives seek to improve daily operations for the workforce. Implementation of these initiatives has led to tangible benefits and products for the workforce, such as enhanced web resources, outreach products outlining team capabilities and improved processes for obtaining customer feedback. Additionally, leadership has been able to make the changes called for in the strategy without eliminating areas that are already functioning at a high level – this tailored approach to change has made the workforce more comfortable with the process and led many to embrace the strategy.

Members of the workforce began to think about how their work fit into the larger organization and ultimately worked together to serve the end user – the Warfighter and first responders.

Keep what works

Early in the strategy development process, ECBC Engineering recognized the value of its unique brand – an Army organization that offers a state-of-the-art systems engineering approach to lifecycle acquisition with a recognized quick response capability in providing CB defense solutions. This helped to focus the mission and provided a great deal of clarity about where the organization fit into the new set of DoD priorities. To realize the benefit of this unique brand, the strategic planning team included several initiatives in the strategy that were aimed at communicating these unique core capabilities to internal and external stakeholders.

Building on this, four key Directorate capability areas were identified: Design, Build, Test and Support. These became central to the Directorate's brand, and later formed the basis for engaging the workforce. These four elements, equal parts of the ECBC Engineering's core capabilities, allowed everyone to "find a home" in the strategy. Shifting the focus to capabilities instead of an organizational chart was an important first step towards building a culture of effective communication; members of the workforce began to think about how their work fit into the larger organization and ultimately worked together to serve the end user – the Warfighter and first responders.

Fix what doesn't work

This strategy development process has provided the ECBC Engineering leadership and workforce with a unique platform for improving Directorate operations, which has been a key motivator for many of the staff involved in implementation. This has also been a way for senior leadership in the organization to enact changes needed to keep the Directorate workforce responsive to changes in the industry. Historically, suggested (and some mandated) improvements to the organization with a high potential for positive impact did not gain traction because there was no framework for execution. This strategic approach, however, provided the framework necessary for prioritizing and subsequently implementing these initiatives.

An early example of this was an initiative that studied potential improvements to the ECBC Engineering website. An individual from within an ECBC Engineering team proposed changes to the Directorate website, and was referred to the strategy management process. With support from the core team, this individual formed an initiative group to explore potential improvements to the website. The initiative team (comprised of members from the ECBC Engineering workforce) pointed out that a customer visiting the Directorate's website had to know how the Directorate's teams were organized to find information about specific capabilities. They worked to distribute a survey on the website to gather input for improvements, and spoke with teams outside the Directorate to gather best practices. Through the work of the initiative team, the website was reorganized to present the same content by capability and make it easier for customers to find what they need.

These initial successes in the strategy implementation process had a great impact on morale, because they created a feeling of empowerment and confidence in the process for those working to make change. They realized their ideas made a difference and that leadership was committed to their success. These success stories also inspired several individuals that were not already involved in the strategy management process to propose new initiatives for change, and promoted the value of the process.

ECBC Engineering – Ready for the future

The need for high performing organizations to provide innovative solutions is crucial for the safety of Warfighters, first responders and the American public. Leaders of DoD organizations must understand the challenges to the nation's defense and be able to translate these into actions that will shape their organization for future operations. ECBC Engineering continues to engage in a strategy management process that builds processes, products and staff within the organization to effectively meet these challenges. This will ensure the continued relevance of the organization within the CB defense community, and ultimately result in the best solutions for the Warfighter.

William Klein is Associate Director for Resource Management and Systems Engineering with the Edgewood Chemical Biological Center Engineering Directorate. Mr. Klein has a bachelor's degree in Engineering from Loyola University, and has been involved with Aberdeen Proving Ground's chemical and biological defense programs since 1980. He is also a member of the Acquisition Corps, maintaining Level III certifications in Systems Planning; Research, Development, and Engineering; and also in Logistics.

Ed Bowen is Branch Chief for the Edgewood Chemical Biological Center Engineering Directorate Strategic Planning and Business Operations Branch. Mr. Bowen has a bachelor's degree in History from Towson State University and a Master's of Business Administration from Loyola University. He has worked for the Army since 1980.

ECBC ENGINEERS COLLABORATE TO CREATE COST-EFFECTIVE TRAINING OPTIONS FOR THE WARFIGHTER

Teachers use it to instruct, football players study their plays on it, and now soldiers can use it as a one-stop device for training refreshers, an easy-to-carry installation manual and more.

"The Department of the Army and Army customers are looking to increase use of mobile devices for Warfighters," said COL Raymond Compton, military deputy of the Edgewood Chemical Biological Center (ECBC). "On one small mobile device, a Warfighter has a full library of information across different applications to support a device or even to support the operation of a full vehicle. If a Warfighter is carrying a mobile device, the weight of their backpack is significantly less."

In addition to being cost-effective, the 21st century advancements in technology, coupled with a desire to equip the Warfighter with a single-source for everything needed, makes the use of iPad applications increasingly necessary. ECBC's Advanced Design and Manufacturing Division (ADM) Conceptual Modeling and Animation Branch, Technology and Systems Integration Branch, and the Electronic Drawing Development Branch partnered to create two iPad applications. One application simulates the Husky Mounted Detection System Surrogate (HMDSS), and the other recreates Mobile Counter Improvised Explosives Device Training (MCIT). Both iPad applications were handed over directly to the Joint Improvised Explosives Device Defeat Organization (JIEDDO). The MCIT and HMDSS are Continental United States (CONUS) devices intended to be used by soldiers directly. The HMDSS iPad app will be delivered by JIEDDO to support locations where HMDSS vehicles are being used for training. The MCIT is used both as a "marketing" tool for the system by JIEDDO, as well as a direct informative device to be used by soldiers on various bases.

> "The ability to get started on basic MCIT training on the iPad helps the Warfighter learn faster and is cheaper."
>
> - Jeff Warwick, Conceptual Modeling and Animation Branch Chief

"The Technology and Systems Integration Branch contributed to functional translation of real world data into the virtual environment, Engineering Drawing helped with the virtual modeling, and Conceptual Modeling and Animation assisted with the software development and user interface," said Kevin Wallace, Technology and Systems Integration Branch Chief. "The great thing about the Conceptual Modeling and Animation Branch is that they have the ability to help other branches present their visions and further the potential of their ideas."

With the tap of a screen, Warfighters can reference the full HMDSS installation manual, as well as train themselves on the equipment. The iPad application gives an accurate visualization of the inside of an HMDSS allowing the user to use the functions that are in the actual vehicle. Users can practice reading the Ground Penetrating Radar which detects metallic and non-metallic explosive hazards, pressure plates, and antitank mines.

In the event of a malfunction, rather than flip through pages of a thick book, the Warfighter can get quick instructions from an easy-to-use-application and speed up the entire process. Wallace noted that booklet manuals wear and tear, and often cannot hold up while in theater.

"The intuitive care associated with carrying an iPad is much different than a book, which can be thrown into a backpack and easily torn and ripped," Wallace said.

HMDSS iPAD APPLICATION

In the HMDSS application, the user simulates driving a vehicle and receiving alerts of potential threats. From there, the driver must determine a course of action to take to ensure safety. All simulations are based on events that could actually happen. Additionally, the HMDSS application allows the user to go on virtual Route Clearance Missions, and includes a full user manual of the vehicle.

While the HMDSS application has all of the same functions as the vehicle and provides the Warfighter with a detailed model of the vehicle, Conceptual Modeling and Animation Branch Chief, Jeff Warwick, said the iPad application is best used to refresh actual in-person training, not substitute it.

"Maybe it's been a few months between the in-person training and a Warfighter is about to operate the HMDSS vehicle again and needs a quick reminder. Rather than getting in an actual vehicle that may not be available for practice, the Warfighter can pick up a simple device and train from wherever he is," Warwick said.

"The HMDSS application is a functional tool that can be used at the user level," said Wallace. "It condenses hundreds of pages of a manual into one intuitive application."

The HMDSS application and the actual HMDSS vehicle were simultaneously in production. With the vehicle development just a few feet away from the Conceptual Modeling and Animation office, the application received updates and changes along with the real-life vehicle, heightening the accuracy of the application. Additional data gathered by the engineers who built the HMDSS were incorporated into the application as well.

"Constant communication between all teams involved, blended with frequent customer feedback and expert Warfighter opinions, helped the project come together," Warwick said.

MCIT iPAD APPLICATION

By the time the HMDSS project came along, the branches were already well-prepared to take on the task of creating the HMDSS application. In Spring 2010 the branches created their first iPad application for the MCIT, which has already been handed off to JIEDDO.

The MCIT application simulates a Mobile Counter Improvised Explosives Device Trainer, which is a series of four modified 40' Conex boxes set up in a series to educate Warfighters on improvised explosive devices (IEDs). Each station gives tips on how to identify IEDs, in addition to hands-on scenario training that uses narratives and role playing to guide the Warfighter from station to station. The entire system is interactive and equipped to give hands-on, self-paced training to Warfighters. There are a limited number of the MCIT stations per geographic location. Shipping the equipment from one location to another, or transporting a Warfighter to a training location, can be costly. Recreating the MCIT with all of its capabilities on an iPad has paved the way for a more cost-effective approach to the MCIT trainings.

"With the closest MCIT facility in Kentucky, it takes a lot of money and time to send a Warfighter to the nearest MCIT for training," Warwick said. "The ability to get started on basic MCIT training on the iPad helps the Warfighter learn faster, for cheaper. Once he can make it down to Kentucky he already has a good idea in mind of what to expect and can get the most out of his training. Then after he leaves, he can continue to practice with the application."

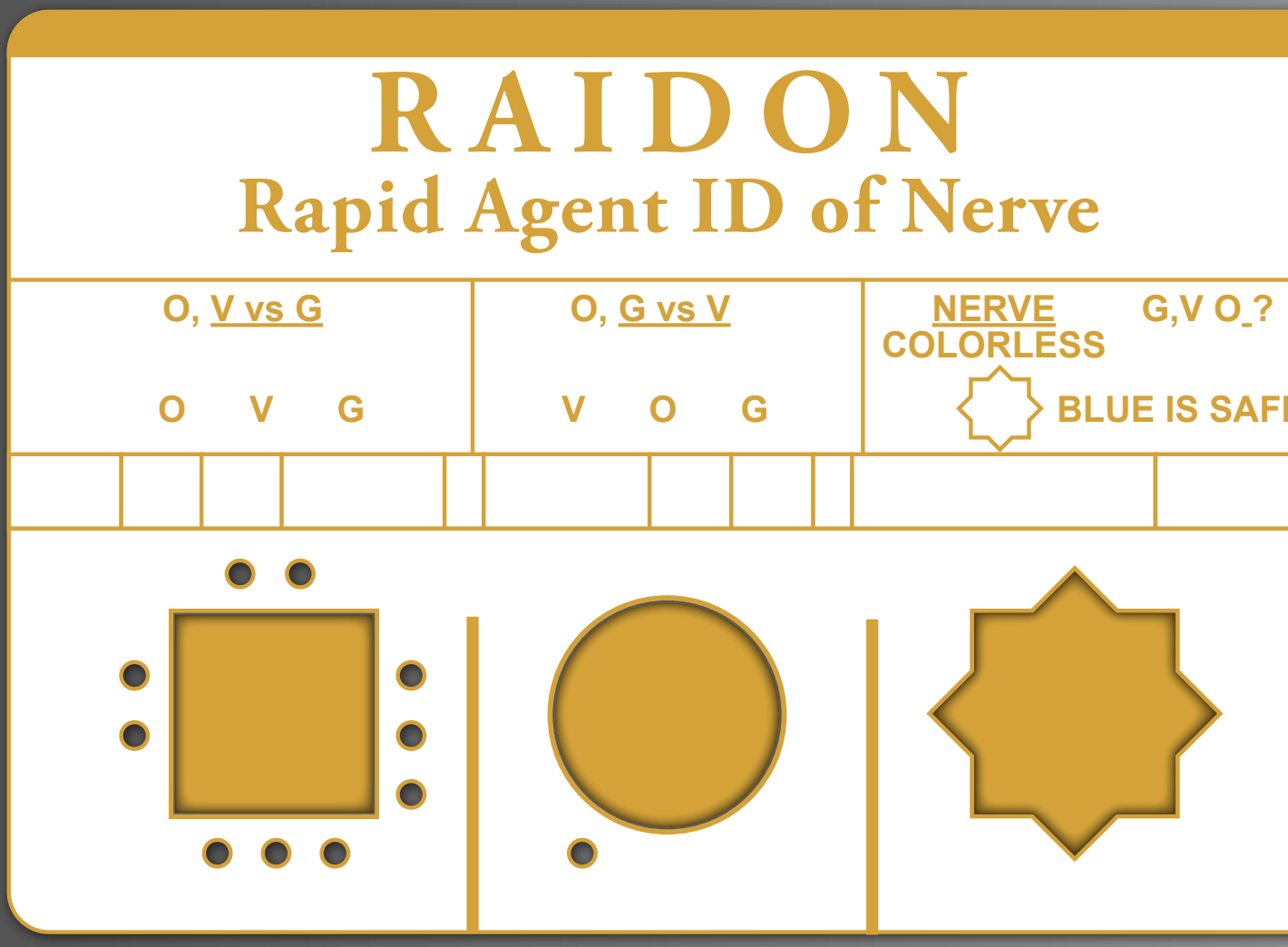
While the MCIT and HMDSS trainers are the only projects the group has developed so far, Wallace said the experience has made them interested in becoming more involved in the creation of tablet and handheld devices to serve the Warfighter in different realms.

> "The HMDSS application is a functional tool that can be used at the user level. It condenses hundreds of pages of a manual into one intuitive application."
>
> - Kevin Wallace, Technology and Systems Integration Branch Chief

COL Compton has seen mobile devices used in many areas from on-site biometrics to language translators and more. "The Army Chief Information Officer/G-6 is creating sites for contractors, civilians, and Army members to develop more mobile applications for the Warfighter," COL Compton said.

In addition to becoming a cheaper and more convenient option for frequent trainings, COL Compton said another advantage to using mobile applications is their ability to bridge the gap between younger Warfighters who grew up in an electronic world and their older counterparts.

"The soldiers of today were raised playing with video games and virtual equipment like XBox and iPads. Those games can be translated into a lot of useful methods for training," COL Compton said. "It's beneficial to take advantage of this type of intuitive knowledge the young Warfighter has, and use it to help them do their mission better."



ECBC INVENTORS PAVE WAY FOR ENHANCED NERVE AGENT DETECTION, AWARDED PATENT

Edgewood Chemical Biological Center's Jim Genovese, Robin Matthews and Science Applications International Corporation on-site contractor Kwok Ong, were awarded with an official patent in November, for their latest accomplishment, the Rapid Agent Identification of Nerve Agent detector (RAIDON).

The new technology, U.S. Patent number 8057761, bridges a capability gap in the world of chemical detection, supplementing the currently fielded tactical chemical detection devices. It permits quick discrimination between classes of nerve agents in the field environment once nerve agent is detected.

"There are numerous detectors such as JCAD, ACADA, M256A1 that detect nerve agents, but the problem is they are all vanilla. They don't tell you what family of nerve agents they fall in," said Jim Genovese, Leader of the Innovative Development Engineering Acquisition Team.

> "It is simple and gets the capability to the Warfighter. We are not afraid to try creative and retro methods."
>
> – Robin Matthews, Applied Detection Technology Team Member and Co-inventor Chemist

The M256A1 kit is currently used across the Department of Defense to provide a chemical vapor detection capability at low cost, with minimal training, and without the need for a power source. An improved version, the M256A2 kit, entered production in FY10 to a standard detection method for low volatility solid and liquid agents in the field. However, it still does not provide nerve agent classification capability.

"The RAIDON provides the nerve agent classification information lacking in the existing kits by leveraging the field-proven technology and form/function of the M256A1 kit," Genovese said. "Once the M256A1 shows nerve agent detection, tactical users can then quickly detect and discriminate nerve agent types in the field without having to use sophisticated detectors."

The inventor trio work on the RAIDON began more than six years ago, in 2005, when Genovese identified a requirement and growing need in both the medical and intelligence communities for identifying the speciation of nerve agents. Fielding a detector that is capable of expedient discrimination of nerve agent classes in the field permits more effective medical responses and protective measures tailored to the detected agent's characteristics.

"The RAIDON can provide a near-term tactical method for discriminating nerve agent and pesticide class at a low cost and with low technical risk," Ong, co-inventor chemist, said.

The prototype does not require a complicated, expensive, instrumental base, but instead is likened to "retro chemistry" and is something the Warfighter would be able to carry in their pocket. In order to minimize training requirements and enable rapid transition from prototypes to production-ready systems, the RAIDON uses colorimetric chemical reactions similar to the M256A2 kit.

"It is simple and gets the capability to the Warfighter. We are not afraid to try creative and retro methods," Matthews, Applied Detection Technology team member and co-inventor chemist, said.

Genovese lightheartedly describes his team's approach to the research as "Edisonian," characterized by "hunt and try" discovery. As the patent recipients of Genovese's well-intended wild goose chases, Matthews and Ong look back fondly now at the various milestones of success, which eventually led to the development RAIDON.

"We would try more of one thing, less of the other, dry versus wet – it was all a part of going through the rigor to find the best means for classifying the nerve agents," Matthews said.

While the awarded patent is the "cherry on top" of the team's past six years of successful research, it is not the end of the three inventors' story. In fact, it is more of a second beginning. A prototype of the RAIDON currently exists but the team is in need of further funding to refine the chemical concepts and conduct stability testing. For now, the technology does not exist in theater.

As a means of generating buzz around the invention, Genovese presented their research accomplishments to Dr. Charles Hurst, COL (Ret), Chief of the U.S. Army Medical Research Institute of Chemical Defense Chemical Casualty Care Division in the fall of 2009. Hurst's advocacy for the continued development of the RAIDON technology was clear in a follow-up letter addressed to the Joint Project Manager for Nuclear Biological Chemical Contamination Avoidance.

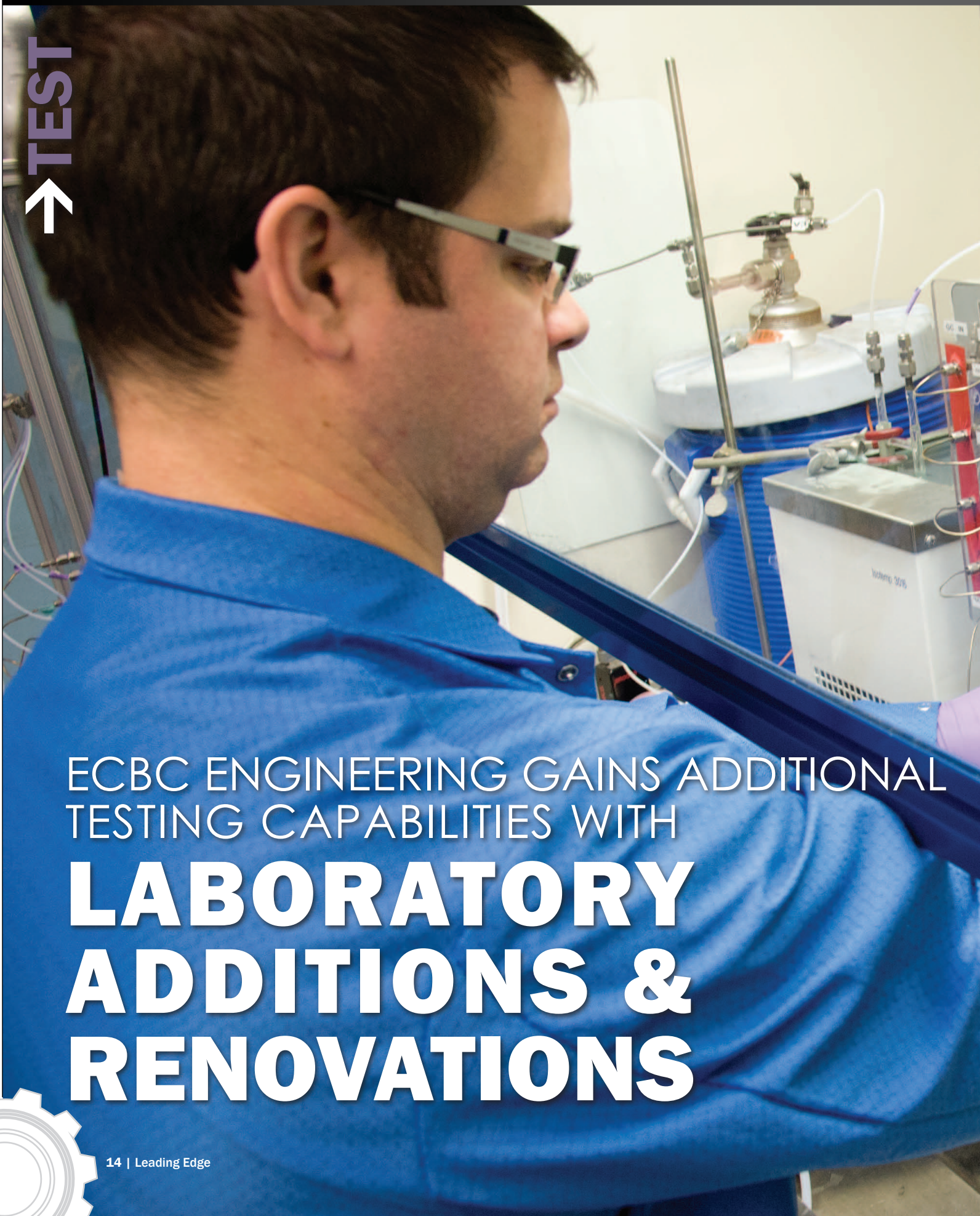
"To my knowledge these capabilities are unique and are cutting edge. For medical personnel the RAIDON will allow for nerve agent/cholinergic substance discrimination, greater protection and more efficient and effective treatment regimens resulting in better patient outcomes," Hurst stated in the letter.

"I believe, Hurst's words were 'we needed the RAIDON in the field yesterday'," Genovese said. "As a valued customer and a key member in the U.S. Army medical community, his support was significant."

> "The RAIDON provides the nerve agent classification information lacking in the existing kits by leveraging the field proven technology and form/function of the M256A1 kit."
>
> – Jim Genovese, Leader of the Innovative Development Engineering Acquisition Team

The team remains optimistic that their research will be taken to the next level to develop the RAIDON past a prototype. Between Ong, Matthews and Genovese, they boast an impressive resume of awarded patents and have a thorough understanding of how patents can evolve.

"You can never be too busy to patent your work. In many ways, it can be the most important thing you do," Genovese said. "Make time to do the needed paperwork to file for a patent. You may get push back, but do your due diligence to stand by your work and its authenticity. You are the subject matter expert."



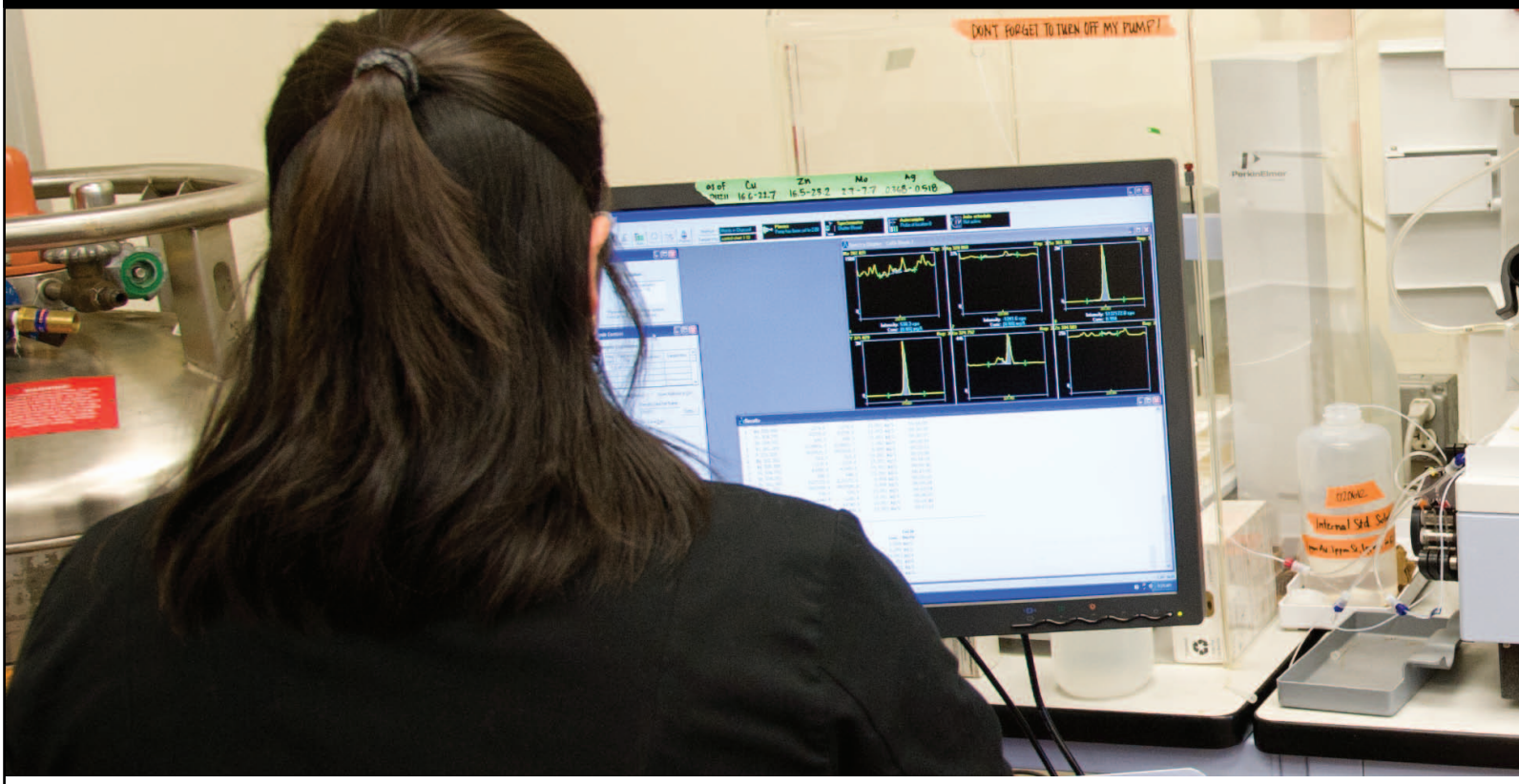
TEST

ECBC ENGINEERING GAINS ADDITIONAL TESTING CAPABILITIES WITH

LABORATORY ADDITIONS & RENOVATIONS

"ECBC Engineering's new test equipment also gives us capability to compete within the community by driving down test cost. Our customers benefit from our new testing capacity and subsequently the ability to keep cost down. This new test fixture and renovated laboratory will afford us the economy of scale and state-of-the-art features that reduce labor cost."

- Brian MacIver, Permeation and Analytical Solutions Branch Chief



Edgewood Chemical Biological Center Engineering Directorate has improved their testing capabilities with recent laboratory renovations. Two testing branches added new laboratories that will expand its capabilities taking a large step toward increasing the safety and reliability of Warfighter equipment.

The Permeation and Analytical Solutions Branch (PASB) provides chemical agent and compound analytical solutions in support of decontamination and protection commodity area testing. Their testing capabilities consist of near-real-time quantitative materials permeation and unique testing against chemical agents and novel compounds throughout the acquisition lifecycle. New equipment such as the 26-cell Aerosol Vapor Liquid Assessment Group (AVLAG), and a 282-flood cell test system, enhances the branch's ability to test chemicals more accurately and provide a thorough analysis.

"Number one, the new facilities have increased our testing capacity and two they have enhanced the capability by providing a more robust quality test program predicated on routine preventative maintenance and internal system checks," said Brian MacIver, PASB Branch Chief.

PASB unveiled the new AVLAG permeation test system and the 282-flood cell test system in February 2012. The 26-cell AVLAG test fixture design includes modifications to increase test capacity through efficiency, improved data quality and enhanced customer interaction by using web-based tools such as SharePoint®, which fostered a collaborative effort across ECBC's Engineering Test Division branches. The test fixture is designed to support the Joint Equipment Assessment Program (JEAP) surveillance of Individual Protective Equipment (IPE) as a function of the Defense, Reutilization, Accountability and Disposal Project, the evaluation of the military's stockpile of chemical protective clothing. Pine Bluff Arsenal will participate in JEAP testing with an identical 26-cell AVLAG test system to be installed by PASB personnel. In addition to enhanced testing capabilities, MacIver said that the news equipment provides economic benefits as well.

"Number one, the new facilities have increased our testing capacity and two they have enhanced the capability by providing a more robust quality test program predicated on routine preventative maintenance and internal system checks."

- Brian MacIver, Permeation and Analytical Solutions Branch Chief

"This equipment also gives the capability to compete within the community by driving down test cost," MacIver said. "Our competitors benefit from test capacity and subsequently the ability to keep cost down. This new test fixture and renovated laboratory afford us the economy of scale and state-of-the-art features that reduce labor cost."

The Protective Equipment Test (PET) Branch also made several laboratory changes that will provide engineers the space and equipment to conduct their mission effectively and conduct highly accurate testing on Warfighter equipment.

“These new testing systems will allow us to run multiple tests a day, which heightens our accuracy in testing,”

-Jonathan Grzeika, Protective Equipment Test Branch Chemical Engineer

PET Branch’s mission is to “protect the nation’s protectors” through conducting first article, production lot acceptance and surveillance testing on military, unique and civilian, individual and collective protective equipment.

“These new testing systems will allow us to run multiple tests a day, which heightens our accuracy in testing,” said Jonathan Grzeika, a chemical engineer for the Carbon Team in the PET Branch. “The new hoods allow us to test more types of chemical agents, than we were able to before.”

PET Branch’s newly recertified labs will soon be up and running allowing the team to expand their capability service offerings for the Warfighter. Grzeika said the new testing labs will enhance all aspects of the types of testing the PET Branch conducts: carbon testing, end item testing of filters, AVLAG permeation test system, and better SiMulant Agent Resistant Test MaNikin (SMARTMAN) agent testing.

The upgrades to the labs and new equipment will increase the data quality, environmental control and capacity of PET’s loose sorbent, canisters/cartridges and filter testing capabilities by four times the previous amount. The Quality Assurance capabilities will be enhanced, allowing the branch to comb through a data set to determine anomalies in testing.

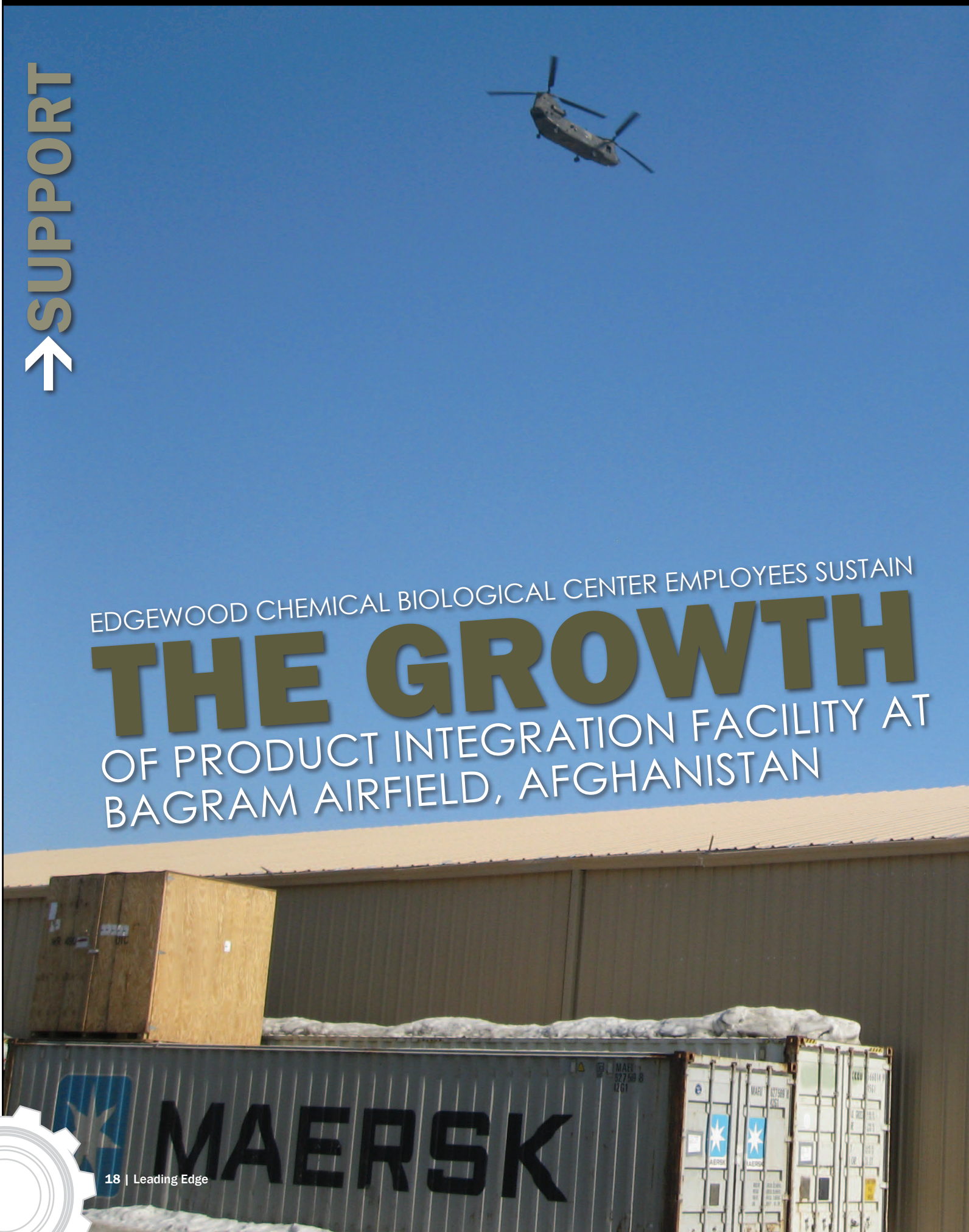
The goal for these renovations is to make the PET Branch a “one-stop shop” for production lot testing needs. With more hood space and increased testing capabilities, the PET Branch is able to become that one stop. Additional lab space will allow for there to be backup test systems in the event of maintenance work.

“When one hood is down for maintenance, there will be other usable hoods available,” Grzeika said. “The labs will have a sorbent bed testing system with new analytical and environmental monitoring and controls, as well as a new filter system that can do four times as many filters as the previous system with new analytical instrumentation and environmental control and monitoring.”

These new testing capabilities come at an especially pertinent time. During renovations, the PET Branch sacrificed space in order to make room for its anticipated bright future. Since the upgrades began in spring 2010, the PET Branch created improvised testing spaces and collaborated with teams in ECBC’s Research and Technology Directorate (R&T) to ensure the branch could continue to meet their customers’ requirements and carry on with testing during the upgrades. While space was a luxury during this time, working with the R&T Directorate gave the PET Branch a sneak preview of the new technology they would receive following the renovations. During the downtime, the PET Branch transitioned several technological improvements and methods to the R&T Directorate’s cutting-edge sorbent testing labs. Dr. Stan Ostazeski from R&T’s Forensic Analytical Center also contributed hoods to help the PET Branch continue with testing during the move.

Grzeika said while he is glad the PET Branch did not lose momentum during the renovations and had good cause to form partnerships within R&T, he is excited to get to the new labs and utilize the optimized testing to produce major results for the Warfighter.

“The experience of improvising our work space really helped us become better testers. It was nice to develop our creativity – altering our test samples to take up half of the real hood space it typically requires,” Grzeika said. “But at the same time, the idea of getting into these new labs and starting off with a fresh slate to do even more precise testing is exciting.”



EDGEWOOD CHEMICAL BIOLOGICAL CENTER EMPLOYEES SUSTAIN

THE GROWTH

OF PRODUCT INTEGRATION FACILITY AT BAGRAM AIRFIELD, AFGHANISTAN

Creating Warfighter equipment within the United States serves U.S. Warfighters abroad, but Edgewood Chemical Biological Center (ECBC) employees are taking the security of having safe equipment one step further through deploying and assisting in the creation of Product Integration Facilities (PIF) at Bagram Airfield, Afghanistan. The Center's efforts are a part of the U.S. Army Research, Development and Engineering Command (RDECOM) Field Assistant Science and Technology (RFAST) program.

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>
> - Kevin Washok, Advanced Design and Manufacturing Division

This RFAST program deploys civilian engineers and technicians to Afghanistan for three-to-six months to assist the Warfighter with all technical equipment needs. The program's mission is to streamline communication between the Warfighter and the technical professionals in order to troubleshoot issues with the Warfighter's equipment. The technicians and engineers stationed abroad can easily examine equipment, identify capability gaps and work directly with the end users – the Warfighter – to develop working solutions in a more efficient manner.

Setting-up

The ECBC Advanced Design and Manufacturing Division (ADM), first assisted with the set-up of the Afghanistan PIF, and along with other RDECOM organizations, provided personnel the support for day-to-day functions of keeping the PIF operational.

Kevin Washok of ADM was one of the original team members to set up the RFAST program at Bagram Airfield in Afghanistan in summer 2011. In the planning stages of the program at Bagram, ADM helped to create the concept for a technical village that provided the base for a larger RFAST operation in Bagram. Some of the initial responsibilities of setting up the PIF included determining what services the Bagram site would offer and how the RFAST mission would work in Afghanistan, including coordination and reach back to Continental United States resources such as the RDECOM Prototype Integration Facilities (PIFs), program managers and the safety community.

"Being stationed abroad gives Warfighters the advantage of having their needs quickly met, and gives the technical workers immediate insight and ideas on how to improve the equipment they build," Washok said.

"After ADM helped with the initial set-up, the RFAST PIF Director – who was Dr. LTC Alan Samuels from ECBC's Research and Technology Directorate at the time - looked to ECBC to provide key personnel for the first rotation in Bagram," said Mark Schlein, ADM Division Chief. "Kevin applied and was chosen from about a dozen or so other applicants to represent ECBC."

Helping the new RFAST location take a step in the right direction, Washok worked to establish a safety program at Bagram modeled after ECBC's Safety Program. Andy Cote from the ECBC Risk Office supported Washok and his colleagues to develop a safety plan appropriate to the site's needs.

"We took the safety measures provided to us by Mr. Cote and adapted them to unique situations we had. We were able to mirror what is done at ECBC with the addition of a few Standard Operating Procedures particular to Afghanistan," Washok said. "The help Mr. Cote provided us was significant and allowed us to get things in place over there."

Once all the processes were put into place to create an operational facility, the PIF was ready to serve as an operational help center. Colin Graham, an engineer in ADM joined the RFAST program in December 2011, to take over Washok's duties and officially open the PIF for business.

PHOTO OF BAGRAM AIRBASE, AFGHANISTAN COURTESY OF COLIN GRAHAM

Open for Business

With the PIF up and running since mid-December, Graham said he and his colleagues from Tank Automotive Research, Development and Engineering Center (TARDEC), Armament Research, Development and Engineering Center (ARDEC),and RDECOM get a lot of visits from Warfighters looking for solutions to equipment problems. Graham said about 90 percent of the inquiries come directly from Warfighters who have heard about the work done at the PIF and walk in to the facility seeking help. The opportunity to talk about equipment issues face-to-face and work to solve them is an experience that Graham said is invaluable. Usually, when a Warfighter visits the PIF with a problem, his or her issue can be resolved in two to three days.

In addition to assisting the Warfighters, Graham said he also works closely with the Joint Program Office for Mine Resistant Ambush Protection (JPO MRAP), the Program Manager for Forward Looking Infrared (PM FLIR), The Program Manager for Tactical Vehicles (PM TV), as well as Program Manager assured Mobility Systems (PM aMS) to find on-the-spot solutions for the Warfighter.

While Graham appreciates working personally with the Warfighter, he notes that having the raw materials to find these solutions can at times be challenging. Finding the best material to fix a problem is tough when resources like brass are not readily available in Afghanistan.

This requires the workers to be resourceful and find alternate materials to complete the project.

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>
> - Mark Schlein, Advanced Design and Manufacturing Division Chief

"We have a lot of critical materials, but we do not always have materials that are the best fit," Graham said. "Material availability is different out here. Sometimes we have to use steel instead of Aluminum and while it works, the steel might

make it a little bit heavier than usual. In the end, the soldiers are still happy with the product, and that is what is important."

ECBC is also helping the PIF with establishing a structural framework for the longevity of the RFAST program. Previous to Graham's tour, Washok's group created a Safety Program for the PIF using the ECBC Safety Program as an example.

"Our safety program is still in effect at RFAST Bagram and is the only one of its kind over here," Graham said. "The next step of implementing structure is to adapt a Quality Program for the PIF. While more standards are in place than in mid-December 2011, not a lot of manpower and a quick turnaround are holding the program from becoming full-fledged at this time."

Lasting Impressions

Currently, Bagram's RFAST Program is looking to ECBC to potentially manage the business aspects of the program, which would include contracting, purchasing and coordinating maintenance contracts.

"We're working up a plan on how we can support them with the business of the program. Anytime you take on these tasks that serve a greater purpose you feel a sense of accomplishment. You also get the satisfaction of knowing you're making a difference right where it counts," Schlein said.

Schlein would like to maintain ECBC's presence in Afghanistan through the RFAST program, ideally stationing an engineer or technician from the Center in each RFAST rotation.

"There are always three technicians in Bagram at one time," Schlein said. "The plan, as employees are available, is to have a technician from ECBC in Bagram at all times along with representatives from the other RDECOM subordinate organizations."

Despite the 12-hour, seven days a week schedule, Graham and Washok both defined their experiences as, "an opportunity of a lifetime."

"Being here has given me a lot of opportunity to not only work with the Warfighter, but also learn how it feels to work in a new type of environment that challenges me," Graham said.

PHOTO OF BAGRAM AIRBASE, AFGHANISTAN COURTESY OF COLIN GRAHAM

Engineering in the **Community**

"Engineering in the Community" highlights the extracurricular efforts that Engineering employees have made in their local communities including volunteer work and conference participation. See how our well-rounded engineers share their knowledge outside of the Monday-Friday work week. Visit our blog at **http://edgewoodchembio.blogspot.com** to read these full stories.

Conferences

- ECBC Engineers participated in February's Marine West Expo held in Camp Pendleton, CA in early February. The annual expo is intended to provide active and retired Marines an opportunity to observe new gear and products, state-of-the-art technology, and a vast array of capabilities from organizations directly connected with the Warfighter experience.
- ECBC Engineering's Protective Equipment Test Branch, Detection Engineering Branch and Test, Reliability and Evaluation Branch participated in the 2012 National Defense Industrial Organization Joint CBRN Conference held in Baltimore, MD. The Conference and Exhibition provided a forum for the exchange of CBRN defense information among Warfighters, CBRN incident responders, technology developers, acquisition professionals, and the supporting industry. The theme for 2012 was "Beyond BRAC...What's next in CBRN Defense?"
- ECBC Engineering participated in the CBRNe South America, 13-14 Mar 12, in Rio de Janeiro, Brazil, with an exhibit and conference attendance. Jorge Christian, Engineering Directorate's Protection Engineering Division Chief participated as well as ECBC"s Dr. Augustus W. Fountain, Acting Director, Research and Technology and Debra Thedford, Directorate of Program Integration. The ECBC exhibit highlighted ECBC's center-wide core capabilities and international programs.

STEM-related Work

- Several ECBC Engineers participated in the "Engineering is Elementary" program at local Joppatowne Elementary School to teach children the basics of Engineering. "Engineering is Elementary" takes storylines from children's books and uses them to guide lessons in science and engineering. One book, "Yi Min's Great Wall" focuses on a child, Yi Min, who is trying to prevent a rabbit from invading his carrot garden. The students try to find a solution for the character through engineering walls of their own.
- Pyrotechnics Branch Chief, Joe Domanico, gave a lecture on fireworks and the science of pyrotechnics at a local middle school to more than 100 eighth-grade students. Domanico's lectures are intended to show students how chemistry is used in science and promote firework safety.

Workforce Development

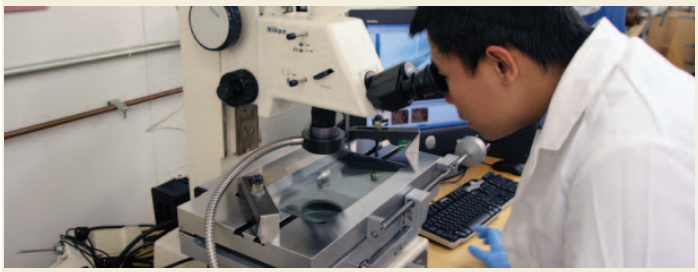
- The Engineering Directorate hosted its Second Annual ECBC Women in Science and Engineering Panel Event featuring female scientists and engineers from across the Center. Nearly 100 members of the workforce gathered to hear thoughts on the role women play in a career field that is historically underrepresented by women. The panel can be viewed on ECBC's YouTube site at http://www.youtube.com/edgewoodchembio

This Quarter June 2012

- ECBC-Rock Island's Industrial Base Team has been designated as the Army Materiel Command's (AMC) Industrial Base Capabilities Division's (IBCD) Continuity of Operations Plan Activity and Responsibility. The cooperative partnership between ECBC-RI and AMC-IBCD will allow the Army IB Program to be functional despite the occurrence of unforeseen disasters.

- ECBC's Advanced Design and Manufacturing Team, Pyrotechnics and Explosives Branch, the Innovative Development Engineering Acquisitions (IDEA) Branch, along with support from the Center's Research and Technology Directorate created the Colorimetric Reconnaissance Explosive Squad Screening (CRESS) detector. The CRESS detector detects unsophisticated, homemade substances such as ammonium nitrate, commonly used in improvised explosives. The new detector will be ready for an operational assessment in Fall 2012. The first prototypes will be used by the Fort Benning Infantry School in Georgia.

- In January 2012, ECBC celebrated 95 years of providing ChemBio solutions to the Warfighter. ECBC Engineering published a special "History Of" Edition of its monthly newsletter, and shared fun facts about the organization's history on Facebook and Twitter. Visit **http://issuu.com/ecbcengineering** to view the newsletter, and check out our Facebook Timeline at **http://www.facebook.com/EdgewoodChemBioCenter** to see more about our 95-year and counting commitment to excellence.



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