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Chief of Chemical and Commandant

U.S. Army Chemical, Biological, Radiological, and Nuclear School

As I near the end of my tour as your 32d Chief of Chemical and Commandant of the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), Fort Leonard Wood, Missouri, I can't help but reflect on the fact that our Corps and our Army are at a critical point in history. We have ended a 20-year war in Afghanistan, continued to fight the battle against the Novel Coronavirus (COVID-19), and watched geopolitical tensions with several of our near-peer competitors come to bear. As I write, our Army has positioned forces overseas while the most extensive European land war since World War II continues to rage between Russia and Ukraine. We are, no doubt, in turbulent times—and it is more important now than ever that the Regiment remain ready and relevant in support of our Nation's maneuver formations.

Brigadier General Sean Crockett

Our Fiscal Year 2023 priorities remain people first and modernization. To accomplish our goals, we have developed specific capabilities across the doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) domains that will ensure survivability and enable freedom of action in large-scale ground combat and multidomain operations against near-peer threats in a complex chemical, biological, radiological, and nuclear (CBRN) environment. Modernization objectives will set conditions for mission success for the Army of 2030 and beyond, utilizing our three core functions: assess, protect, and mitigate.

People First

People first efforts include a thorough evaluation of the personnel structure of the Chemical Corps. We need a structure that is optimized for current and future requirements in order to maximize the potential of our Soldiers to meet those demands. We must build on the excellence that exists within our ranks. To those ends, we are continuing to analyze the development of appropriately broad and sufficiently deep expertise. Achieving a balance in breadth and depth will align our Soldier capabilities with modernization objectives spanning the DOTMLPF domains, magnifying their effects. This strategy is intended to build and maintain CBRN defense expertise across our core functions. These structural changes are works in progress, and much is left to do—with many impacts to consider. The discussion that is invited by these proposals is needed. More importantly, these structural changes will guide actions that ensure that the U.S. Army Chemical Regiment can successfully fulfill the needs of the Army now and into the future. Our Regiment will continue refining current proposals and engaging in dialogue with the field to move forward with deliberate and well-developed structural change.

Modernization

Our efforts to modernize CBRN capabilities and formations continue along an irreversible path. Working with our partners across science, technology, and advanced development, we continue to develop prototype capabilities designed to meet the challenges that we expect the Army of 2030 to face in large-scale combat operations. To maximize the employment of these capabilities, we are also assessing our force structure to ensure that we are correctly organized at all levels to support movement and maneuver in multidomain operations.

Conclusion

In closing, as I approach the end of my 24-month tour as the 32d Chief of Chemical and Commandant of USACBRNS, I am honored and humbled to have had this opportunity to serve our Corps and I look forward to our accomplishments in the years ahead. I want to personally thank the members of the Regiment who support our mission day in and day out. Your continued dedication to this formation has allowed us to remain steadfast in our training and support to the maneuver forces over the years. Our training and modernization efforts will ensure that our Corps remains ready and relevant as we transition to Army 2030 and beyond. I am equally confident that our planned trajectory for modernization supports the way in which the Army wishes to modernize, providing the warfighter the capability to ensure success in future CBRN environments. To all of our Dragon Soldiers and their Families, Department of the Army civilians, CBRN enterprise stakeholders, and joint partners around the globe . . . You continue to represent the strongest CBRN counterforce team this Nation has ever seen. Collectively, we will be the decisive edge in support of the future force.

Dragon Soldiers! CBRN Warriors! Elementis, Regamus, Proelium!

Regimental Command Sergeant Major

Command Sergeant Major
Raymond Perez Quitugua Jr.

Teammates, I am honored to be your 16th Regimental Command Sergeant Major. Serving as the Command Sergeant Major of the U.S. Army Chemical Corps and the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), Fort Leonard Wood, Missouri, for these past 9 months has, without a doubt, been the highlight of my career thus far. With the incredible team we have here at USACBRNS and the strenuous efforts of chemical, biological, radiological, and nuclear (CBRN) leaders serving in the field, we have achieved so much in this concise period. To be as efficient as possible, it was necessary for me to operationalize my role. In doing so, I came to see myself as functioning in three Chemical Corps capacities. First, in conjunction with Chief of Chemical Brigadier General Sean Crockett, I serve as the Regimental Command Sergeant Major of the Corps. Second, as the senior enlisted leader, I am partnered with Brigadier General Crockett as the commandant of USACBRNS. Third, since the Chemical Corps is the Army proponent for CBRN defense and countering weapons of mass destruction, Brigadier General Crocket and I lead those efforts, in partnership with our joint, multinational, and industry partners.

As the Regimental Command Sergeant Major of our Corps and School, I am proud to champion your causes and serve as your biggest cheerleader. My travels take me far and wide, where I showcase your actions and efforts to the rest of the Army. My energy is not just applied to Component (COMPO) 1; two-thirds of the total Army CBRN structure resides in COMPOs 2 and 3. Dragon Soldiers in the Army National Guard and Army Reserves: You are doing amazing things, and it's important to me that you are also recognized for your selfless efforts. Help me tell your story; it's one of the most fulfilling things that I can do.

In my role of overseeing USACBRNS, I supervise and influence the programs of instruction for all CBRN Professional Military Education courses. These include Advanced Individual Training, the Advanced Leaders Course, the Senior Leaders Course, and all of the officer and warrant officer courses. Bridging the gap between what is taught in the institutional domain and what is practiced and utilized in the operational domain is vital. Visiting units and observing training helps me in this regard as well.

Finally, I am excited about the future of our Corps. As a representative of all things for which we are the proponent, I see all the programs and initiatives that will define the Chemical Corps of 2030 and beyond on the horizon. These include improvements and technical breakthroughs in mounted reconnaissance, contamination mitigation, and CBRN protection. Future force design updates will change the structure of our formations so that we may better operate in large-scale combat operations in a multidomain environment. Unmanned robotics, autonomous decontamination, and advanced machine learning are just a few of the fields to which we are applying science and technology efforts.

As you can see, the future is bright for our Corps. You serve in a field that is relevant and necessary for winning tomorrow's wars. The rest of the command team and I could not be prouder to be a part of your squad.

We look forward to seeing the fantastic things that you continue to do as we go out and visit the force.

Dragon Soldiers! CBRN Warriors!

Elementis, Regamus, Proelium! Be all you can be!

Regimental Chief Warrant Officer

Greetings, fellow Dragon Soldiers, Family members, and civilians!

Chief Warrant Officer Four Humphrey B. Hills II

As we continue to support the Army with modernization efforts, we are refining warrant officer Professional Military Education to support the pivot to large-scale combat operations and multidomain operations. This is the opportune time for us to look at Professional Military Education, as we will execute a critical-task site selection board in the 3d quarter of Fiscal Year (FY) 2023 in order to redefine the tasks that will be instructed in support of large-scale combat operations, multidomain operations, and the Army of 2030 and beyond. The focus of these modifications will be on our core tasks (assess, protect, mitigate) and on leader development throughout our cohort.

This has been an exceptional year for our Regiment and the chemical, biological, radiological, and nuclear (CBRN) warrant officer cohort. As we celebrate 105 years of prestigious Chemical Regiment service to our Nation and 12 years of our elite warrant officer cohort, I am excited to announce that, as of 1 June 2023, the Army will experience the first wave of CBRN chief warrant officers four amongst its ranks. With the achievement of this new milestone, we continue to carve out our piece of illustrious Regimental history. This is a momentous occasion and a step toward ensuring that we retain our finest talent for continued service to our country.

With recruiting remaining one of our top priorities, it is imperative that we continue to seek out the most qualified individuals aspiring to become warrant officers. Consequently, eight of our Active Component CBRN noncommissioned officers were selected to attend Warrant Officer Candidate School. These outstanding individuals were chosen from more than 50 packets submitted to the FY 23 Warrant Officer Selection Board. Please join me in congratulating the Army's newest Active Component CBRN warrant officer candidates and their Families:

- Sergeant First Class Christopher D. Aguirre.
- Sergeant First Class Kevin J. Calorobles.
- Sergeant First Class Jonathan T. David.
- Sergeant First Class Kenneth L. Holloman.
- Sergeant First Class Andrew K. Lasson.
- Staff Sergeant Hwanglyong J. Hwangbo.
- Staff Sergeant Dominique D. Lockwood.
- Staff Sergeant Tiffany M. White.

We continue to promote and highlight diversity, equality, and inclusion as we build our future fighting force. Telling our "Army stories" is one way that we can reconnect with, and regain the trust of, the American public—and it's something with which we must be comfortable. This is an all-hands operation; it will take everyone broadcasting our message about what we do each day as we continue to protect our Nation's freedom.

In conclusion, it continues to be an honor and a privilege to serve as your 4th Regimental Chief Warrant Officer. I appreciate the continued support, hard work, dedication, and daily sacrifice from each of you throughout this journey. It has been and continues to be rewarding. Please remember our deployed brothers and sisters in arms, along with their Families, until they come home.

Stay safe, calm, and absolutely motivated, and continue to care for yourself and each other. Be All You Can Be!

Dragon Soldiers! CBRN Warriors!

Elementis, Regamus, Proelium—We rule the battle by means of the elements!

Multidomain Operations:

The Latest Evolution of Operational Doctrine

By Captain Carlos J. Valencia and Major Philip S. Cooney

Doctrine represents the total collection of U.S. Army knowledge gained over 247 years of war, uneasy tensions, and peace. Over the past 40 years, the world and the operational environment (OE) in which we find ourselves have significantly changed, as various advancements have been made by peer threats. Loitering munitions, electronic warfare, unmanned systems, and nonnation state actors (among other technologies and factors) have revolutionized how war is now fought and how the Army must adapt to meet these threats. After a nearly 20-year focus on counterinsurgency operations, the Army began shifting its doctrinal focus back toward large-scale combat operations in 2017, with the publication of Field Manual (FM) 3-0, *Operations*.[1] The 2022 edition of FM 3-0 introduces the new Army operational concept (multidomain operations), which retains the focus on large-scale combat operations, builds on the importance of integrating joint and multinational capabilities, and expands on the combined arms approach—with an emphasis on creating complementary and reinforcing effects with capabilities from multiple domains.[2]

Multidomain operations refer to the combined arms employment of joint and Army capabilities to create and exploit relative advantages to achieve objectives, defeat enemy forces, and consolidate gains on behalf of joint force commanders. Multidomain operations constitute the Army contribution to the joint fight. All operations are multidomain operations, regardless of joint force capabilities contributed at each Army echelon. This is because Army forces employ organic capabilities in multiple domains and continuously benefit from capabilities that they do not control; examples include benefits gained from the Global Positioning System and from combat aviation support from the U.S. Navy or the U.S. Air Force. Multidomain operations demand a mindset that focuses on how Army forces view the OE and threats. But what does the modern OE look like, and how do the domains fit in?

An OE is a composite of the conditions, circumstances, and influences that affect the employment of capabilities that bear on the commander's decisions. Within the context of an OE, a domain is a physically defined portion of the OE that requires a unique set of warfighting capabilities and skills. The OE includes portions of the land, maritime, air, space, and cyberspace domains as impacted through three dimensions (human, physical, and information). The land, maritime, air, and space domains are defined by their physical characteristics, and cyberspace—a manmade network of networks—connects them, as represented by the dots shown in Figure 1.

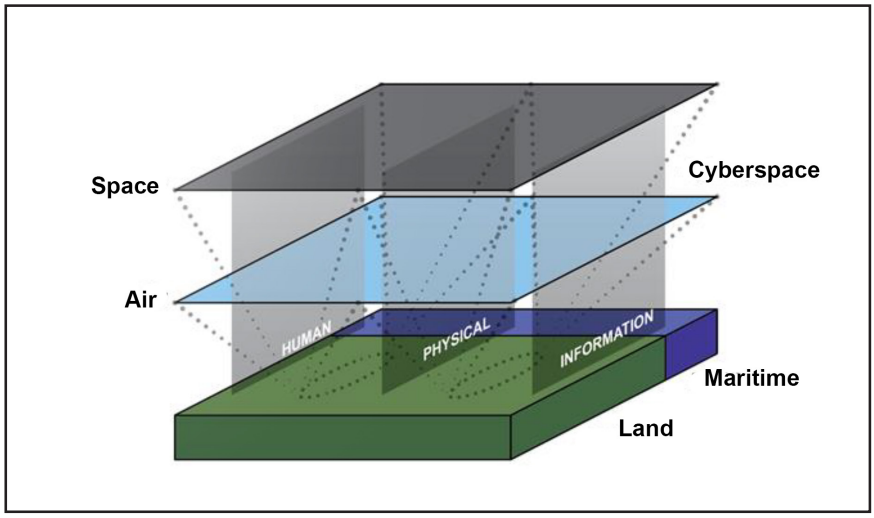

Figure 1. The OE

Leaders must understand how these three dimensions impact the OE. From a simple machine gun team crew action to a major offensive campaign, all operations affect the physical world, the humans who reside in it, and the information by which it is conceptualized. Additionally, multidomain operations aim for Army leaders to think beyond previous planning considerations and emphasize the integration of the Army capabilities across the five domains in order to compound effects with sister Services and deter and defeat peer threats at the lowest cost.

An additional change to the updated version of FM 3-0 is the introduction of the strategic situation, which stems from the competition continuum introduced in Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States*.[3] The strategic situation describes how the Army conducts itself across the range of military operations in three

strategic contexts—competition below armed conflict, crisis, and armed conflict. Together, these three strategic contexts form a progressive continuum along which the Army must be prepared to proceed in order to match an adversary's escalating violence and increases in U.S. national interest. In competition below armed conflict, nation or nonnation states with unaligned interests use various peaceful and malicious methods to compete with one another and gain an upper hand. The traditional Army contribution to unified action during this strategic context of competition below armed conflict consists of military engagement and security cooperation while preparing for armed conflict. As events or incidents that threaten U.S. national interests occur, the strategic context gradually moves toward crisis; this may require Army intervention, and Soldiers may be deployed to forward locations to deter conflict and prepare for war. If all else fails, then nation or nonnation states may begin using lethal force to achieve their goals; and in response, the Army conducts combat operations, exploiting its preparations from the competition and crisis strategic contexts to defeat the adversary. Competition below armed conflict, crisis, and armed conflict are not terribly foreign concepts, but the strategic situation helps leaders better conceptualize operations as the Army operates in different strategic contexts around the world.

Additional major updates and changes to FM 3-0 include—

- Establishing the dynamics of combat power—leadership, firepower, information, mobility, and survivability—which are generated by the warfighting functions.
- Identifying the four tenets of operations: agility, convergence, endurance, and depth. These tenets are attributes that should be built into all plans and operations, and they are directly related to how the Army operational concept should be employed. The new FM 3-0 introduces convergence as an outcome achieved by the concerted employment of capabilities from multiple domains and echelons against combinations of decisive points in any domain to create effects against a system, formation, or decision maker or within a specific geographic area.
- Describing nine imperatives as actions that Army forces must take to defeat peer enemy forces and succeed in OEs extended through all domains. The imperatives are—
  - See yourself, see the enemy, and understand the OE.
  - Account for being under constant observation and engaged in all forms of enemy contact.
  - Create and exploit relative physical, information, and human advantages in pursuit of decision dominance.
  - Make initial contact with the smallest element possible.
  - Impose multiple dilemmas on the enemy.
  - Anticipate, plan, and execute transitions.
  - Designate, weigh, and sustain the main effort.
  - Consolidate gains continuously.
  - Understand and manage the effects of operations on units and Soldiers.
- Providing an update to the operational framework by—
  - Expanding assigned areas and introducing and defining zone and sector areas.
  - Removing consolidation area, as the consolidation of gains now occurs throughout the entire operation, regardless of location.
  - Reintroducing main effort, supporting effort, and reserve, which replace decisive, shaping, and supporting efforts.
- Adding informational considerations to the mission variables, which are aspects of the three dimensions (human, physical, and information) that affect how humans and automated systems derive meaning from, use, act upon, and are impacted by information.
- Introducing influence as a ninth form of contact.
- Adding the theater strategic level as the fourth level of war.
- Adding chapters on Army operations in maritime-dominated environments and leadership during operations.

As with similar events of the past, the 2022 version of FM 3-0 will drive an evolutionary change across Army doctrine, including updates and changes to U.S. Army Chemical Corps doctrine. As the Army doubles down on its focus on large-scale combat operations, FM 3-0 should serve as a reminder of the three Chemical Corps core functions to assess, protect, and mitigate with regard to chemical, biological, radiological, and nuclear (CBRN) threats on the battlefield in order to support maneuver commanders in closing with and destroying the enemy. In the next few years, updates will be made to Army Doctrine Publication (ADP) 3-37, *Protection*,[4] FM 3-11, *Chemical, Biological, Radiological, and Nuclear Operations*,[5] and various CBRN Army techniques publications so that they align with the new version of FM 3-0. CBRN leaders must lean forward, understand FM 3-0, and use the information contained therein when communicating with senior leaders and Soldiers. CBRN leaders and Soldiers will need to answer various questions posed by the update to FM 3-0, including—

- How do CBRN capabilities complement and reinforce other branch and Service capabilities across each of the domains?
- How do CBRN forces create effects through the different dimensions?
- How do CBRN capabilities contribute to competition below armed conflict, crisis, and armed conflict?

As Soldiers, we are no strangers to the three dimensions, as we work within those dimensions on a day-to-day basis, conducting our three functions in support of competition below armed conflict, crisis, and armed conflict. Understanding and excelling at these functions contribute to mission success in CBRN environments across all decisive-action tasks. These core functions may be executed individually, simultaneously, or sequentially and are applicable to all levels of our future OEs.[6]

FM 3-0 is a critical piece of doctrine that leaders must read in order to understand Army operations and how each branch of the Army contributes to the fight—and this version is no different.

Following the publication of FM 3-0, CBRN doctrine will be updated and sent throughout the Regiment for review. As drafts of the various publications appear in leaders' e-mail inboxes, we implore each of you to read them and provide your feedback; this is the only way that we can improve our doctrine.

Endnotes:

[1]FM 3-0, *Operations*, 10 June 2017, (now obsolete).

[2]FM 3-0, *Operations*, 1 October 2022.

[3]JP 1, *Doctrine for the Armed Forces of the United States*, 14 November 2000.

[4]ADP 3-37, *Protection*, 31 July 2019.

[5]FM 3-11, *Chemical, Biological, Radiological, and Nuclear Operations*, 23 May 2019.

[6]Ibid.

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Major Cooney is the chief of the CBRN Doctrine Branch, Doctrine Division, Fielded Force Integration Directorate, U.S. Army Maneuver Support Center of Excellence.

By Chief Warrant Officer Three Macio E. Brown

"Technology cannot advance without the vision of a better tomorrow."
—Chief Warrant Officer Three Macio E. Brown

The Chemical Biological Operational Analysis (CBOA) event, developed and executed by the Defense Threat Reduction Agency (DTRA), provides researchers an opportunity to elicit warfighter feedback during the technology development process of emerging chemical, biological, radiological, and nuclear (CBRN) capabilities for use in a realistic operational environment.

CBOA 22 was held at Eglin Air Force Base, Florida, in May 2022. In its role as the Joint Science and Technology Office (JSTO) for the Chemical and Biological Defense Program, Chemical and Biological Technologies Department, DTRA is the Department of Defense hub for chemical and biological technical expertise. The JSTO, which leads the defense community in preparing for chemical and biological threats, identifies and provides cutting-edge technology solutions to protect the security of the American people while empowering warfighters to achieve their missions in dangerous environments. The JSTO is responsible not only for protecting against the known threats of today but also for anticipating the major threats of tomorrow. In addition, JSTO provides science and technology support to the Department of Defense, other government agencies, and the international community.

DTRA sponsored more than 300 U.S. government, academia, and industry representatives as participants for CBOA 22, which addressed military capability gaps and high-priority mission deficiencies. During the week-long event, new CBRN-related technologies were assessed by capturing user feedback from all branches of the U.S. armed forces. Technologies were rated at technology readiness levels ranging from 3 to 8, based on four mission areas corresponding to the CBRN core functions: assess, protect, mitigate, and integrate command and control management. The assessment focused on the following characteristics of the technologies: performance, adaptability, ability to be integrated into the mission command common operating picture, digital security, environmental robustness, training burden, ease of use, task-load requirements for system operations, propensity for system malfunctions, routine maintenance burden, and logistical impacts. The event consisted of three lanes, which contained multiple operational scenarios to demonstrate the effectiveness of the technologies.

CBRN Protection 2030 and Beyond

According to Army Doctrine Publication (ADP) 3-37, *Protection*, "Many state and nonstate actors (including terrorists and criminals) possess or have the capability to possess, develop, or proliferate [weapons of mass destruction] WMD. The most likely adversaries during large-scale ground combat have significant WMD capabilities and the doctrine to employ them during conventional operations. The training to conduct operations in a WMD environment is critical to operational success."[1] In order to achieve freedom of action, increase lethality, and enable movement and maneuver in the execution of large-scale ground combat operations in the complex CBRN environment, the Army must aggressively develop future CBRN defense capabilities to outpace our adversaries.[2]

U.S. Army Futures Command (AFC) Pamphlet (Pam) 71-20-7, *Army Futures Command Concept for Protection 2028*, builds upon the ideas of the multidomain operations concept and serves as the baseline for required CBRN protection capabilities to enable Army forces in multidomain operations through CBRN reconnaissance and surveillance, integrated early warning, real-time understanding, inherent survivability, and mitigation of CBRN hazards.[3] The key to successful all-domain protection includes improvement of artificial intelligence and machine learning for CBRN detection and mitigation capabilities. CBOA 22 highlighted breakthrough scientific discoveries and technological innovations that support the central idea of the core CBRN competencies (assess, protect, and mitigate) and the integrating activity of hazard awareness and understanding in support of the *United States Army Chemical Biological Radiological Nuclear (CBRN) Science & Technology Strategy*.[4] By employing capabilities that enable decision making and protect the force, commanders can sense, assess, understand, decide, and act faster and more effectively, thereby gaining an information advantage.

CBOA Technologies Overview

CBRN assessment capabilities enable commanders to understand the environment as early as possible so that they may make informed, risk-based decisions that protect the force while retaining freedom of action in a CBRN environment. The following assessment technologies were assessed during CBOA 22:

- **Dial-a-Threat Assay**—a hand-held, unpowered, human-readable biological threat identifier.
- **Biological Automated Collector/Detector for Expeditionary Reconnaissance (BioACER©)**—a fully automated biological collection and identification device that can be released from an unmanned aerial system (UAS) for remote analysis over a plume.

- **Falcon 4G©**—a 4th-generation laser-based CBRN standoff detector (which was used in a base defense scenario).
- **FentAlert©**—an all-environments screening assay for pharmaceutical fentanyl-based agents.
- **Far-Forward Advanced Sequencing Technology**—a technology used to identify deoxyribonucleic acid- or ribonucleic acid-based organisms.
- **Hazardous-material small UAS**—a UAS that is used to fly optimized patterns through hazardous areas, detecting, identifying, quantifying, and mapping hazardous data in real time, thereby enhancing situational awareness and improving decision quality.
- **MUSA P3I©**—a semiautonomous quadrupedal robot with integrated chemical and radiological detection/identification instruments that can also take photographs in the hot zone and conduct most CBRN reconnaissance/sampling missions.
- **NuGBall©**—a portable sensor network for real-time CBRN contamination mapping.
- **Pendar X10©**—a handheld standoff Raman spectroscopy chemical identification system used to identify unknown materials (liquid, solid, gel) at a distance of 1 to 6 feet within a few seconds (Figure 1).

Figure 1. Pendar X10

- **Raman spectrometer**—a spectrometer used to identify collected particles.
- **Rigaku©**—a portable handheld, dual-technology 1064-nanometer for the identification of chemicals and toxic industrial chemicals.

CBRN protection capabilities enable inherent survivability (individual and collective) in support of large-scale combat operations, without degradation or loss of combat effectiveness in a CBRN environment. The following protection technology was assessed during CBOA 22:

- **Second Skin©**—a mask cover that is installed on a standard M50 mask to improve the protective garment hood and mask interface.

CBRN mitigation contributes to the negation of hazard effects by providing commanders the flexibility to make risk-based decisions about the mitigation of residual CBRN contamination without the reduction of combat power or unnecessary expenditure of time and resources. The following mitigation technology was assessed during CBOA 22:

- **Decontaminating skin soap**—a soap that is used to rapidly decontaminate sensitive equipment, materials, and skin from chemical warfare agents, biological warfare agents, toxic industrial chemicals, toxic industrial materials, nontraditional agents, pharmaceutical-based agents, and other emerging threats.

Digital Battlespace Command and Control Management

Digital battlespace command and control management systems provide CBRN staffs with the information required for commanders to make decisions with enhanced situational awareness and understanding in a timelier manner. Digital battlespace command and control management tools allow CBRN staffs to receive large amounts of CBRN threat information and intelligence, conduct analysis, and develop trends related to enemy CBRN employment. Technology developers presented the following capabilities during CBOA 22:

- **CBRN Analysis Software**—a commercial, off-the-shelf knowledge management application.
- **Multiintelligence-Enabled Discovery**—artificial-intelligence, machine-learning algorithms that use Azure Cloud© and Azure Cognitive Services© to provide near-real-time processing of multiple types of raw, unformatted environmental and intelligence data to provide intelligence insight and information to decision makers.

Conclusion

CBOA forges the future of CBRN modernization by showcasing experimentation, demonstration, and capability development for the joint force. Commanders need the ability to see the adversary, deny it anonymity, counter specific strengths, achieve positions of advantage, and expand and exploit gained areas. Lieutenant General D. Scott McKean, director of the Futures and Concepts Center, Army Futures Command, Fort Eustis, Virginia, prefaced his CBOA 22 speech on AFC Pam 71-20-7 by stating, "Looking forward, the Army must develop capabilities that can support and integrate with our joint, interagency, interorganizational, and multinational partners to expand the protection capability, increase capacity in competition, and operate at scale in armed conflict." This guidance exemplifies the Army commitment to protecting the force, improving survivability, and reestablishing the readiness of forces through the development of modernized capabilities.

Endnotes:

[1]ADP 3-37, *Protection*, 31 July 2019.

[2]*CBRN Operations Force Modernization Strategy*, U.S. Army CBRN School, Fort Leonard Wood, Missouri, July 2018.

[3]AFC Pam 71-20-7, *Army Futures Command Concept for Protection 2028*, 7 April 2021.

[4]*United States Army Chemical Biological Radiological Nuclear (CBRN) Science & Technology Strategy*, U.S. Army, 2022.

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AI: Driving Change Toward a Data-Centric Chemical Corps

By Sergeant First Class Jesus Ambrocio, Staff Sergeant Nayeli L. Crosby, Staff Sergeant Joseph A. Feola, Staff Sergeant Scott A. Mintz, and Staff Sergeant Chang Yue

Artificial intelligence (AI) has been rapidly developing over the past few years, radically changing how we interact, plan, and leverage technology in our everyday lives. The latest National Defense Strategy[1] outlines the role of AI in building enduring advantages by leveraging commercial market capabilities and implementing trusted AI platforms in the force. With the increased deployment of AI throughout the Department of Defense (DOD), the U.S. Army Chemical Corps stands to gain a vital resource across formations and components at the tactical, operational, and strategic theater levels.

AI

AI is a field of computer science that enhances the simulation of intelligent behavior by computer systems.[2] Breakthroughs and rapid iteration have brought AI-enabled services and products with incredible capabilities to market. Although the parameters of AI are extensive, its components are applied in everyday life. And AI is here today. Examples include the use of Global Positioning System navigation for determining best routes, the use of a chat box with an AI avatar for interaction on a website, and the use of historical data to create solutions to crucial problems. These military-adjacent capabilities are beginning to be used across DOD.

AI is a field with subsets that are working tangentially or individually. The two most common subsets are data analytics and machine learning. To fully utilize and integrate emerging AI technology, we must expand and iterate on implementing AI in critical domains of the Chemical Corps. The Soldier and, ultimately, the commander are still the key lynchpins in the decision-making process.

Humans serve as the decision point in the four-step cycle known as the observe-orient-decide-act (OODA) loop,[3] a concept developed by U.S. Air Force Colonel John R. Boyd; in a sense, AI is an enabler. The OODA concept has driven a great deal of strategic thought and planning regarding how combat operations evolve to win the fight. As DOD continues iterations of emerging AI technology, more of our systems and processes will become automated, underscoring how rapidly AI has been and will continue to be developed. Endeavors of complete autonomy using AI are still being researched and show promising results.

AI Today

DOD has begun implementation of AI in aircraft, and the upcoming Chemical Corps Tactical Contamination Mitigation System is currently in development. The integration of AI in aircraft has improved detection and aided in the targeting process via the Air Force "kill chain"[4] by linking data and processing it through the Air Force-distributed Standard Ground System, which is spread across the globe. The Tactical Contamination Mitigation System will use unmanned ground vehicles to conduct assessments and apply decontaminants. These AI-enabled features will classify potential contamination and decontaminate the area without the need for Soldiers. These combined features will reduce the requirements for manpower and resources, which can then be applied elsewhere in the fight. However, Service-specific applications are only one use of AI.

An AI-enabled joint force would offer an incredible suite of tools to aid in warfighting functions across multidomain operations. This article discusses how chemical, biological, radiological, and nuclear (CBRN) planning and operations can be aided by AI integration in the land and air domains and the physical, information, and human dimensions. With the focus on large-scale combat operations (LSCO), contested and challenged environments are to be expected. AI enablement can reduce the overhead of planning and resource requirements while increasing the speed with which warfighting functions take place across the operational environment.

Future Vision of AI in CBRN

As the Army pivots its efforts in modernization and doctrine for LSCO, so too must adaptions be made to the tools that enable warfighters to correctly execute their tasks faster and with as much context as possible. The ability to pivot as the battle ensues will rapidly and exponentially propagate from the Soldiers on the ground to the corps headquarters. At these critical levels, we envision an integration with AI and we highlight the positive impact on our Dragon Soldiers.

In terms of CBRN staffs at the battalion and brigade levels, AI could be utilized to promote faster reporting systems, both on the sending and receiving ends. For example, AI-enabled software could be used to quickly generate CBRN reports based on data collected at the edge of the fight, highlighting the concept of Soldiers as sensors and integrating it to produce a common operating picture at the tactical level. A CBRN warning order could also be generated based on information received from a

higher echelon. Such a two-way, integrated communication scenario would be beneficial at the edge of the fight, where the speed of information transmission is critical to success in CBRN-contaminated environments.

Additionally, AI-enabled software could be used for early detection, allowing for faster responses to CBRN threats. For CBRN staff planning at battalion and brigade levels, a quicker detection rate for CBRN threats would result in faster countermeasures and more timely protection against imminent threats. The "every Soldier as a sensor concept" could be combined and implemented with unmanned aerial systems/unmanned ground vehicles, alongside traditional standoff detection equipment. Thanks to the machine learning capabilities of AI, CBRN threats could be accurately identified and assessed. The resources and logistics necessary for commanders to make precise decisions about overcoming any CBRN threat could be generated.

From warning and reporting to sensing at the edge of the fight, AI could—through speed, accuracy, and context—enhance the data throughput of our Soldiers at the tactical level. Together, these ideas and concepts could improve the relevancy of data to commanders, rendering them better informed and better able to efficiently fight and win in CBRN-contaminated environments.

But the Regular Army makes up just one-third of our branch. The U.S. Army Reserve and the Army National Guard also stand to gain an immense opportunity with this emerging technology. One of the major struggles for the U.S. Army Reserve is the maintenance of vehicles because they are not operated or serviced as often as their Regular Army counterparts. The use of AI to help identify upcoming maintenance requirements and issues would save time and money by placing the focus on vehicles and equipment, thus improving response time for deploying units. This data-focused approach would also enable better integration beyond the Chemical Corps. AI—specifically, data analytics—could be integrated to keep track of equipment capabilities and status and to monitor future maintenance impacts based on current service plans. Tying this data-centric approach to the radiological/nuclear side of CBRN, the software could further be used to record the radiological exposure of Soldiers on the line to ensure accurate adherence to operational exposure guidance limits. This is crucial when conducting operations through the U.S. Army National Guard and partner agencies in support of homeland defense.

The deployed area of operations can have a negative effect on the sending and receiving of reports and updates. Critical reporting requirements are sometimes delayed due to network issues. AI could be integrated to send real-time status reports to higher headquarters by automatically switching to the best network for use and updating the latest data stream. This concept has begun to make its way to software-defined radios being tested today.[5] A conceptual implementation might consist of a CBRN sensor, such as an Internet of Things (IoT)™ device, attached to the tactical network and dispersed over the area of operations to sense for CBRN agents. When a possible threat is detected, a check of surrounding sensors combined with live data from a Soldier could indicate a CBRN threat. A warning could then be sent via the best pathway, as dictated by the algorithm, to reach the proper echelon as quickly as possible. Through this implementation of continuous integrated delivery, live data streams could be horizontally injected so that all stakeholders would be aware of the situations across their formations.

As the Army transitions to the LSCO fight, the Chemical Branch also stands to gain sustainment efficiencies. Effectively managing dispersed personnel and resources is vital in maintaining sustained land operations. AI can be used to continuously assess information to improve mission analysis, providing commanders with the capability to anticipate personnel requirements related to the Soldier-as-a-sensor concept and informing higher echelons of accurate operational capabilities. Implementing AI to continuously monitor all Soldiers would improve interoperability throughout all echelons, enhancing CBRN warfighting functions. These AI capabilities would transform the ability of commanders to access critical information, allowing them to strengthen the management of resources and dispersed CBRN units.

The link between the hazard assessment platoons, the chemical company, and the battalion is key to framing the use of this new technology. Adopting AI at the hazard assessment platoon level while a team is downrange would potentially reduce time on target for dismounted operations and would help the overall mission go smoother. Employing capabilities that make our jobs less stressful while also reducing the risk to Soldiers is a winning combination.

The envisioned software could help identify precursors and agents studied in secure research laboratories and assist in narrowing possible chemical threats. This would increase the lethality of our Soldiers and decrease the time spent wearing the self-contained breathing apparatus (SCBA). A stream of data obtained from Soldiers and unmanned vehicles, coupled with incident command post software, could enable faster real-time threat assessments at the tactical and theater levels. The data stream could also be integrated with CBRN vehicles, providing wider reconnaissance of possible contamination. This would decrease the burden on higher-echelon CBRN experts by providing real-time data and analytics of potential threats.

Another way that AI technology could help the Chemical Corps evolve and modernize is through the use of the software to establish a data-focused incident command post. Integrating AI with sensors could help establish faster team and equipment monitoring and measurement of hot and cold zones. In conjunction with the possible integration of AI into incident command post software, AI could also be integrated into existing hardware, automating the monitoring of variables that Soldiers typically observe, such as wind directions, humidity, and other environmental factors. Automating the monitoring of these variables would lead to faster time on target to confirm or deny the presence of CBRN threats.

Conclusion

With the ever-increasing evolution of AI, we must, as a Corps, seize the opportunity by integrating AI capabilities

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CBRN Warrant Officer Journal: What a Difference a Year Makes

By Warrant Officer One Joshua D. Jimenez
and Warrant Officer One Alan "Michael" Jones

The first 100 days of our predecessors were marked with the uncertainty of new roles as Military Occupational Specialty (MOS) 740As–Chemical, Biological, Radiological, and Nuclear (CBRN) Technicians; unclear expectations from their units; and the need to find their paths in the U.S. Army. By the time we met these Soldiers, they had developed refined individual and collective ambitions and goals, assimilated their new roles that were so vital to their unit's accomplishments, and illuminated the trails that they had blazed for others to follow. Their first 100 days seemed like a foggy, bumpy road, but their last year cleared the way for their replacements (us) to charge full steam ahead. These two outstanding warrant officers were instrumental in laying the foundation upon which the company currently stands.

Any mentorship that one can obtain before becoming a warrant officer one will bolster and streamline the first 100 days of the transition, beginning with the Warrant Officer Candidate School, Fort Novosel, Alabama; continuing with the Warrant Officer Basic Course, Fort Leonard Wood, Missouri; and culminating with the first duty station. Those who are fortunate enough to serve in a CBRN battalion will have team, company, and battalion warrant officers who will surely share their experiences and demonstrate how CBRN technicians focus on maintenance, sustainment, and certifications. New CBRN warrant officers must manage a flood of inherited information, reference materials for troubleshooting equipment, points of contact for higher-level support, and log-on information for a myriad of websites. Just as our predecessors recognized the need to build their networks, other warrant officers in their first 100 days will also soon learn that they are only as good as their networks. The collective knowledge of the cohort across all branches provides units with the technical expertise of innovative integrators of emerging technologies, who can develop specialized teams of Soldiers. All of this knowledge, wisdom, and experience helps new warrant officers to more quickly become confident warfighters who are considered technical experts, combat leaders, trainers, and advisors.

We must all traverse our first 100 days as warrant officers ourselves, facing uncertainty and sensing a lack of clarity while finding our paths; no amount of mentorship can spare that effort. The key is to listen to those who have been through it before, heed their guidance, and feel their empathy, for new warrant officers are their legacy—and even the legacy of those who have gone before them. Before long, it will become apparent how much difference a year has made.

Unit Support

740As support a wide range of Army missions throughout their careers. In Korea, CBRN technicians are specifically charged with supporting their assigned units and the Korean Peninsula in all aspects of CBRN. This includes maintaining readiness with regard to dismounted reconnaissance sets, vehicles, and equipment. The mission focus is on assessing, protecting, and mitigating all threats, which requires that a team of 740As work together toward a common goal. Additionally, 740As have worked with sister Services to extend their influence outside of the Army organization. CBRN technicians have become accustomed to building relationships, as the unit never fights alone.

Continuous education and self-development for 740As are critical in amplifying the need for CBRN technicians in any organization in the Army. The warrant officers of the 23d CBRN Battalion, Camp Humphreys, Korea, have secured and attended new classes to learn about all capabilities and maintenance requirements and how to advise commanders on combat capabilities. Over the past year, significant strides have been made in building a strong alliance with U.S. allies; what a difference a year has made!

Extended Influence

The influence of CBRN technicians outside the Chemical Corps is equally as crucial as their influence within the organization they currently support. To be effective, it is important that warrant officers possess relationship-building

qualities. The ability to convince others that CBRN support is essential maintains and increases CBRN relevancy. Sometimes, the title of warrant officer is not enough and 740As must be able to articulate the precise value of CBRN units and explain what CBRN technicians bring to the fight. Extending influence is dependent upon listening, building connections, developing oneself, and integrating into the needs of the unit.

While stationed in Korea, 740As have established relationships with a multitude of units across the Korean Peninsula. CBRN technicians in Korea often participate in monthly warrant officer professional development briefings to network and engage their counterparts in other MOSs; this assists with posturing unit readiness if it becomes necessary to "fight tonight." Understanding the organization allows for the building of trust among each for the betterment of all.

Teamwork

Lastly, teamwork is the foundation that has been set for the CBRN warrant officer cohort. The more CBRN technicians can collaborate toward a common goal, the more efficient and effective they are. As new warrant officers still testing the waters and finding our way, we have become integrated into a Family, with members who have each other's best interest in mind. This cohort is diverse, constantly facing new hurdles and working to grow. Success hinges on group collaboration and team effectiveness—and on never needing to recreate the wheel but, rather, building on the foundation that has been set.

Join us; you will not regret it! What a difference a year makes!

We All We Got! (#WAWG)

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("AI:Driving Change Toward a Data-Centric Chemical Corps," continued from page 11)

and becoming leaders in AI-enabled operations. The visions presented in this article include a variety of concepts that can be used to work toward a solution to problems as we pivot to the LSCO fight and continue to modernize the Army of 2030.

In addition to the benefits of AI for our warfighting functions, our U.S. Army Reserve and Army National Guard Soldiers and formations stand to gain capabilities in the field of homeland defense. The cases discussed in this article offer a glimpse into the likely future of the Chemical Corps at various levels of multidomain operations. AI is here, and it is continually iterating. We must innovate now in order to overmatch, fight, and win in any operational environment.

Endnotes:

[1]*2022 National Defense Strategy*, U.S. Department of Defense, 27 October 2022, <https://www.defense.gov/News/Releases/Release/Article/3201683/department-of-defense-releases-its-2022-strategic-reviews-national-defense-stra/>, accessed on 10 April 2023.

[2]Darrell M. West, "What Is Artificial Intelligence?" *Brookings*, 4 October 2018, <https://www.brookings.edu/research/what-is-artificial-intelligence/> accessed on 10 April 2023.

[3]Gary Olson, "Keeping the Human in the OODA Loop," *Federal Times*, 31 October 2022, <https://www.federaltimes.com/management/2022/10/31/keeping-the-human-in-the-ooda-loop/>, accessed on 5 April 2023.

[4]David Hambling, "Artificial Intelligence is Now Part of U.S. Air Force's 'Kill Chain,' " *Forbes*, 28 October 2021, <https://www.forbes.com/sites/davidhambling/2021/10/28/ai-now-part-of-us-air-force-kill-chain/>, accessed on 10 April 2023.

[5]Jon Harper, "Military, Industry Gung-Ho on Software Defined Radios," *National Defense*, 15 February 2019, <https://www.nationaldefensemagazine.org/articles/2019/2/15/military-industry-gung-ho-on-software-defined-radios>, accessed on 10 April 2023.

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My Experience as a U.S. Army CBRN Officer

By Captain Anthony S. Portuesi

What are my purpose and mission in life? What vision do I have for myself and for the legacy I leave for others? What major values will help me get there? Why have I been called to serve?

Let me tell my Army story. My family immigrated to the United States from Italy in or around 1940. My paternal grandparents—my beautiful grandmother (Nonna) from Rome and my eccentric grandfather (Nonno) from Sicily—came to the United States with little but worked extremely hard. My maternal grandparents emigrated from Naples, Italy, where they came from low-income families. Searching for a better life in the United States, all of my grandparents understood the meaning of service and sacrifice. Ultimately, this had an enormous impact on their grandchildren. My inspiration for service to my country came from my maternal grandfather—Peter Vacarro, who served honorably in World War II; and as a result, I have always felt a calling to military service.

I grew up in a lower- to middle-class household with a twin brother and a younger brother. My brothers and I were loved fervently and equally. We didn't have all of the nicest toys, but my parents taught us the values of hard work, discipline, dedication, and perseverance in pursuit of our goals. Throughout the early stages of my life, I become accustomed to family and friends who continually sacrificed for one another.

My twin brother Jonathan and I did nearly everything together when we were young. Twins can be competitive with each other, but our competitiveness proved to be healthy because we both ended up becoming commissioned officers in the U.S. Army and leading younger generations of Soldiers.

I have served in all types of Army organizations, from combined arms battalions in the armor arena to the world's most elite special operations raid force. The mentorship that I have sought out not only from my superior officers but also from my noncommissioned officer counterparts has been critical, given their vast wealth of knowledge and experience. Having served with special operations forces and the 75th Ranger Regiment, Fort Benning, Georgia, I know what it means to be a servant leader and to sacrifice for the greater good. I was recently selected for the Functional Area 40 Voluntary Transfer Incentive Program (Space Operations) with the personal end goal of fulfilling a childhood dream of mine and becoming an Army astronaut. Realizing that most—if not all—of those selected as astronaut candidates possess doctorate degrees, my planned course of action for this career path involves becoming a doctor of medicine. I have always had a passion to help and coach others, and I truly believe that I can have a positive impact on the community. Therefore, my leadership in this field would immensely serve the community. But it is not all about me.

I have always wanted to lead others because I know what it takes to overcome adversity. The most important lesson that I have learned throughout this journey called life is that you must always know your version of "why." I have had the privilege of leading the Soldiers of the 75th Ranger Regiment, and their stories resonate with many—including me. Ultimately, if you can tell Soldiers why what they're doing is important, then they will follow you.

What would I do if I knew that I could not fail? As I continue to evaluate my life goals, I ask myself this question every day. Throughout my time outside the Service as well as in the military, I have been told that I could not do something because of some preconceived notion that someone had of me. However, the fact that one person—or even many people—writes me off does not mean I that I cannot succeed. My number one goal in life is to avoid being a "statistic." How can I take what I am now and become better than I was yesterday? I realize that to become truly extraordinary, I must be able to sacrifice who I am now for what I will become as I meet my new goals. I believe that this approach is the difference between failure and true success in any profession—particularly in our profession of arms.

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Immediate-Response Force: Responding to a Chemical Attack in a LSCO Fight

By Captain Alex T. Roan

Although nuclear weapons remain the most destructive weapons in the world, chemical weapons top the list of the most taboo and fear-inducing weapons of modern warfare. The use of chemical weapons violates multiple international treaties.[1, 2, 3] As such, the slightest possibility of a chemical attack draws worldwide distress. In response to this threat, President Joseph R. Biden attempted to make the U.S. stance against chemical weapons known by "drawing a red line" and explicitly stating that the United States would directly respond to any Russian use of chemical weapons against Ukraine.[4] If Russia decides to leverage chemical weapons, it will fall to the chemical, biological, radiological, nuclear, and explosives (CBRNE) Soldiers and commanders of Task Force 82 (TF82), 82d Airborne Division, Fort Bragg, North Carolina, to accurately assess and plan a ground response.

As a TF82 company commander, responding to this possible chemical threat is the primary mission. The CBRN Reconnaissance Platoon, Headquarters and Headquarters Company (HHC), 307th Engineer Battalion, 3d Brigade, 82d Airborne Division, which is under my command, allows our brigade to detect, assess, and confirm the presence of chemical weapons. This article highlights potential shortfalls in our tactical organizational design and in the equipment that our unit carries when responding to a chemical attack on a modern urban target within a large-scale combat operations (LSCO) setting. To understand this article, it is essential to understand what constitutes a current urban target, why a LSCO setting matters, and what capabilities are available. This article establishes tactics for emerging chemical attacks, describes our ability to respond with special equipment and techniques, and explains the deficits between theory and capability. This analysis assesses our capability to effectively respond to emerging scenarios and drive organizational change.

Assessing a Threat

Henry Kissinger aptly stated, "The more powerful the weapons . . . the greater the reluctance to use them."[5] While this sentiment generally holds true for nuclear weapons, it does not necessarily prove true for chemical weapons. Although the most prolific use of chemical weapons occurred during World War I, such weapons continue to plague the battlefield. However, the implementation of chemical weapons has become more sporadic; the tactics for employing these weapons have also evolved.

For the purposes of this article, overt chemical munition attacks by state level militaries are excluded from discussion. Such attacks would escalate far beyond company missions, and responses would likely be kinetic. Instead, this article examines a more likely, and potentially more damaging, scenario involving a subversive enemy employing chemical weapons to delegitimize the U.S. military.

I define a modern urban battlefield as city infrastructure capable of sustaining large populations and providing first-world commodities. This setting contributes to the complexity of chemical weapon employment due to the inevitability of the daily lives of a large number of civilians being suddenly interrupted by warfare. The establishment of this setting under the banner of a LSCO fight results in a posture that includes many government agencies, nongovernmental organizations, humanitarian aid, and modern Army equipment on both sides of the conflict.

The type of attack that I am most concerned about is one that would target civilians and military forces alike. An attack of this type would almost certainly aim to degrade the perception that the military was able to provide refuge to those fleeing the conflict. In the most sinister of scenarios, this might even appear to be the military's fault. These types of scenarios have occurred and have created a precedent for future implementation.

For example, during the Moscow Theatre hostage crisis in 2002, Chechen rebels stormed a theatre, taking more than 100 hostages; the Russians responded by pumping a gas mixture containing a lethal substance into the theater to incapacitate the hostage-takers, resulting in the deaths of more than 120 people.[6] Russia's deployment of a lethal substance against the Chechen rebels proves that certain substances

A Polish CBRNE unit demonstrates the capabilities of an armored reconnaissance vehicle.

can immediately incapacitate crowds. Encountering a weapon like this at a refugee center or a border crossing location under the guise of riot control could create a massive problem for our forces. Additionally, Russia could use a similar tactic to control riots within its own country, further legitimizing this application without risking an international response.

Another example recently occurred in the Russia-Ukraine conflict but, fortunately, did not result in death. Heavy Russian shelling resulted in the rupture of ammonia storage tanks in the northern Ukrainian city of Rubejny, Lugansk Oblast, spilling toxic ammonia and causing nearby residents to seek shelter.[7] This scenario demonstrates that, under the right conditions, the enemy could improvise, creating a chemical weapon using civilian industrial chemical plants and effectively destabilizing an urban objective. This improvised tactic would actively combine toxic industrial materials (TIMs)- and artillery-based targets to form a TIM-artillery approach to urban-centric objectives. Although attacks like this can cause severe hardship to civilians and military personnel, they do not constitute the direct employment of a chemical munition and, therefore, do not cross that ever-diminishing red line.

Responding to a Threat

To understand how the 82d Airborne Division would respond to the scenarios described above, it is important to understand how TF82 mobilizes and postures. It is no secret that the 82d Airborne Division can deploy anywhere in the world within 18 hours, but that feat translates to a large force of very light paratroopers arriving armed to the teeth with little else to sustain or protect it. The TF82 CBRN Reconnaissance Platoon carries everything it needs to assess a target for the presence of chemical or toxic materials and decontaminate its members. The design creates two distinct mission-critical gaps in capability: the lack of superior-level capacity to investigate and determine the type of chemical compounds present and the inability to decontaminate a large population, including vehicles. To better convey the importance of capabilities, I would like to address each of the two scenarios described above and explain how the U.S. Army might respond.

In the first scenario, the toxic substance is employed in gas form in an urban center, killing more than 120 people. Most U.S. Army CBRN units carry organic equipment that will protect Soldiers from a gas threat, thus allowing continued operations in and around the target area. However, the TF82 CBRN Reconnaissance Platoon does not carry drugs that counter the effects of toxic substances. For that, it would be necessary to coordinate for outside support.

U.S. Army Soldiers decontaminate Polish soldiers during training.

The CBRN Reconnaissance Platoon has the tools necessary to take samples of any chemicals detected on-site and rely on coordination to determine definitive chemical presence based on sample chemistry. A tremendous higher-level asset that could bolster TF82 is the U.S. Navy preventative medical team. The team's Level 2 assessment capability applies to theater level rather than tactical-level decision making. The naval team can only support forward tactical operations if the assessment is time-consuming and would stall tactical operations. The naval team is not equipped to accompany a forward tactical element, meaning that all samples must be returned to a designated site that employs leak prevention measures. Once the analysis is complete, a diagnosis produces two outcomes—a treatment and a defense. Given limited time to respond, the tactical commander will be able to respond to a suspected chemical attack only by cordoning the area and tending to casualties. Once the catalyst is known, the ability to save lives depends on a higher level of medical care and the proper drugs for countering the chemical deployed.

Polish soldiers conduct decontamination after a mission.

In the ammonia spill scenario, the ability of the CBRN Reconnaissance Platoon to respond would be quickly degraded and dictated by the chemical concentration. TF82 cannot contain the spill or clean or decontaminate affected areas. TF82 has a containerized kit that includes a full-body encapsulation suit with a self-contained breathing apparatus (SCBA) for extended presence on an objective.

Recommendations

The underlying logic in determining the posture of the company commander, brigade commander, and TF82 commander to respond to a chemical attack depends on a precarious balance between threat assessment and budget constraints. The mission is highly fluid, and it would not be feasible to account for all possible attack vectors. Assessing the threat involves considering the likelihood of an attack and the potential damage it could cause. So far, the approach demonstrates a willingness to accept a high level of risk based on the unlikeliness of a chemical attack. However, the potential for significant casualties in such an attack remains.

Three levels of change could be implemented to better posture TF82 forces to respond to a chemical attack on military and civilian populations. I am not suggesting that we overhaul our force posture for the most dangerous course of action; rather, I propose an intermediate approach that aligns assets to set the stage for a response.

The first level of change would be the simplest to implement. Any potential for future operations must be aligned in Europe, so the U.S. Army should coordinate with the North Atlantic Treaty Organization (NATO) regarding any changes in the response to the threat of chemical warfare. NATO would benefit from this proposal due to the proximity of NATO allies to the frontlines. TF82 would also greatly benefit from receiving a second CBRN reconnaissance platoon as an attachment to HHC. This added workforce would allow maintenance of the same posture across multiple locations. As the HHC commander responsible for the CBRN Reconnaissance Platoon, I am uniquely positioned to recognize that preparedness requires a shared understanding of higher-level assessment and treatment assets. This level and type of readiness are critical to TF82. Preparedness begins with posturing the necessary personal protection, detection, and medical treatment equipment in theater and ends with a rehearsal in which these assets are coalesced within an acceptable timeline.

The second level of change would be to coordinate directly with emergency services in the host country. This change would allow a faster return on investment. Since the assessed scenarios take place in a modern urban setting, emergency services would be readily available. This option would enable the 82d Airborne Division to circumvent the bureaucratic red tape that is linked to dealing with host nation armed forces and allow on-the-ground coordination. TF82 should attach a chemical decontamination company to its ranks to facilitate this option. This company would not be a part of the 82d Airborne Division and would need to come from an enabling unit. The challenge of coordinating the restructuring of TF82 to accommodate such a company would be outdone by the benefit of having a dedicated company to assess, plan, and respond to a chemical attack.

The third level of change would require a redesign of organic equipment and force composition. The addition of a dedicated chemical decontamination company is a concept that has been previously introduced, and the company even existed at one point. However, due to threat level, downsizing, and force restructuring, this asset was removed from the division. The strongest argument against this change is simple: We have not needed that company asset. However, I contend that the weaponry and the intensity of a LSCO battlefield warrant the return of this internal asset.

Conclusion

From my perspective, one of the keystones in responding to a chemical threat is the authorization for U.S. forces to engage. This type of authorization is weightier than an order for paratroopers to rush forward into an unknowable situation. Secondary effects must be considered. The 82d's current mission requirements do not exactly warrant the mobilization of massive supplies in preparation for a chemical attack; however, improving our posture is possible and is the responsible thing to do.

A LSCO war will test every level of readiness and stress the ability to adapt. The U.S. Army must continue to build shared understanding at all levels. Army leaders must accurately assess organizational design and how it relates to the enemy, constantly considering chemical weapons and how U.S. forces can respond to them. Tailoring the force posture to respond to chemical weapons (whether intentional or unintentional) within a city will be crucial. This posture must provide detection, assessment, diagnosis, and treatment capabilities. In any future conflict, the possibility that civilian

populations would become a target for chemical weapons must be considered—and these crucial aspects will save military and civilian lives.

Urban battlefields hold a special place in the U.S. Army history; 100 years ago, the U.S. Army established military dominance across European cities. Although the way we fight urban battles has been molded by the contemporary age, the daunting threat of chemical weapons remains eerily familiar and frighteningly effective.

Endnotes:

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(*"My Experience as a U.S. Army CBRN Officer,"* continued from page 14)

My peers and I have reluctantly become accustomed to the not-so-desirable assignments that a CBRN officer can have. These "undesirable assignments" usually involve completing the monthly unit status report, serving as the additional duty guru, or performing pretty much any job that is not within the scope of a CBRN officer. However, these assignments give CBRN officers the distinct advantage of becoming true "generalists" within their organizations. They quickly learn all of the ins and outs of the organization and represent the continuity required when senior leaders and command teams transition in and out. And if you find yourself questioning your decisions as a CBRN officer, you are not the only one because I too have had those reservations from time to time. However, you are the sole person responsible for your career; and usually, all you need to do is ask for what you desire. I would have never been able to lead a cavalry scout platoon as a young lieutenant or attend the Ranger Assessment and Selection Program if I had not made my goals and desires known. But those goals and desires were never for personal gain. I knew that I had joined the Army because I wanted to be a leader and to have a positive impact on others' lives—and the best way to do that was to be placed outside of my comfort zone. All of the assignments that I have sought out have done just that for me.

So, what is the "so what" of this article? How can we solve the Army's recruitment and retention problem? By highlighting my experiences as an officer in the U.S. Army, maybe—just maybe—I can positively affect the way a few of my peers and others think about joining the Service or change their outlooks regarding their current career paths. My stories may be of assistance to someone who is thinking of joining the armed forces. Many of my peers/superiors and I know that we can effectively contribute to future generations of Service members and truly have an impact on the entire organization by telling our Army stories. The experiences of those of us who make up the less than 1 percent of the population of the United States that serve in the military can have a lasting positive impact on the Soldiers and Families who come after us, and we can "be all we can be." Our legacies are made up of the stories and memories that others will relate. We are charged with being servant leaders in order to steward our profession.

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The CBRN Warrant Officer of 2030

By Warrant Officer One Alejandra Gallego

The U.S. Army is undergoing a significant modernization effort in order to prevail in large-scale combat operations and against its current near-peer adversaries. For the Army of 2030, it will strive to focus on reorganizing the force, modernizing equipment, and transforming the way it trains.

During my time in the Chemical, Biological, Radiological, and Nuclear (CBRN) Warrant Officer Basic Course, I was constantly challenged and enriched by different mentors who provided us with lessons learned and pointers, guided us toward success, and shared ways that we could be postively impact our cohort. After graduating from the course, one particular question has lingered with me: What will the CBRN warrant officer of 2030 bring to the fight? Chief Warrant Officer Four Humphrey B. Hills, our Regimental Chief Warrant Officer, had posed that question during one of the many CBRN Warrant Officer Basic Course mentorship sessions.

The CBRN warrant officer of the next decade will play a key role in developing the Army of 2030 modernization strategy and achieving superiority over near-peer adversaries. We will be crucial trainers of specialized teams and integrators of new technologies covered in the Army 2030 strategic plan. We will be required to equip ourselves with extensive knowledge and fluently advise maneuver commanders concerning all warfighting functions. We will be subject matter experts in CBRN protection functions during all phases of large-scale combat operations and will possess unmatched skills for integrating CBRN capabilities across all multidomain operations.

My futuristic view is one in which technology will be maximized to purposely engage and educate the Soldiers of 2030 and to understand their needs. Technological innovation during the next decade will play a vital role in how we train our force to use new equipment. Expanding on our current capabilities in military gaming by improving the ability to create simulated scenarios tailored to specific CBRN organizational training gaps could result in endless training benefits. Using virtual reality to simulate CBRN environments is the way ahead for training, based on the positive reception of the new generation of Soldiers to computer-generated reality. Warrant officers are critical for the effective modernization and integration of new equipment.

The Chemical Branch is now experiencing a significant equipment upgrade with the update to the Nuclear, Biological, Chemical, Radiological Vehicle (NBCRV) platform and many other progressive innovations aligning with the Army of 2030[1] strategy. We are mandated to master new-equipment operations and to be the driving force in training and adequately maintaining new equipment. I am honored to be a part of this ever-changing time in which, each day, CBRN warrant officers spearhead the Chemical Branch into a more lethal, multiskilled, and technologically superior organization. The warrant officer of 2030 will be challenged daily, will thrive in virtual reality, and will offer unlimited value to any Army organization.

Endnote:

[1]*Army of 2030*, U.S. Army, 5 October 2022, <https://www.army.mil/article/260799/army_of_2030>, accessed on 30 March 2023.

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By First Lieutenant Robyn H. Franklin

The original concept of the combat training center (CTC) was designed to change how the U.S. Army trains and develops leaders and units for the next fight. In 1980, the establishment of the National Training Center (NTC), Fort Irwin, California, allowed the U.S. Army to build upon lessons learned from previous conflicts. Since then, CTCs have overseen the integration of the brigade combat team model for deployment of units and the adaptation of scenarios in order to replicate the dynamic and ever-changing threats that were faced during Operations Enduring Freedom and Iraqi Freedom to counterinsurgency operations following 11 September 2001 (9/11). As Field Manual (FM) 3-0, *Operations*,[1] overhauls Army operations, NTC looks to challenge rotational training unit leaders at all echelons to coordinate efforts across domains. As CTCs continue modernization efforts to keep pace with current threats, they now rely on new technology and revive previously inactivated capabilities across the Army to replicate enemy effects rather than enemy assets.

In his article entitled "Recommendations for Intelligence Staffs Concerning Russian New Generation Warfare," Lieutenant Colonel Charles K. Bartles outlines three significant differences between Russia and the element acting as the Russian adversary, or the opposing force (OPFOR), in the areas of the military decision-making process, the concept of warfighting functions, and the use of doctrinal templates.[2]

In the Russian system, the commander decides the courses of action by thinking not about performing the warfighting function but, rather, about implementing capabilities. Additionally, tactics are standardized at the battalion level and below (such as in a battle drill), thus streamlining the decision-making process and reducing staff requirements. While OPFOR tactics draw heavily on influences from peer and near-peer adversaries, the OPFOR is confined to the same military decision-making and staff-centric planning processes as the brigades with which they fight.

The 11th Armored Cavalry Regiment, Fort Irwin, known as the "Blackhorse" Regiment, has a unique mission set and modified table of organization and equipment. Blackhorse leaders master U.S. Army doctrine along with Training Circular (TC) 7-100.2, *Opposing Force Tactics*,[3] representing the OPFOR; fighting (with regular and irregular forces) as Donovians; and annexing their geographical neighbor, Atropia, to focus Army brigade combat teams on the post-9/11 counterinsurgency fight. As the Army transitions to multidomain operations in large-scale combat operations, Blackhorse continues to pace modern adversaries by imitating unconventional threats such as electronic warfare and drone swarms.

While Donovia fights similarly to Russia and with Russian-replicated equipment, the main difference between OPFOR and Russian doctrine lies in the purpose. The OPFOR is a training aid designed to test the training units on their mission- essential tasks (METs) in structured scenarios. At NTC, reception, staging, and onward integration take place over 5 days. At the beginning of the decisive action rotation, the Blackhorse Regiment mobilizes to fight as a division tactical group. Regimental task organizations dissolve as units realign to replicate two functional brigade tactical groups with squadron organic assets and regimentally supported enablers. At the start of a rotation, echelons fight one level above their garrison designation. For example, garrison troop command teams fight as mechanized infantry battalions and squadron command teams lead brigade tactical groups.

Competently integrating enablers and assets in the close and deep fight is critical to battlefield preparation prior to any direct contact. Donovian doctrine, like its real-life counterpart, is heavily reliant on artillery to displace and attrit enemy forces before the first force-on-force engagement. Clandestine NTC laboratory training sites, o-chlorobenzylidene malononitrile (CS) gas, and smoke are used to replicate chemical, biological, radiological,

and nuclear (CBRN) threats to deployable units. NTC has established several locations across the desert for conducting site exploitation and site assessments, ranging from bunkers built into hillsides to compounds constructed in the centers of cities. The operations group creates scenarios tailored to the assessed unit. To evaluate units on CBRN METs, the OPFOR simulates CBRN warfare by employing CS gas for terrain exploitation or denial, targeting critical defense assets and equipment and creating psychological effects.

The Smoke Platoon, initially formed under the now-deactivated 54th Chemical Detachment, is a unique enabler for the Blackhorse Regiment. This is the only smoke platoon in existence in the Regular Army; however, there are M56 smoke generators aligned to engineer units and smoke companies within the U.S. Army National Guard. Although the Blackhorse Smoke Platoon has had many homes within the Regiment, this specialty platoon is currently aligned under the Regimental Headquarters and Headquarters Troop, 11th Armored Cavalry Regiment, NTC. During rotation, the Smoke Platoon becomes a division asset attached to the lead brigade tactical group (O-5 level commander) and provides direct maneuver support to the mechanized infantry battalion (O-3 level commander). The Smoke Platoon provides two separate capabilities—special munitions (coordinated through the brigade tactical group fire support officer) and "live" smoke (to provide battlefield obscuration). The platoon utilizes M56 smoke generators, or "coyotes," mounted on the M1113 high-mobility, multipurpose, wheeled vehicle (HMMWV), manned and led by Military Occupational Specialty 74D–series CBRN Specialists. Additionally, Blackhorse has smoke pot capabilities; however, smoke pots are resourced and allocated separately from a smoke platoon.

Doctrinally, the Smoke Platoon supports light and airborne units at breaches and wet-gap crossings, obscuring friendly forces and targets or conducting deception operations. The unit replicates enemy capabilities, including the Russian TDA-3, a truck much like the U.S. medium tactical vehicle; the Russian TMS-65U decontamination vehicle, which has smoke and decontamination capabilities such that operators can direct the decontamination solution into the engine exhaust and direct the hot gas stream; and the Russian MRO-D, a white phosphorous smoke warhead. Russian doctrine calls for the use of smoke to obscure tactical movements and positions and infrared pellets to degrade targeting and observation. Although Donovian tactics mainly follow Russian doctrine, Chinese doctrine also accounts for the use of battlefield obscuration. The Chinese Type 87 mortar allows for special munitions, including smoke. And the Chinese PHL-81 is a 122-millimeter multiple-rocket launcher with similar effects that can be replicated by a smoke pot or smoke truck. Chinese doctrine calls for the use of smoke for obscuration and—combined with other assets such as loudspeakers, decoys, fire, and unmanned equipment—for psychological attacks.

To meet the training needs of deploying units under rapidly changing conditions, CTCs continue to turn to legacy equipment to imitate the effects of enemy capabilities. This allows CTCs to effectively train MET requirements with legacy equipment or replicated capabilities.

Endnotes:

[1]FM-3-0, *Operations*, 1 October 2022.

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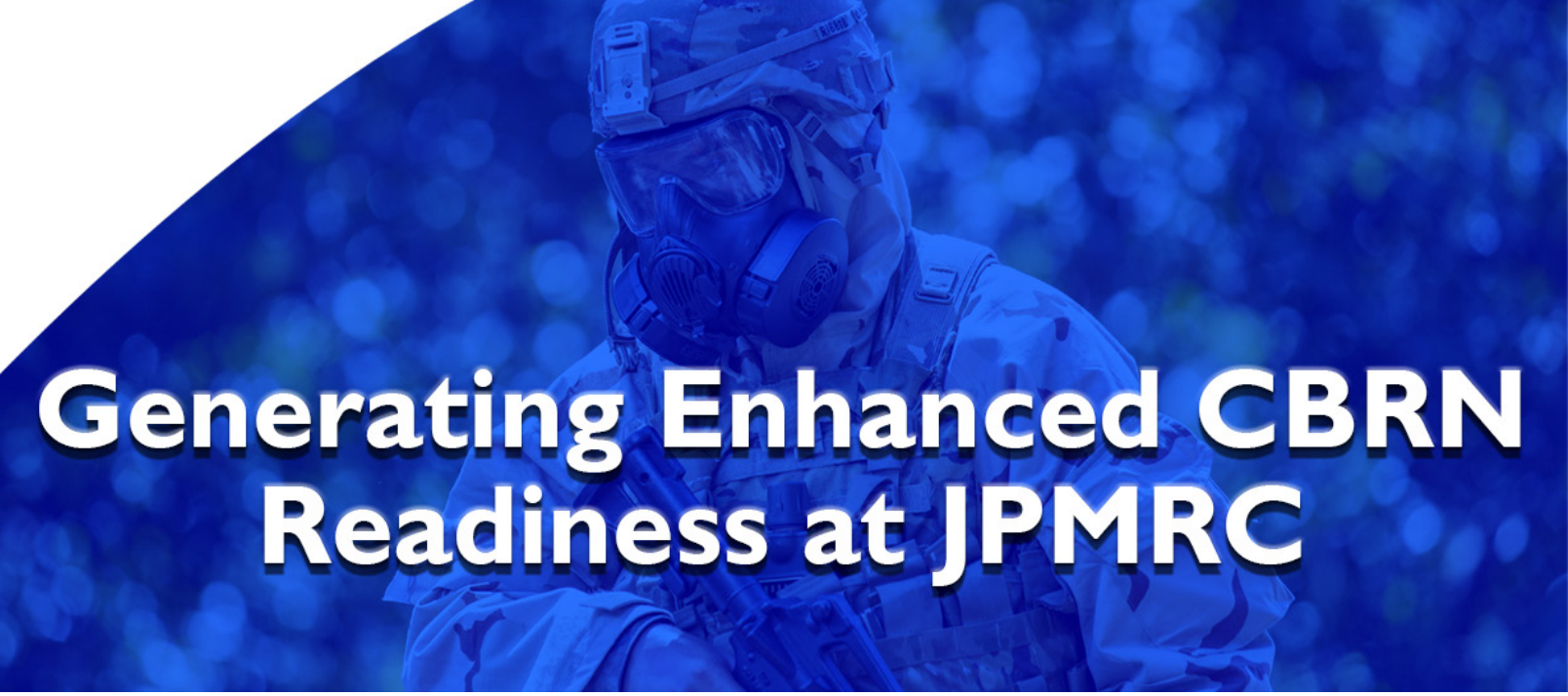

Generating Enhanced CBRN Readiness at JPMRC

By Captain Christopher C. Piasecki

In today's complex national security environment, the threat of near-peer adversaries possessing weapons of mass destruction (WMD) continues to increase. Future conflict in the Indo-Pacific theater will likely involve the use of chemical, biological, radiological, and nuclear (CBRN) WMD.[1] However, while U.S. adversaries are substantially fortifying their WMD development and posture, U.S. Army readiness to conduct operations in a CBRN-contaminated environment has severely atrophied. At all echelons, the U.S. Army deficiency in CBRN-focused training has caused a deterioration of basic CBRN capabilities, proficiency, and readiness.[2] By remastering CBRN fundamentals, revitalizing CBRN equipment sets, and conducting training for large-scale combat operations (LSCO) in simulated CBRN environments, the U.S. Army of 2030 will be better prepared to fight and win the Nation's wars.

"By remastering CBRN fundamentals, revitalizing CBRN equipment sets, and conducting training for large-scale combat operations (LSCO) in simulated CBRN environments, the U.S. Army of 2030 will be better prepared to fight and win the Nation's wars."

The U.S. Indo-Pacific Command (USINDOPACOM) area of operations (AOR) is the world's largest and most consequential theater of operations, with pacing threats posed by the People's Republic of China, the Democratic People's Republic of Korea, and Russia. These adversaries are well known to possess ever-growing arsenals of CBRN agents and WMD.[3] Under the steadfast leadership of General Charles A. Flynn, the U.S. Army Pacific (USARPAC) has dedicated significant effort and resources to the expansion and development of the Joint Pacific Multinational Readiness Center (JPMRC) as a top priority to retain combat power and generate readiness within the USINDOPACOM AOR. The JPMRC is the first Army regional combat training center (CTC) to be located within the Indo-Pacific theater of operations. It will play a significant role in preparing the Army of 2030 for LSCO in CBRN-contaminated environments.[4]

The JPMRC is an innovative CTC that allows the retention of trained forces in the Indo-Pacific theater so that they are continuously available to the combatant commander. The unique capabilities of the JPMRC allow for joint and combined partner operations to be executed with allies at locations throughout the USINDOPACOM AOR. The JPMRC conducts three training rotations each year—one in the Hawaiian Islands, one in Alaska, and one in an allied or partner nation. The diversity of locale and the resultant versatility provide incredible opportunities for U.S. military forces to train in the same physical environments in which they will be expected to fight. A complex doctrinal simulation provides the foundation for each exercise and allows for honest feedback, with virtual and constructive effects throughout the battlefield and across multiple echelons.

Since the height of the Cold War, the U.S. Army has dedicated the time and resources needed to adequately prepare ground forces for CBRN employment[5]—and the JPMRC is no exception. Another innovative capability fostered at JPMRC is the integration of enhanced CBRN training scenarios and rigorous assessments by CBRN subject matter experts that increase the value of training and evaluation at this newest Army CTC. By ensuring that CBRN threats and conditions are prevalent throughout the JPMRC training scenario, units will prioritize CBRN readiness at home station before assessments of CBRN readiness are conducted at the CTC.

Army force readiness is transient. Readiness naturally dissipates due to personnel turnover and the need to maintain institutional and organizational memory. Therefore, readiness

must be continuously generated through dynamic training. The best way to verify that Army units at the echelon are trained and ready to complete their distinct mission sets in a CBRN-contaminated environment is the employment of CBRN readiness.[6] Unfortunately, Army readiness for conducting LSCO in a CBRN-contaminated environment is nearly depleted. The execution of more dynamic and vigorous CBRN training and the employment of more agile combat employment in theater can improve the U.S. Army force posture against near-peer adversaries in the Indo-Pacific region. The term "applied readiness" can be used to describe this paradigm. CBRN training focused forward in the Indo-Pacific theater requires expeditionary advanced basing operations and facilitates the execution of maneuver operations in the environment. Forces that achieve recurrent forward presence in theater continuously generate and renew applied readiness, which is easily demonstrated and assessed by the combatant commander.

The mechanism for generating applied readiness in the USINDOPACOM AOR is the Operation Pathways series of exercises. Operation Pathways provides the U.S. Army Pacific with multinational and joint training opportunities. It generates readiness, develops interoperability with allies and partners, and contributes to integrated deterrence of regional adversaries. By incorporating enhanced CBRN training into the follow-on rotation of units through Operation Pathways, the USARPAC commander successfully generates and employs applied readiness throughout the theater. This, in turn, leads to enhanced integrated deterrence, which is the culmination of forward positioning and the forward presence of military units in-theater.[7] Maintaining and exercising ground forces in-theater signals to U.S. adversaries in the region that the United States is dedicated to maintaining more persistent capabilities than can be provided by the potentially transient presence of air and naval forces in the region.

The Army of 2030 will be better trained and equipped to conduct LSCO in a CBRN-contaminated environment due to the innovative and enhanced CBRN training available at CTCs like JPMRC. However, enhanced CBRN training may be a misnomer. Much of this training involves remastering the fundamentals of CBRN detection, decontamination, and avoidance.[8, 9, 10] This is the same training that U.S. Army units tend to dismiss or deprioritize due to competing and ever-changing requirements. Enhanced CBRN training is, at its core, the reprioritization of CBRN fundamentals so that they are at the forefront of all training exercises and events. By including CBRN-related training events and challenges for commanders at all echelons, the U.S. Army can better train and prepare for real-world WMD contingencies.

The reprioritization of CBRN training and evaluation at CTCs like JPMRC is a much-needed course correction for the Army. However, much more must be done to ensure that our forces can fight and win during LSCO in CBRN-contaminated environments.[11] As the current situation in Ukraine has demonstrated, the threat of CBRN WMD posed by our adversaries is persistent.[12] U.S. Army CBRN Soldiers must be trained, equipped, and recognized for the unique challenges inherently posed by their military occupational specialty (MOS). Commanders at all echelons regularly fail by assigning these specialty Soldiers additional duties and borrowing them for military manpower taskings, such as gate guard duty or headcount duty at the dining facility, rather than utilizing them to train their formations in the complex science of CBRN warfare.[13] The success of the Army of 2030 will depend on the ability of commanders to understand and appreciate the importance of operating within a CBRN environment to generate applied readiness for combatant commanders.[14] The enhanced CBRN training at JPMRC and other Army CTCs is the first step on a much longer journey toward U.S. Army proficiency with LSCO in CBRN-contaminated environments.

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[6]Joint Publication (JP) 3-40, *Joint Countering Weapons of Mass Destruction*, 27 November 2019.

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[13]Kick et al.

[14]*Army of 2030*.

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Team-Building Lessons Learned and Best Practices

By Master Sergeant Russell E. Gehrlein (Retired)

The concept of **People First** has been a focus of the U.S. Army; the U.S. Army Training and Doctrine Command; the Maneuver Support Center of Excellence; and the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) for several years now. However, taking care of Soldiers and accomplishing the mission at the same time has always been a challenge—especially when the mission puts Soldiers at risk.

This article does not summarize the ways in which the Army has changed how it currently takes care of Soldiers; rather, it provides a means for me to share some of the ways that I have been putting my people first. This is a follow-up to an article that I wrote for the Winter 2019 issue of the *Army Chemical Review*.[1]

For those who do not know me, I am a Department of the Army civilian, serving as the operations officer for USACBRNS, Fort Leonard Wood, Missouri—a position that I have held for 15 years. I also worked in operations for 13 of my 20 years as a Regular Army Soldier. Since I wrote the Winter 2019 article,[2] 33 officers and noncommissioned officers have been members of my team. Moreover, I have worked for a total of 15 leaders (from chief of staff to commandant). Each of these people has impacted me. As a result, I would like to share some helpful team-building lessons learned and best practices that have made my teams successful. My intent is to help military and Department of the Army civilian leaders more effectively build their own teams.

Giving the Greeting of the Day

Giving the greeting of the day is a very simple, yet effective way that all team leaders can do better. A while back, as I was walking down the hallway, I passed a sergeant major whom I did not know. I greeted him with, "Good morning, sergeant major!" He responded in kind. That felt good. I thought about how important this military tradition is to building a culture of dignity and respect in the workplace.

Greeting our coworkers is even more important than greeting those whom we do not know. An exchange of "Good morning" between teammates is a great way to begin a conversation. It may lead to asking, "How are you doing?" or stating, "I haven't seen you in a while. How are the kids/grandkids/wife?" It can open up doors for showing compassionate leadership. When we consistently greet our bosses, peers, and subordinates, our connections deepen, and we have more opportunities to offer help, if needed.

Treating Team Members with Dignity and Respect

Treating team members with dignity and respect may be the most important aspect of team building. Most Soldiers and Department of the Army civilians can talk about dignity and respect, but it is more difficult to "walk the walk" with the team every day. Treating all personnel, regardless of their demographic, with dignity and respect has been constantly reinforced for centralized promotion and command select boards as well as for civilian hiring actions and promotions at every level of the military. I believe that our strength lies in our unity of purpose amidst great diversity. Every member of the team brings something positive to the table based on who they are and where they come from.

When I present an orientation briefing to new members of our section, I make certain that they understand that this office will always be a safe place to work. Neither sexual harassment nor racial discrimination will ever be tolerated. Despite our differences, we will all strive to get along and work as a team to accomplish the mission of supporting the Chemical Corps, regardless of race, gender, component, rank, age, or any other category. The same applies even with team members who are not chemical, biological, radiological, and nuclear (CBRN) Soldiers.

How do we treat those who are different from us with dignity and respect? We notice them. We say, "Please" and "Thank you." We praise in public and correct in private. We ask questions and we really listen to the answers in order to get to know our teammates. Personally, I remind my teammates on a daily basis that they are appreciated and that they are valued members of the team. I am intentional in my actions to ensure that every member of the team is treated like Family. I monitor my relationships with each team member as well as manage the relationships that each team member has with the others on the team.

Showing Respect to Others Outside the Organization

On my first tour in Korea, I was assigned to a military police company, where I witnessed a classic example of an individual conveying disrespect to someone at our higher headquarters whom I did not know. My company commander always referred to the battalion operations officer as "Major Problems." I was fairly certain that the rank of the battalion operations officer was that of major; however, I'm pretty sure that "Problems" wasn't really his last name.

Disrespect is cancerous. It starts out small and then spreads to others—both inside and outside of an organization. If tolerated, it becomes a new standard that eventually destroys everything in its path. And, as one of my coworkers stated, we tend to remember negative things better than we remember positive ones.

Allowing yourself or your employees to make jokes about, or otherwise disrespect, leaders or staff members from other organizations with which you work (whether above or below you) may come back to bite you. Even though expressing your frustration and voicing how much you despise them may seem to unite your team, that can actually be counterproductive and can destroy the quality teamwork that you are trying to develop. It would be hypocritical to emphasize the concept of treating others with dignity and respect and then do the exact opposite with regard to folks who happen to work upstairs or down the street. Furthermore, getting transferred to another office and finding out that the new team with which you will be working with has heard that you have been bad-mouthing them makes for a bad situation.

Managing Team Relationships

In my view, my job as a supervisor is not only to manage the people on my team but also their relationships. This is a business application of a mathematical concept called "combinatorial theory." Without going into the details of the formula used to calculate the number of distinct relationships on a team of any size, as I did in my previous article,[3] I offer some examples. With five team members, there are a total of 10 relationships because there are four people with whom each of the five members must work; however, it is not necessary to count the relationships twice. (The relationship between Sergeant Jones and First Lieutenant Smith is the same relationship as that between First Lieutenant Smith and Sergeant Jones.) Using the same logic, if there are seven members on a team, then there are a total of 21 relationships.

As a team leader, you must understand that everyone on your team is connected not only to you but also to each other. Every relationship among team members is important and needs to be managed by the leader. The chain is only as strong as its weakest link. Team leaders are responsible for constantly assessing; correcting, as needed; and seeking to improve the relationships between each of the team members—not merely their own relationships with the other members of the team.

Developing Personal Relationships

I have been intentional and consistent in developing my employees. I set high standards, and I enforce them. I get my employees to think, feel, and act the way that I would in certain situations. I train them on skills they may lack. I thank them for their efforts and help them improve, when needed. I take a genuine interest in them, their Families, and their military careers beyond their current assignments.

When my employees depart, they leave knowing that they made a difference. Whether they are moving to their next

duty station or leaving the Army, they know what "right looks like." Perhaps they can make a difference in their next assignment by passing on some of the lessons they learned about how to treat folks with dignity and respect while they were under my leadership.

In the words of an officer who worked on my team for 5 months, "Work isn't so bad if you build yourself a home around it. And you certainly have created a home here—not just for yourself, but for others like me, longing to be accepted, appreciated, and acknowledged." More recently, a senior noncommissioned officer who has since been transferred expressed gratitude for treating him like Family.

Conclusion: Closing With a Challenge

I encourage you, as team leaders, to take a hard look at how you function as leaders, no matter how big the organization you lead. You may manage a team of teams. Ask yourself: Can we do better?

I trust that some of my insights will be helpful and will enable you hard-working team leaders at every level to be more successful in completing your unending and thankless jobs. Know this: Your work in building and leading teams truly matters to the to the Corps and the Army!

Endnotes:

[1]Russell E. Gehrlein, "Operations Lessons Learned and Best Practices," *Army Chemical Review*, Winter 2019.

[2]Ibid.

[3]Ibid.

Master Sergeant Gehrlein (Retired) is the operations officer for USACBRNS. He served 20 years as a Regular Army Soldier, holding a variety of staff and leadership positions within the Chemical Corps, and has served 15 years as a Department of the Army civilian. He is a member of the Sergeant Audie Murphy Club; was the 1991 Fort Lewis, Washington, Noncommissioned Officer of the Year; and received the Ancient and Honorable Orders of the Dragon and the U.S. Army Forces Command Major General Aubrey "Red" Newman Award for Excellence in mentoring. He earned a bachelor's degree in mathematics from Colorado State University and a master's degree in biblical studies from Grand Rapids Theological Seminary.

When the Tip of the Spear is Broken

By Ms. Christy L. Lindberg

On the eve of World War II, as Germany and Japan were building their military strength, the U.S. Congress was gradually decreasing military appropriations. The all-time low strength of 495 officers and enlisted men in the Chemical Warfare Service (CWS) revealed how ill-prepared the United States was for a global conflict. By December 1940, the size of the CWS had increased to 381 officers and 1,506 enlisted men. The events at Pearl Harbor, Hawaii, on 7 December 1941 illustrated that prewar planning assessments were correct but that proper equipment and supplies were needed. The history of CWS activities in the Pacific Theater from 8 December 1941 to 6 May 1942 serves as "an excellent example of what can be accomplished when foresight, initiative, and wholehearted devotion to duty are applied to the many problems of modern warfare and illustrates how much can be accomplished with little."[1] The ingenuity and hard work of the CWS in the Philippine Islands stand out as some of the best examples of the Dragon Warrior ethos.

Following the establishment of the CWS as a permanent branch of the Army in 1920, CWS leaders accepted Army intelligence presumptions that the next anticipated conflict would be with Japan in the Far East. Accordingly, the CWS positioned its combat units, the "tip of the spear," in strategic locations in the Pacific, notably the Panama Canal Zone and the Hawaiian and Philippine Islands. (The Philippine Islands had become a U.S. protectorate in 1898, following the Spanish-American War—when the Japanese viewed American naval and air installations as a threat to their dominance in the region.) The Hawaiian Islands are located 4,200 miles from Japan, making the Philippines the closest potential battlefield in the Pacific. Therefore, the very tip of the spear consisted of American forces on the Philippine Islands, approximately 1,800 miles from Japan.

The importance placed on the Philippines is reflected in the strength of the CWS Soldiers positioned there; roughly 20 percent of the total number of CWS personnel were stationed in the Philippines. Lieutenant Colonel Stuart Hamilton, who—prior to the onset of World War II—served on the War Department general staff in Washington, D.C., coordinated CWS activities in the Philippines. As a chemical officer in the U.S. Army Philippine Department, Hamilton supervised gas warfare preparations and the readiness of chemical supplies and equipment in the Far East Pacific Theater. Hamilton led the headquarters and support staff and directed all CWS units in the Philippines, including

Lieutenant Colonel Hamilton

the 4th and 5th Separate Chemical Companies (weapons), which were tasked with dispensing chemical agents and smoke on the battlefield with primary weapons that rendered the World War I-era 4-inch Stokes Mortars and 8-inch Livens Projectors outdated. The Chemical Weapons Depot of the Philippines Department, located in a storage warehouse near Bataan, stored bulk agents, gas masks, and decontamination and defensive equipment. The depot also performed missions similar to those of chemical laboratory companies, analyzing and evaluating enemy chemical warfare agents and determining the best methods for protection, identification, and decontamination operations. The 2d and 7th Companies (service, aviation) ventured into the emerging realm of aviation and were responsible for receiving, storing, preparing, loading, and

arming apparatuses for employing smokescreens and dispersing chemical warfare agents.[2] Finally, a CWS training cadre instructed Philippine Army personnel in chemical offensive and defensive operations. With the looming threat of war, Congress had started to pour money into the Army build-up; however, it was too late to aid operations in the Philippines.

Accounting for the time difference across the International Date Line, the 7 December attack on Pearl Harbor occurred simultaneously to the Japanese attacks in the Philippines on 8 December. The bulk of the U.S. Army Far East Air Force fields were destroyed by Japanese bombing attacks, and there was no longer a need for CWS air operations companies; thus, they were handed service rifles and attached to the 31st Infantry Regiment. This trend continued as the Japanese landed, unopposed, on northern Luzon on 10 December and then on southern Luzon 2 days later. As the Japanese marched (along two axes and without protective air power) on Manila, the bulk of the American naval fleet withdrew to Java, effectively cutting off American reinforcements and resupply.

In 1941, the Philippine Department consisted of 14 officers, 275 enlisted Soldiers, and 12 cadres for Philippine Scouts (a U.S. Army organization generally made up of Filipino and Filapino-American troops, which was in existence from 1901 to the end of World War II), whose chief mission was to prepare the U.S. Army for a potential Japanese attack using gas warfare. In preparation for a chemical attack, Lieutenant Colonel Hamilton established a chemical warfare impregnation plant; from the spring of 1941, the plant conducted 24-hour operations, producing sufficient chemical protective clothing for U.S. troops. The plant remained in operation until 23 December 1941, when Japanese aircraft bombed it and destroyed the necessary equipment. In late January 1942, with the Japanese advance closing in on Manila, Colonel George F. Unmacht, Chief Chemical Officer, U.S. Army Forces, Far East, was ordered back to the United States to report on conditions in the Philippines. Traveling by submarine, Unmacht shepherded a collection of captured Japanese chemical warfare materiel for further study at the CWS Research and Development Department, Edgewood Arsenal, Maryland. With Unmacht's departure, Lieutenant Colonel Hamilton assumed his duties.

The prewar Chemical Weapons Depot stockpile contained 200,000 service gas masks and 80,000 training masks; by Christmas 1941, these had all been issued to the local civilian population and to the newly formed Philippine Army Division, which was preparing to defend the Philippine Islands. Without fear for his own safety, Lieutenant Colonel Hamilton personally supervised the evacuation of chemical warfare supplies from Manila and Bataan to the island of Corregidor and directed the destruction of technical machinery and equipment to deny them to the enemy. All chemical supplies, including coveralls, hoods, socks, gloves, shoes, and leggings, were shipped out of the areas.

In defense of the Philippines, the Chemical Department, CWS, developed field-expedient, hand-thrown incendiary devices (Molotov cocktails) at the Chemical Weapons Depot, filling salvaged beer and soda bottles with a mixture of kerosene, gasoline, and crude oil. The Molotov cocktails were issued to troops at Fort Drum, Fort Hughes, and Fort Mills, Philippines, in April 1942. Soon after the Japanese air raids began, Lieutenant Colonel Hamilton's CWS Soldiers needed to eliminate the threat of an accidental release of stockpiled toxic chemicals on Corregidor, which could result from Japanese aerial bombing. These chemical stockpiles amounted to six full and one empty 1-ton galvanized-iron

From left to right: Private First Class Samuel Stenzler, Private First Class Frank Spear (CWS), and Captain James McDonald Gallagher resting, with hands bound, during the Bataan Death March to Camp O'Donnell, Capas, Tarlac, Philippines

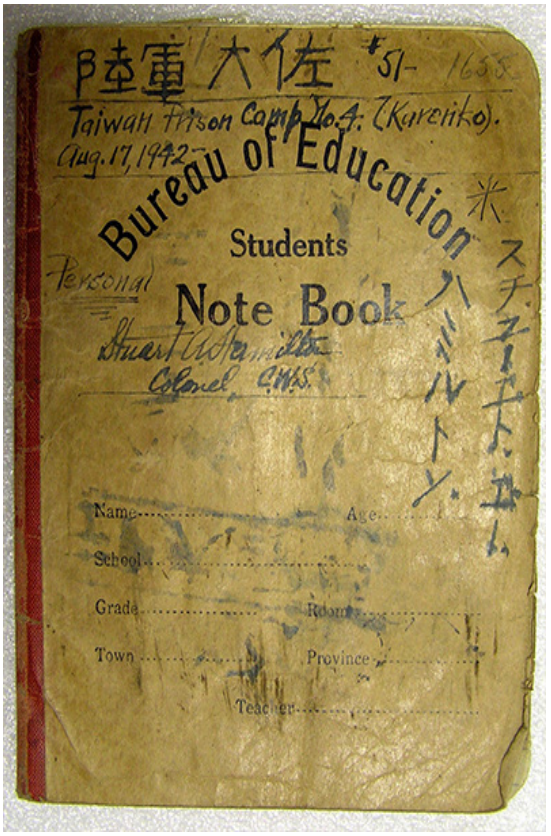
chlorine containers; an unknown number of 150-pound chlorine, phosgene, and tear gas cylinders; and 100-pound bombs filled with mustard agent. Hamilton and his staff supervised the drainage and disposal of all these containers. The 1-ton containers of chlorine were drained and then disposed of by dumping them in the waters off Corregidor, the 150-pound toxic-gas cylinders were buried or dumped, and the 100-pound bombs of mustard agent were buried. The enemy never did discover these toxic materials disposed of by the CWS during the relentless air raids.

In addition, Lieutenant Colonel Hamilton established an emergency chemical laboratory, where analyses and tests could be conducted on water and captured Japanese materials such as gas masks, landmine explosive charges, and flamethrowers. At times, blood sugar tests were conducted for the hospital. The amount of commercial high-test hypochlorite (HTH) required for effective purification of drinking water was also determined at the emergency chemical laboratory. Although the CWS originally furnished HTH for use in mustard agent decontamination, its alternative use for water purification undoubtedly saved many Soldiers from contracting dysentery and/or typhoid from contaminated water during the siege of Bataan and Corregidor. This same emergency chemical laboratory established emergency fill plants at Bataan and on Corregidor, where liquid bleach was manufactured to kill tropical vectors, such as mosquitoes, rats, lice, and flies, in hopes of reducing the spread of malaria and hemorrhagic fever.

CWS troops worked diligently to gather information about, and examples of, Japanese chemical warfare material, often while close to the enemy and while under fire. They acquired enemy gas masks and other protective equipment, medical items for treating gas wounds, smoke projectors and pots, chemical grenades filled with hydrogen cyanide (HCN), and flame throwers. Lieutenant Colonel Hamilton drafted detailed reports and boxed up samples of captured Japanese chemical warfare materials to be shipped back to Edgewood Arsenal for further testing. The samples that Hamilton exported back to the United States took up considerable space in the cramped submarines, revealing their importance with regard to military intelligence. These materials constituted the first examples of Japanese chemical warfare material captured, and they surely assisted in the intelligence analysis of enemy capabilities to wage chemical warfare against the Allied Forces operating in the Pacific.

Through Lieutenant Colonel Hamilton's innovations, the Chemical Department drained the sulfur trioxide from 4-inch Stokes mortar rounds and converted the agent into sulphuric acid.[3] This ingenuity was vital for continued charging of electrical storage batteries, which were essential for lighting, and for powering radios and vehicle batteries on Corregidor. Chemical laboratories that were established during this time also produced medical compounds to augment dwindling medical supplies, such as aspirin and antimalarial quinine. One of these laboratories was hit during an air raid, killing five CWS Soldiers who had voluntarily remained at the post. One of these men, Private First Class Henry George Gansz Jr., was posthumously awarded the Silver Star for his bravery and dedication to duty.

The U.S. Army did not have reliable flamethrowers in the Philippine Islands when the war began, so CWS Soldiers on Corregidor developed improvised flamethrowers from chemical decontamination equipment. The CWS technicians also modified gas masks and decontamination equipment to make self-contained diving apparatuses for underwater recovery operations in Manila Bay and to modify Livens Projectors for use as antiaircraft weapons. Finally, the CWS technicians modified collective protective blowers and filters



Lieutenant Colonel Hamilton's journal

to ventilate the tunnels and bunkers on Corregidor, many of which were utilized as makeshift field hospitals to care for injured and sick troops or as quarters for Allied Forces.

On 9 April 1942, American and Filipino forces at Bataan were pinned down without food or ammunition; they surrendered to the Imperial Japanese forces and began the long march to captivity. A month later, on 7 May 1942—nearly 5 months after the first attacks—U.S. forces on Corregidor (which included Lieutenant Colonel Hamilton and the remaining CWS troops under his command) were also forced to surrender.

The men who had fought so valiantly and so long, waiting in vain for reinforcements and resupply, now faced years of imprisonment in makeshift prison camps, enduring ill treatment, torture, starvation, and a lack of medical treatment at the hands of their captors. As 1942 dragged into 1943 and

then 1944, U.S. forces slowly, but inevitably, closed in to recapture the Philippines. The Japanese pulled the prisoners from the camps on the Philippines for shipment to forced labor camps in Japan and occupied China. Loaded on unmarked, overcrowded cargo ships nicknamed "Hellships" by their human cargo, the prisoners fared no better there. The ships became targets of the U.S. Navy—and many were sunk with no survivors. Released at the conclusion of the war, after 38 months of captivity, the prisoners began to make their way home and Family members began to learn about the fate of their loved ones. Left behind them, in shallow graves and watery depths, were more than one-third of the men who had surrendered in 1942.

Lieutenant Colonel Hamilton, along with other high-ranking Allied officers who had been captured in Java, Singapore, and the Philippines, was held in Hoten Prison Camp in Manchuria until liberated by Russian forces on 24 October 1945. While his rank afforded him better treatment than many enlisted prisoners, he lost nearly half his body weight. Under the eyes of his guards, Hamilton painstakingly reconstructed, from memory, the names of the men who had served under him and their fates. In many cases, his journals provide the only information that exists concerning the deaths of these men, proving invaluable to military investigators and grieving Families across the United States. The effects of starvation during captivity eventually destroyed Hamilton's health and led to his early death.

How did we lose the tip of the spear? Many of the lessons learned in the fight for the Philippines are still relevant today. There is no substitute for preparedness. In 1941, units were placed in an advance outpost without the proper equipment. Also, lost was the ability of the long-serving chemical officers and noncommissioned officers of the prewar Army to use their years of experience just when their expertise was needed most—to train and lead what would, by 1944, include 65,000 new members of the CWS. Still, these Soldiers demonstrated the American trait of improvisation, using their ingenuity and devotion to duty to hold out as long as possible. The United States was not prepared for the conflict in the Far East, and the lack of state-of-the art equipment and proper training and the inability to be resupplied and reinforced were enormous obstacles to overcome. Yet, what does this say about the CWS Soldiers in the Philippines? Did they complain, lose faith, and throw up their hands—or did they choose to take on additional responsibilities in place of, or in addition to, their primary mission? They were Soldiers first; they embodied the hallmark of American adaptability and flexibility. They saw a problem and found a solution. Making battery acid in laboratories, building ventilation systems in tunnels, and conducting battlefield reconnaissance for enemy equipment are just a few examples of how they demonstrated their devotion to duty.

Learning what the Japanese could use against the United States based on information derived from captured Japanese equipment was eventually of benefit to the development of U.S. technology, such as an improvised flamethrower ignition system. While the tip of the spear was broken in the Philippines in 1942, the dedicated men of the CWS exemplify the American fighting spirit—Never Give Up the Fight!

Endnotes:

[1]*History of Chemical Section*, Vol. 1, U.S. Armed Forces Middle Pacific and predecessor commands, 7 December 1941–2 September 1945.

[2]Robert Walk "Gas, Gas Masks, and Smelly Clothing: The Unsung Heroes of the Chemical Warfare Service During World War II," *Army Chemical Review*, July–December 2007, pp. 43–49.

[3]*History of Chemical Section*.

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"*History of Chemical Section*, Vol. 1–5, U.S. Army Forces Middle Pacific and predecessor commands," 7 December 1941–2 September 1945.

Brooks E. Kleber and Dale Birdsell, "United States Army in World War II: The Technical Services: The Chemical Warfare Service: Chemicals in Combat," Office of the Chief of Military History, Department of the Army, Washington, D.C., 1959.

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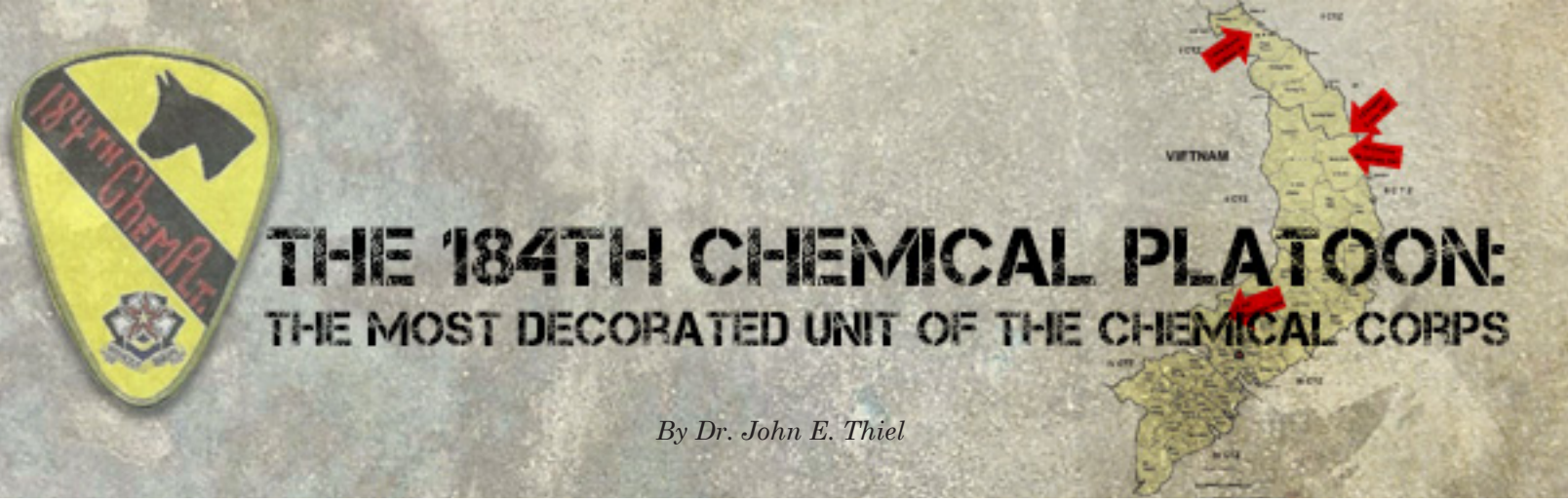
Ms. Lindberg is the regimental historian at the U.S. Army Chemical, Biological, Radiological, and Nuclear School History Office, Fort Leonard Wood, Missouri. She holds a bachelor's degree in history, humanities, and political science from the University of Northern Iowa, Cedar Falls, and a master's degree in history from Missouri State University, Springfield.



THE 184TH CHEMICAL PLATOON:
THE MOST DECORATED UNIT OF THE CHEMICAL CORPS

By Dr. John E. Thiel

The Vietnam War

Most people, whether within or outside of the U.S. Army Chemical Corps, are unaware of its operations in the Vietnam War. Therefore, it is no wonder that its units and Soldiers go unmentioned in the annals of the war. Chemical units were not elite units with illustrious histories like infantry battalions. They were small units, generally with fewer than 45 Soldiers, so it is not surprising that they would get lost among the combat divisions of 12,000 or more. Still, the chemical units significantly contributed to the war effort and saved many lives on the ground.

Chemical Soldiers were a diverse bunch who did not know what they were getting into but followed orders as best they could. They did not earn combat infantry badges, but they spent time on isolated firebases and even humped through the jungle and had overnight campouts there—just like the grunts. They flew more missions that counted as combat assaults than the average infantryman, including perilous daily intelligence-gathering missions over enemy territory. They rigged high explosives and dispersed large quantities of herbicides, insecticides, riot control agents, and napalm by air and on the ground. This is not to diminish the day-to-day suffering that the infantrymen endured, as the chemical Soldiers led a life of comparative luxury; still, they also faced circumstances that required bravery above and beyond the typical call of duty.

The business of being a chemical Soldier in Vietnam was dangerous. Every mission was dangerous. Those men did not want to be there any more or less than anyone else, but they did not hesitate to do their frightening jobs. They were enlisted or drafted with visions of duty behind the frontlines. Instead, they found themselves in the air, hovering over enemy camps, dropping exploding drums of riot control agent or napalm, flying at treetop level with bullets whizzing about them, or mapping enemy positions; on the ground, handling explosives; and sometimes, even underground. Indeed, all the men who served in the Chemical Corps in Vietnam were heroes, demonstrating courage, daring, and self-sacrifice. As always, though, some stood out from among the others.

War Heroes

Many of the members of one small Chemical Corps unit in Vietnam, the 184th Chemical Platoon (Direct Support), 1st Cavalry Division (Airmobile), performed heroic actions during the war. This article describes some of those actions. Indeed, other heroic actions were also performed; however, this discussion is limited to those for which details are readily available.

January 1967

On 19 January 1967, elements of the 1st Battalion, 14th Infantry Regiment, 25th Infantry Division, discovered a vast cavern and tunnel complex in the mountains between the Soui Ca and Vinh Thanh Valleys. The caverns were believed to have been used as the Viet Cong Provincial Headquarters. On 26 January, the 184th Chemical Platoon was called upon to help clear the cave complex. The commanding officer, First Lieutenant Gary E. Harvey, and Specialist Fourth Class Jose R. Santiago-Colon entered one of the caverns. They moved slowly along the dark passages until an enemy soldier fired upon them. They killed the enemy soldier and then continued routing five additional Viet Cong from the cavern. For their heroic actions, Harvey and Santiago-Colon were awarded the Bronze Star with V for valor.[1, 2]

June 1967

At approximately 0400, 6 June 1967, Specialist Fourth Class Bobby Blount, Company B, 15th Medical Battalion, saw two enemy mortar rounds land in the ammunition dump at Landing Zone (LZ) English in Vietnam. The "Operational Report and Lessons Learned" of the 1st Cavalry Division states, "On 6 June, the division lost a 3-day stock of Class II, IV, and V supplies in a fire and subsequent explosions caused by enemy action at LZ English. Two division members were killed and 39 wounded during the holocaust."[3] The 3-day stock translates to approximately 1,900 tons of supplies. Nearly two-thirds of those supplies consisted of ammunition—1,250 tons of assorted shells, rockets, grenades, and incendiaries.

While it is true that "only" two men died as a result of the ammunition dump explosions, many more than the reported 39 were wounded, as at least 109 Purple Hearts were awarded in relation to the incident.[4, 5, 6, 7] It is also noteworthy that the "Operational Report and Lessons Learned" uses the word "holocaust" to describe the mass destruction, emphasizing that this was no ordinary fire. The secondary fires and explosions continued for more than 5 hours; fragments, unexploded ordnance, and burning debris rained over most of the base, destroying tentage and equipment, including helicopters. The exploding ammunition (Class V supplies) alone would have been bad enough, but clothing and equipment

(Class II supplies), including tentage; housekeeping supplies; and construction materials (Class IV supplies), such as lumber and sandbags, were also stored in the area. In addition, the Division Support Command reported that the area had also contained packaged petroleum, oil, and lubricants (Class III supplies).[8] Consequently, the fires ignited by the explosions were supplied with an abundance of fuel, perpetuating the catastrophe. Also compounding the devastation was the fact there were no sandbags or earth berms separating the various explosives from the other classes of supplies at the dump. Everything was stored side by side on wooden pallets.

Because U.S. Army divisions do not include fire companies like stateside military installatio ns do, there was no firefighting capability at LZ English. However, not far away to the south, at LZ Two-Bits, the 1st Cavalry Division did have a power-driven decontaminating apparatus, a truck-mounted 400-gallon water tank with pumps that made it capable of use like a fire truck. The commanding officer of the 184th Chemical Platoon, First Lieutenant Ver Neil D. Mesecher, and four volunteers, at significant peril, rushed the power-driven decontaminating apparatus up the road to LZ English in an attempt to control the fires. Upon arriving on the scene, the team found a large ammunition bunker burning and in grave danger of exploding. At the risk of losing their lives, the team members entered the bunker and extinguished the fire. Although exposed to flying shrapnel and intense heat, the team directed their firefighting efforts to other supply and troop billeting areas. Their actions resulted in saving critically needed ammunition, valuable government property, and several lives.[9] For their heroic actions, Mesecher; Specialist Fifth Class George C. Deveau; and Specialists Fourth Class Alan W. Catlett, Ronald L. Green, and Jose R. Santiago-Colon were awarded the Soldier's Medal. And yes, that is the same Specialist Fourth Class Santiago-Colon who, 6 months earlier, had earned the Bronze Star with V for valor.

March 1968

Late Wednesday night, 24 March 1968, the most intense shelling of the Vietnam War began on Camp Evans. A significant number of the mortar rounds landed in the area of the 184th Chemical Platoon due to its proximity to the division tactical operations center. One of the early rounds hit a rafter of the officers' hooch, severely wounding executive officer Second Lieutenant John W. (Bill) Smith. Shortly thereafter, Specialist Fourth Class Richard E. Wipert and Private First Class John E. Thiel were severely wounded when a mortar round hit the ridge board of their hooch. Fearing a ground attack, the commanding officer, First Lieutenant Jan A. Van Prooyen, braved the incoming mortars to run to the main troop bunker to organize the men. When the shelling let up, Van Prooyen sent the platoon sergeant to obtain medical aid and asked for volunteers to look for and assist casualties. He then returned to assist Second Lieutenant Smith.[10]

Despite the threat of continued shelling, Sergeant Nathaniel J. Booker, Specialist Fourth Class Edward Brown, and Private First Class James C. Covington answered the call for volunteers. They knew that there was at least one casualty in Hooch Number 5, so they entered it first. In the darkness, they found a hole in the floor and Private First Class Thiel in the hole. After Thiel had initially been wounded, another mortar round had landed close to him. That round had penetrated the floor, and the explosion had acted like an air burst under the floor. The blast had blown out an approximately 1-foot-deep crater under the hooch, the floor had collapsed under Thiel's weight, and he had fallen through it, into the shallow hole under the hooch. Sergeant Booker jumped into the hole and lifted Thiel to Specialist Fourth Class Brown and Private First Class Covington, who carried him to a truck that then took him and Wipert (who was recovered by Staff Seargent Louis M. Morrison) to the aid station. Van Prooyen was awarded the Bronze Star with V for valor, and Booker, Brown, and Covington were awarded the Army Commendation Medal with V for valor.[11]

December 1968

Specialist Fourth Class Hershel D. Cude Jr. and Sergeant George M. Fagerstrom, 184th Chemical Platoon, were part of the airborne personnel detector crew of the 184th Chemical Platoon on a mission flown by Troop A, 1st Battalion, 9th Cavalry Regiment, northeast of Tay Ninh, near LZ Joe, on 13 December 1968. Cude's seat was on the left side of the helicopter. The aircraft had been flying at treetop level when it crossed a road at a right angle. A lone figure on the road caught Cude's eye. In a split second, Cude recognized the green uniform and pith helmet of a North Vietnamese soldier bringing his AK-47 to bear on the helicopter. Cude grabbed his M-16, which was already locked and loaded on fully automatic, and fired on the target, killing the soldier before he could fire on the helicopter. The pilot circled back for a second look and confirmed that the North Vietnamese soldier was lying in the road. Cude was awarded the Air Medal with V for valor for his quick action, which prevented a potentially catastrophic loss of life and equipment.[12]

Conclusion

Considering only awards for valor, the 184th Chemical Platoon can lay claim to the title of "Most Decorated Chemical Unit in Vietnam" with 14 such awards—a total of six Soldier's Medals, three Bronze Stars for Valor, two Air Medals for Valor, and three Army Commendation Medals for Valor. If awards for meritorious service were included in consideration, the 184th would still be among the leaders, if not the sole leader, as it was also awarded a Meritorious Unit Citation.

As an integral part of the 1st Cavalry Division, the 184th Chemical Platoon operated in the most hostile environments during the Vietnam War. Indeed, it lost as many men (two) to enemy action as any other chemical unit and totaled at least 16 Purple Hearts. By any measure, the men of the 184th Chemical Platoon distinguished themselves during their service in the Vietnam War. The record of the 184th Chemical Platoon must be included in the discussion of the most decorated unit in the history of the Chemical Corps—especially since the platoon was a small unit made up of only 42 Soldiers.

Endnotes:

[1]General Order 1640, 1st Cavalry Division, 13April 1967.

[2]General Order 1690, 1st Cavalry Division, 14 April 1967.

[3]"Operational Report and Lessons Learned", 1st Cavalry Division, quarter ending 31 July 1967.

[4]General Order 3463, 1st Cavalry Division, 25 June 1967.

[5]General Order 4787, 1st Cavalry Division, 22 August 1967.

[6]General Order 4930, 1st Cavalry Division, 29 August 1967.

[7]General Order 4932, 1st Cavalry Division, 29 August 1967.

[8]"Operational Report and Lessons Learned", p 24.

[9]General Order 4741, 1st Cavalry Division, 19 August 1967.

[10]General Order 5125, 1st Cavalry Division, 18 June 1968.

[11]Eyewitness report from Major General Jan A. Van Prooyen (Retired), Ph.D.; First Sergeant Richard Robertson (Retired); Master Sergeant Louis M. Morrison (Retired); and Sergeant First Class Edward Brown (Retired), Ph.D. during an interview, October 2019.

[12]Eyewitness report from Sergeant George A. Fagerstrom during an interview with the author, April 2012.

Dr. Thiel retired from the U.S. Army with permanent disability due to combat wounds received while serving with the 184th Chemical Platoon and the 26th Chemical Detachment, both of the 1st Cavalry Division (Airmobile) in Vietnam. He is an expert on U.S. Army Chemical Corps unit operations in the Vietnam War and World War II. He has been a prolific contributor to the U.S. Army Chemical Corps Museum and the Corps Historian's Office. He was admitted to the Honorable Order of the Dragon by direction of the Chief of Chemical and selected to the U.S. Army Chemical Corps Hall of Fame as its 70th member. Dr. Thiel holds a bachelor of science degree in management; a master's degree in business administration; and a Ph.D. in strategic business analysis from the Kelley School of Business, Indiana University, Bloomington.

Photograph and Illustration Guide

Photographs and illustrations contribute a great deal to the visual appeal of an article. When submitting them with your article, please keep the following in mind:

- Subject matter—Action shots that show Soldiers who are training or performing their jobs are the best way to enhance an article. Static photographs of landscapes, structures, or distant machinery in action are less useful. Photographs of groups of people smiling at the camera or "grip and grin" shots add little to an article and are unlikely to be used.
- Format—Photographs saved in JPEG (or JPG) format and sent as attachments to an e-mail are best. Photographs and other graphics should not be embedded in a Microsoft® Word document or PowerPoint presentation. Graphics files are large, and there are limits to the size of messages that can be sent via e-mail systems. For example, our system cannot accept messages larger than 20 megabytes (MB). One solution is to send separate e-mails with just one or two attachments each.
- Size and resolution—The ideal photograph or graphic for reproduction is 5 x 7 inches at 300 dots per inch (dpi), but smaller sizes may be acceptable. If the photograph is a JPEG, it should be no smaller than 150 kilobytes. A 5- x 7-inch, 300 dpi photograph saved as a TIF should be 1MB to 3MB in size. When taking photographs, use the highest resolution setting on your camera and save them at a resolution no lower than 200 dpi. Do not manipulate photographs by sharpening, resizing, retouching, or cropping the image. Using a graphics software program (such as Adobe® Photoshop) to increase the size and/or resolution of a small photograph will not increase the quality of the photograph.
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- Photographs of foreign nationals—Due to security restrictions, photographs of foreign nationals cannot be published without digital editing (blurring faces), unless the photograph(s) are accompanied by permission to release signed by the subject(s).
- Graphs/charts and illustrations—We prefer to work with original digital graphic files.
- Submit the original PowerPoint slides and/or layered Adobe Photoshop/Illustration files. Do not save them in a different format or flatten the layers

2022 Honorees of the U.S. Army Chemical Corps

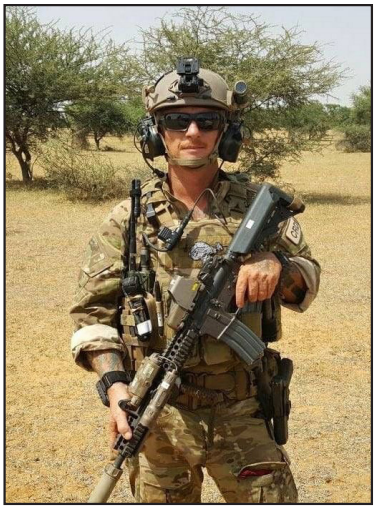
Compiled by Ms. Christy L. Lindberg

Hall of Fame Inductee

The U.S. Army Chemical Corps Hall of Fame award is the highest form of recognition offered by the Regiment. This coveted award honors those who have made landmark contributions to the overall history and traditions of the Chemical Corps. These individuals have distinguished themselves through advances in science and technology, a lifetime of service and dedication to the Corps, or gallentry in battle. One individual—Sergeant First Class Jeremiah Johnson—was inducted into the Hall of Fame in June 2022.

Sergeant First Class Jeremiah Johnson

Jeremiah Johnson, who was born in North Carolina, loved his Family, country, and friends. Known as a hardworking man of many talents, he enjoyed riding and working on motorcycles, forging, customizing knives, smoking cigars and pipes, and spending time outdoors with his Family. Jeremiah owned a small business; but in 2007, he answered the call to serve his Nation. He became a loyal and devoted Soldier.



After attending one-station unit training as a Military Occupational Specialty (MOS) 74D–Chemical, Biological, Radiological, and Nuclear (CBRN) Specialist at the home of the U.S. Army Chemical Corps, Fort Leonard Wood, Missouri, Johnson was assigned to the 181st Chemical Company, 2d Chemical Battalion, Fort Hood, Texas. He also served as a chemical operations noncommissioned officer (NCO) with the 22d Chemical Battalion, Aberdeen Proving Ground, Maryland, and deployed to Jordan.

In 2015, the United States and Niger signed a military agreement committing the two countries to work together in the fight against terrorism. Sergeant Johnson deployed to Niger as a chemical operations NCO/site exploitation specialist with the 14th Chemical Reconnaissance Detachment, assigned to the 3d Special Forces Group (Airborne), which supported Special Forces Operational Detachment–Alpha 3212 (ODA 3212) during Operation Juniper Shield. U.S. Army Special Forces personnel repeatedly trained Nigerian armed forces personnel to assist in the fight against terrorist operations launched from neighboring countries.

On 4 October 2017, while the 14th Chemical Reconnaissance Detachment was advising the Nigerien Special Reconnaissance Battalion, the detachment conducted a mounted reconnaissance patrol through the Tillaberi Region of Niger. Upon return to the base, the eight-vehicle convoy was ambushed by Islamic State of the Greater Sahara armed militants. During the attack, Sergeant Johnson repeatedly exposed himself to intense enemy fire while providing his detachment with cover fire and shuttling ammunition to the gunner. When the detachment was ordered to withdraw, Sergeant Johnson maintained his position, covering the detachment withdrawal until he and a fellow Soldier were overtaken. Had he not remained to cover the withdrawal from the kill zone, he might have survived the engagement. Instead, pinned down by the enemy, his actions tragically led to his death—but enabled his teammates to survive.

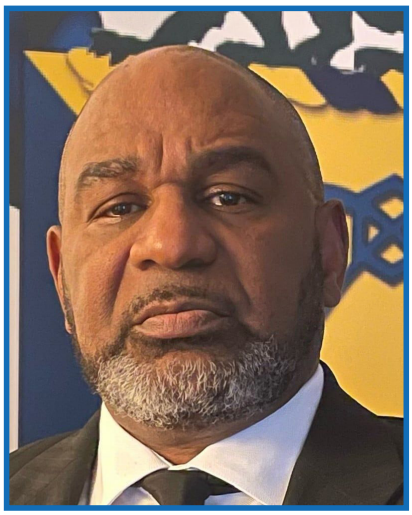
For his courageous actions, Sergeant Johnson was posthumously promoted to sergeant first class and awarded the Bronze Star with "V" device, the Purple Heart, and the Meritorious Service Medal. In 2021, in recognition of his courage, service, and sacrifice while fighting and serving with the Soldiers of ODA 3212, Sergeant First Class Johnson was named an honorary Green Beret, making him one of only 13 recipients recognized with this prestigious honor since the creation of the Special Forces in 1963. At the ceremony, Lieutenant General Francis M. Beaudette, commanding general of the U.S. Army Special Operations Command, stated, "These men [Sergeant First Class Jeremiah Johnson and Sergeant LaDavid Johnson] represent the very finest our Nation has ever produced, stalwart in their dedication to duty, selfless in every aspect of action and of deed, valorous in the face of overwhelming odds and danger, and committed to freeing the oppressed."[1] And according to Major General Patrick B. Roberson, "Jeremiah's actions and service were in the full keeping of the Special Forces motto, '*De Oppresso Liber*'—To Free the Oppressed."[2] In 2022, in further testament to his heroic actions, Sergeant First Class Jeremiah Johnson's Bronze Star with "V" device was upgraded to the Silver Star. It is an honor to add Sergeant First Class Johnson's name to the Chemical Corps Hall of Fame roll, where his devotion and service serve as an example for past, current, and future Dragon Soldiers to remember and emulate.

Distinguished Member of the Corps Inductee

The award of Distinguished Member of the Corps signifies that an individual has not only contributed a lifetime of service to the Chemical Corps, but also continues to support the Chief of Chemical in implementing the Corps vision. Beyond the normal duties of their post-Service occupation, these individuals have exhibited altruistic and philanthropic qualities for the benefit of the Corps and the Nation. One individual—Sergeant Major William A. Jackson (Retired)—was inducted into the Distinguished Member of the Corps in June 2022.

Sergeant Major William A. Jackson (Retired)

William A. Jackson was born and raised in Oakland, California. His parents instilled in him a strong faith and work ethic that inspired him to serve his community and his Nation. He entered the Army in 1977 and served as a chemical and infantry Soldier for more than 30 years. He filled various positions, from CBRN staff NCO to Chemical Corps Sergeant Major. Before activation of the 23d Chemical Battalion, Joint Base Lewis-McCord, Washington, Jackson served as a senior enlisted advisor to the 11th and 12th Chemical Companies.



Upon retirement, Sergeant Major Jackson continued to emphasize the development of others by participating in speaking engagements for the local equal opportunity office and for graduates of NCO Academy Enlisted Professional Military Education Leadership Courses. He also volunteered at the Madigan Army Community Center, serving on the Patient and Family Advocacy Council, where he worked to improve the patient and Family health care experience. In addition, Jackson also collaborated with the Chemical Corps Regimental Association (CCRA), Fort Leonard Wood, Missouri; CBRN leaders; and I Corps to establish the Pacific Northwest Regimental Week (including the CBRN Ball)—an annual event since 2003. His efforts successfully impacted the partnership amongst tenant units that has been sustained throughout decades of leadership turnover and increased the awareness of CBRN history and readiness.

Sergeant Major Jackson (Retired) continues his dedication to the communities in the area of Joint Base Lewis-McCord, Lacey, and Olympia, Washington. He has brought the local CBRN community together through his volunteer work that has generated multiple fundraising activities, including annual golf scrambles and a scavenger hunt at the Fort Lewis Museum. Sergeant Major Jackson also played an integral role in the installation—and, now, continual maintenance of—the Purple Smoke Tree Memorial, including a dedication plaque to the Chemical Corps, at the Fort Lewis Museum. He holds a board position at the Seattle and American Lake Veteran Administration Hospital, Tacoma, Washington, where he continues to support veterans as a patient advocate. He serves as the editor for the 1st Cavalry Soldiers newsletter; vice president at an all-volunteer Amtrak Station in Olympia; and an ambassador for the U.S. Cyber Mission, supporting science, technology, engineering, and mathematics activities.

Sergeant Major Jackson (Retired) has followed his 30-year military career by dedicating his free time to serving the Joint Base Lewis-McCord community, the Chemical Corps, and the CBRN enterprise. His goodwill and honesty make him deserving of the Distinguished Member of the Corps award.

Endnotes:

[1]"Soldiers Awarded Honorary Green Beret," *U.S. Army*, 23 July 2021, <https://www.army.mil/article/248744/soldiers_awarded_honorary_green_beret>, accessed on 19 April 2023.

[2]Department of the Army John F. Kennedy Special Warfare Center and School memorandum, 1 March 2021.

Ms. Lindberg is the regimental historian at the U.S. Army Chemical, Biological, Radiological, and Nuclear School History Office, Fort Leonard Wood, Missouri. She holds a bachelor's degree in history, humanities, and political science from the University of Northern Iowa, Cedar Falls, and a master's degree in history from Missouri State University, Springfield.

New Doctrine Developments

By Ms. Sharon McCann

Several current chemical, biological, radiological, and nuclear (CBRN) doctrine products will be revised this year.

The first of the products to be revised will be Army Techniques Publication (ATP) 3-90.40, *Combined Arms Countering Weapons of Mass Destruction*.[1] The revised version of ATP 3-90.40 will be a multi-Service publication that will supersede ATP 3-11.23, *Multi-Service Tactics, Techniques, and Procedures for Weapons of Mass Destruction Elimination Operations*.[2] This publication will be a product of observations and lessons learned from combined arms countering weapons of mass destruction (CWMD) exercises and operations. CWMD operations are military operations conducted by combined arms teams and enabled by CBRN, explosive-ordnance disposal, and other technical-specialist elements. This publication will establish a bridge from strategic concepts in joint doctrine to operational and tactical CWMD operations in Army doctrine. It will describe using the targeting cycle for CWMD target development and employing multidomain effects in support of CWMD operations.

ATP 3-11.32, *Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Passive Defense*,[3] will be significantly revised to address the modernization of contamination mitigation strategies but also to address the creation of the core functions in Field Manual (FM) 3-11, *Chemical, Biological, Radiological, and Nuclear Operations*.[4] ATP 3-11.32, will be split into two publications: ATP 3-11.32, *Chemical, Biological, Radiological, and Nuclear Protection*,[5] and ATP 3-11.33, *Chemical, Biological, Radiological, and Nuclear Contamination Mitigation*.[6]

ATP 3-11.32 will address the core protection function and its relationship to the protection warfighting function and CBRN defense. It will provide guidance for the protection of personnel, equipment, and infrastructure in CBRN environments. ATP 3-11.33 will address the ability to mitigate CBRN incidents through actions to prepare for, respond to, and recover from contamination. Decontamination is difficult. Depending on whether the hazard is chemical, biological, or radiological/nuclear, decontamination is limited by the ability to detect contamination and decontaminate to negligible levels. The modernization strategy for contamination mitigation includes focusing more on actions before considering decontamination.

Guidance and information contained in these new doctrine products will cover new techniques—one of which is tactical decontamination and another of which is modified detailed equipment decontamination that includes new equipment and materials, such as the Contamination Indicator Decontamination Assurance System and the Joint General-Purpose Decontaminant. The most crucial aspect for all CBRN Soldiers to understand is that advising a commander on contamination mitigation entails being aware of all of the tools available and providing the commander with options that mitigate the risk to force and risk to mission.

To be useful, doctrine must be read and understood. Unfortunately, due to the sensitive nature of some of the information in CBRN ATPs, these ATPs will not be made into audiobooks. Being a skilled CBRN professional requires some study, and studying new doctrine as it is published is very important.

Endnotes:

[1]ATP 3-90.40, *Combined Arms Countering Weapons of Mass Destruction*, 29 June 2017.

[2]ATP 3-11.23, *Multi-Service Tactics, Techniques, and Procedures for Weapons of Mass Destruction Elimination Operations*, 1 November 2013.

[3]ATP 3-11.32, *Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Passive Defense*, 13 May 2016.

[4]FM 3-11, *Chemical, Biological, Radiological, and Nuclear Operations*, 23 May 2019.

[5]ATP 3-11.32, *Chemical, Biological, Radiological, and Nuclear Protection* (to be published).

[6]ATP 3-11.33, *Chemical, Biological, Radiological, and Nuclear Contamination Mitigation* (to be published).

Ms. McCann is the Deputy Chief, CBRN Doctrine Branch, Doctrine Division, Fielded Force Integration Directorate, U.S. Army Maneuver Support Center of Excellence, Fort Leonard Wood, Missouri. She retired from the U.S. Army as first sergeant of the 12th Chemical Company, Schweinfurt, Germany, in 2010. She holds a bachelor's degree in homeland security and emergency management from Ashford University, San Diego, California.

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