Army Chemical Review

The Professional Bulletin of the Chemical Corps

Summer 2016



HEADQUARTERS, DEPARTMENT OF THE ARMY
Approved for public release; distribution is unlimited.
PB 3-16-1

U.S. Army
Chemical, Biological, Radiological, and Nuclear School
(573) XXX-XXXX
DSN 676-XXXX (563 prefix) or 581-XXXX (596 prefix)

COMMANDANT
BG Maria R. Gervais **563-8053**
<maria.r.gervais.mil@mail.mil>

ASSISTANT COMMANDANT
COL Scott D. Kimmell **563-8053**
<scott.d.kimmell.mil@mail.mil>

CHIEF OF STAFF
MAJ Robert T. Paul **563-8052**
<robert.t.paul.mil@mail.mil>

REGIMENTAL COMMAND SERGEANT MAJOR
CSM Kenneth J. Kraus Jr. **563-6133**
<kenneth.j.kraus.mil@mail.mil>

REGIMENTAL CHIEF WARRANT OFFICER
CW2 Matthew D. Chrisman **563-8051**
<matthew.d.chrisman.mil@mail.mil>

DEPUTY ASSISTANT COMMANDANT
VACANT **563-8132**

DEPUTY ASSISTANT COMMANDANT– ARMY RESERVE
LTC(P) Leslie M. Dillard **563-8050**
<leslie.m.dillard.mil@mail.mil>

DEPUTY ASSISTANT COMMANDANT–NATIONAL GUARD
LTC Kenneth R. Napier **563-7676**
<kenneth.r.napier.mil@mail.mil>

3D CHEMICAL BRIGADE
COL Darryl O. Hood **596-0016**
<darryl.o.hood.mil@mail.mil>

DIRECTORATE OF TRAINING AND LEADER DEVELOPMENT
COL Kent B. Soebbing **563-6531**
<kent.b.soebbing.mil@mail.mil>

PERSONNEL DEVELOPMENT OFFICE
MAJ Chadrick K. Walley **563-7374**
<chadrick.k.walley.mil@mail.mil>

CHIEF OF DOCTRINE
MAJ Caleb G. Laue **563-8189**
<caleb.g.laue.mil@mail.mil>

G-37 PUBLICATIONS
Managing Editor, Diana K. Dean **563-4137**
<diana.k.dean.civ@mail.mil>

Editor, Cheryl L. Green **563-5004**
<cheryl.l.green26.civ@mail.mil>

Graphic Designer, Dennis L. Schellingberger **563-5267**
<dennis.l.schellingberger.civ@mail.mil>

Editorial Assistant, Cynthia S. Fuller **563-7651**
<cynthia.s.fuller3.civ@mail.mil>

Army Chemical Review (ACR) (ISSN 0899-7047) is published biannually in June and December by the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), Fort Leonard Wood, Missouri. The *ACR* highlights unique Army chemical, biological, radiological, and nuclear technical-response capabilities for supporting national countering weapons of mass destruction operations and conducting all-hazmat mitigation across the range of military operations anytime, anywhere. The objectives of *ACR* are to inform, motivate, increase knowledge, improve performance, and provide a forum for the exchange of ideas. This publication presents professional information; but the views expressed herein are those of the authors, not the Department of Defense or its elements. The content does not necessarily reflect the official U.S. Army position and does not change or supersede any information in other U.S. Army publications. The use of news items constitutes neither affirmation of their accuracy nor product endorsement.

Articles to be considered for publication are due 15 February and 15 August. Send submissions by e-mail to <usarmy.leonardwood.mscoe.mbx.mdotacr@mail.mil>, or send an electronic copy in Microsoft® Word on a CD and a double-spaced copy of the manuscript to Army Chemical Review, 14010 MSCoE Loop, Building 3201, Suite 2661, Fort Leonard Wood, MO 65473-8702. Due to the limited space per issue, we normally do not print articles that have been published elsewhere.

Articles may be reprinted if credit is given to *ACR* and its authors. All photographs are official U.S. Army photographs unless otherwise noted. *ACR* reserves the right to edit material.

PERSONAL SUBSCRIPTIONS are available through the U.S. Government Printing Office, P.O. Box 979050, St. Louis, MO 63197-9000.

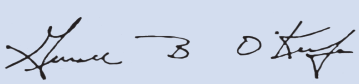
UNIT SUBSCRIPTIONS are available by e-mailing <usarmy.leonardwood.mscoe.mbx.mdotacr@mail.mil> Please include the complete mailing address (including unit name, street address, and building number) and the number of copies per issue.

POSTMASTER: Send unit address changes to Army Chemical Review, 14010 MSCoE Loop, Building 3201, Suite 2661, Fort Leonard Wood, MO 65473-8702.

By Order of the Secretary of the Army:

MARK A. MILLEY
General, United States Army
Chief of Staff

Official:



GERALD B. O'KEEFE
Administrative Assistant to the
Secretary of the Army
1604901

Army Chemical Review

The Professional Bulletin of the Chemical Corps

PB 3-16-1, Summer 2016

2 **Chief of Chemical and Commandant, U.S. Army Chemical, Biological, Radiological, and Nuclear School**

4 **Regimental Command Sergeant Major**

6 **Regimental Chief Warrant Officer**

7 **It Happened One Night: A Toxic Industrial Chemical Escape**
By Dr. John R. Kennedy

10 **Successful CBRN Officer Practices**
By Major Sean Michael Reilly

13 **Success as a Battalion CBRN Officer**
By Captain Robert R. Koorn

14 **Utilizing Off-Post, CBRN-Focused Training Centers**
By Captain Melvin Tre Flintroy III

16 **2d Chemical Battalion Introduces the 4.2-Inch Chemical Mortar**
By Mr. Walter J. Eldredge

19 **Maintaining CBRN Readiness in the Republic of Korea**
By Captain Henry D. Hannible and Captain Maxmilian Seo

20 **What Do You Report? NATO or U.S.?**
By Captain Nikki D. Martinez

24 **Finding CBRN Training Opportunities Abroad**
By Master Sergeant Christopher C. Lemley

26 **Three Meters**
By Captain Ian P. Sandall

27 **A Double-Eagle Day for the Chemical Corps**

28 **The Devaluation of CBRN Capabilities at the Brigade Level**
By First Lieutenant Matthew A. Engel

30 **CBRN Course Provides First-Responder Basics**
By Mr. Stephen L. Standifird

31 **The Order of the Dragon**
By Specialist Marissa C. Blunt

32 **The Challenge of Doctrine**
By Mrs. Sharon M. McCann

33 **Doctrine Update**

36 **Reserve Component Update**

38 **The Commandant's Reading Program**
Compiled by Lieutenant Colonel James P. Harwell

40 **Writer's Guide**

41 **Photo/Illustration Guide**

Subscribe to the digital version of *Army Chemical Review*

Scan the QR code or access the online form at <http://www.wood.army.mil/digital_chmsubscription.htm>.



Cover photos: Stephen L. Standifird, Fort Leonard Wood Public Affairs Office

Chief of Chemical and Commandant, U.S. Army Chemical, Biological, Radiological, and Nuclear School

Greetings Dragon Soldiers, Civilians, and Families of the Regiment!

It is hard to believe that 2 years have passed since I took over as the Chief of Chemical and the Commandant of the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS). In my final message as the 28th Chief of Chemical and Commandant, I would like to welcome our new leadership, provide my observations as I reflect on my tenure as the humble leader of your Regiment, and thank the team with which I have served for more than 2 years.



Brigadier General Maria R. Gervais

As we enter the summer of 2016, the Regiment and USACBRNS will experience a heavy turnover in key personnel. We welcome the following leaders:

- On 26 May, Brigadier General James E. Bonner became the 29th Chief of Chemical and commandant of USACBRNS. Jim and his wife Debra are no strangers to Fort Leonard Wood, as he previously commanded the 3d Chemical Brigade. Congratulations, Colonel Bonner; I look forward to you taking this Regiment to new heights.
- In July, Command Sergeant Major Henney M. Hodgkins will become the 14th Regimental Command Sergeant Major. She possesses a wealth of experience, having served in chemical, biological, radiological, and nuclear (CBRN) positions at all levels within our Regiment.
- In July, Lieutenant Colonel Dale (Sean) Crockett will transition into the assistant commandant position.
- Chief Warrant Officer Two Jesse S. Deberry will transition into the Regimental Chief Warrant Officer position.

We also witness the retirement of two of the most influential leaders in our history:

- Lieutenant General Thomas W. Spoehr, our 24th Chief of Chemical and Commandant of USACBRNS, will retire after 36 years of service to our Regiment, our Army, and our Nation. He is a visionary leader whose efforts led to the development of our single most capable platform—the nuclear, biological, and chemical reconnaissance vehicle (NBCRV)—and the dismounted reconnaissance sets, kits, and outfits (DRSKO), which are being fielded to CBRN units today. Not only has he been a visionary leader of our Regiment, but he is also a mentor and friend to many. From the entire Regiment, congratulations on your retirement, Lieutenant General Spoehr; thank you for your service; and most importantly, thank you and your wife Cynthia for your inspirational leadership.
- Command Sergeant Major Patrick Z. Alston, who served as our 10th Regimental Command Sergeant Major, retired on 13 May 2016 after 35 years of service. He rose to the highest levels of senior enlisted leadership. He served first as the command senior enlisted leader, Defense Threat Reduction Agency/U.S. Strategic Command Center for Combating Weapons of Mass Destruction (WMD), and at the four-star nominative level in his final assignment, in which he served as the senior enlisted leader for the U.S. Strategic Command. Command Sergeant Major Alston will always be remembered for his passion in leading Dragon Soldiers. We wish you and your wife Felicia the best of luck in retirement, Command Sergeant Major Alston, and thank you for serving as the ultimate role model for Dragon Soldiers.

As I reflect back on my 2 years as your Chief of Chemical and Commandant, I would like offer a few observations for consideration:

- **Observation 1.** It has been an absolute honor and privilege to serve as your Commandant. Every day, I witnessed Dragon Soldiers exhibiting extraordinary leadership and professionalism during the execution of their mission. I stand proud and confident knowing that our Regiment serves as America's CBRN counterforce and that we are prepared to execute the mission when called upon.
- **Observation 2.** CBRN readiness and the survivability of the force must always remain our No. 1 priority. Today, the WMD threat is increasing—not diminishing, as some would like to think. For the past 14 years, the Army has focused on counterinsurgency operations in two theaters where the threat did not require a sustained focus on CBRN readiness. As you know, the No. 1 priority of the Chief of Staff of the Army is readiness—and today, our Army needs our CBRN expertise in order to "reset the Army" in terms of CBRN preparedness and readiness. Dragon Soldiers across the Army must assist all Soldiers in returning to a high level of CBRN readiness. If our force can't fight, survive, and win in a CBRN

environment, then we have failed the fundamental mission that was established for the Chemical Warfare Service in 1917—the mission to train and equip the American Expeditionary Forces for chemical combat.

- **Observation 3.** The recent Force Design Update (FDU) and the fielding of the NBCRV and DRSKO are the most evolutionary changes to our Regiment in the past 30 years. These changes improve our ability to guard the force, protect the homeland, and address the emerging countering-WMD mission that the Army will lead for the Department of Defense. The FDU changed our Cold War era force structure (composed primarily of decontamination and biological detection assets) to a force structure that allows us to address the WMD threat in a proactive, versus reactive, manner. As a Regiment, we must embrace this change and identify ways to make the FDU and our platforms better, more agile, and expeditionary.
- **Observation 4.** Although the NBCRV is our single most capable CBRN platform and DRSKO improve our dismounted CBRN reconnaissance capability, both of these capabilities are a sustainment challenge for the Army. However, I believe that the measures currently being emplaced by USACBRNS will meet this challenge in the near- and mid-term. First, the basic Training and Resource Model has been corrected, which allows for improved accuracy in operating tempo funding for these capabilities. The additional skill identifier (ASI) F1 (Biological Integrated Detection System/Joint Biological Point Detection System Repairer) and ASI F6 (NBCRV Sensor Suite Maintenance Technician) population is growing and becoming more experienced with the two capabilities; and the implementation of the warrant officer program, coupled with our revised warrant officer professional military education program, will provide technical experts at the team through corps level. These technical experts will provide a consistent focus on our sophisticated sensor suites and WMD-exploitation sustainment and training requirements. Finally, beginning in fiscal year 2018, the NBCRV will undergo a sensor suite upgrade that will improve reliability, reduce the cost of consumables, and introduce a chemical surface detector that should prevent the Soldier and the platform from exposure to contaminated areas.
- **Observation 5.** Our training and leader development has evolved (and continues to evolve) so that we can properly prepare our officers, noncommissioned officers, and Soldiers to carry out the countering-WMD mission and meet the needs of Force 2025.[1] We are improving our technical training, expanding our credentialing opportunities, and implementing a counter-WMD master program in October 2016—all of which will improve our ability to serve as technical advisors to commanders on the counter-WMD mission.

As I sign off as the 28th Chief of Chemical, I would like to thank the USACBRNS personnel of whom I asked so much, and then some, so that we could properly train and equip Dragon Soldiers:

- To the quiet, yet proud, professionals at the Capabilities Development Integration Directorate, Directorate of Training and Leader Development, Personnel Development Office, and the 3d Chemical Brigade who worked tirelessly, without any expectation of fanfare, to take care of our Dragon Soldiers, our civilians, and our Families and to the entire team—I can only offer a simple thank you. I enjoyed every moment of my tenure, and I will truly miss each and every one of you.
- To Regimental Command Sergeant Major Kenneth J. and Fran Kraus—thank you for all you've done for our Regiment. Command Sergeant Major Kraus—congratulations on your selection to serve as the command sergeant major of the U.S. Army Cadet Command, Fort Knox, Kentucky.
- To Regimental Chief Warrant Officer Matthew D. Chrisman—thank you for developing and implementing the Warrant Officer Basic and Advanced Courses and for finalizing Army Regulation (AR) 600-3, *The Army Personnel Development System*. You made serving as the first-ever Regimental Chief Warrant Officer look easy. Best of luck at Fort Hood, Texas.
- Finally, to Colonel Scott Kimmell, the assistant commandant—thank you for synchronizing the efforts of USACBRNS and the Regiment. It has been a phenomenal performance; I can't thank you enough, and I wish you the best of luck as you retire.

It has truly been an honor and a privilege to serve as the 28th Chief of Chemical and the Commandant of USACBRNS.

Endnote:

[1]Force 2025 and Beyond, <http://www.arcic.army.mil/app_Documents/tradoc_ausa_force2025andbeyond-unifiedlandoperations-wininacomplexworld_07oct2014.pdf>, accessed on 25 April 2016.

Reference:

AR 600-3, *The Army Personnel Development System*, (to be published).

Elementis regamus proelium!

Regimental Command Sergeant Major

Today, we are a globally engaged Army with nearly 200,000 Soldiers deployed in more than 130 countries worldwide. While counterinsurgency operations dominated how we fought for more than a decade, and will continue to be a challenge on the battlefield, that will not be how we fight and win in future conflicts. We are a combat-seasoned force, but we cannot win our Nation's wars by continuing on one topology of war. To win in a complex world, we must develop agile and adaptive leaders. In a complex world, we will be in unknown locations fighting against an unknown threat. We will be forced to contend with unknowable circumstances, and the operating environment will be constantly changing.



Command Sergeant Major Kenneth J. Kraus Jr.

Future leaders will face existential threats, nonstate actors, and super-empowered individuals. To combat this, the Army requires scalable capabilities and trusted leaders of character to successfully employ them. Many will compare this to "thinking outside of the box." What's most important is to know what is ***inside*** the box first. What's inside the box is constantly changing doctrine, regulations, and technology. But leaders must not create standards that are not aligned with how the Army will fight in the future.

To help describe what I believe is necessary to develop and build an adaptive leader, see Figure 1. This figure does not reflect doctrine, but merely my opinion regarding some factors to consider in the development process. This diagram is just ***one*** way to meet the end state—not the ***only*** way.

Many of the items and topics depicted in the diagram of Figure 1 can and should be changed or adapted as needed over time. This diagram is nested in the tenets of Army leader development as noted in paragraph 1-3 of Field Manual 6-22, *Leader Development*.[1] The initial message to the force by the 39th Chief of Staff of the Army, General Mark A. Milley, inspired the creation of this diagram.[2] In that message, General Milley established three priorities:

- Improving readiness.
- Building a future Army.
- Taking care of troops.

General Milley described building a future Army as the building of an agile, adaptive Army that is open to new ideas and new ways of doing things. His other two priorities are captured on the outer band of this diagram. The inner bands represent overarching factors of consideration (changing operating environment, developing career map, assessing, and evaluating). At the hub of the diagram is trust. Trust is the bedrock on which our profession is formed, and it is reliant on the character, ability, and strength of our Army. Without trust, leaders and Soldiers lose their authority and effectiveness. I argue that we need to trust each other and our leaders automatically and implicitly, until proven otherwise.

Each of the pie slices in Figure 1 represents a major category (assignments, education, recruitment/accessions, missions, experience, or training) in which a variety of elements of our profession reside. Every Soldier enters the system through recruitment or accessions; from the point of graduation from advanced individual training or the Basic Officer Leader's Course, the path forward varies greatly. There is no specified or directed course in a Soldier's career that is guaranteed to develop an agile and adaptive leader. It's the accumulated experience from each commodity area and the interaction with a variety of leaders that will shape the adaptability of a Soldier.

A specific concern is Soldiers who limit themselves in duty assignments or duty locations. Soldiers must leave their comfort zones (certain duty assignments or locations) to broaden their careers. When a Soldier is placed in a new position at a new duty station and performs superbly at each task, his or her adaptability grows. Staying in one location or in similar duty positions for extended periods (more than 7 continuous years) will stunt adaptability.

The common threads in this diagram are years of experience; lifelong learning; growth as a leader; and the best possible performance at each duty assignment, regardless of the position or level of responsibility. I have shared my personal experience with many leaders: For six continuous years, I was not assigned to any chemical, biological, radiological, and nuclear (CBRN) positions—nor did I perform many CBRN tasks. I had a great work ethic, I worked very hard to achieve success, and I never failed to fulfill my duty. Part of the reason for my success was that I learned when to ask for assistance from a coach or mentor. We are a team of teams, and no one should think that he or she must tackle complex situations alone.

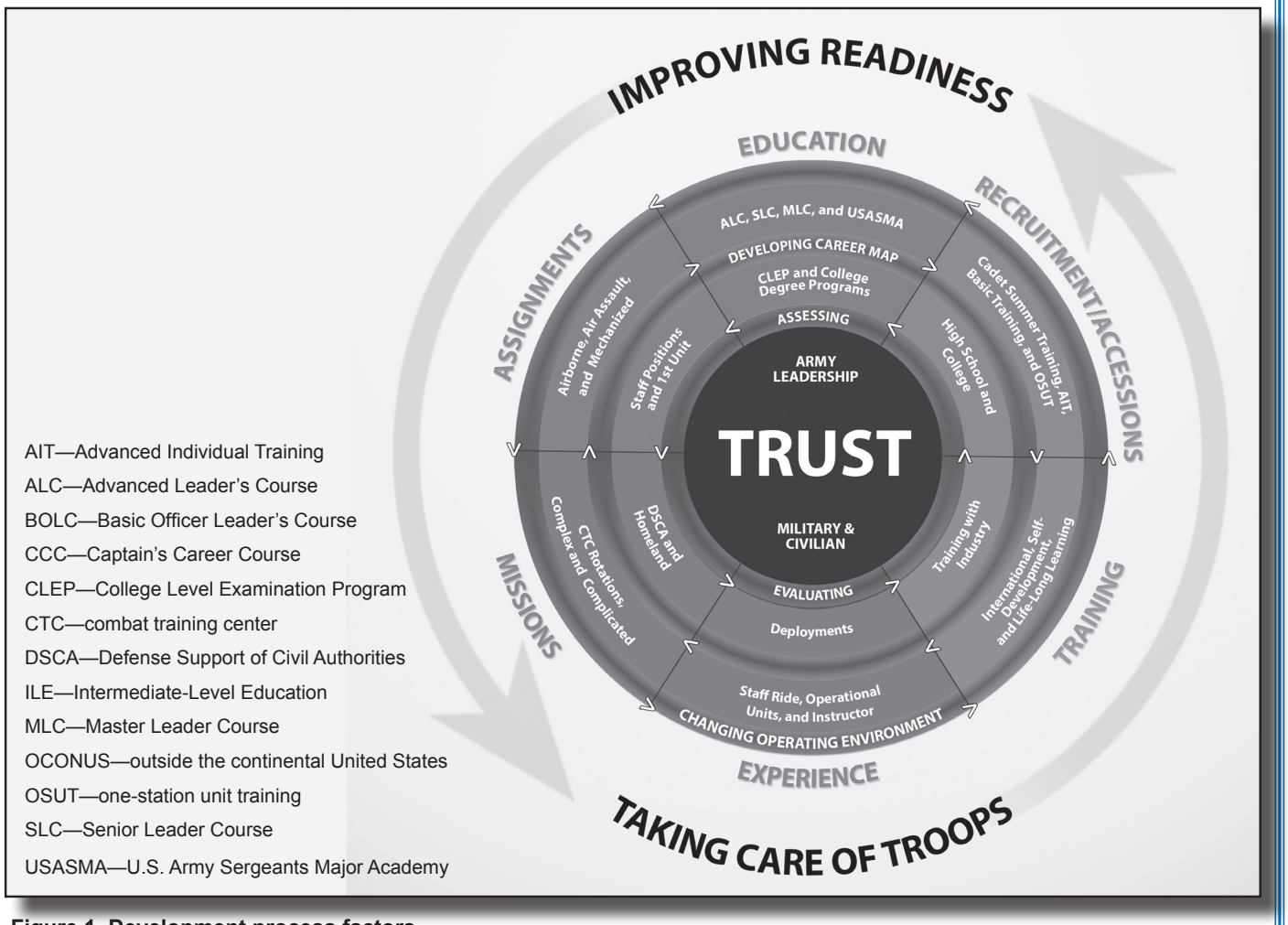


Figure 1. Development process factors

Finally, this is my last message in *Army Chemical Review*. I will report to Fort Knox, Kentucky, this summer to be the command sergeant major of the U.S. Army Cadet Command, replacing Command Sergeant Major Gabriel S. Arnold. I would like to congratulate Command Sergeant Major Arnold on his selection for a U.S. Army Sergeant's Major Academy fellow!

As I depart Fort Leonard Wood as the Chemical Corps Regimental Command Sergeant Major, I hope I have made a positive impact on our Corps and our profession. I have always tried to provide clarity and transparency in all things. I will truly miss the great team here, which often gets little credit for its hard work in posturing the Regiment for a successful future. Without great people on our team, we will never achieve superior results.

For all of you whom I visited in my short 20 months in this position, thank you for your candor and professionalism. I enjoyed the conversations and discussions with you and all of your great CBRN Soldiers. You are the future of the Corps, and it is in great hands. Continue to perform at high levels, and beat our drum to improve CBRN readiness across the Army.

I will see you at the next rally point! I will not be sad because I'm leaving; I will be glad that I was here! Dragon 7, signing off the net.

Endnotes:

[1]Field Manual 6-22, *Leader Development*, 30 June 2015.

[2]"39th Chief of Staff of the Army Initial Message to the Army," *Military Times*, <http://ec.militarytimes.com/static/pdfs/Initial_Message_39th_CSA.pdf>, accessed on 27 April 2016.

Regimental Chief Warrant Officer

Greetings to all Dragon Soldiers around the world.

Army warrant officers have been serving this Nation as expert technicians and quiet professionals for almost 100 years. While other Army branches have enjoyed decades of warrant officer history and lessons learned, chemical, biological, radiological, and nuclear (CBRN) warrant officers have just 5 years of history under their belt. But in those five short years, much history has been made. Nearly every day represents a possible first for Military Occupational Specialty (MOS) 740A. But trust me when I say that those 5 years have been hard fought to get CBRN warrant officers where they are today.



Chief Warrant Officer Two Matthew Chrisman

As our CBRN commanders settle in with the addition of an expert CBRN technician in their formations, new realizations are discovered almost daily; and as the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) works tirelessly to define the role of warrant officers, units in the field have begun to understand the value that professionals with vast experience can bring to an organization. Over these past few years, the warrant officers themselves have also come to realize what roles they should perform. Warrant officers are a tremendous asset in the development of other officers and noncommissioned officers (NCOs). As a commissioned officer and former NCO, the Dragon warrant officer's knowledge base is an untapped resource from which the Chemical Corps has only begun to benefit.

In the past 3 years, USACBRNS has taken enormous strides and made great progress for warrant officers—progress that began with three decisions:

- The first decision was to integrate CBRN warrant officers into CBRN units. The 740A MOS brings a level of focus on core competencies that have atrophied for the past 15 years of counterinsurgency operations.
- The second decision was to make the warrant officer selection process more challenging. Hazmat technician and superior NCO evaluations are now required just to be considered for 740A selection; these requirements have demanded more from the NCOs who seek appointment. To date, the Army has selected 84 highly qualified CBRN NCOs to be CBRN warrant officers.
- The third decision was to take ownership of the warrant officers' professional military education. The first Warrant Officer Basic Course (WOBC) taught by the Army was held in the summer of 2015. And although it was the seventh CBRN WOBC conducted overall, it was the first that provided the level of technical training required by warrant officers for their first assignments in hazard response companies and technical escort teams. And just this past April, 12 students graduated from the Warrant Officer Advanced Course (WOAC). WOAC is designed to develop field grade warrant officers and prepare them for positions on CBRN staffs from battalion through Corps echelons.

These decisions, which differed from the original proposed CBRN warrant officer plan, required that someone champion these efforts and execute them with a high level of devotion. Officers focus on officer development, while NCOs focus on NCO development; therefore, a warrant officer should take care of the professional development of the warrant officer population. Consequently, a fourth decision—the decision to establish a CBRN Regimental Chief Warrant Officer position—was made 14 years ahead of schedule.

For the past 3 years, I have dedicated my time and efforts to these decisions that are now part of our history. This will be my last time to write as your Regimental Chief Warrant Officer. It has been a true honor to serve in this position, but it is now my goal to champion these efforts out in the field. We look to the future as we continue to build our warrant officer cohorts, improve their professional military education, and strengthen the bonds we have created in our Regiment. I wish the next Regimental Chief Warrant Officer all the future success that I experienced in the past.

Elementis regamus proelium!



It Happened One Night: A Toxic Industrial Chemical Escape

By Dr. John R. Kennedy

At any time and at any place in the world where they may be deployed, warfighters face a potent threat. Chemical, biological, radiological, and nuclear (CBRN) Soldiers must be able to cope with this threat. Consider what happened one night in 1984.

A Night of Death and Chaos

Bhopal, India, is a city of 800,000, located 355 miles south of New Delhi. Around midnight on 3–4 December 1984 at the Union Carbide plant in Bhopal, a storage tank of methyl isocyanate (Chemical Abstract Services [CAS] No. 624-83-9) became excessively hot. The pressure in the tank began to rise to dangerous levels; finally, the excessive pressure caused between 40 and 45 metric tons of the toxic industrial chemical (TIC) to spew into the atmosphere. The escaping gas quickly overwhelmed the inadequate and nonfunctional safety systems. A gas cloud formed and extended south and east over the highly populated shanty towns near the plant. It took 2 hours to bring the leak under control.[1, 2, 3, 4]

Survivors have described the catastrophic results. Aziza Sultan recounted, "At about 12:30 a.m., I woke to the sound of my baby coughing badly. In the half-light, I saw that the room was filled with a white cloud. I heard a lot of people shouting. They were shouting 'run, run.' Then I started coughing, with each breath seeming as if I was breathing in fire. My eyes were burning."[5]

Another survivor, Champa Devi Shulka, remembered, "It felt like somebody had filled our bodies up with red chilies; our eyes had tears coming out, [our] noses were watering, [and] we had froth in our mouths. The coughing was so bad that people were writhing in pain. Some people just got up and ran in whatever they were wearing, or even if they were wearing nothing at all. Somebody was running this way, and somebody was running that way; some people were running in their underclothes. People were only concerned as to how they would save their lives, so they just ran." He continued, "Those who fell were not picked up by anybody; they just kept falling and were trampled on by other people. People climbed and scrambled over each other to save their lives—even cows were running . . . crushing people as they ran."[6]

An estimated 200,000 frightened people filled the streets.[7] Many died in the stampedes. Perhaps they were the lucky ones. The most common early effects were vomiting and the sensation of burning in the eyes, nose, and throat. Some of those exposed to the gas vomited uncontrollably and went into convulsions. Numerous people were blinded by the toxic gases. Many lost control of their bodily functions and urinated or defecated. Some pregnant women spontaneously miscarried. The toxic gases caused such massive secretions in some victims that their lungs became clogged with fluids; others suffered spasmodic constriction of the bronchial tubes. Both effects led to death by suffocation.[8]

One of the immediate effects on the populace was chaos. An "every man for himself" attitude prevailed, and there was a breakdown of civil order. People stole vehicles and drove them through the hordes of running victims who were trying to escape. The police headquarters was in total disarray.[9]

According to an account contained in *Five Past Midnight in Bhopal: The Epic Story of the World's Deadliest Industrial Disaster*:

> *Arjun Singh, the chief minister of Madhya Pradesh, radioed in to speak with Police Chief Swaraj Puri.*
>
> *"You must stop people leaving. Put barricades across all roads leading out of the city and make people go back to their homes."*

"Sir," the police chief answered, "How can I stop people leaving when my own policemen have disappeared along with the other fugitives?"[10]

Bhopal's main infirmary, Hamidia Hospital, was overwhelmed—as were the makeshift clinics that sprang up. On the morning of 3 December, 12,000 people tried to receive help at Humidia Hospital; however, the facility could only support the treatment of 750 people. By 5 December, 55,000 had approached Humida Hospital seeking treatment.[11] This dire situation was even worse because of staff shortages; many of the doctors had also been exposed to the gas and were unable to work.[12] Patients filled the hospital and grounds outside. Bodies lay scattered in the wards, corridors, verandas, and approaches. Doctors, nurses, and medical students worked feverishly trying to treat the patients.[13, 14]

Ultimately, hospital staff members were forced to close the registers; there was no way they could record every name with the massive influx of victims. Making matters worse, the doctors had no idea how to treat their patients. Dr. Deepak Gandhe, one of the physicians on duty, realized that the refugees had come from near the Union Carbide plant. He contacted Union Carbide's official physician in Bhopal, Dr. L. S. Loya. It was nearly 2 a.m. on 4 December before he was able to reach Dr. Loya. Dr. Gandhe would later state, "That was the first time I ever heard of the cruel name of methyl isocyanate."[15]

According to an account contained in *Five Past Midnight in Bhopal: The Epic Story of the World's Deadliest Industrial Disaster,* once Dr. Gandhe was able to contact Dr. Loya—

Loya tried to be calming. "It's not a deadly gas; just irritating, like tear gas."

"You are joking! My hospital's overrun with people dying like flies," Gandhe responded.

"Breathing in a strong dose may eventually cause pulmonary edema," Loya admitted.

"What antidote should we administer?" pleaded Gandhe.

The Union Carbide doctor responded, "There is no antidote for this gas."

Apparently, still not overly concerned, Dr. Loya continued, "In any case, there is no need for an antidote. Get your patients to drink a lot, and wash their eyes with compresses steeped in water. Methyl isocyanate has the advantage of being soluble in water."[16]

Thousands of humans lay dead in the streets; thousands of animals were also killed by the gas. As the days passed, the stench of decay arose from the bloated carcasses of the dead (humans, water buffalo, cattle, goats, dogs, and horses). Cholera became an increasing threat as the bodies decomposed in the open air. Rats scurried around the corpses, raising the threat of the bubonic plague. Vultures and dogs feasted on the rotting flesh. The army finally arrived and removed the bodies with cranes.[17] Some of the bloated animal carcasses that were found inside of abandoned dwellings had become so large that doorways and walls had to be broken to remove them. The army officer in charge of the operation stated, "Twenty dumpers and six cranes . . . were detailed to carry out . . . the task of removing 790 buffalo, 270 cows, 483 goats, 90 dogs, and 23 horses" that were strewn throughout the shantytown.[18]

For some, the catastrophe was a golden opportunity. Pillagers arrived with pliers to remove gold teeth from the mouths of the dead. Some stripped the jewelry from women, including the jewels embedded in their noses. Watches, money—anything was fair game for pilferage.[19]

Just as the facilities to care for the injured had been overwhelmed, so too were the facilities for the dead. Hindu tradition calls for cremation with one pyre for one body, but there was not enough firewood for all of the victims. Therefore, the Hindu dead were wrapped in cotton shrouds, covered with flowers, and cremated with as many as five or six on a single pyre. Smoke and flames were sent skyward as huge fires burned all night long.[20]

Muslim rites call for burial with one body for each grave, with the head of the deceased pointing toward Mecca. There was not enough time nor enough gravediggers for this. Graves were dug 15 feet wide and 6 feet long, and 11 bodies were placed in each of the graves. When the gravediggers ran out of burial space, old graves were opened and bones that had been at rest for 100 years were displaced to make room for the newly dead. In the haste to bury the victims, some graves were not dug sufficiently deep. Packs of dogs dug up the graves that were too shallow and devoured the bodies.[21]

This terrible night of human suffering is described in more extensive and graphic detail in Part 3 of the book *Five Past Midnight in Bhopal: The Epic Story of the World's Deadliest Industrial Disaste*r and elsewhere.[22, 23, 24, 25, 26]

As might be expected, there were also long-term consequences of the TIC release. A year later, three or four people were still dying every day as a result of the exposure to the toxic vapors. Hundreds, if not thousands, were partially or totally blind. And there was constant coughing everywhere from those who suffered chronic respiratory damage from the methyl isocyanate exposure. Individuals who had lost most or all of their families were still lying in a stupor, unable to cope with their losses. At least 10,000 people were still receiving care for lung and eye damage. Although thousands of people had received some monetary compensation from the government, many received nothing. Some of those who had suffered financial losses and had been unable to work were ruthlessly exploited by usurers (people who loan money at excessive rates of interest) seeking to take advantage of their plight.[27]

Twenty years after the incident, the people of Bhopal were still feeling the effects. In a report published in 2004, Amnesty International estimated that 100,000 victims were suffering from incident-related debilitating illnesses for which treatment was largely ineffective.[28]

In early December 2004, on the 20th anniversary of the tragedy in Bhopal, an international conference was held at the Indian Institute of Technology in Kanpur, India. During that conference, Dr. S. K. Jain, a senior consultant in pulmonology at Moolchand K. R. Hospital, New Delhi, estimated that about two-thirds of Bhopal's 1984 population of 800,000 suffered health problems as a result of the TIC release. Jain maintained that 4 percent of the population (32,000 people) were severely affected and suffered high morbidity, while another 9 percent of the population (72,000 people) were moderately affected and 50 percent of the population (400,000 people) were mildly affected.[29] The official studies of the long-term health effects of the incident were halted about 10 years after the incident. Jain stated that these studies showed that the health of the victims did not get worse over time; and in particular, there was no evidence that exposure to the gas had any carcinogenic or genetic effects on the survivors.[30] However, these studies have been disputed by many.[31, 32, 33]

The actual number of people killed as the result of the leak in Bhopal is also disputed. Union Carbide accepts the estimate of the government of Madhya Pradesh of 3,800 deaths. A report by the British Broadcasting Corporation, written 20 years after the incident, states that the official death toll was initially 3,000 with 15,000 subsequent deaths.[34] In its report, "Clouds of Injustice: Bhopal Disaster 20 Years On," Amnesty International maintains that between 7,000 and 10,000 people died in the immediate aftermath of the Bhopal incident and that at least another 15,000 people died between 1985 and 2003. This brings the death toll to more than 20,000 people.[35] An article published in *The New York Times* in March 2011 states that the TIC release killed about 15,000 people and sickened about half a million people.[36] An article published by Greenpeace International states that the methyl isocyanate leak has killed 20,000 people in Bhopal since 1984.[37] According to the vast majority of these estimates, far more people were killed by this TIC release than were killed in the 11 September 2001 terrorist attacks on the United States. The Bhopal gas leak is considered to be the most catastrophic industrial accident in history.[38]

The Bhopal incident clearly demonstrates that a TIC release can be as lethal as a deliberate attack employing chemical warfare agents (CWAs). This is remarkable because the TIC release at Bhopal was not especially large (between 40 and 45 metric tons) and the toxicity was far lower than conventional CWAs and less toxic than many other common industrial chemicals.

Although it seems unlikely that another TIC release will be as devastating as the Bhopal incident, one that was only a fraction as devastating would be an event that no one would want to experience. Unfortunately, TIC releases are a reality of modern life and they are far more likely to occur than deliberate CWA attacks. Dragon Soldiers have the responsibility to protect the force against CWA attacks, but they must also be able to defend against TIC releases. To do this, they must be prepared, they must be trained, and they must have the equipment.

Endnotes:

[1]"India's Chemical Tragedy: Death Toll at Bhopal Still Rising," *Chemical and Engineering News*, 10 December 1984, pp. 6–7, <http://pubs.acs.org/doi/abs/10.1021/cen-v062n050.p006>, accessed on 11 April 2016.

[2]Michael Heylin, "Bhopal: A C&EN Special Issue," *Chemical and Engineering News*, 11 February 1985, pp. 14–15, <http://pubs.acs.org/doi/abs/10.1021/cen-v063n006.p014>, accessed on 11 April 2016.

[3]Jean-Francois Tremblay, "Bhopal Today: Health Problems Persist, and the Former Union Carbide Site Has Yet to be Cleaned Up," *Chemical and Engineering News*, 24 January 2005, pp. 28–31, <http://pubs.acs.org/doi/abs/10.1021/cen-v083n004.p028>, accessed on 11 April 2016.

[4]Themistocles D'Silva, *The Black Box of Bhopal: A Closer Look at the World's Industrial Disaster*, Trafford Publishing, Bloomington, Indiana, 2006, pp. 14–15.

[5]"Union Carbide's Disaster," *The Bhopal Medical Appeal*, <http://bhopal.org/what-happened/union-carbides-disaster/>, accessed on 2 May 2016.

[6]Ibid.

[7]Mark Whitaker et al., "It was Like Breathing Fire . . .," *Newsweek*, 17 December 1984, pp. 26–34.

[8]"Bhopal Accident," *Corrosion Doctors*, <http://corrosion-doctors.org/Pollution/bhopal.htm>, accessed on 11 April 2016.

[9]Dominique Lapiere and Javier Moro, *Five Past Midnight in Bhopal: The Epic Story of the World's Deadliest Industrial Disaster*, Hachette Book Group, New York, 1997, p. 309.

[10]Ibid, pp. 228–339.

[11]B. Bowaonder and T. Miyake, "Managing Hazardous Facilities: Lessons from the Bhopal Accident," *Journal of Hazardous Materials*, Volume 19, Issue 3, 1988, pp. 237–269.

[12]Whitaker.

[13]Pico Iyer, "India's Night of Death," *Time*, 17 December 1984, pp. 22–31.

[14]Dean Brelis, "I Thought I Had Seen Everything," *Time*, 17 December 1984, p. 25.

[15]Lapiere, pp. 326–327.

[16]Ibid.

[17]Iyer.

[18]D'Silva.

[19]Ibid.

[20]Ibid.

[21]Brelis.

[22]Lapiere.

[23]Whitaker.

[24]Iyer.

[25]"Clouds of Injustice: Bhopal Disaster 20 Years On," Amnesty International, London, United Kingdom, 29 November 2004, <https://www.amnesty.org/en/documents/ASA20/015/2004/en/>, accessed on 12 April 2016.

[26]"Bhopal Disaster 20 Years Later: A Look at One of the Worst Industrial Disasters in History," *Democracy Now!*,

(continued on page 12)

Successful CBRN Officer Practices

By Major Sean Michael Reilly

During the past 2 years as Europe's senior chemical, biological, radiological, and nuclear (CBRN) observer-coach trainer, I have watched brigade combat teams (BCTs) react to chemical strikes with varying degrees of success. Sometimes the BCT CBRN officers who are training at the Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany, act quickly and guide subordinate units correctly. Other times, BCTs ignore strikes or forget about them in the chaos of the command post.

CBRN noncommissioned officer (NCO) Sergeant First Class Arthur Andrike and I have observed eight CBRN officers during the month-long BCT rotations through JMRC, a U.S. Army training area in southeast Germany that supports U.S. and allied nation forces. There are several indicators of successful brigade CBRN officers with good performances.

CBRN as the Primary Responsibility

When CBRN tasks are the primary responsibility of the CBRN officer, reports to the brigade command post are thoroughly researched. CBRN officers verify those reports and advise units when to don mission-oriented protective posture (MOPP) gear or continue to monitor with the Joint Chemical Agent Detector. CBRN officers also have time to verify numerous false alarms. Reports that are proven false by the CBRN officer and relayed across the BCT help keep the real reports credible. However, this thorough research doesn't occur when the CBRN officer is tasked with other duties.

CDE Inventory

Successful BCT CBRN officers have a chemical defense equipment (CDE) inventory. BCTs at JMRC are often composed of units from different nations or U.S. units attached to the BCT. Communicating with those units before they arrive at JMRC is difficult, and CBRN officers don't know what CDE those units have before arrival. This often leads to trouble because CBRN officers cannot give the commander an accurate assessment of the BCT vulnerability. Successful CBRN officers visit their subordinate battalions early in the reception, staging, onward movement, and integration process and get a basic CDE inventory list of equipment (masks, overgarments, M256 kits, M8 and M9 paper, Joint Chemical Agent Detectors, and equivalent items from North Atlantic Treaty Organization [NATO] partners). Ideally, CBRN officers would have a more comprehensive CDE inventory but, thus far, it's been a struggle for most units just to get an inventory of basic items.

Communication

BCT CBRN officers should stay in contact with battalion CBRN staff. After an initial report of a chemical attack, it is usually difficult for the BCT CBRN officer to get additional information because of the chaos that is typical of command posts. The communication networks are tied up with other traffic. Proficient BCT CBRN officers avoid this by making face-to-face contact with battalion CBRN officers during reception, staging, onward movement, and integration to get to know them; to get important contact information (telephone numbers, e-mail addresses); and then to contact those battalion officers daily to keep the lines of communication open. When an attack occurs, the BCT CBRN officer has a number to call to quickly get pertinent information from a fellow CBRN Soldier. These face-to-face meetings during reception, staging, onward movement, and integration are often skipped, but they make subsequent telephone conversations easier during the exercise.

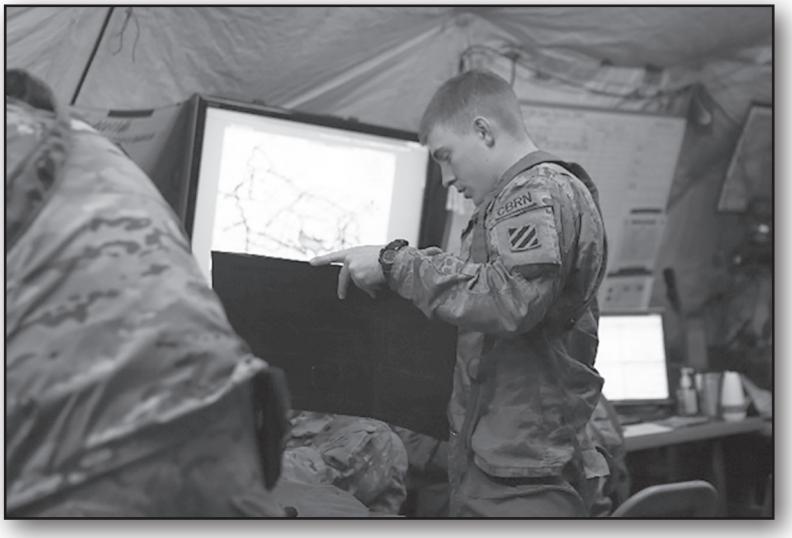
MDMP Participation

BCT CBRN officers should participate in the military decision-making process (MDMP). In some brigades, CBRN issues are not addressed during the MDMP. This is often because the CBRN officer is not present during the MDMP—the brigade operations staff officer or the executive officer has excused him or her to attend to other duties. However, successful CBRN officers find a way to make it to the MDMP. In my opinion, the CBRN officer should work with the brigade intelligence staff officer (S-2) to ensure that the enemy use of chemicals is accurately portrayed in enemy course of action development during intelligence preparation of the battlefield. At a minimum, the CBRN officer is present during war gaming and executes an enemy chemical attack during the course of the battle. This will prompt the brigade to plan for dirty routes and contaminated casualties,

locations for staging CBRN reconnaissance assets, and determinations of the brigade MOPP level before the mission. Again, this is ideally coordinated with the S-2 during the intelligence preparation of the battlefield before the war game.

Coordination

BCT CBRN officers should coordinate with the S-2 and field artillery officer. If enemy CBRN capabilities and intent are briefed differently by the CBRN officer and the S-2, things may appear to be uncoordinated. But this situation is easily avoided with initiative from the CBRN officer. The S-2 has much to do during MDMP, so the BCT CBRN officer should seek out the S-2. The conversation to ensure that those two officers are coordinated can start as simply as, "I think the enemy will use nonpersistent chemical agents right here before it attacks to degrade our command and control and fighting ability. What do you think?" Similarly, since most conventional chemical attacks are performed with indirect fire, it helps if the CBRN officer speaks with the field artillery officer about likely chemical munitions and their ranges.



First Lieutenant Matthew Trail, 1st Brigade, 3d Infantry Division, works in the brigade command post during training at JMRC in November 2015.

TIC and TIM Preparation

A successful BCT CBRN officer is prepared for toxic industrial chemical (TIC) and toxic industrial material (TIM) events. BCT CBRN officers should have the *Emergency Response Guidebook*, which provides safe stand-off distances for TICs and TIMs. The CBRN officer identifies the specific chemical, assesses the situation, and locates the safety distance in the *Emergency Response Guidebook*. He or she relays the pertinent information to the units in the vicinity. The CBRN officer should also inform the BCT of signs and symptoms of TIC exposure and the required first aid measures, which are also presented in the *Emergency Response Guidebook*. Some CBRN officers have provided this information as a TIC fact sheet that is attached as an annex to the BCT daily fragmentary order.

CBRN Ownership

A successful BCT CBRN officer takes ownership of CBRN issues. In a few brigade command posts, if the CBRN officer was absent at the time of a chemical strike, battle captains or others took over the response after a chemical strike occurred. Some got it right, correctly plotting the strike and warning affected units. But sometimes the battle captains forgot about the strike due to the overwhelming command post activity, plotted a wrong wind direction, or failed to look downwind and advise units. With good CBRN officers, this only happens once. They will tactfully tell the battle captains to direct all CBRN reports to the CBRN officer or CBRN NCO, who have the time to research chemical reports and the knowledge to offer the correct advice. If battalions in a BCT have CBRN officers and CBRN NCOs, the brigade CBRN team should let the battalions deal with the strikes, but also monitor results and help the battalions when asked.

Verification of Chemical Strikes

If a chemical strike has not been verified by M256 kits, by the Joint Chemical Agent Detector, or by casualties that are exhibiting signs of chemical agent exposure, a prudent CBRN officer waits to issue guidance. The CBRN officer's credibility will be damaged by a countermand of his or her initial guidance if a chemical strike is proven false. Putting units in MOPP 1 or higher level should only be done after verifying the strike. However, there is one exception: If a unit is immediately downwind of a suspected chemical strike, the BCT CBRN officer should order the unit to don MOPP 4 before verification. Waiting to verify the chemical strike in this situation could get Soldiers killed because a chemical cloud could reach the unit before verification is received. For units farther downwind, the time of arrival and time of stay calculations should be used as shown in Field Manual (FM) 3-11.3, *Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance*. Using these calculations can keep units out of MOPP—at least until the chemical strike can be verified.

Chemical Strike Reports

Successful BCT CBRN officers send out a summary after each chemical strike report. Most chemical strike reports reach the brigade command post on a transverse chat or a radio frequency that all other units are monitoring. Many of these reports are false (it is usually indirect smoke), but no one follows up to confirm that. On the other hand, the CBRN officer is duty-bound to confirm what is real and not real. The CBRN officer needs to put the truth out where it can be seen by subordinate units. This keeps reports credible, and units are clear on what is a danger and what is not a danger. The summaries include details of the chemical strike: strike location, strike time, agent, downwind direction and wind speed, and guidance for units downwind. If the reported chemical strike was false, the summary simply states that

the previously reported chemical strike was false. Ideally, verified chemical strikes should be submitted on a CBRN 2 Report (a report of evaluated data, detailed in NATO Allied Engineering Publication [AEP]-45, *Warning and Reporting and Hazard Prediction of Chemical, Biological, Radiological, and Nuclear Incidents [Reference Manual])*, but few units that I have observed used CBRN reports. Instead, the units send the reports down in the "5 W" (who, what, when, where, and why) format. I don't necessarily consider this a bad practice because Graphic Training Aid (GTA) 03-06-008, *CBRN Warning and Reporting System*, is hard to use and hard to understand, even for a trained Soldier.

Conclusion

BCT CBRN officers are assets to the brigade command post and are often employed in roles other than CBRN roles, but the best CBRN officers that I have observed are dedicated solely to CBRN aspects. This gives them the time to research chemical attack reports, give sound guidance to subordinate units, get accurate CDE inventories, participate in MDMP, and develop and execute a communication plan with subordinate battalions.

References:

AEP-45, *Warning and Reporting and Hazard Prediction of Chemical, Biological, Radiological, and Nuclear Incidents* (*Reference Manual*), 8 January 2015, p. 3-1.

Emergency Response Guidebook, 2012, <http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_7410989F4294AE44A2EBF6A80ADB640BCA8E4200/filename/ERG2012.pdf>, accessed on 7 April 2016.

FM 3-11.3, *Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance*, 2 February 2006.

GTA 03-06-008, *CBRN Warning and Reporting System*, 1 November 2011.

Major Reilly is the senior CBRN observer-coach trainer at JMRC, Hohenfels, Germany. He holds a bachelor's degree in journalism from Temple University, Philadelphia, Pennsylvania, and a master's degree in environmental management from Webster University.



("It Happened One Night: . . . ," continued from page 9)

2 December 2004, <http://www.democracynow.org/2004/12/2/bhopal_disaster_20_years_later_a >, accessed on 12 April 2016.

[27]Wil Lepkowski, "People of India Struggle Toward Appropriate Response to Tragedy," *Chemical and Engineering News*, 11 February 1985, pp. 16–26, <http://pubs.acs.org/doi/abs/10.1021/cen-v063n006.p016>, accessed on 12 April 2016.

[28]"Clouds of Injustice: Bhopal Disaster 20 Years On."

[29]Tremblay.

[30]Ibid.

[31]Nishant Ranjan et al., "Methyl Isocyanate Exposure and Growth Pattern of Adolescents in Bhopal," *Journal of the American Medical Association*, 8 October 2003, pp. 1856–1857.

[32]V. Ramana Dhara, "Assessing Exposure to Toxic Gases in Bhopal," *Journal of the American Medical Association*, 28 January 2004, p. 422.

[33]Daya Varma et al., "Assessing Exposure to Toxic Gases in Bhopal—In Reply," *Journal of the American Medical Association*, 28 January 2004, p. 422.

[34]"Rallies Held Over Bhopal Disaster," British Broadcasting Corporation News, 3 December 2004, <http://news.bbc.co.uk/2/hi/south_asia/4064527.stm>, accessed on 12 April 2016.

[35]"Clouds of Injustice: Bhopal Disaster 20 Years On."

[36]"West Virginia: Bayer Ends Toxic Chemical Production," *The New York Times*, 18 March 2011, p. A17, <http://www.nytimes.com/2011/03/19/us/19brfs-BAYERENDSTOX_BRF.html?ref=Bhopal>, accessed on 12 April 2016.

[37]"Bhopal Disaster," Greenpeace International, Amsterdam, Netherlands, <http://www.greenpeace.org/usa/en/campaigns/toxics/justice-for-bhopal/>, accessed on 7 July 2014.

[38]Alan Taylor, "Bhopal: The World's Worst Industrial Disaster; 30 Years Later," *The Atlantic*, 2 December 2014, <http://www.theatlantic.com/photo/2014/12/bhopal-the-worlds-worst-industrial-disaster-30-years-later/100864/>, accessed on 12 April 2016.

Dr. Kennedy is a physical scientist with the Edgewood Chemical Biological Center, Aberdeen Proving Ground, Maryland. He holds a bachelor of science degree in chemistry from New Mexico State University, Las Cruces; a master of science degree in physical chemistry from Texas Tech University, Lubbock; and a doctor of philosophy degree in physical chemistry from Texas A&M University, College Station. He is a retired U.S. Army Reserve lieutenant colonel and a graduate of the U.S. Army Command and General Staff College and the College of Naval Command and Staff, U.S. Naval War College. Dr. Kennedy is also a member of the Army Acquisition Corps.

Success as a Battalion CBRN Officer

By Captain Robert R. Koorn

As a young lieutenant, being assigned as the battalion chemical, biological, radiological, and nuclear (CBRN) officer for 1st Battalion, 9th Cavalry Regiment, Fort Hood, Texas, was a challenging, but rewarding, assignment. I was the first battalion CBRN officer to be assigned to the unit in the past few years. When I joined, the unit was moving to a new brigade and transforming from an armored reconnaissance squadron to a combined arms battalion. My task was to build a new battalion CBRN program from scratch and prepare it for an upcoming deployment to Korea. During this time, I learned many lessons about how to build and manage a successful CBRN program. The keys to success as a battalion CBRN officer are simple:

- Build and nurture relationships inside and outside the organization.
- Seek out, and excel at, challenging assignments; and continuously strive for self-development.
- Be tactically and technically proficient.
- Conduct low-density training, and create systems to maintain a battalion CBRN program.

Build and Nurture Relationships Inside and Outside the Organization

Most lieutenants fresh out of the Basic Officer Leader's Course are technically proficient, know the latest doctrine, and have the necessary training to complete their jobs. However, they lack "real" Army experience and the tactical savvy expected by maneuver commanders. The best way to bridge this gap is to build and nurture relationships inside and outside the organization. The battalion CBRN officer is responsible for the battalion CBRN program and for advising the commander on CBRN matters. In order to accomplish this, he or she should seek out and build relationships with subordinates, peers, and superiors and seek mentors. The most important relationship is the relationship with the battalion CBRN noncommissioned officer (NCO). Building a strong relationship with the battalion CBRN NCO and recording expectations in writing will pay major dividends while getting a CBRN program up to speed. Having good relationships with the brigade CBRN officer and sister battalion CBRN officers allows for the acquisition of needed training supplies and the consolidation of training and planning for major chemical training events. Building relationships with company command teams, removing roadblocks that might inhibit training, and providing sound CBRN suggestions enhance preplanned training. The battalion training meeting provides a great opportunity for the coordination of training events.

Seek out, and Excel at, Challenging Assignments; and Continuously Strive for Self-Development

A battalion CBRN officer should seek out, and excel at, challenging assignments and continually strive for self-development. Many battalions don't know how CBRN officers should be employed. This can be used as an opportunity for CBRN officers to create their own jobs. A good way to do this is to find the key players in the operations and training section and take on some of their workload—for example, writing the daily fragmentary orders, preparing training meeting slides, preparing command and staff slides, and helping the chain of command with important tasks. The benefit to this strategy is that it quickly helps build relationships with people at the company, battalion, and brigade levels. The CBRN officer becomes a key player in the battalion battle rhythm, marking him or her as somebody who knows what is going on, which may provide an opportunity to directly influence things in the battalion. Excelling at these challenging assignments means that the

(continued on page 15)

Utilizing Off-Post, CBRN-Focused Training Centers

By Captain Melvin Tre Flintroy III

Introduction

The Chemical Corps is in an exciting time of transition as its units reshape to meet the revised Force Design Update for fiscal year 2016. Company level leadership will be challenged to construct better training plans in order to embody the updated warfighting role of the Chemical Corps. To develop mission-capable and deployable chemical, biological, radiological, and nuclear (CBRN) platoons, commanders must seek valuable and cost-effective training opportunities that meet new operational demands. As leaders reevaluate their long-range training calendars, off-post CBRN-focused training centers are one existing commodity that should be better utilized. Off-post training sites are beneficial because they change the conditions, allow Soldiers to be evaluated by technical experts, and are able to be tailored for unique missions or operational environments (train as you fight).

"Off-post training sites are beneficial because they change the conditions, allow Soldiers to be evaluated by technical experts, and are able to be tailored for unique missions or operational environments (train as you fight)."

"Although many U.S. Army Forces Command posts have high-quality training areas and ranges, in my experience, they fall short in meeting the needs of CBRN units."

Change the Conditions

Typically, the first question raised in response to the thesis of this article is: "Why not just improve and take better advantage of on-post training?" This is fair question, especially with the additional costs that are associated with off-post training. In a force in which cutbacks are commonplace, the checkbook often drives decision making. Although many U.S. Army Forces Command posts have high-quality training areas and ranges, in my experience, they fall short in meeting the needs of CBRN units. By the time I arrived at my assignment as a platoon leader in a CBRN company, many of the Soldiers had used the appropriate training areas and ranges at least 10 to 15 times. I believe that familiarity breeds contempt and that allowing complacency in Soldiers (by not continually challenging them with new and innovative training opportunities) is a failure of leadership. So, in preparation for an annual company certification exercise, I researched cost-effective training opportunities and found many that would meet our needs.

Evaluate the Soldiers

CBRN-focused training centers (Center for National Response, Gallagher, West Virginia; Dugway Proving Ground, Dugway, Utah; and CBRN Defense Training Center, Fort Leonard Wood, Missouri) allow company and battalion commanders to assess and evaluate the readiness of their platoons. Leader development should continually be stressed at all levels of operations. By changing the conditions of training, leaders can be evaluated on the operational training domain (institutional and self-development), which is defined in Army Doctrine Publication (ADP) 7-0, *Training Units and Developing Leaders*, as "the training activities organizations undertake while at home station, at maneuver combat training centers, during joint exercises, at mobilization centers, and while operationally deployed."[1] What better way to develop versatile leaders than to send them and their platoons away from the unit footprint with an evaluated or simulated platoon level deployment?

Train As You Will Fight

" 'Train as you will fight' means training under an expected operational environment for the mission [that you are assigned]. This means establishing in training what the unit can expect during operations, to include the culture of an operational environment. Commanders and other leaders replicate cultural settings as much as possible during training, using role players or actual mission partners."[2]

The ability of a platoon leader to train as he or she will fight allows for the development of a versatile leader. Understanding the cradle-to-grave aspect of platoon level deployment is also beneficial for junior officers. Few lieutenants are exposed to unit movement operations. Sending a

lieutenant and his or her platoon away from home station and primarily involving the platoon leadership in the logistics and sustainment planning needed for safely deploying, executing the training, and redeploying demonstrates what can be expected in a real-world mission.

As a platoon leader in 2014, I deployed my dismounted reconnaissance and surveillance platoon to the Center for National Response to prepare for the company Defense CBRN Response Force, U.S. Army North, annual evaluation. We were exposed to new training scenarios, and we were evaluated in Memorial Tunnel by the Center for National Response staff. My platoon was challenged with real-world scenarios ranging from sampling operations and chemical laboratories process identification to patient recovery. I was challenged personally by the requirement of planning the movement operations of personnel and containers. By providing daily logistics and operational update briefings to home station, my company commander tested our reactivity as challenges were provided, adding additional levels of realism to the scenarios.

These are the types of experiences that help young, inexperienced Soldiers understand an operational environment that is unique to the Chemical Corps. CBRN officers are expected to order subordinates into a contaminated environment and manage successful mission execution. If we can duplicate the stressors involved in operating under adverse circumstances in personal protective equipment (that will degrade our abilities), we can truly train as we fight and keep our Corps as relevant as prescribed in the new Force Design Update.

Conclusion

The most rewarding part of deploying my platoon away from the rigors of home station was the camaraderie and *espirt-de-corps* that was developed as we trained hard each day. We became a stronger, close-knit group. With the new Force Design Update and the challenges ahead, company commanders should look for better ways to train Soldiers. Using off-post training sites should be considered because they prepare the platoon for a stand-alone deployment; and if done correctly, leaders can develop teams and build camaraderie. Although off-post training sites cost money up front, the benefit of building the team is well worth the expense.

Endnotes:

[1]ADP 7-0, *Training Units and Developing Leaders*, 23 August 2012, p. 3.

[2]Ibid, p. 6.

Reference:

Center for National Response, Joint Interagency Training and Education Center, <http://www.wv.ngb.army.mil/jitec/cnr%20website/index.html>, accessed on 19 April 2016.

Captain Flintroy is the CBRN officer for the 3d Infantry Division Artillery, Fort Stewart, Georgia. He holds a bachelor's degree from the University of North Carolina and a master's degree in environmental management from Webster University.

("Success as a Battalion CBRN . . . ," continued from page 13)

CBRN officer will be seen as squared-away, and people will take his or her input seriously. In addition, a CBRN officer should set himself or herself apart from peers and strive for self-development by attending air assault school, participating in a spur ride, or qualifying as an expert on a weapon, as examples.

Be Tactically and Technically Proficient

A CBRN officer should be tactically and technically proficient. He or she should be able to communicate in the same language as the maneuver commander. A good way to start is by studying operational terms and graphics. Simply put, words have meaning and a tactically proficient officer is able to select the right words to communicate his or her intent to subordinates, peers, and superiors. While tactical proficiency is important, so is technical proficiency. A CBRN officer must know the unit CBRN capabilities and offer sound recommendations about how to employ those capabilities to achieve the commander's intent. The best way to learn these capabilities is to talk to the battalion CBRN NCO and CBRN specialists (Military Occupational Specialty 74D) assigned to the battalion.

Conduct Low-Density Training, and Create Systems to Maintain a Battalion CBRN Program

Finally, a CBRN officer should conduct low-density training and create systems to maintain a battalion CBRN program. For example, a battalion CBRN inspection program could be established to allow face time with the battalion CBRN NCO and company CBRN NCOs, ensuring that CBRN teams are established, trained, and properly equipped. This should include ensuring that equipment is being calibrated and maintained on schedule and dropped off for maintenance at appropriate times. The benefit of establishing this type of program is twofold. First, it allows CBRN Soldiers to remain proficient with equipment and their craft by practicing monthly. Second, it ensures that the battalion is always mission-ready. In addition to monthly inspections, scheduling and conducting low-density training is imperative. The CBRN NCO should create and execute monthly, low-density CBRN training to keep CBRN Soldiers sharp and ready to perform their wartime mission. It is the battalion CBRN officer's job to remove roadblocks that might inhibit this training.

In short, being a successful battalion CBRN officer boils down to four things. A CBRN officer must build and nurture relationships inside and outside the organization; seek out, and excel at, challenging assignments and continually strive for self-development; be tactically and technically proficient; and conduct low-density training, and create systems to maintain the battalion CBRN program.

Captain Koorn serves as the chief of the Chemical/Biological Section, CBRN Sciences Branch, U.S. Army Medical Department Center and School, Fort Sam Houston, Texas. He holds a bachelor's degree in biology from Rutgers University, New Brunswick, New Jersey.

2D CHEMICAL BATTALION INTRODUCES THE 4.2-INCH CHEMICAL MORTAR

By Mr. Walter J. Eldredge

In June 1943, the 2d Chemical Battalion sailed for the invasion of Sicily, Italy. Its weapon, the 4.2-inch chemical mortar, was shrouded in mystery. It was assumed that it was there in case of chemical warfare, but few understood its employment as a conventional weapon. It fired a shell about the same size as the 105-millimeter howitzer, but with a higher payload at a peak rate of 20 rounds per minute, compared to six rounds per minute for the 105-millimeter howitzer. Although its stated range was 3,200 yards, the actual range was often more than 4,000 yards; furthermore, its rifled barrel yielded an accuracy that was unheard of for mortar fire.

Two years earlier, Major General (then Brigadier General) William N. Porter, Chief of the Chemical Warfare Service, knew that chemical troops could not serve as a deterrent against chemicals by standing idly around the battlefield. He tasked his research and development staff to develop a high-explosive shell for the mortar. Through superb political maneuvering, he obtained funding for six chemical mortar battalions and added a phrase to Field Manual (FM) 100-5, *Operations*: "Chemical troops . . . assist other units of the field forces by firing high explosive."[1] Porter's troops now had a legitimate combat role—at least on paper. But unless combat officers began clamoring for support from chemical mortars by the end of the Sicilian campaign, they would quietly go on the shelf, leaving the United States with no chemical deterrent. And no combined arms officers had trained with chemical mortars, nor did they understand how to fit this mystery weapon into their operations.



A chemical mortar squad training at Fort Bragg, North Carolina, in 1942



A chemical mortar in action in Cassino, Italy, in 1944

The exception was the 45th Infantry Division, to which the 2d Chemical Battalion was attached. Through the efforts of the battalion commander, Lieutenant Colonel Robert W. Breaks, these two units exercised together at Fort Bragg, North Carolina; trained in the Virginia mountains; and made four practice amphibious landings together. No other chemical battalion that invaded Sicily had trained with an infantry unit or had any amphibious experience; they met the units they were to support onboard the ship as they crossed the Atlantic.

Although the invasion landings were scattered, the 2d Chemical Battalion mortar platoons rallied and went into action with nearby troops. They supported attacks, broke up counter attacks, and took out German points of resistance. "There was no book, no experience," said Lieutenant Colonel Breaks. "The weapon had never been used in combat before. Nobody knew how it would perform or how best to use it. That day, we literally fired the first shots ever fired in anger with the 4.2-inch mortar."[2]

Within a few days, members of the 2d Chemical Battalion were racing with the 45th Division, hauling their guns 130 miles in 8 days, directly north across the island of Sicily. They slept on new ground every night for 3 weeks. The 45th Division clearly recognized the value of the chemical

battalion. "We would pass infantry platoons who had fallen out on a break, and guys would get up to help us move a cart over a rough spot," said First Lieutenant Dave Goodell. "They wanted those 'big mortars' up where they were." Goodell called in one famous round that dropped directly into the open turret of a German tank, firmly establishing the 4.2-inch mortar reputation for pinpoint accuracy—"which was pretty funny," said Goodell, "considering it was a pitch-black night and I was firing at the sound of their engine; I never saw the target."[3]

This was the last combat period for the other chemical mortar battalions in Sicily. The 83d Chemical Battalion was tasked to clear western Sicily of resistance, but the Germans had withdrawn their defending units to the east and there were virtually no targets. The 3d Division, unfamiliar with the mortars, released the 3d Chemical Battalion to II Corps reserve, and they were put to work guarding prisoner-of-war camps.



A chemical mortar in action in Calore Valley, Italy, in 1943

Reaching the north coast, the 45th Infantry Division turned east in the famous race for Messina, Italy. Prepared German positions looked directly out on the coastal road; and the shoulders, ravines, and slopes off the road were heavily mined. First Lieutenant Paul J. Eldredge described the action: "When the infantry came up against the next prepared position, our platoon commanders would find gun positions, get an observer with radio or wire communication into a location where he could see the terrain, and prepare ammunition for whatever missions were requested. Sometimes they wanted smoke screens, sometimes high explosive, sometimes both."[4]

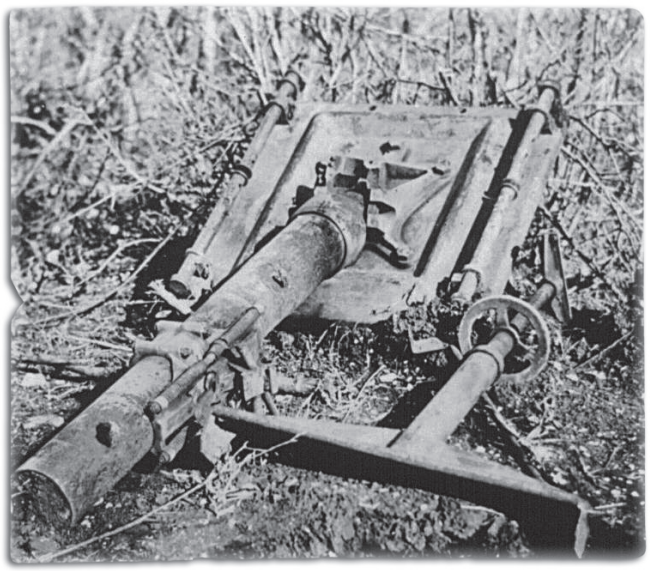
After a week of grinding east, the 45th Infantry Division was pulled out of the line and relieved by 3d Division. On the night of 31 July 1943, the Soldiers in the 2d Chemical Battalion gun positions watched as the Soldiers of the 3d Division moved forward and those of the 45th Division moved back. The next morning, they received orders to move east with the 3d Division; they would not be relieved.

The officers of the 2d Chemical Battalion soon realized how lucky they had been to experience combat with the same infantry units that they had worked with in training. Officers of the 3d Division had no idea about the combat role of the 4.2-inch mortar. The mortar personnel had not even been assigned a radio frequency. Lieutenant Colonel Breaks and the company commanders had their hands full with an on-the-job educational program about the usefulness of 4.2-inch chemical mortars.

The 3d Division had been advancing rapidly, enveloping primarily Italian defenders. On the north coast, Germans occupied steep ridges and deep ravines crossed the single road; this was a recipe for disaster. The lead infantry battalion repeatedly came under observed fire and discovered that its artillery support was too far to the rear, not yet emplaced, or unable to reach the German guns on the reverse slopes. And the commander of the leading battalion repeatedly found a 2d Chemical Battalion officer at his elbow, map in hand, explaining how soon his guns could block German observation with smoke and drop high explosives into their gun emplacements and pillboxes.

On 4 August 1943, the 3d Division prepared to cross the Furiano River and assault a high, rocky feature known as the San Fratello Ridge. The artillery had not yet registered, so the support for the crossing fell entirely to the 2d Chemical Battalion. Two companies fired high explosives at probable gun emplacements, while another company fired smoke to screen observation. Each fired more than 1,000 rounds in barrages, rolling forward with the infantry from a 1,000- to 3,500-yard range. The assault battalions were forced to return past mines, wire, and automatic weapons with interlocked fields of fire on the open bed of the dry river.

On the morning of 6 August, the 2d Chemical Battalion fired smoke during a renewed assault. By this time, the Germans knew the general location of the mortars, and shells were soon striking directly on the gun positions. In one platoon, four of six guns were knocked out. Two companies suffered reduced fire capacity when shells exploded their ammunition supplies. Telephone wire to the observers was repeatedly knocked out, and Soldiers were wounded while splicing the breaks. The assaulting infantry, two battalions of the 15th Infantry Regiment, made it part of the way to the San Fratello Ridge. As the infantry advanced, it got closer to the German observers and the hidden guns and it was unable to advance or withdraw without massive casualties. Midafternoon, the commander of the 15th Infantry summoned Lieutenant Colonel Breaks. The 15th Infantry could survive to withdraw after dark if its positions were quickly shielded by massive amounts of smoke.



A chemical mortar that was destroyed by German artillery in 1944

Lieutenant Colonel Breaks looked at the map and said, "Sir, I can start a screen. But we're firing from known positions, and we're liable to lose the company that fires for us." The infantry colonel said, "We're either going to lose one of your companies, or we're going to lose two of my battalions."[5]

Captain Lowell "Tommy" Thompson volunteered his company (Company D) for the mission. 2d Platoon returned to a position that it had just been forced to leave, with guns stripped to minimum crews. Instead of passing the shells down a line as usual, the Soldiers stayed under cover, with shells prepared to fire; then raced for the guns; fired; and dove back. It was Russian roulette, but it would get the screen started immediately. Soon, 2d Platoon shells were bursting just uphill from where the 15th Infantry was hugging rocks and tree roots. Clouds of thick, white smoke rolled up and blended into an impenetrable shield between them and the probing eyes only a few yards away. Mortar crews raced to and from their shallow holes to adjust the guns and fire the rounds; but within a couple of hours, the position was taking concentrated fire. It was only a matter of time before Soldiers would be dying in their trenches.

Meanwhile, First Lieutenant Eldredge directed 1st Platoon to a new position. It was rocky and uneven and made for lousy emplacement, but it was sheltered behind a low rise. 1st Platoon took over the mission as 2d Platoon, spattered by near misses, went around a small ridge to shelter. Shells fell in searching patterns and cleared the low rise to scream over the heads of the 1st Platoon Soldiers, but they continued the screen until full dark at 2215, when the 15th Infantry crawled back over the river bed.

The 2d Chemical Battalion would never again have to explain the purpose of a 4.2-inch mortar to the 3d Division. General Porter had won his fight to create a combat role for chemical troops. General Lucian K. Truscott, 3d Division commander, issued a formal commendation to the unit for the action at San Fratello Ridge. Within 6 months, General Alfred M. Gruenther, chief of staff of the Fifth Army in Italy, made the public statement that he would not commit a division to combat without a chemical mortar battalion attached. When the U.S. Third Army became operational in France a year later, General George S. Patton ordered, "No infantry division will be committed to combat without a chemical mortar battalion attached. No infantry regiment will be committed without a chemical mortar company attached."[6]

Chemical mortars spread rapidly throughout the Army. In the Pacific, they were often the first heavy weapons on a hostile beach, long before conventional artillery could be set up. They were even fired from landing craft. Plans for the invasion of Japan called for no less than 32 chemical mortar battalions—more than the number of infantry divisions.

Epilogue: *The M2A1 4.2-inch mortar was standardized in 1947 as the heavy support weapon for the U.S. Army and U.S. Marine Corps. The M30 model of the 4.2-inch mortar was fielded in 1952. It was designed with a circular base plate for 360-degree traverse and a range of 6,000 yards. Some M2A1s continued in service through the Korean War. In Vietnam, the standard infantry heavy weapons company carried 4.2-inch mortars mounted on mobile tracked vehicles. In 1990, the Army phased out the 4.2-inch mortar and replaced it with a 120-millimeter mortar of Israeli design. The replacement was gradual, and the M30 model of the 4.2-inch mortar was still an active weapon as late as 1998.*

Endnotes:

[1]Lieutenant Colonel Graydon C. Essman, Letter to Commanding General, Army Ground Forces, War Department, Washington, D.C., for Chief, Chemical Warfare Service, National Archives and Records Administration, Record Group 407, 22 January 1943.

[2]Walter J. Eldredge, *Finding My Father's War: A Baby Boomer and the 2nd Chemical Mortar Battalion in World War II*, 23 June 2004, <www.dragonscribe.com>, accessed on 22 March 2016.

[3]Ibid.

[4]Ibid.

[5]Robert W. Breaks, "My Men Had Guts," *Chemical Warfare Service Bulletin*, Volume 30, February–March 1944.

[6]George S. Patton, Headquarters Third Army, "Letter of Instruction No. 2," Section 11.b(13), 3 August 1944.

References:

FM 100-5, *Operations*, 22 May 1941. This publication is obsolete.

William S. Hutchinson Jr., "Use of the 4.2-Inch Mortar in the Invasion of Sicily," *Chemical Warfare Service Bulletin*, October 1943.

Mr. Eldredge is the historian for the U.S. Army 2d Chemical Battalion, his father's unit in World War II. He holds a bachelor's degree in mechanical engineering from the Massachusetts Institute of Technology.

Maintaining CBRN Readiness in the Republic of Korea

By Captain Henry D. Hannible and Captain Maxmilian Seo

Anyone who has been stationed in Korea can tell stories about the fast operational tempo and high turnover rate. Being stationed in Korea for a few years and having served in various positions and at different duty stations, we have first-hand knowledge of these challenges.

According to a recent article in *Army Chemical Review*, the turnover rate of the 23d Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Battalion, Camp Stanley, Korea, was 50 percent over 6 months.[1] This is a trend for all units stationed on the Korean peninsula—not just chemical, biological, radiological, and nuclear (CBRN) units. The turnover rate, combined with the 12-month tour lengths of unaccompanied Soldiers, has devastating effects on unit readiness and operational tempo. Let's follow a typical example: A Soldier arrives in Korea and takes 30 days to in-process, unpack, learn about the area, and get settled in; at Month 6 or 7, the Soldier takes 30 days of leave; and at Month 11, he or she begins to out-process and clear the installation. That leaves the unit with only 9 months of useful service.

Additionally, imagine the administrative workload for processing monthly and quarterly counseling, leave forms, awards, and noncommissioned officer and officer evaluation reports for 50 percent of the unit personnel every 6 months. Furthermore, there are unique theater level training exercises (Key Resolve, Ulchi Freedom Guardian, Focused Passage, and Courageous Channel) in Korea every year. The 2d Infantry Division has additional division level exercises (including Warpath II and Warpath III) throughout the year. All of these factors increase the operational tempo and limit the unit ability to focus on the mission and train on mission-essential tasks.

As we ponder this problem, we look to our combat arms brethren to see how they deal with the same issues. Maybe they're onto something with their 9-month brigade combat team (BCT) rotations. But how does it work?

In fiscal year 2014, BCTs began rotating into Korea for 9-month deployments. 1st Battalion, 12th Cavalry Regiment, was the first, followed by 3d Brigade Combat Team, 1st Cavalry Division. Since the units ***deploy*** to Korea, they go through the same vigorous training leading up to deployments in Iraq or Afghanistan. All crews arrive fully qualified on their vehicles and weapon systems, alleviating the need to conduct gunneries while deployed. Requirements for administrative processing are significantly reduced since Soldiers are technically still with the same unit until the 36-month tour of duty is complete. Instead of permanently assigning Soldiers to Korea, and enduring the challenges that go with a permanent change of station, Soldiers and crews are already trained and ready to "Fight Tonight" as soon as they hit the ground. We can apply this same principle to CBRN units.

CBRN units (like the 23d CBRNE Battalion) could and would benefit from 9-month deployments to Korea. Stryker crews would arrive qualified; reconnaissance and surveillance platoons would arrive trained and certified; and all Army Regulation 350-1, *Army Training and Leader Development*, and other mandatory training would

(continued on page 23)

What Do You Report? NATO or U.S.?

By Captain Nikki D. Martinez

Given the increased awareness and international emphasis on global chemical, biological, radiological, and nuclear (CBRN) threats and the recognition of the devastating consequences related to these incidents, U.S. CBRN doctrinal language and reports should mirror North Atlantic Treaty Organization (NATO) CBRN language in order to reduce friction and misunderstandings during international CBRN responses. U.S. forces have been regionally aligned with combatant commanders responsible for responding to global CBRN emergencies. When the staffs of these commanders use U.S. CBRN doctrine, they do not have the correct tools necessary to effectively communicate with their NATO counterparts.

Synchronization Issues

The synchronization of U.S. and NATO reporting systems and terminology would reduce the amount of time required to coordinate efforts in CBRN situations. The easiest doctrine to synchronize would be regarding nuclear, biological, and chemical (NBC) (U.S. Army) and CBRN (NATO) reporting procedures. (See Table 1.)

The U.S. and NATO reporting systems are essentially the same, but the U.S. system uses slightly different verbiage than the NATO system. Understanding and properly using NBC and CBRN reports is vital for all commanders when responding to an international incident. Per Allied Tactical Publication (ATP)-3.8.1, *CBRN Defence on Operations*, "NATO and national CBRN message standardization is needed to ensure speed of transmission and correct interpretation of CBRN information during operations, thus enabling multinational and bilateral cooperation."[1] NBC report naming conventions and processes are already so similar to CBRN conventions and processes that there is little reason for not integrating NATO terminology into U.S. terminology.

Even more worrisome than the lack of report standardization is the lack of uniformity in the confirmation of agent terms that are used during survey and sample missions. If commanders do not fully understand initial-entry team reports, they may take improper force protection measures or send responders downrange in improper personal protective equipment (PPE). (See Table 2, page 22.)

The terminology used by survey and sample teams when conveying their analyses leaves room for error in interpretation. If an incident commander misunderstands the level of confirmation of a hazard, he or she may miss a critical window for approving prophylaxis or, conversely, begin an overly aggressive program of treatment, which risks the unnecessary reduction of emergency supplies (especially where there are limited vaccines or treatment supplies available in-theater). Terminology also affects the level of certainty of a command team in releasing information to the public through nongovernmental agencies or the media.

Confusion in Naming Conventions

The quick establishment of the capabilities and limitations of U.S. and NATO CBRN elements during an emergency response is hindered by confusing U.S. unit naming conventions. The disconnection in naming conventions may cause a U.S. or NATO commander to lose time in identifying resources or to misuse a unit.

A serious nuclear incident of the future would surely warrant international cooperation, like that experienced during the response to the Fukushima reactor meltdown in Japan. The rapid identification of the capabilities inherent in nuclear response teams (NRTs) (U.S. Army) versus Functional Area 52 (nuclear and counterproliferation) personnel (U.S. Army) versus the sampling and identification of radiological agents (SIRA) (NATO) will be important for response commanders, many of whom may not be versed in U.S. Army doctrine.[2] Understanding the capabilities and decontamination requirements of each unit is a critical concern, as evidenced when facing serious radiological contamination of ships, helicopters, and planes during the global response to the incident in Japan.

On a more immediate level, almost all international CBRN response forces will employ survey and sample teams. However, based on U.S. doctrine and naming conventions, it is unlikely that incident commanders in an international response will be able to rapidly identify the assets that they have in-theater. Since much of the technical U.S. Army CBRN training falls under Foreign Disclosure 3 classification (so that it is not releasable to students from foreign countries), our allies are not likely to understand the functionality of some of our teams. This confusion may be alleviated by renaming some of our U.S. Army teams. For example, the technical escort CBRN response team (U.S. Army) could be renamed using the equivalent international classification of sampling and identification of biological, chemical, and radiological agent (SIBCRA) team. Although some particular skills and equipment are specific to the U.S.

Report Flow	U.S. NBC Reports[1]	NATO CBRN Reports[2, 3]
Lower to higher	NBC1. Observer's Report. Provides basic data for the CBRN attack.	CBRN 1. Observer's Report. Provides basic data.
Higher to lower	NBC2. Passes evaluated data from collected NBC1 reports.	CBRN 2. Passes evaluated data from collected CBRN 1 reports.
Higher to lower	NBC3. Provides immediate warning of predicted contamination and hazard areas.	CBRN 3. Provides immediate warning of predicted CBRN contamination and hazard areas. This report can be used primarily to inform units without an organic CBRN W&R capability about a CBRN incident.
Lower to higher	NBC4. Reports detection data, monitoring, and survey results. This report is used if an attack is not observed and the first indication of the contamination is by detection.	CBRN 4. Reports detection data, CBRN monitoring, and survey results. This report is used— • If an incident is not observed and the first indication of CBRN contamination is by detection. • To report measured CBRN contamination as a part of a survey or monitoring activity.
Higher to lower	NBC5. Reports information about actual contamination. This report can also include areas of possible contamination, but only if the actual contamination coordinates are also included in the report.	CBRN 5. Reports information about areas of actual CBRN contamination. This report can also include areas of possible CBRN contamination, but only if actual CBRN contamination coordinates are included in the report.
	NBC6. (Optional) Reports detailed information about CBRN events	CBRN 6. Reports detailed information about CBRN incidents.
Lower and higher (CBRN staff level analysis)	CBRN reports (CBRNWRS). Uses a standard format and line items to shorten the message. The CBRNWRS is based on a code letter system. Each type of NBC report is comprised of a sequence of lines and has a unique identifier.	CBRN SITREP. Provides a summary of CBRN activity relating to possible or actual CBRN incidents, including "what if" and planning scenarios. The report is to be forwarded by CBRN staffs, as necessary, to commanders and staffs at whatever levels are not specifically involved with CBRN to inform them of the general CBRN situation and activities.
Note 1: From FM 3-11.3, *Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance*. ***Note 2:*** From ATP-3.8.1, *CBRN Defence on Operations*. ***Note 3:*** From ATP-45, *Warning and Reporting and Hazard Prediction of Chemical, Biological, Radiological, and Nuclear Incidents*.		
Legend: ATP—allied tactical publication CBRN—chemical, biological, radiological, and nuclear CBRNWRS—Chemical, Biological, Radiological, and Nuclear Warning and Reporting System FM—field manual NATO—North Atlantic Treaty Organization NBC—nuclear, biological, and chemical SITREP—situational report W&R—warning and reporting		

Table 1. NBC reports (U.S. Army) versus CBRN reports (NATO)

teams, renaming the teams clarifies the general scope of capabilities for NATO incident commanders. Although NATO doctrine accounts for a wide range of equipment; tactics, techniques, and procedures; and specific capabilities within individual nations, it functions best when similar resources are named according to international standards.

Recommendations and Conclusion

Some recommendations include—

- Standardizing CBRN reporting procedures according to NATO doctrine.
- Standardizing U.S. and NATO levels of confirmation.
- Standardizing naming conventions for CBRN teams to international standards (SIRA or SIBCRA) as applicable to their general capabilities.
- Adding a block of instruction at the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) to address the critical differences between U.S. and NATO CBRN doctrine.

Conclusion

In the future, there will be international CBRN responses in which U.S. forces will need to rapidly integrate with our

Uunited States (Levels of Confirmation)[1]	NATO (Levels of Confirmation)[2]
Presumptive The employment of technologies with limited specificity and sensitivity by general-purpose forces in a field environment to determine the presence of a CBRN hazard with a low level of confidence and the degree of certainty necessary to support immediate tactical decisions. Obtained using commonly fielded devices/materials/technologies available to general-purpose forces to indicate/warn of the possible presence of a CBRN/target substance	**Provisional** One of the following criteria has been met: • The presence of a unique antigen for the biological agent in question is demonstrated by a positive reaction with a specific antibody in an immunoassay test. • The presence of a unique nucleic acid sequence for the biological agent in question is demonstrated by a positive reaction with a specific nucleic acid probe (gene probe) in a genetic-based assay. • A positive response is indicated by in vitro culture or multimetabolic assays.
Field Confirmatory The employment of technologies with increased specificity and sensitivity by technical forces in a field environment to identify CBRN hazards with a moderate level of confidence and the degree of certainty necessary to support follow-on tactical decisions. Obtained using fielded devices/materials/technologies that are available to specially trained personnel and units in a field environment. Includes collection and analyses of samples to substantiate the presence and type of a CBRN/target substance at a given area/location. Field confirmatory identification can be used to prove (or disprove) previous presumptive results. Results in higher confidence levels to support tactical decisions regarding avoidance, protection, and decontamination measures and immediate treatment.	**Confirmed** Any two of the three criteria for provisional identification have been met in the presence of authentic reference standards (positive and negative controls) under identical experimental conditions.
Theater Validation The employment of multiple, independent, established protocols and technologies by scientific experts in the controlled environment of a fixed or mobile/transportable laboratory to characterize a CBRN hazard with a high level of confidence and the degree of certainty necessary to support operational-level decisions. Using accepted QA measures, quantifies the CBRN sample. Provides additional critical information to support timely and effective decisions regarding avoidance, protection, and decontamination measures and medical prophylaxis and treatment for affected units and personnel. Can also support preliminary attribution to implicate or support trace analytics for the source of the identified CBRN material.	**Unambiguous** Can only be provided by national reference and forensic laboratories.
Definitive The employment of multiple, state-of-the-art, independent, established protocols and technologies by scientific experts in a nationally recognized laboratory to determine the unambiguous identity of a CBRN hazard with the highest level of confidence and degree of certainty necessary to support strategic-level decisions. Supports attribution to implicate or point to the source of the identified material. Uses the highest-level QA measures.	(No fourth level)
Note 1: From Army Techniques Publication 3-11.37, *Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Reconnaissance and Surveillance.* ***Note 2:*** From AEP-66, *NATO Handbook for Sampling and Identification of Biological, Chemical, and Radiological Agents (SIBCRA).*	
Legend: AEP—allied engineering publication CBRN—chemical, biological, radiological, and nuclear NATO—North Atlantic Treaty Organization QA—quality assurance	

Table 2. Terms used to designate levels of confirmation of CBRN hazards

NATO allies. This is inevitable. These collaborations will take place in response to accidentally occurring events or deliberate CBRN attacks. U.S. doctrine has recently undergone a massive overhaul to facilitate better joint forces communication when addressing CBRN threats: Now we need to take a hard look at how best to integrate NATO standards into our joint doctrine and CBRN training. We owe this to our CBRN Soldiers so that they can quickly, efficiently, and properly advise commanders about how to best assist our international partners in correctly leveraging capabilities, identifying hazards, and saving lives.

Editor's Note: According to Mrs. Sharon M. McCann, Deputy Chief, CBRN Doctrine, Capabilities Development Integration Directorate, U.S. Army Maneuver Support Center of Excellence, Technical Manual 3-11.32, *Multi-Service Reference for CBRN Warning and Reporting and Hazard Prediction Procedures*, will correct the disparity between NATO terminology and U.S. forces in CBRN messages. This technical manual will be published by the end of the year.

Endnotes:

[1]ATP-3.8.1, *CBRN Defence on Operations*, Volume 1, 14 January 2010.

[2]Allied Engineering Publication (AEP)-49, *NATO Handbook for Sampling and Identification of Radiological Agents (SIRA)*, Volume 1, 1 July 2006.

References:

AEP-66, *NATO Handbook for Sampling and Identification of Biological, Chemical, and Radiological Agents (SIBCRA)*, 15 April 2015.

AJP-3.8, *Allied Joint Doctrine for Chemical, Biological, Radiological, and Nuclear Defence*, 30 March 2012.

Army Techniques Publication 3-11.37, *Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Reconnaissance and Surveillance*, 25 March 2013.

ATP-45, *Warning and Reporting and Hazard Prediction of Chemical, Biological, Radiological, and Nuclear Incidents (Operators Manual)*, 23 January 2014.

Field Manual 3-11.3, *Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance*, 2 February 2006.

Captain Martinez is a small-group instructor for the CBRN Basic Officer Leader Course at the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), Fort Leonard Wood, Missouri. Her previous assignment was a reconnaissance platoon leader and executive officer, 173d Special Troops Battalion (Airborne), Bamberg, Germany.

("Maintaining CBRN Readiness . . . ," continued from page 19)

be complete.[2] Vehicles, weapons, and CBRN technical equipment would stay in Korea, and administrative processing would be completed at home station. This would enhance CBRN readiness in Korea; units would be ready to fight and focus on mission objectives upon arrival.

In addition to administrative processing, medical processing would also be accomplished at home station before and after deployment. The time that it takes to prepare and routinely maintain unit medical readiness while in Korea has an inverse impact on the unit's ability to remain fully qualified on CBRN tasks. Units that are scheduled to deploy on a 9-month rotation to Korea would complete full medical processing before leaving the United States. Upon arrival in Korea, the unit would go through a 1- to 2-day medical in-processing. When the rotation is close to completion, the unit would go through a 1- to 2-day medical out-processing in Korea to medically clear the unit for redeployment.

To summarize, the practice of 9-month rotations has been in effect for some time and is a success in terms of mission readiness and relative combat power. Although this is common practice for maneuver elements, it has yet to be realized by CBRN units. By adapting the same idea, CBRN units would be able to spend more time on their true wartime mission set and less time on administrative or non-CBRN-related tasks. Lastly, this overarching concept would benefit main deploying units and units that are organic to the Korean fighting force.

Endnotes:

[1]Denise R. Little and Rogelio A. Pineda, "The 23d CBRNE Battalion: How We Train and Sustain," *Army Chemical Review*, Summer 2015, p. 14.

[2]Army Regulation 350-1, *Army Training and Leader Development*, 19 August 2014.

Captain Hannible is the brigade CBRN officer for the 35th Air Defense Artillery Brigade, 2d Infantry Division, Republic of Korea. At the time this article was written, he was a student in the CBRN Captain's Career Course at Fort Leonard Wood, Missouri. He holds a bachelor's degree in aeronautical science from Embry–Riddle Aeronautical University, Daytona Beach, Florida, and a master's degree in education from American InterContinental University, Hoffman Estates, Illinois.

Captain Seo is the brigade CBRN officer for the 1st Combat Aviation Brigade, 1st Infantry Division, Fort Riley, Kansas. At the time the article was written, he was a student in the CBRN Captain's Career Course at Fort Leonard Wood, Missouri. He holds a bachelor's degree in computer science from the University of Maryland, Baltimore County.

Finding CBRN Training Opportunities Abroad

By Master Sergeant Christopher C. Lemley

So what do you do when you are a deployed chemical, biological, radiological, and nuclear (CBRN) Soldier and you want to keep up with your CBRN skills? If you are Specialist Nicholas Groves of Company F, 1-168th Air Traffic Control Squadron (ATS) of the Arizona National Guard, you find a way to incorporate your skill set into the mission at hand. His unit, which is continuously involved in aviation operations throughout the region, took some time out to become engulfed in CBRN defensive operations. Considering that his full-time assignment primarily dealt with flight operations, he was a long way from his CBRN roots. That didn't stop Specialist Groves from coming up with a plan to conduct an exercise that would test the unit ability to perform CBRN functions. Getting this approved by a ground unit was a long shot, and it was an even longer shot when pitching the idea to the commander of a full-time aviation unit deployed and engaged in 24-hour-a-day operations. However, Groves was determined to train the unit on how to properly decontaminate a CH-47 Chinook helicopter. Crazy? Not if you are a hard-charging, 21-year old specialist who loves his craft.



Soldiers from 1-168th ATS decontaminate a CH-47 Chinook helicopter during a training exercise.

Specialist Groves almost missed his calling to become a Dragon Soldier. He was initially steered toward Military Occupational Specialty 11B, infantryman, but his recruiter encouraged him to pursue becoming a 74D, CBRN specialist. He signed the paperwork and began his journey to become a Dragon Soldier. His enlistment began in 2012, when he attended basic training at Fort Leonard Wood, Missouri. He then began advanced individual training at the 84th Chemical Battalion, where he built the foundation for his future ideas. After advanced individual training, Groves was assigned to Company F, 1-168th ATS, where he learned that most units that aren't part of the Chemical Branch typically don't give CBRN issues a second thought. He spent the next few months refining the CBRN room, which is the primary location for the storage and maintenance of CBRN equipment, and honing the skills that would ultimately land him a role in assisting the battalion in improving CBRN procedures. He was instrumental in passing a number of important external evaluations conducted by the U.S. Army Forces Command and the Air Traffic Services Command. Riding this wave of success, he started thinking about the next evolution of CBRN training for the unit.

"When I first found out that I was going to be a part of a company that coordinates with aircraft, my first thought was how cool it would be to decontaminate an aircraft," said Groves. Thus began his 3-year escapade to get that exercise approved. Groves asked about decontaminating an aircraft while stateside, but "They looked at me like I was crazy," said Groves. "Now that I'm in Kuwait, [the leadership said] . . . why not?" notes Groves. Fast-forward to 9 February 2016—the day of his long-awaited exercise. After several



Soldiers from 1-168th ATS decontaminate a CH-47 Chinook helicopter during a training exercise.

weeks of training, with the support of the 366th Chemical Company, Fort Stewart, Georgia, the unit participated in the culminating event of an exercise in decontaminating a CH-47 Chinook helicopter.

The decontamination process was completed in four distinct phases. Phase 1 consisted of Soldiers simulating the cutting and removal of fabrics and other non-mission-essential materials and equipment from the aircraft, followed by the decontamination of the internal equipment using the M295 decontamination kit. Phase 2 consisted of the gross decontamination of the exterior using the M12 decontamination pump. Gross decontamination refers to a quick, "down and dirty" removal of any loose contaminants that don't need much attention or can be easily removed. Phase 3 consisted of a more robust technical decontamination using brushes and mops, specifically focusing on any hard-to-reach places or areas that needed special attention in order to release more stubborn or caked-on contaminants. Phase 4 consisted of another gross decontamination using the M12 decontamination pump to remove leftover residue.

Specialist Groves led the unit through three iterations of the decontamination process, placing unit members in a variety of decontamination positions so that they could become familiar with all aspects of the process. Meanwhile, on another part of the facility, members of the 366th Chemical Company were initiating a different phase of the operation—site surveying and biological detection. Unit members set up the operation with Stryker vehicles just off the airbase and then split into two groups. The first group focused on ensuring that the base was safe by conducting a site survey and characterization to confirm there was no CBRN threat. This is an important part of the operation; it verifies that any area the unit occupies has been properly cleared and marked for contamination. The second group focused on conducting biological air sampling of the surrounding area—a precaution that certifies that the air in the surrounding area is safe for the occupying troops.

Upon completion of the exercise, the Soldiers experienced a rare treat. U.S. Army Training and Doctrine Command Command Sergeant Major Scott C. Schroeder, who was present to witness the exercise, took time out to thank the participants for their diligence, dedication, and dedicated service. He handed out coins of excellence to some of the Soldiers whom he believed deserved special recognition. Following this, Specialist Groves, the 366th Chemical Company leadership, and Command Sergeant Major Schroeder revisited small portions of the Chinook decontamination exercise, where they were presented with small blocks of instruction explaining the how and why of decontamination, during which Command Sergeant Major Schroeder was an active participant in hands-on exercises. Overall, the exercise seemed to be a great success and hopefully the start of bigger things to come for units in regard to CBRN training. "It was a great opportunity to improve Soldier readiness in an ever-changing, ever-evolving environment where CBRN threats are real, as well as being able to conduct a multiunit exercise with companies that have entirely different mission functions," remarked Groves. So no matter where you are, or what type of unit you are assigned to, you can find meaningful CBRN training if you are competent, committed, and persistent.



Command Sergeant Major Schroeder provides feedback to Soldiers from 1-168th ATS following the CBRN exercise.

Master Sergeant Lemley is the U.S. Army National Guard noncommissioned officer for the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USCBRNS). He holds a bachelor's degree in general studies with a minor in business from Columbia College, Columbia, Missouri.

Three Meters

By Captain Ian P. Sandall

Three meters is not a long distance. We walk farther than that to change the channel on the television or to turn on a light switch. While 3 meters seems like almost nothing, something as small as that can drastically alter your career path in the Army. How you define your path as a chemical, biological, radiological, and nuclear (CBRN) Soldier can help you prepare for small variables that may throw your plans off track.

The 3-meter factor has followed me throughout my career. The first time it affected me was during Combat Water Survival Training at Officer Candidate School. One of the requirements is to swim 15 meters while in uniform and holding a rifle. Never a strong swimmer, I quickly realized that the extra weight of my uniform and the rifle made the task more difficult. When I was approximately 3 meters from the end of the pool, my exhaustion caught up with me and I began to sink. I panicked and quickly reached for the side of the pool. I was immediately disqualified on that portion of the event; and it cost me 10 points on the officer candidate point scale, which is used to determine the order in which officer candidates are allowed to choose a career branch. The following month, when career branches were selected, the Soldier ahead of me selected the last available air defense artillery slot—the career branch that I had planned to select. If I had earned those 10 points from the swimming test, I would have been ahead of that Soldier. So instead, I chose the Chemical Branch, which turned out to be a good career choice.

After graduating from the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) at Fort Leonard Wood, Missouri, I attended U.S. Army Airborne School at Fort Benning, Georgia. The 3-meter factor was waiting for me there too. The drop zone at the Airborne School is a massive field of soft, tilled earth with a small, hard-packed dirt road running through it. On my second jump, I let too much air out of my parachute and came down too fast. In that massive drop zone of soft earth, I managed to land hard on the road and I fractured my spine. If I had landed 3 meters in another direction, I would have missed the road and saved my back. Because of my injury, I dropped out of Airborne School and, without my airborne wings, I was reassigned from Fort Bragg, North Carolina, to Fort Riley, Kansas. Thus, I experienced yet another major career change due to that 3-meter factor.

While these events represented major changes to my life plans, they did not alter my overall career path. Early in my career, I established three methods to help stay on track without excessive stress or burnout:

- **Keep your plans broad.** As a CBRN Soldier, there are numerous paths that can be taken, but certain milestones must be met. As a noncommissioned officer, squad leader and platoon sergeant positions are stepping stones to first sergeant or sergeant major promotions. As a lieutenant, staff, platoon leader, and executive officer experience serve as stepping stones to promotion. As a captain, company command experience is a stepping stone. The more milestones met, the better chance a CBRN Soldier has of achieving his or her goals in the future. Focus on those milestones to reach your long-term goals. Planning your career path in so much detail that there is no room for change if you are thrown off course may lead to disappointment. Not everyone can be a jumpmaster or serve in the mounted color guard. Seek opportunities to achieve the major milestones, and let the rest fall into place as opportunities arise.
- **Actively seek opportunities.** Very rarely do good jobs simply fall into someone's lap. They are the result of working hard and seeking opportunities. If a platoon sergeant is leaving, communicate your interest in the position. If a platoon leader position opens, find out how to interview for the position. If you are a captain, let your commander know that you are interested in company command and prove that you are the right person for the job. You may not get the squad, platoon, or company that you want, but you are hitting a milestone and gaining valuable knowledge and experience that will help throughout your career.
- **Be flexible.** Adaptation is part of being a Soldier. Adjust to major changes in your plans, and have a backup plan or two. You may hope to serve in a technical escort company or work at Aberdeen Proving Ground, Maryland; but because career paths are often based on opportunity, plan for alternate paths. Be ready to completely change direction if your original plan is not working or if a new opportunity presents itself.

The Chemical Corps has the largest choice of career paths of all the branches of the Army. While most CBRN Soldiers start out with aspirations of holding the perfect job, it's important to understand that something as small as 3 meters can drastically change one's goals. Most of us will likely discover a "dream job" of which we had no knowledge or desire to perform when we started; a chance meeting with a general at a social function can lead to an aide-de-camp position, a review of an updated Officer or Enlisted Record Brief can lead to a job at the White House, or an assignment announcing a ceremony for a battalion can lead to a job with the 3d Infantry Regiment (The Old Guard). Keep your plans broad, but hit your milestones, actively seek out opportunities, and be flexible. You will find happiness and be successful in your Army career.

Captain Sandall is the brigade CBRN officer for 2d Infantry Division Artillery, Joint Base Lewis-McChord, Washington. He holds a bachelor's degree in media art and animation from the Art Institute of Pittsburg, Pennsylvania.

A Double-Eagle Day for the Chemical Corps

On 5 February 2016, members of the U.S. Army Chemical Corps gathered in the Joint Staff Flag Room at the Pentagon for a special dual-promotion ceremony. Major General Peggy C. Combs presided over the promotion of the husband-and-wife team of John D. and Connie R. Shank to colonel. Major General Combs enthusiastically opened her comments by saying, "Welcome . . . it is a happy and historic hour for our Regiment and our Army. This [is] a first—the promotion of a husband and wife to colonel in our small, but mighty Regiment." She went on to say that she "couldn't be more thrilled to be asked to preside over the ceremony." Major General Combs thanked the Shanks' children "for your service and sacrifice as you have supported your mom and dad in service." Other attendees at the ceremony included Lieutenant General Thomas W. Spoehr; Major General Leslie C. Smith; Mr. Bernard E. Johnson; Brigadier General William E. King; Brigadier General Michael E. Bobeck; and many other Chemical Corps officers, retired officers, and Department of the Army civilians who work in the National Capital Region.



Major General Peggy C. Combs, Colonel John D. Shank, and Colonel Connie R. Shank at the Shanks' promotion ceremony

John and Connie Shank have worked directly for and with Major General Combs during the course of their careers and have served the Chemical Corps and our Nation for more than 52 years—26 years each. In 1992, as a second lieutenant, Connie first worked for then Captain Combs in Hawaii. From 2004 to 2005, John worked with then Lieutenant Colonel Combs while stationed at the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), Fort Leonard Wood, Missouri. John again worked directly for then Colonel Combs from 2010 to 2011, when they were assigned to the Army Staff G-8, Washington, D.C. From 2011 to 2012, John and Connie worked with then Brigadier General Combs while assigned to the Headquarters, U.S. Army Cadet Command, Fort Knox, Kentucky.

In his promotion ceremony remarks, Colonel John Shank said that "It has been an honor to serve our Army as a Chemical officer." John talked about how the Chemical Corps is a Family and that it was gratifying to look out at the audience and see so many friends that he and Connie had worked for and with over the course of the last 26 years.

Colonel Connie Shank said that it was an honor to be able to continue to serve in the Army as a colonel and that her Family had always served our country. Connie told the audience that she was initially notified of her selection for promotion when her Family was touring the Statue of Liberty. She said that the Statue of Liberty represented opportunity for many immigrants and that it symbolizes how she was given the opportunity to continue to serve and defend our country. Connie commented on how her Family continued to support her throughout her career as a Soldier for life. Connie has served the Chemical Corps in the Army National Guard, Regular Army, and U.S. Army Reserve in Individual Mobilization Augmentee and Troop Program Unit assignments. As a Reservist, Connie has served at USACBRNS, at combatant command and Army staff levels, and in her current assignment in the 76th Operational Response Command, Salt Lake City, Utah.

The Devaluation of CBRN Capabilities at the Brigade Level



By First Lieutenant Matthew A. Engel

The armored brigade combat team (ABCT) is designed to be self-sustaining. All enablers are organic to the brigade to allow the combined arms battalions to engage with and destroy the enemy. The ABCT consists of three combined arms battalions, a cavalry squadron, a field artillery battalion, a brigade support battalion, and a brigade engineer battalion (BEB). The BEB consists of two engineer companies; a signal company; a military intelligence company; and a headquarters and headquarters company that contains a mounted chemical, biological, radiological, and nuclear (CBRN) reconnaissance platoon. In addition to the mounted CBRN reconnaissance platoon, each battalion is authorized (according to the modified table of organization and equipment [MTOE]) CBRN personnel to serve as advisors to the battalion commander. Although each ABCT has a mounted chemical reconnaissance platoon and each battalion has a CBRN cell, CBRN elements have been cut to the point of being ineffective. Due to limited numbers and additional duties, CBRN personnel cannot conduct the required training to protect the almost 5,000 ABCT Soldiers from CBRN threats.

The major CBRN asset available to the ABCT commander is the mounted CBRN reconnaissance platoon in the BEB. This platoon is capable of conducting one reconnaissance mission at a time. A Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV) has a complex sensor suite that is mounted on a Stryker chassis. The sensor suite consists of chemical, biological, and radiological sensors; a meteorological sensor; and a network that ties all of the sensors together. To be qualified to operate the NBCRV, CBRN Soldiers must earn the Additional Skill Identifier L6. To become L6-qualified, CBRN Soldiers attend the 6-week CBRN Reconnaissance for Brigade Combat Teams Course, Fort Leonard Wood, Missouri. Since NBCRVs are mounted on Strykers, the CBRN platoon requires a Stryker chassis mechanic, a separate mechanic to maintain the sensors, and a civilian field service representative. The Army allocates disproportionate resources to maintain the NBCRVs—with the justification that the mounted CBRN reconnaissance platoon provides the ABCT commander with an internal capability to detect and mark the limits of CBRN contamination, thus enabling the ABCT to maintain freedom of maneuver in a chemically contaminated environment.

The CBRN platoon is assigned to an engineer company commander in an engineer battalion with no CBRN officer on staff. A CBRN sergeant first class is assigned to the intelligence section; but with the exception of the platoon leader and platoon sergeant, there are no additional CBRN experts to advise the battalion staff. CBRN training is planned during quarterly training conferences, but rarely carried out once the quarter begins. The lack of training is not malicious; however, the CBRN platoon is the one area where the Headquarters and Headquarters Company commander is willing to absorb the risk associated with a lack of training. According to the observer-coach trainers at the National Training Center (NTC), Fort Irwin, California, this is a problem across the Army. The NBCRVs are often used as gun trucks because commanders do not know how to employ the CBRN asset.

In addition to the one CBRN platoon in the BEB, each combined arms battalion, cavalry squadron, and field artillery battalion are assigned one CBRN officer, one CBRN noncommissioned officer, and three CBRN specialists. The brigade support battalion and BEB are assigned a CBRN sergeant first class. The MTOE was designed in this way to

provide battalion commanders with a CBRN subject matter expert to advise them, plot chemical downwind hazards, and organize decontamination assets following attacks. The noncommissioned officer and CBRN specialists assist the CBRN officer with training and organizing decontamination efforts. The CBRN specialist's job is to ensure that each battalion and squadron can perform operational decontamination after a persistent chemical attack. In addition to maintaining the decontamination equipment for the battalion, they train and direct non-CBRN Soldiers on the operation of the decontamination equipment used during decontamination operations.

". . . maneuver commanders and operations officers often consider CBRN cells to be manpower for additional duties. CBRN subject matter experts are assigned additional duties, while CBRN training is left unaccomplished."

However, maneuver commanders and operations officers often consider CBRN cells to be manpower for additional duties. CBRN subject matter experts are assigned additional duties, while CBRN training is left unaccomplished. Despite Army Regulation (AR) 350-1, *Army Training and Leader Development*, requirements to conduct certain CBRN tasks annually, the training is "pencil-whipped" to allow time for higher-priority training and to ensure that the focus is not diverted from the additional duties of CBRN personnel. Even training in coordination with other events is often cancelled because it is seen as a nuisance. Another issue that handicaps the CBRN cell is a lack of organic personnel to operate decontamination equipment. Therefore, additional non-CBRN Soldiers are needed for decontamination teams—but company commanders don't always support training for decontamination teams.

In garrison, there are no real consequences for the failure to conduct CBRN training. But this lack of training can be disastrous in decisive-action rotations or while deployed. During NTC 15-06, a combined arms battalion suffered the consequences of the lack of decontamination operations training.

Despite several chemical strikes against coalition forces during the rotation, the CBRN reconnaissance platoon was never launched to confirm or deny contamination. Instead, the CBRN platoon remained at the battalion tactical operations center to maintain primary sectors of fire authorized in the defense plan. Following a nonpersistent chemical attack that the CBRN reconnaissance platoon failed to reconnoiter, the combined arms battalion was unable to conduct decontamination operations. Due to other assigned tasks in the battalion tactical operations center, the CBRN cell failed to prepare the decontamination equipment before the attack. Once the attack occurred, it was too late. The decontamination equipment and water required for decontamination operations were gathered, but the CBRN cell was unable to coordinate movement to the decontamination site. Even if the combined arms battalion could have delivered the decontamination assets to the decontamination site, there were no trained Soldiers in any of the companies to provide a decontamination team; the Soldiers had not received the required on-site training.

Meanwhile, Soldiers remained contaminated for several hours until a suspension of battlefield effects enabled them to remove the Mission-Oriented Protective Posture (MOPP) 4 gear. At NTC, this failure is a significant event for those Soldiers in MOPP 4. But in a real-life scenario, the company would be removed from the fight until it was decontaminated, the evacuation of casualties would not be possible until the gross contamination was removed, and Soldiers' lives would be in danger.

To remedy the lack of CBRN capabilities at brigades and battalions, a CBRN company should be added to the BEBs. A CBRN company is an all-inclusive package of CBRN assets that would enable the ABCT to fight and win on a CBRN-contaminated battlefield. A CBRN company consists of one mounted CBRN reconnaissance platoon, one dismounted reconnaissance platoon, an equipment decontamination platoon, and a personnel decontamination platoon.

The mounted CBRN reconnaissance platoon in the CBRN companies is twice as large as the BEB reconnaissance platoon and can conduct two reconnaissance missions at a time, doubling the brigade commander's capabilities. The dismounted reconnaissance platoon would allow the ABCT commander to conduct site exploitation and detect toxic industrial chemicals and materials. Both of these dismounted capabilities are currently lacking in the ABCT. The decontamination platoon would provide the brigade with the ability to conduct technical decontamination, which is a step beyond what each battalion CBRN cell can perform without outside support from a CBRN company.

In addition to more robust reconnaissance and decontamination capabilities, having a company commander in charge of CBRN operations would ensure that CBRN training were completed and assets were allocated correctly. By adding a CBRN company to the MTOE, CBRN tasks would move from the hands of maneuver commanders into the hands of subject matter experts. A commander who ensured that CBRN training and maintenance occurred would also enable the brigade to fight and win in a CBRN-contaminated environment. The alternative is an ABCT that is removed from the fight by chemical munitions, while many of America's best are left at risk in the process.

Reference:

AR 350-1, *Army Training and Leader Development*, 19 August 2014.

First Lieutenant Engel is the liaison officer to the U.S. Army Forces Central Command, 2d ABCT, 82d BEB. He holds a bachelor's degree in history from the University of Oklahoma.

CBRN COURSE PROVIDES FIRST-RESPONDER BASICS

By Mr. Stephen L. Standifird

Three students fully encapsulated in blue personal protective suits approach an overturned rail car. Their detection equipment audibly beeps, indicating a contaminant is in the area. Between heavy breaths on their self-contained breathing apparatus, the team relays the situation to the command center.

This site reconnaissance was one of the steps required of students during the field training exercise portion of the 2-week Chemical, Biological, Radiological, and Nuclear (CBRN) Responder Course at the First Lieutenant Joseph Terry CBRN Responder Training Facility.



CBRN Responder Course students examine a potential hazard.

Students attending this course are taught the basic skills required to respond to a weapons of mass destruction incident. The course includes training and familiarization on personal protective equipment; emergency response in-transit procedures; planning and preparing for domestic reconnaissance operations; fundamentals of toxic industrial chemicals and materials; sampling and collection procedures; and procedures to set up, process through, and close out a survey team decontamination site.

After successful course completion, the students earn certification from the National Fire Protection Association in the areas of hazmat operations and hazmat technician. "These certifications can take a long time to get, and we do it in 2 weeks," said the supervisory instructor. He added that there are multiple performance evaluations and written tests, all of which are difficult.

A student agreed that it was a tough course, but rewarding overall. "Just the awareness with this course is beneficial," said the Arkansas National Guard Soldier. "This course provides the operational and technical aspects of [CBRN] response. [The instructors] have taught us exactly what we need to know and how to do it well," he added. The course helps students gain knowledge about incident sites so that they can direct others on how to proceed.

The supervisory instructor and his staff typically train 24 students in each of the 20 classes offered annually. The course is open to all federal agencies and Services. International students have also attended. "Most of the students come through because these are skills they need for their job," the supervisory instructor said. U.S. Air Force students who graduate are typically in emergency management occupations, while Soldiers and Marines take this class as part of their CBRN military occupational specialty training, he added.

Another student remarked that the information she is learning will pay off for her unit as soon as she graduates. "At the base, I am in charge of running the chemical response program," she said. "I make sure all of our instruments for CBRN response are working and are up to specifications."

Mr. Standifird is the assistant editor of the GUIDON at the Public Affairs Office, Fort Leonard Wood, Missouri.

The Order of the Dragon

By Specialist Marissa C. Blunt



In the Army, awards are given to Soldiers who perform in an outstanding manner. These Soldiers exhibit something that sets them apart from their peers. Almost every branch has its own prestigious awards. The Order of the Dragon Program for the Dragon Soldiers of the Chemical Corps is made up of three awards: the Ancient Order, the Honorable Order, and the Carol Ann Watson Spouse Award. The awards are given by the Chemical Corps Regimental Association (CCRA) to recognize chemical, biological, radiological, and nuclear (CBRN) Soldiers and their spouses. The awardees show integrity, exemplary service to the Corps, and an outstanding level of job proficiency. They are a substantial asset to the Chemical Corps over the course of their careers. CBRN Soldiers who earn this award must meet specific criteria.

To be eligible for the Ancient Order of the Dragon award, a Soldier must—

- Be a lifetime member of the CCRA.
- Be a member of the U.S. Armed forces, have served (retired or honorably discharged) the U.S Armed forces, or have provided service to the Chemical Corps or enhanced CBRN readiness for the majority of his or her career.
- Complete more than 20 years of service to the Chemical Corps or the CBRN readiness mission and the CCRA.
- Maintain the highest standards of personal conduct throughout his or her career.

To be eligible for the Honorable Order of the Dragon award, a Soldier must—

- Be a lifetime member of the CCRA.
- Be a member of the U.S. Armed forces or Department of Defense, have served (retired or honorably discharged) the U.S Armed forces or the Department of Defense, or have provided service to the Chemical Corps or enhanced CBRN readiness for the majority of his or her career.
- Complete more than 5 years of service to the Chemical Corps or the CBRN readiness mission and the CCRA.
- Possess qualities that set him or her apart from peers.
- Be a graduate of the CBRN Senior Leader's Course or the CBRN Captain's Career Course (CBRN Soldiers only).
- Maintain the highest standards of personal conduct throughout his or her career.
- Be eligible for favorable military actions (military personnel only).

To be eligible for the Carol Ann Watson Spouse Award, the nominated individual must—

- Have voluntarily provided significant contributions and support to the Chemical Corps, a CBRN unit, CBRN Families, or the CBRN community.
- Possess qualities that set the individual apart from other spouses or peers.
- Not be a previous Carol Ann Watson Spouse Award recipient.

Once approved for the Order of the Dragon Program, the awardee is presented with the award and a medallion in a suitable ceremony. For more information on the Order of the Dragon Program and how to nominate an individual, visit <http://ccrassn.org/dragon.htm>.

How to Wear: For military awardees and male civilians, the Order of the Dragon medallion is worn with the ribbon around the neck, outside the shirt collar, and inside the coat collar. The medallion hangs at the full length of the ribbon with the dragon facing outwards. When the four-in-hand tie is worn (male civilians), the medallion hangs over the tie. For female civilians, the award can be worn around the neck (hanging at the full length of the ribbon) or as a broach, as appropriate for the specific gown or dress. The Carol Ann Watson Award is designed to be worn as a ribbon or as a broach. The medallion may be worn at any official Army, Service, or Department of Defense event or occasion or other specific event or occasion approved by the Chief of Chemical.

Specialist Blunt is the multimedia illustrator for the Personnel Development Office, U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS), Fort Leonard Wood, Missouri.

The Challenge of Doctrine

By Mrs. Sharon M. McCann

While attending the Basic Noncommissioned Officer Course and reading a duffle bag full of publications, I found errors and wondered about the writers: "Can't they do a spell check? Who even checks these things?" Of course, now I know. I am walking the proverbial mile in the doctrine developer's shoes and beginning to understand the challenge of doctrine. I will not go into a dissertation about the woes of being a doctrine developer. Suffice it to say that while doctrine seems slow and unresponsive to the current operating environment from the outside viewpoint, there is a lot going on behind the scenes.

When I was in my first dual-purpose platoon at Fort Campbell, Kentucky, neither generators nor electronics were taken to the field. If you needed something to pass the time, the platoon sergeant had a foot locker of doctrine publications for you to read. But now I know chemical, biological, radiological, and nuclear (CBRN) Soldiers who do not read doctrine and others who are frustrated by changes in doctrine. The purpose of doctrine is to provide guiding principles that stand the test of time. But operations change so quickly that doctrine may seem out of date. Conversely, some CBRN Soldiers find the doctrine changes frustrating (including changes in terminology, such as the change from command and control to mission command and the change in the definition of military leadership).

What do 21st century Soldiers expect and need from doctrine? Do they expect it to be as responsive as their electronics? Do they expect it to be like Wikipedia? Do they expect it to be enduring?

Some principles of doctrine will not change. For example, there will continue to be no direct references to equipment, as references to specific pieces of equipment do not stand the test of time. Although equipment changes, the principles that govern the conduct of operations should not.

One hallmark of modern operations is change. Rather than explaining how to conduct a decontamination operation, the new CBRN passive defense manual will provide considerations and techniques. But more importantly, it will provide guidance on how to understand CBRN hazards, what to plan for, and how to protect troops. The absence of specific details allows leader flexibility. Because every situation is unique, leaders are required to understand the situation, have the skills to find the best solution given the body of knowledge available, understand the proven principles (doctrine), and know about the available resources. Of course, this means that Soldiers need to read and be familiar with these proven principles.

And those who apply doctrine to training and execution and want to have their input heard have the chance to become contributors. In addition to the time-honored doctrine development process, the U.S. Army Training and Doctrine Command has adopted milWiki—a doctrine wiki that allows users to collaborate and comment on draft doctrine documents online—and incorporate it into milSuite. The milSuite Army Doctrine Web portal is available at <https://www.milsuite.mil/wiki/Portal:Army_Doctrine>; a common access card is required. Insight from contributors in the field can be considered by doctrine developers and incorporated into future doctrine revisions.

Collaboration is critical for successful doctrine. We cannot know what users in the field expect out of doctrine if our doctrine team does not receive their feedback. The operating force is the best source for understanding the impact of doctrine changes. We challenge all Dragon Soldiers to become instrumental partners in the development and revision of CBRN doctrine. Every profession develops a unique body of knowledge to support the conduct of operations. The body of knowledge for the CBRN profession is doctrine, and contributions are key to mission accomplishment. Our challenge to you is this: The next time you read a doctrine publication, ask yourself if it supports the needs for the conduct of a task, mission, or operation. If not, please provide feedback on what is wrong and a recommendation about how to correct it. We value your operational experience, and your feedback is critical in ensuring that the body of knowledge is relevant.

You can recommend changes with a Department of the Army (DA) Form 2028, *Recommended Changes to Publications and Blank Forms*. The DA Form 2028 can be submitted via e-mail at <usarmy.leonardwood.mscoe.mbx.cdidcodddcbrndoc@mail.mil>. You can also contribute to doctrine and create and participate in discussions on the CBRN community page found on milBook using the milSuite link provided above.

Reference:

DA Form 2028, *Recommended Changes to Publications and Blank Forms*, September 2015.

Mrs. McCann is the Deputy Chief, CBRN Doctrine Branch, Maneuver Support Center of Excellence, Fort Leonard Wood, Missouri. She retired from the U.S. Army as a first sergeant. She holds a bachelor's degree in homeland security and emergency management from Ashford University, San Diego, California.

DOCTRINE UPDATE

U.S. Army Maneuver Support Center of Excellence
Capabilities Development Integration Directorate
Concepts, Organization, and Doctrine Development Division

Number	Title	Date	Status
Joint Publications			
The U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) is not the proponent for joint publications (JPs). However, the Chemical, Biological, Radiological, and Nuclear (CBRN) Doctrine Branch; Concepts, Organization, and Doctrine Development Division; Capabilities Development Integration Directorate; U.S. Army Maneuver Support Center of Excellence, is often a key stakeholder and sometimes the lead agent for a JP. Five JPs affect the development or revision of tactical-level CBRN publications.			
JP 3-11	*Operations in Chemical, Biological, Radiological, and Nuclear (CBRN) Environments*	4 Oct 13	Current.
JP 3-11 is based on a new definition of the CBRN environment as "an operational environment that includes CBRN threats and hazards and their potential resulting effects." Rather than dwelling on post-event hazards that require reactions, the focus is on pre-event threats and hazards that allow proactive measures. JP 3-11 also includes information about the new, validated, and approved concepts of hazard awareness, understanding, and contamination mitigation.			
JP 3-27	*Homeland Defense*	29 Jul 13	Current. A request for feedback (RFF) was initiated to assess JP 3-27 for any necessary changes. The RFF ended November 2015, pending the final report.
JP 3-27 provides information across the range of military operations (including interorganizational coordination, planning, and mission command) that is required to defeat external threats to, and aggression against, the homeland—or other threats—as directed by the President. JP 3-27 covers the federal and state interagency coordination of roles that are unique to homeland defense and then refers to JP 3-08, *Interorganizational Coordination During Joint Operations*, for more detailed guidance. JP 3-27 also addresses the dual roles of the Army National Guard in federal and state chains of command and explains how those roles affect homeland defense.			
JP 3-28	*Civil Support*	31 Jul 13	Current.
JP 3-28 provides overarching guidelines and principles to assist commanders and staffs in planning, conducting, and assessing defense support of civil authorities (DSCA). It introduces the principle of civilian agencies being in charge of domestic operations that receive military support. It also discusses the unique command relationships and coordinating processes to be used when operating in DSCA capacity. Finally, JP 3-28 discusses selected aspects of supporting and sustaining the joint force during these specific types of operations.			
JP 3-40	*Countering Weapons of Mass Destruction*	31 Oct 14	Current.
JP 3-40 provides a framework focused on a series of strategic approaches. Countering weapons of mass destruction (WMD) lines of effort are to prevent acquisition, contain and reduce threats, and respond to crises. These lines of effort are supported by the *prepare* strategic enabler. Sections describing the Countering Terrorism Campaign and explaining how countering WMD relates to DSCA have also been added. JP 3-40 continues to focus on "left of boom" (dissuade, deter, disrupt) proactive measures.			
JP 3-41	*Chemical, Biological, Radiological, and Nuclear Consequence Management*	21 Jun 12	Current. Will be updated in the near future according to a formal assessment report that recommends a change rather than a full revision.
JP 3-41 now focuses only on CBRN. It includes a new framework for CBRN response, elevates consequence management to a federal government level of effort, and aligns joint doctrine with the Department of Defense (DOD) contribution to consequence management. This publication introduces three subsets of consequence management (domestic, foreign, and DOD-led CBRN) and discusses the roles and responsibilities of the subsets and the differences between them. JP 3-41 also introduces the DOD chemical, biological, radiological, and nuclear response enterprise (CRE), an integrated Regular Army and Reserve Component approach to CBRN response. When directed by the Secretary of Defense and the state governor, the DOD CRE conducts CBRN response operations in support of civil authorities responding to CBRN incidents within the United States and its territories to save lives and minimize human suffering.[1, 2]			
Multi-Service Publications			
The USACBRNS is the U.S. Army proponent and lead agent for eight tactical-level, multi-Service publications. Seven of the publications are sponsored by the Joint Requirements Office for CBRN Defense (J-8), Joint Chiefs of Staff.			
FM 3-11 MCWP 3-37.1 NWP 3-11 AFTTP 3-2.42	*Multi-Service Doctrine for Chemical, Biological, Radiological, and Nuclear Operations*	1 Jul 11	Current. Will be revised in the near future due to the publishing of the *Department of Defense Strategy for Countering Weapons of Mass Destruction* and the Army's white paper on "Countering Weapons of Mass Destruction." The revision timeline will be based on guidance from the Joint Requirements Office and a decision from all four Services.
Field Manual (FM) 3-11 is the only field manual for which the USACBRNS is the lead agent. It focuses on combating WMD, discusses the strategic pillars and tactical objectives, and translates the military mission areas into eight tactical tasks. This represents a huge paradigm shift for the CBRN community. Our focus moves toward the more proactive role of conducting or supporting active defense, interdiction operations, offensive operations, and elimination operations and away from the reactive role of passive defense (including avoidance, protection, and decontamination).			

Number	Title	Date	Status
ATP 3-11.23 MCWP 3-37.7 NTTP 3-11.35 AFTTP 3-2.71	*Multi-Service Tactics, Techniques, and Procedures for Weapons of Mass Destruction Elimination Operations*	1 Nov 13	Current.
Army Techniques Publication (ATP) 3-11.23. The WMD–elimination isolation activity is the seam that links the battle handover from a conventional CBRN force conducting the assessment task to the technical CBRN force conducting exploitation and destruction tasks. ATP 3-11.23 educates the reader on performing the entire process from cradle (reconnoitering) to grave (monitoring and redirecting) and on planning, preparing, executing, and assessing considerations throughout.			
ATP 3-11.32 MCWP 3-37.2 NTTP 3-11.37 AFTTP 3-2.46	*Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Passive Defense*	TBD	Under development. Will combine, revise, and supersede FM 3-11.3, FM 3-11.4, and FM 3-11.5. Will be published 3d quarter, fiscal year (FY) 2016.
ATP 3-11.32 will contain information for conducting operations; performing tactics, techniques, and procedures (TTP); and understanding how to carry out CBRN passive defense. A complementary technical manual (TM) (TM 3-11.42/MCWP 3-37.2A/NTRP 3-11.25/AFTTP 3-2.56) will be published in 2016. It will contain reference material for CBRN warning, reporting, and hazard prediction procedures.			
ATP 3-11.36 MCRP 3-37B NTTP 3-11.34 AFTTP 3-2.70	*Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Aspects of Command and Control*	1 Nov 13	Under revision. The name will change to *Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Planning*.
ATP 3-11.36 includes the doctrinal employment of CBRN capabilities (organizations, personnel, technology, and information) to characterize CBRN threats and hazards, including toxic industrial materials, for the commander and the force. This manual also incorporates the joint doctrine elements for countering WMD. It is designed to provide operational- and tactical-level commanders and staffs with capability employment planning data and considerations to shape military operations involving CBRN threats and hazards and operations in CBRN environments.			
ATP 3-11.37 MCWP 3-37.4 NTTP 3-11.29 AFTTP 3-2.44	*Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Reconnaissance and Surveillance*	25 Mar 13	Current.
ATP 3-11.37 establishes forms, modes, and methods of (and tasks for) CBRN reconnaissance and surveillance. It also establishes four new CBRN hazard identification levels that have been accepted by combatant commanders and the medical community for environmental samples and clinical specimens. These hazard identification levels allow the conventional force to provide the commander with sample identification at higher levels of confidence. This, in turn, allows the commander to make timely, higher-level decisions that enhance force protection, improve mission accomplishment, and result in resource savings. It establishes a sample management process and educates Soldiers on the protocols of the process, from sample collection through transfer. Finally, it instructs Soldiers on dismounted reconnaissance operations in urban environments.			
ATP 3-11.41 MCRP 3-37.2C NTTP 3-11.24 AFTTP(I) 3-2.37	*Multi-Service Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Consequence Management Operations*	30 Jul 15	Current.
ATP 3-11.41 provides commanders, staffs, key agencies, and military members with a key reference for planning and conducting CBRN consequence management. This publication provides a reference for planning, resourcing, and executing CBRN consequence management in support of domestic or foreign agencies responding to a CBRN incident. The principal audience for this multi-Service publication is CBRN responders who plan and conduct CBRN consequence management operations in domestic, foreign, or theater operational environments, to include military installations.			
ATP 3-11.46 AFTTP 3-2.81	*Weapons of Mass Destruction–Civil Support Team Operations*	20 May 14	Current. Change 1, dated 6 April 2015, corrects the code under which the WMD–civil support teams (CSTs) teams serve depending on their duty status.
ATP 3-11.46 serves as the foundation for WMD-CST doctrine. It focuses on the organization, mission, mission command, and operations of WMD-CSTs, which are full-time Army National Guard units designed to provide the specialized capability necessary to respond to intentional and unintentional incidents and natural and man-made disasters. The WMD-CST, a component of the CRE, provides direct support to local, tribal, state, and federal emergency responders, including fire, police, and emergency medical service personnel. Unless federalized under Title 10, U.S. Code (10 USC), *Armed Forces*, WMD-CSTs operate in 32 USC, *National Guard*, status within the United States and its territories and possessions. Responding under the authority of the state governor, WMD-CSTs assist agencies that may be overwhelmed or may require specific technical capabilities which are not otherwise readily available.			

Number	Title	Date	Status
ATP 3-11.47 AFTTP 3-2.79	*Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives Enhanced Response Force Package (CERFP) and Homeland Response Force (HRF) Operations*	26 Apr 13	Current.
ATP 3-11.47 contains detailed tactical doctrine and TTP and sets the foundation for the tactical employment of the CERFP and HRF. The CERFP and HRF can be pre-positioned, or they can respond to an incident using existing organic transportation and Army National Guard/Air National Guard units that are in 32 USC status. These units are trained and equipped to integrate under the National Incident Management System in support of an incident commander. The CERFP supports the incident commander by planning and exercising mission command, casualty search and extraction, ambulatory and nonambulatory mass casualty decontamination, emergency medical triage and patient stabilization, and fatality search and recovery. The HRF supports the incident commander by planning, mission command, security operations and, if applicable, CERFP operations.			
Army-Only Publications			
The USACBRNS is the U.S. Army proponent for three tactical-level, Army-only publications.			
ATP 3-11.24	*Technical Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives (CBRNE) Force Employment*	6 May 14	Current.
ATP 3-11.24 describes how CBRNE forces support combatant commanders through every phase of operations conducted in-theater and in the homeland. This is important in educating those who are outside the CBRN community with regard to the true capabilities of the technical CBRNE force. The appendixes include information about specific technical CBRNE force missions, organizations, capabilities, and employment considerations.			
ATP 3-11.50	*Battlefield Obscuration*	15 May 14	Current.
ATP 3-11.50 provides TTP to plan obscuration operations and employ obscurants during, or in support of, unified land military operations at the tactical through operational levels of war.			
ATP 3-90.40	*Combined Arms Countering Weapons of Mass Destruction*	TBD	Under development.
ATP 3-90.40 provides tactical-level commanders, staffs, and key agencies with a primary reference for planning, synchronizing, integrating, and executing combined arms countering weapons of mass destruction.			
Technical Manuals			
The USACBRNS is the proponent and approving authority for two TMs.			
TM 3-11.32 MCWP 3-37.2A NTRP 3-11.25 AFTTP 3-2.56	*Multi-Service Reference for Chemical, Biological, Radiological, and Nuclear (CBRN) Warning, Reporting, and Hazard Prediction Procedures*	TBD	Under development. Will be published 1st quarter FY 17.
TM 3-11.32 will provide reference material for CBRN warning messages, incident reporting, and hazard prediction procedures.			
TM 3-11.42 MCWP 3-38.1 NTTP 3-11.36 AFTTP 3-2.82	*Multi-Service Tactics, Techniques, and Procedures for Installation Emergency Management*	23 Jun 14	Current.
TM 3-11.42 addresses the installation commander's response to an incident that takes place on an installation. The scope of this revision has been expanded from CBRN defense to all-hazards installation emergency management, which includes the management of CBRN events. The publication defines the roles of DOD installation commanders and staffs and provides the TTP associated with installation planning and preparedness for, response to, and recovery from all hazards in order to save lives, protect property, and sustain mission readiness.			
TM 3-11.91 MCRP 3-37.1B NTRP 3-11.32 AFTTP 3-2.55	*Chemical, Biological, Radiological, and Nuclear Threats and Hazards*	TBD	Under development. Will revise and supersede FM 3-11.9 and FM 3-11.11.
TM 3-11.91 serves as a single source of information to help understand the CBRN environment. It includes the technical aspects of CBRN threats and hazards, including information about the chemistry of homemade explosives. In addition to the technical information on CBRN threats and hazards, it also includes basic educational information and covers the "so what" and field behavior of CBRN hazards (including riot control agents and herbicides). The appendixes contain scientific CBRN data, and the centerpiece of the manual is the CBRN threats and hazards diagram.			

[1]The Secretary of Defense authorizes DSCA support by federal military forces (defense chemical, biological, radiological, and nuclear response force [DCRF] and command and control chemical, biological, radiological, and nuclear response element [C2CRE] A and C2CRE B).

[2]The state governor authorizes DSCA by Army National Guard forces under state mission command (WMD-CST, CERFP, and HRF).

Professional Military Education

Qualification training courses are listed and described in Table 1.

Table 1. Qualification training courses

Enlisted/Noncommissioned Officer (NCO) Qualification Training Courses	
74D10 Chemical, Biological, Radiological, and Nuclear (CBRN) Specialist Course (School Code 031)	
Phase I (Course 031-74D10 [R] [dL])	Once Soldiers are enrolled in Phase I, they will receive e-mail instructions from the Army Distributed Learning Program via Army Knowledge Online (AKO). Students must complete Phase I before reporting for Phase II training. An Army Correspondence Course Program (ACCP) certificate of completion (e-mailed) or other documentation must be presented as proof of Phase I completion during Phase II in-processing. Soldiers who experience problems with Phase I should telephone the ACCP at (800) 275-2872 (Option 3) or (757) 878-3322/3335. If no ACCP representative is available, they should contact Master Sergeant Larry Foreman at (573) 563-7757 or <larry.d.foreman.mil@mail.mil>.
74D10 CBRN Specialist Course (School Code L031)	
Phases II and III (Course 031-74D10 [R1])	These phases consist of resident training conducted at Fort Leonard Wood, Missouri. Soldiers must have an e-mail printout indicating that they have completed Phase I. Soldiers who fail to provide the printout are returned to their units.
74D 2/3/4 CBRN Transition Course (School Code L031)	
This is a three-phase resident course. Soldiers attending the CBRN Transition Course (031-74D2/3/4) must be graduates of a military occupational specialty (MOS) Advanced Leader Course (ALC) or Basic Noncommissioned Officer Course (BNCOC). Soldiers who have not attended ALC or BNCOC must attend the CBRN Specialist Course (031-74D10) to become 74D10 MOS-qualified. Hazmat Awareness Training is now a prerequisite for all courses. The Air Force Civil Engineer Center (AFCEC) Web site no longer contains the training. Training can still be completed at <http://totalforcevlc.golearnportal.org/>. (A common access card [CAC] is required.)	
74D30 CBRN ALC (School Code L031, Course 031-74D30-C45)	
CBRN ALC is a three-phase resident course. Phase I is waived for Soldiers who possess a certificate indicating that they have completed Department of Defense (DOD)-certified hazmat training at the technician level. Effective 1 October 2014, graduation from Structured Self-Development, Level II, is a prerequisite for attending CBRN ALC.	
74D40 Senior Leader Course (SLC) (School Code L031, Course 031-74D40-C46)	
This is a three-phase resident course conducted at Fort Leonard Wood. Graduation from Structured Self-Development, Level III, is a prerequisite for attending SLC.	
Officer Qualification Training Courses	
CBRN Captain's Career Course (C3) (School Code 031)	
Phase I (Course 4-3-C23 [dL])	This branch-specific distributed learning (dL) phase consists of 108 hours of dL instruction, which must be completed within 60 days before attending Phase II. Unit trainers enroll Soldiers through the Army Training Requirements System (ATTRS). Students receive e-mail instructions from the Army Distributed Learning Program. Hazmat awareness training can be accessed at <https://afcec.adls.af.mil> and completed by students prior to attending Phase II. Students who encounter problems should contact the U.S. Army Chemical, Biological, Radiological, and Nuclear School (USACBRNS) U.S. Army Reserve (USAR) Training Development NCO, Master Sergeant Larry Foreman, at (573) 563-7757 or <larry.d.foreman.mil@mail.mil>. The successful completion of Phase I is a prerequisite for Phase II attendance.
Phase II (Course 4-3-C23)	This branch-specific resident phase consists of 2 weeks of training conducted at USACBRNS. The focus is on radiological operations, live-agent training, hazmat awareness and operations level training and certification, and the basics of the Joint Warning and Reporting Network used within the Maneuver Control System. The successful completion of Phase II is a prerequisite for enrollment in Phase III.
Phase III (Course 4-3-C23 [dL])	This common-core (CC) phase consists of 59.2 hours of dL instruction. Unit trainers enroll Soldiers through ATTRS. Students receive e-mail instructions from the Army Distributed Learning Program. Students must complete Phase III within 60 days of attending Phase IV. Those who encounter problems should contact Master Sergeant Foreman at (573) 563-7757 or <larry.d.foreman.mil@mail.mil>. The successful completion of Phase III is a prerequisite for Phase IV attendance.
Phase IV (Course 4-3-C23)	This resident phase consists of 2 weeks of training conducted at USACBRNS. The focus is on a computer-aided exercise that includes additional Joint Warning and Reporting Network and Maneuver Control System training, culminating in a military decision-making process exercise using state-of-the-art battle simulation equipment.

Joint Senior Leader Course (Course 4K-74A/494-F18)
This is a 4-day course for senior leaders focusing on operational- and strategic-level aspects of countering weapons of mass destruction (WMD). Participants also receive toxic-agent training at the Chemical Defense Training Facility. In addition, the Joint SLC forum offers a unique opportunity for senior military leaders, civilian government agency leaders, and leaders representing allied and coalition partners to exchange ideas. You are required to register for the Joint SLC through the Joint SLC action officer, Mr. Steve Nutter at <nutters@battelle.org> or (573) 336-9289. Registration through ATTRS will not guarantee a seat and may result in being bumped from the course.
CBRN Precommand Course (Course 4K0F4)
This is a 5-day course that prepares Regular Army and Reserve Component (RC) officers who have been selected for command of a CBRN battalion or brigade or a CBRN position in a division. Each student receives instruction in the application of Army Doctrine Publication (ADP) 7-0, *Training Units and Developing Leaders*, concepts to the battalion training management process.
Note: Additional information is available at <https://www.atrrs.army.mil/>.

The courses shown in Table 2 are required by command and control chemical, biological, radiological, and nuclear response element (C2CRE); chemical, biological, radiological, nuclear, and explosives enhanced response force package (CERFP); WMD–civil support team (CST); domestic response force; and homeland response force units for MOS qualification.

Table 2. Functional training courses

Mass Casualty Decontamination Course (School Code 031, Course 4K-F25/494-F-30)
This 9-day course is appropriate for CERFP and domestic-response casualty decontamination team members. Students who successfully complete the course receive certification at the operations levels. The Hazmat Awareness course is now a prerequisite for all courses. The AFCEC Web site no longer contains the training. Training can still be completed at <http://totalforcevlc.golearnportal.org/>. (A CAC is required.)
CBRN Responder Course (School Code 031, Course 4K-F24/494-F29)
This 10-day course is appropriate for C2CRE members. All students attending the course must be International Fire Service Accreditation Congress (IFSAC) DOD awareness-certified before arriving. Students who successfully complete the course receive certification at the hazmat operations and technician levels.
Civil Support Skills Course (CSSC) (School Code 031, Course 4K-F20/494-28)
This 8-week course is appropriate for Army National Guard WMD-CST members. Students receive advanced training in hazmat technician, incident command, CBRN survey, point reconnaissance, sampling operations, personal protective equipment selection and certification, and decontamination. They also receive specialized training on a variety of military and commercial CBRN detection equipment.
Note: All students who successfully complete hazmat training are awarded certificates issued by IFSAC and DOD. Additional copies of certificates can be obtained at <http://www.dodffcert.com>.

A Soldier who arrives for any resident course without having first completed all appropriate dL requirements will be returned to his or her unit without action.

USACBRNS RC Personnel

Officers (O-3 through O-5) and NCOs (E-7 through E-9) who are interested in available drilling individual mobilization augmentee positions throughout USACBRNS should contact the USAR training development NCO.

Field grade USAR officers who would like to transfer into the Chemical Corps should contact the USACBRNS Deputy Assistant Commandant–Army Reserve (DAC-AR) for specific branch qualification information.

The 3d Brigade (Chemical), 102d Division (Maneuver Support), is currently seeking instructors for various locations. An applicant should be an E-6 or E-7, should be qualified (or able to be trained) as an Army basic instructor, and should have completed the appropriate NCO Education System coursework. Interested Soldiers should contact the brigade senior operations NCO, Master Sergeant Yamil Rodriguez at (860) 570-7114 or <yamil.rodriguez.mil@mail.mil>.

Contact Information

Lieutenant Colonel (P) Leslie M. Dillard (DAC-AR), (573) 563-8050 or <leslie.m.dillard.mil@mail.mil>.

Sergeant Major Phillip D. Pennington (CBRN USAR Sergeant Major), (573) 563-4026 or <phillip.d.pennington2.mil@mail.mil>.

Master Sergeant Larry D. Foreman (Training Development NCO-AR), (573) 563-7757 or <larry.d.foreman.mil@mail.mil>.

Lieutenant Colonel Kenneth R. Napier (DAC-NG), (573) 563-7676 or <kenneth.r.napier.mil@mail.mil>.

Master Sergeant Christopher C. Lemley (Proponency NCO-NG), (573) 563-7667 or <christopher.c.lemley.mil@mail.mil>.

Sergeant First Class Verna A. Forbes (RC-LNO), (573) 596-3226 or <verna.a.forbes.mil@mail.mil>

Reference:

ADP 7-0, *Training Units and Developing Leaders*, 23 August 2012.

The Commandant's Reading Program

Compiled by Lieutenant Colonel James P. Harwell

President Harry S. Truman once said, "Not all readers are leaders, but all leaders are readers." Reading should form the foundation of every leader's self-development program. It supplements institutional training and operational experience and provides leaders with knowledge to react to a complex world. The Commandant's Reading Program provides chemical, biological, radiological, and nuclear (CBRN) leaders with the basis for a lifelong self-development program. It supplements other reading lists from the Chief of Staff of the Army to the local unit level, with a particular emphasis on the CBRN profession. The Commandant's Reading Program is not all-inclusive. CBRN leaders should use it as a guide, but should develop their personal programs based on their individual needs, knowledge, and experiences.

The reading program consists of two parts—the commandant's bookshelf and nightstand. The commandant's bookshelf is composed of works focused specifically on the CBRN profession. The bookshelf remains relatively static, with only minor changes as new works are published. The commandant's nightstand is a dynamic list of books, papers, and articles that address contemporary issues facing the Chemical Corps and the Army. The Commandant's nightstand will change with each issue of *Army Chemical Review* and reflect the issues that Army senior leaders find important today, providing the basis for discourse among members of the CBRN community of practice.

Commandant's Bookshelf

- Graham T. Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe,* Henry Holt and Company, LLC, New York, 2004, ISBN-13: 978-0-8050-7852-7.
- Kurt M. Campbell et al., *The Nuclear Tipping Point: Why States Reconsider Their Nuclear Choices*, Brookings Institution Press, 2004, ISBN-13: 978-0-8157-1330-2.
- Charles D. Ferguson and William C. Potter, *The Four Faces of Nuclear Terrorism*, Routledge, Taylor & Francis Group, New York, 2005, ISBN-13: 978-0-415-94244-1.
- Laurie Garrett, *The Coming Plague: Newly Emerging Diseases in a World Out of Balance*, The Penguin Group, New York, 1994, ISBN-13: 978-0-14-025091-6.
- Richard L. Garwin and Georges Charpak, *Megawatts and Megatons: The Future of Nuclear Power and Nuclear Weapons,* University of Chicago Press, Chicago, 2002, ISBN-13: 978-0-226-28427-9.
- Robert Harris and Jeremy Paxman, *A Higher Form of Killing: The Secret History of Chemical and Biological Warfare,* Random House Publishing Group, 2002, ISBN-13: 978-0-8129-6653-4.
- David E. Hoffman, *The Dead Hand: The Untold Story of the Cold War Arms Race and Its Dangerous Legacy*, Anchor Books, New York, 2009, ISBN-13: 978-0-307-38784-4.
- Gregory D. Koblentz, *Living Weapons: Biological Warfare and International Security,* Cornell University Press, Ithaca, 2009, ISBN-13: 978-0-8014-7752-2.
- William Langewiesche, *The Atomic Bazaar: The Rise of the Nuclear Poor,* Farrar, Straus, and Giroux, New York, 2007, ISBN-13: 978-0-374-10678-2.
- Judith Miller et al., *Germs: Biological Weapons and America's Secret War*, Touchstone, New York, 2002, ISBN-13: 978-0-684-87159-2.
- Michael B. A. Oldstone, *Viruses, Plagues, & History: Past, Present, and Future*, Oxford University Press, New York, 2010, ISBN-13: 978-0-19-532731-1.
- Richard Preston, *The Demon in the Freezer: A True Story,* Random House Publishing Group, 2002, ISBN-13: 978-00345-46663-1.
- Jonathan B. Tucker (ed.), *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, the MIT Press, Cambridge, Massachusetts, 2000, ISBN-13: 978-0-262-79971-9.
- Jonathan B. Tucker, *War of Nerves: Chemical Warfare from World War I to Al-Qaeda,* Anchor Books, New York, 2006, ISBN-13: 978-1-4000-3233-4.

Commandant's Nightstand

The commandant's nightstand examines specific challenges facing Chemical Corps and Army leaders. In this issue, it focuses on the North Korean weapons of mass destruction threat, the challenges facing the Nation, and the development of the future force to provide for the common defense.

- North Korean weapons of mass destruction threat:
  - Don Oberdorfer and Robert Carlin, *The Two Koreas: A Contemporary History*, Basic Books, New York, 2013, ISBN-13: 978-0465031238.
  - Jonathan D. Pollack, *No Exit: North Korea, Nuclear Weapons, and International Security*, Routledge Publishing, London, 2011, ISBN-13: 978-0415670838.
  - Shane Smith, *North Korea's Evolving Nuclear Strategy*, U.S.-Korea Institute at the Paul H. Nitze School of Advanced International Studies (SAIS), Johns Hopkins University, August 2015, <http://38north.org/wp-content/uploads/2015/09/NKNF_Evolving-Nuclear-Strategy_Smith.pdf>, accessed on 5 May 2016.

  - Robert J. Peters, "The WMD Challenges Posed by a Collapse of North Korea," U.S.-Korea Institute at the Paul H. Nitze SAIS, Johns Hopkins University, 14 April 2015, <http://38north.org/2015/04/rpeters041415/>, accessed on 5 May 2016.
- Challenges facing the Nation:
  - Andrew F. Krepinevich, *7 Deadly Scenarios: A Military Futurist Explores War in the 21st Century*, Bantam Dell, New York, 27 January 2009, ISBN-13: 978-0553805390.
  - Colin S. Gray, *Another Bloody Century: Future Warfare*, Phoenix Press, New Haven, Connecticut, 2005, ISBN-13: 978-0304367344.
- Development of the future force:
  - Douglas A. Macgregor, *Transformation Under Fire: Revolutionizing How America Fights*, Praeger Publishers, Westport, Connecticut, 2003, ISBN: 0-275-98192-4.
  - "National Commission on the Future of the Army," Report to the President and Congress of the United States, Government Printing Office, 28 January 2016, <http://www.ncfa.ncr.gov/sites/default/files/NCFA_Full%20Final%20Report_0.pdf>, accessed on 5 May 2016.
  - U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World*, 7 October 2014, <http://www.army.mil/e2/c/downloads/367967.pdf>, accessed on 5 May 2015.
  - P. W. Singer, *Wired for War: The Robotics Revolution and Conflict in the 21st Century*, Penguin Press, New York, 2009, ISBN-13: 978-0143116844.





Army Chemical Review is always looking for good-quality, action photographs (no "grip and grins," please) to use on the outside covers. If you have photographs of Soldiers who are in the proper, current uniform and are participating in training events or operations or photographs of current, branch-related equipment that is being used during training or operations, please send them to us at <usarmy.leonardwood.mscoe.mbx.mdotacr@mail.mil>. Ensure that photographs depict proper safety and security procedures, and do not send copyrighted photographs. All photographs must be high-resolution; most photographs obtained from the Internet, made smaller for e-mailing, or saved from an electronic file such as a Microsoft® PowerPoint or Word document cannot be used for print. In addition, include a caption that describes the photograph and identifies the subject(s) and photographer (if known). Please see our photograph guide at <http://www.wood.army.mil/chmdsd/documents/PhotoGuide.pdf> for more detailed information.

Army Chemical Review Writer's Guide

Army Chemical Review is a Department of the Army-authenticated publication that contains instructions, guidance, and other materials to continuously improve the professional development of Army chemical, biological, radiological, and nuclear (CBRN) personnel. It also provides a forum for exchanging information and ideas within the Army CBRN community. *Army Chemical Review* includes articles by and about commissioned officers, warrant officers, enlisted Soldiers, Department of the Army civilians, and others. Writers may discuss training, current operations and exercises, doctrine, equipment, history, personal viewpoints, or other areas of general interest to CBRN personnel. Articles may share good ideas and lessons learned or explore better ways of doing things. Shorter, after action type articles and reviews of books on CBRN topics are also welcome.

Articles should be concise, straightforward, and in the active voice. Avoid using acronyms when possible. When used, acronyms must be spelled out and identified at the first use. Also avoid the use of bureaucratic jargon and military buzzwords. Text length should not exceed 2,000 words (about eight double-spaced pages).

Articles submitted to *Army Chemical Review* must be accompanied by a written release from the author's unit or activity security manager before editing can begin. All information contained in an article must be unclassified, nonsensitive, and releasable to the public. It is the author's responsibility to ensure that security is not compromised; information appearing in open sources does not constitute declassification. *Army Chemical Review* is distributed to military units worldwide and is also available for sale by the Government Printing Office. As such, it is readily accessible to nongovernment or foreign individuals and organizations.

Authors are responsible for article accuracy and source documentation. Use endnotes (not footnotes) and references to document sources of quotations, information, and ideas. Limit the number of endnotes to the minimum required for honest acknowledgment. Endnotes and references must contain a complete citation of publication data; for Internet citations, include the date accessed.

Include photographs and/or graphics that illustrate information in the article. Graphics must be accompanied by captions or descriptions; photographs should also be identified with the date, location, unit/personnel, and activity, as applicable. Do not embed photographs in Microsoft® PowerPoint or Word or include photographs or illustrations in the text; instead, send each of them as a separate file. If illustrations are created in PowerPoint, avoid the excessive use of color and shading. Save digital images at a resolution no lower than 200 dpi. Please see the photo guide at <http://www.wood.army.mil/chmdsd/documents/PhotoGuide.pdf> for more information. Copyright concerns and the proliferation of methods used to disseminate art, illustrations, and photographs require that the origin of any graphics be identified. If a graphic is copyrighted, the author must obtain copyright approval and submit it to *Army Chemical Review* with the proposed manuscript. As a general policy, *Army Chemical Review* will not use artwork that cannot be attributed.

Provide a short paragraph that summarizes the content of the article. Also include a short biography, including full name, rank, current unit, job title, and education; U.S. Postal Service mailing address; and a commercial daytime telephone number.

When an article has multiple authors, the primary point of contact should be clearly designated with the initial submission. The designated author will receive all correspondence from *Army Chemical Review* editors and will be responsible for conferring with coauthors concerning revisions before responding to the editors.

Army Chemical Review will notify each author to acknowledge receipt of a manuscript. However, we make no final commitment to publish an article until it has been thoroughly reviewed and, if required, revised to satisfy concerns and conform to publication conventions. We make no guarantee to publish all submitted articles, photographs, or illustrations. If we plan to publish an article, we will notify the author. Therefore, it is important to keep us informed of changes in e-mail addresses and telephone numbers.

Manuscripts submitted to *Army Chemical Review* become government property upon receipt. All articles accepted for publication are subject to grammatical and structural changes as well as editing for length, clarity, and conformity to *Army Chemical Review* style. We will send substantive changes to the author for approval. Authors will receive a courtesy copy of the edited version for review before publication; however, if the author does not respond to *Army Chemical Review* with questions or concerns by a specified suspense date (typically five to seven working days), it will be assumed that the author concurs with all edits and the article will run as is.

Army Chemical Review is published two times a year: June (article deadline is 15 February) and December (article deadline is 15 August). Send submissions by email to <usarmy.leonardwood.mscoe.mbx.mdotacr@mail.mil> or on a CD in Microsoft Word, along with a double-spaced copy of the manuscript, to: Managing Editor, Army Chemical Review, 14010 MSCoE Loop, Building 3201, Suite 2661, Fort Leonard Wood, Missouri 65473-8702.

As an official U.S. Army publication, *Army Chemical Review* is not copyrighted. Material published in *Army Chemical Review* can be freely reproduced, distributed, displayed, or reprinted; however, appropriate credit should be given to *Army Chemical Review* and its authors.

Note: Please indicate if a manuscript is being considered for publication elsewhere. Due to the limited space per issue, we usually do not print articles that have been accepted for publication at other Army venues.

Army Chemical Review Photo/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 photos of landscapes, structures, or distant machinery in action are less useful. Photos 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**—Photos saved in JPEG (or JPG) format and sent as attachments to an e-mail are best. Photos and other graphics should not be embedded in a Microsoft ® Word document or PowerPoint presentation. Graphics files are large, and e-mail systems frequently have limits to the size of messages that can be sent. 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 photo or graphic for print reproduction is 5x7 inches at 300 dots per inch (dpi), but smaller sizes may be acceptable. If the photo is a JPEG, it should be no smaller than 150 kilobytes (KB). A 5x7 inch, 300 dpi photo saved as a TIF should be 1 MB to 3 MB in size. When taking photos, use the highest resolution setting on your camera and save them at a resolution no lower than 200 dpi. Photos appearing on the Internet usually have a resolution of only 72 dpi. They will look fine on a computer monitor, but do not reproduce well in print. However, photos that are available for download as "high resolution" will probably meet the minimum requirements. Do not manipulate photos 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 photo will not increase the quality of the photo so that it can be used in a printed publication. Do not compress photos. We will do all postproduction work. We will not publish photos that are pixilated or out of focus.
- **Copyright**—Images copied from a Web site or a book must be accompanied by copyright permission.
- **Captions**—Include captions that describe the photo and identify the subjects. Captions are subject to editing.
- **Hard copy photos**—Hard copy photos can be mailed to: Maneuver Support Center of Excellence, ATTN: G-37 Publications Support, 14010 MSCoE Loop, Building 3201, Suite 2661, Fort Leonard Wood, MO 65473-8702.
- **Photos of foreign nationals**—Due to security restrictions, photos of foreign nationals cannot be published without digital editing (blurring faces), unless the photo(s) are accompanied by a 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.



PIN: 106124-000