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**REVIEW**

*The Chemical Corps:*  
***ON THE MOVE***



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Back Cover: Brigadier General Thomas Spoehr's promotion ceremony

Inside Back Cover: The Chemical Corps Vision

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# ARMY CHEMICAL REVIEW



THE PROFESSIONAL BULLETIN OF THE CHEMICAL CORPS  
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## Chief of Chemical



**Brigadier General  
Thomas Spoehr**

Greetings Dragon Soldiers! It is unbelievable how much has happened since my last Army Chemical Review article. I want to hit on some of the high points. First, working with you—our Corps stakeholders—we have developed a revised Chemical Corps Vision (see also the inside back cover):

**A Corps and Army capable now of countering the entire range of CBRN threats and effects to protect our Nation, operating seamlessly with military and civilian partners, while conducting simultaneous operations from civil support to war.**

I ask your support in communicating this Vision to all Chemical Corps Soldiers and those we work with. A vision is a *desirable* and *imaginable* picture of the future that is *feasible* and *focused*. Our Vision was developed with your participation, and I think that it transmits a powerful message on the direction we want our Corps to take. We must now work on the strategies and objectives that must be achieved to complete our Vision.

On 28 June 2007, we will mark the 89th anniversary of the founding of the Chemical Corps. We will celebrate this anniversary 24–27 June during Regimental Week at Fort Leonard Wood, Missouri. Scheduled events include a Warfighter Seminar on 24 June; Colonels', General Officers', and Sergeants' Major Conferences on 25 June; a Regimental Review on 26 June; and the Green Dragon Ball on 27 June. Invitations will be provided soon; meanwhile, please note your calendars and make plans to attend. It will be a great opportunity to exchange warfighting insight. Additionally, the National Defense Industrial Association will conduct the Joint Chemical, Biological, Radiological, and Nuclear Conference during the same week (see the complete agenda on page 11 or at <http://www.wood.army.mil/usacmls/nonflash/conference.html>). I look forward to seeing you in June!

Command Sergeant Major Alston and I continue to visit Dragon Soldiers. In November, we traveled to Kuwait and Iraq where we were fortunate enough to visit many Dragon Soldiers serving there. (There is also a new team in Iraq under the leadership of III Corps, and we hope to visit them soon.) Everywhere we went, we saw Dragon Soldiers fully engaged in supporting the war effort by performing a myriad of diverse tasks: hazardous material response, convoy security, quick-reaction force response, forward operating base protection, force protection, and other missions. What was the common denominator in these Chemical Soldiers? Pride in jobs well done—a fact reaffirmed through their chains of command! We also visited Dugway Proving Ground, Utah, where the new Stryker Nuclear, Biological, and Chemical Reconnaissance Vehicle was being tested. Stryker brigades are already receiving these systems; what a huge addition to our capabilities they present! Our Soldiers really love it.

I am really excited about the Joint Warning and Reporting Network and the Joint Effects Model Programs (see page 12). Both battle management tools are on track and firmly on a path to success. They are linked to the Army Battle Command Systems and are being developed cooperatively with these programs. We are working hard at the Chemical School to support these programs with appropriate training and doctrine material and to increase the amount of institutional training time we give them in our core courses.

We are working quickly to move the Joint Nuclear, Biological, and Chemical Reconnaissance System, Increment II, to fielding. We completed a very successful limited-objective experiment on this system with Soldiers from Fort Lewis, Washington, and Fort Richardson, Alaska, and gained much insight. This system consists of the most advanced commercial, off-the-shelf detection and protection equipment available; and it is mounted on a trailer towed by a high-mobility, multipurpose wheeled vehicle. The system is designed for use by Infantry brigade combat team reconnaissance platoons, heavy Chemical company decontamination platoons, and a number of other Chemical units.

We are firmly focused on doing two things at the Chemical School:

- Producing tactically and technically trained Dragon Soldiers and leaders.
- Supporting the ongoing war effort.

Let me know if you see an area where we could do better. I encourage you to provide input to me at [ChiefofChemical@wood.army.mil](mailto:ChiefofChemical@wood.army.mil). In the meantime, please continue to take care of your fellow Dragon Soldiers.

*Elementis, Regamus, Proelium!*

# *The Ever-Evolving Chemical Corps*

As I begin this article, I reflect back on my initial experience in this great Army branch—the Chemical Corps. Some 23 years ago, I found myself changing my military occupational specialty for reclassification into a corps commonly known as *NBC*. I found it quite amusing that the acronym *NBC*—nuclear, biological, and chemical—was referred to by my counterparts in the Army as “nobody cares.” I can go a step further to say that during my initial assignment as a Chemical specialist in the 4th Chemical Company in South Korea, my major charge was to spray out bus stops with our handy-dandy M12s or be the laundry and bath expert at Team Spirit.



**Command Sergeant Major  
Patrick Z. Alston**

I was taught that we should integrate *NBC* training into company, battalion, or brigade level standing operating procedures. But as I embarked on the task, I was always hit with the statement: “*NBC*, hmmm . . . Why train on something no one cares about?” As we entered the 1990s, we found ourselves facing an enemy country known to be using *NBC* weapons. This country’s leader—Saddam Hussein—had recently used *NBC* weapons in the war between Iran and Iraq, and Army leaders immediately felt that he would deploy these same weapons on our troops during Operations Desert Storm and Desert Shield. It is during this time that the Chemical Corps was considered a high commodity on the battlefield. Somehow the acronym *NBC* had evolved from “nobody cares” to its true meaning of “nuclear, biological, and chemical.”

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*As a society in this 21st Century, we are faced with the reality of terrorism and the likelihood that we could be attacked in one of four forms of WMD: chemical, biological, radiological, and nuclear . . . .*

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During the initial phases of Operations Desert Storm and Desert Shield, our military began to rely heavily on *NBC* specialists to ensure the operability of their M17A1 masks, M8 chemical-agent alarms, and all other elements of Chemical equipment. The Chemical specialist became “somebody,” an element needed to ensure mission success in the area of *NBC* threats.

At the conclusion of the first Iraqi war, redeployment efforts were realized. Back on the home front, on our prestigious American soil, the Chemical specialist reverted back into the old groove of “nobody cares” and “who are you?” As years passed, the M17A1 mask became history and the implementation of the M40 protective mask was achieved. The 11 September 2001 attack on our Nation introduced the fear of terrorists invading us on our soil. Shortly after 9/11, anthrax—a nonstandard chemical agent—showed its ugly head as terrorists attacked us through the U.S. Postal Service. These two events reestablished the importance of trained professionals in our Chemical Corps.

Operation Iraqi Freedom and the hunt for the “smoking gun” stash of weapons of mass destruction (WMD) once again brought the Chemical Corps to the forefront of the Army’s mission. However, with the military’s inability to find the weapons, we found ourselves reverting back into the secondary roles to which we had become accustomed.

WMD seems to be the new buzz phrase in Army language. What is the possibility that terrorists will use WMD in the United States to kill and injure American citizens and members of our armed forces? The threat is very genuine! As a society in this 21st Century, we are faced with the reality of terrorism and the likelihood that we could be attacked in one of four forms of WMD: chemical, biological, radiological, and nuclear (CBRN). The acronym *NBC*—and the associated stigma of “nobody cares”—is history. Detecting, identifying, mitigating, and decontaminating against CBRN threats is the future of the ever-evolving Chemical Corps. It is who we are; it is what we do best!



A Stryker NBCRV vehicle is shown in a field, with a large, stylized title 'Stryker NBCRV' overlaid on the image. The vehicle is a tracked carrier with a complex sensor and weapon system mounted on top. The background shows a hazy, outdoor environment with some trees and a cloudy sky.

# *Stryker NBCRV*

*By Mr. Bruce Baldwin*

Dragon Soldiers are spearheading the path in testing, training, and fielding the new Stryker Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV). The Stryker NBCRV can detect and identify chemical, biological, radiological, and nuclear (CBRN) hazards on the battlefield. It is the last configuration of the infantry carrier vehicle (ICV) being fielded in the Army's Stryker platform; and it has similar survivability, mobility, communication, lethality, and transportability characteristics as the base ICV, including a platform remote weapon station (RWS) with an M2 .50-caliber machine gun.<sup>1</sup>

The Stryker NBCRV is a complex, robust vehicle system. It provides a capability not previously available to the infantry brigade commander. The Stryker NBCRV is a mounted CBRN reconnaissance system with specialized sensors that are used to support the intelligence preparation of the battlefield. It integrates chemical and biological detection with identification capabilities. Previously, detection and identification operations were performed in separate vehicles operated by Dragon Soldiers with military occupational specialties 74D and 74A (with additional skill identifiers [ASIs] L5 and L4).

The onboard package of CBRN sensors allows Dragon Soldiers to perform conventional CBRN reconnaissance missions and sensitive-site assessments. It does this with a suite of sensors that are integrated into the vehicle platform through the nuclear, biological, and chemical sensor processing group (NBCSPG). Individual sensors provide data to the NBCSPG (laptop computers), which manages and displays the data. Simultaneously, the sensors process the data for use in nuclear, biological, and chemical (NBC) reports that are passed to the Force XXI

Battle Command—Brigade and Below (FBCB2). The sensors enable the system to conduct—

- Rapid, on-the-move standoff chemical-agent detection and class identification.
- On-the-move chemical vapor and liquid point detection and identification.
- Biological surveillance, point detection, and presumptive identification.
- Stationary and on-the-move nuclear and radiological detection.
- Solid, liquid, and vapor sample collection.
- Hazard, warning, marking, and reporting operations.

The NBCRV will fortify a sensor network that provides real-time digitized data through radio frequencies and satellite links at the Stryker brigade combat team (SBCT) headquarters. Dragon Soldiers will be able to provide operational CBRN situational awareness and detailed hazard analysis using detect-to-warn (for the detection and identification of chemical and radiological hazards) and detect-to-treat (for the detection and presumptive identification of biological hazards) capabilities. In addition to detecting and identifying CBRN hazards, operators will be able to collect, store, and transfer samples of chemical and biological agents using strict chain-of-custody protocols as evidence of first use. The system can identify chemical liquid and vapor hazards, toxic industrial chemicals (TIC), and toxic industrial material (TIM). It can also provide presumptive identification of biological agents for later confirmatory analysis and to assist medical personnel with immediate treatment

protocols. These capabilities will increase the combat power of the deployed force and minimize the degradation of force effectiveness under CBRN conditions.

The core of the NBCRV is its onboard CBRN sensor suite. The sensor suite is composed of ten integrated, networked sensors, including the—

- **Joint-Service, Lightweight, Standoff Chemical-Agent Detector (JSLSCAD).** The JSLSCAD provides stationary and on-the-move automated detection and identification of nerve-, blister-, and blood-agent vapors using a passive infrared detector. The scanner can be operated and displayed from the JSLSCAD operator display unit or the primary surveyor's NBCSPG interface.
- **Joint Biological Point Detection System (JBPDS).** The JBPDS provides stationary point detection of biological aerosols. The system continuously monitors the outside ambient air for changes consistent with biological agents. The JBPDS automatically detects, collects, and provides presumptive identification while preserving a sample for further laboratory analysis. The JBPDS can be operated and displayed using its own local control station interface or monitored using the primary surveyor's NBCSPG interface.
- **Chemical-Biological Mass Spectrometer, Block II (CBMS II).** The CBMS II can detect persistent nerve and blister agents and TIC on the ground. It can be operated by the primary surveyor using the operator display unit or operated and monitored using NBCSPG interface.
- **M22 Automatic Chemical-Agent Detector and Alarm (ACADA).** The ACADA provides point detection and identification of chemical vapors. The ACADA has a standard communication interface to send data to the NBCSPG and can be operated by the surveyor as a stand-alone unit (using built-in controls and displays).
- **AN/VDR-2 Radiac Set.** The AN/VDR-2 uses point radiological detection to identify beta and gamma radiation. It is mounted in the vehicle and controlled and monitored by the surveyor using the NBCSPG. It can also be used as a handheld, battery-operated device.
- **AN/UDR-13 Radiac Set.** The AN/UDR-13 uses point radiological detection to measure and display gamma dose rates and total gamma and neutron cumulative dose rates on the battlefield. The AN/UDR-13 is mounted in the vehicle and controlled and monitored by the surveyor using the NBCSPG. It can also be used as a handheld, battery-operated device.
- **Chemical-Vapor Sampling System (CVSS).** The CVSS can collect and store chemical warfare agents and TIC vapor samples for confirmatory analysis by a lab. The CVSS can be operated using a control panel or by the surveyor using NBCSPG interface.
- **Double-Wheel Sampling System (DWSS).** The DWSS is used to transfer chemical agents from the ground to a heated probe head. It consists of two arms and two wheels, extending from the rear of the vehicle, which can alternately be raised and lowered to capture ground samples for analysis by the CBMS II. The system is capable of operating on primary, secondary, and cross-country routes. The system can be operated manually or automatically by the surveyor using a control panel.
- **Meteorological Sensors.** Meteorological sensors provide ground temperature, relative humidity, barometric pressure, and wind speed and direction information. They also measure the ground temperature using temperature probes. The data is sent to the NBCSPG and used to populate weather data in NBC reports.
- **Improved Chemical-Agent Monitor (ICAM).** The ICAM is used to detect and identify nerve and blister agents. It is stored inside the NBCRV and is used to monitor air for possible CBRN hazards.



Chemical Soldier with a JSLSCAD scanner



**A Stryker NBCRV dropping a chemical marker**

The NBCRV also has integrated, stand-alone capabilities, including—

- **Sample Vial Box and Tubes.** A sample vial box inside the NBCRV consists of 24 sealed, nonstick vials that are passed through a glove port and filled by the operator using tongs (located on the rear deck). Surveyors collect samples and store them in the rear of the vehicle for postmission laboratory analysis. It is not necessary for personnel to exit the vehicle to collect these samples.
- **CBRN Marking Material.** CBRN marking flags conform to the guidelines defined in North Atlantic Treaty Organization Standardization Agreement (STANAG) 2002 for marking contaminated areas. The markers are weighted flags that surveyors can deploy outside the vehicle using the marker port in the rear. The flags may be deployed while the NBCRV is stationary or moving.

The NBCRV is a unique reconnaissance vehicle in a new unit organization. Essentially, it is a rolling, armored laboratory in an infantry brigade, capable of detecting and identifying a wide range of CBRN hazards and then forwarding automated alerts to provide improved situational awareness. It provides the commander with the freedom of movement on the battlefield while preserving the combat power required to locate CBRN hazards.

The Army is in the process of standing up seven SBCTs and fielding NBCRVs in each of the reconnaissance, surveillance, and target acquisition (RSTA) squadrons. The NBCRV systems are low-density, mission-specific specialized platforms. They are manned by trained Dragon Soldiers with military occupational specialties 74D and 74A (ASI L6 [NBCRV Brigade Combat Team Course]).

There are three NBCRVs (manned by a crew of four) in each RSTA squadron. The platoon leader, platoon sergeant, and squad leader are the vehicle commanders for these systems. Each system has a Chemical operations noncommissioned officer (surveyor 1) and two Chemical operations specialists (surveyor 2 and the driver). The crew operates the system from inside an overpressure compartment that provides collective protection from environmental hazards. The platoon conducts CBRN operations as part of reconnaissance missions that support the commander's scheme of maneuver (according to the tactics, techniques, and procedures found in Field Manual [FM] 3-11.19).

After completing 10 weeks of operator training and 2 weeks of doctrine and tactics training, Dragon Soldiers from Fort Lewis, Washington, conducted an 8-week sustainment training session at Fort Lewis and Dugway Proving Ground, Utah. On 19 October 2006, the unit completed its initial operational test and evaluation period, consisting of two 9-day exercises in which the unit operated




in the realistic environment of an SBCT area of operation. The unit conducted a full range of mission sets against active opposing forces that employed chemical and biological agent simulants. The test results are still pending, but the unit was commended by visiting officials for their outstanding efforts and dedication to duty. In February 2007, Dragon Soldiers stationed in Germany completed training and fielding on the NBCRV. The next training and fielding is scheduled for Hawaii. The U.S. Army Chemical School (USACMLS), Fort Leonard Wood, Missouri, is scheduled to receive four NBCRVs in support of the L6 institutional training course.

The USACMLS and the product manager for NBC reconnaissance have partnered with the Software Engineering Directorate at Redstone Arsenal, Alabama, to create a robust package of computer simulation hardware and software that mimics many of the NBCRV onboard sensors. The program has proven to add great training value during classroom instruction. A virtual collective NBCRV crew trainer has also been developed and is scheduled for fielding with the vehicle. The virtual crew trainer provides sustainment training on operator and crew drill tasks and provides real-time playback capability (critical in after-action reviews). Additionally, the USACMLS and SBCTs with fielded vehicles will receive a common driver trainer/Stryker variant (CDT/SV). The CDT/SV consists of a Stryker cab with three visual-display units mounted on a six-degree-of-freedom (pitch, roll, yaw, heave, surge, and sway) motion platform. The CDT/SV includes instructor operation and after-action review stations that support unit sustainment and institutional training requirements for the NBCRV. The computer scenarios support instructional goals for individual driver orientation and mission completion tasks.

The armor and the RWS-mounted M2 give the new vehicle the same survivability and lethality as other Stryker vehicles, but the NBCRV has the added capability of detecting and identifying a wide range of CBRN hazards. The improved detection, collection, identification, warning,



**JBPDS biological intake stake**

and reporting capabilities of the NBCRV will considerably increase a commander's situational awareness and allow Dragon Soldiers to "*Elementis, Regamus, Proelium.*" 

**Endnote:**

<sup>1</sup>The Stryker family of vehicles consists of two basic variants: the ICV and the Mobile Gun System. The ICV has nine SVs, each fitted with different mission equipment packages to match the required roles of SBCTs. Additional configurations of the ICV include the medical evacuation vehicle, M1127 reconnaissance vehicle, engineer squad vehicle, mortar carrier, command vehicle, fire support vehicle, and antitank guided-missile vehicle.

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A map of Louisiana showing various parishes and the city of New Orleans. The map is in grayscale and serves as a background for the title. Parishes labeled include Iberville, Assumption, St. James, St. Bernard, and Orleans. The city of New Orleans is marked with a black dot. Other locations like Donaldsonville, Thibodaux, and Lake Pontchartrain are also visible.

# The 21st Chemical Company Provides Aid in New Orleans

*By Captain Aimee Hemery*

On 5 September 2005—exactly one week after Hurricane Katrina ravaged the U.S. Gulf Coast—the 21st Chemical Company rolled out of Fort Bragg, North Carolina. Though the mission was not detailed prior to deployment, leaders and paratroopers of the company expected to support the relief cause with decontamination assets, traffic control, and security missions. Company personnel were eager to make a difference in the disaster efforts, but no one expected that within 72 hours, the company would make history amidst the crumbled structures and desolate streets of posthurricane New Orleans.

The 1,002 mile trip from North Carolina to Louisiana took the 22-vehicle convoy along interstates littered with punctured billboards, twisted road signs, and endless forests of snapped trees. The company slept in parking lots during the six-day journey before reaching their final destination—New Orleans Naval Base—on the southern side of the great Mississippi River.

The company, along with the main body of Task Force Katrina, quickly established base operations; deployed paratroopers to the flooded streets of downtown New Orleans; and prepared to provide personnel and equipment decontamination support to infantry, engineer, military police, and division support assets.

The threat of biological hazards and industrial waste was great in the waters where task force paratroopers were operating. The four fundamental decontamination principles—as soon as possible, only what is necessary, as far forward as possible, and by priority—were the foundation of operations. Performing decontamination operations—

- “As soon as possible” meant immediately decontaminating personnel and equipment when

the workday was over. For most personnel, the end of the workday was between 1700 and 2000, which created a rush hour situation where the volume of decontaminating operations peaked.

- “On only what was necessary” focused on vehicle undercarriages (where most contamination collected), the interiors and exteriors of boats, and the vehicles on which the boats were placed.
- “As far forward as possible” meant that the decontamination site was established as close to the edge of the receding waters as possible and along a main avenue of egress out of the flooded portion of the city to allow for the timely decontamination of personnel and equipment and limit the spread of contamination.
- “By priority” meant decontaminating all personnel (military and civilian) who traveled through or worked in the flooded areas of the city. Urgent cases were treated on an individual basis.

Setting up operations in an urban environment presented constraints and limitations. The decontamination site had to have a reliable water source abundant enough to sustain large numbers of personnel and equipment and ample space to accommodate trucks, trailers, boats, and large equipment (including a turnaround area). On 10 September 2005, the 21st Chemical Company established a decontamination site in a secluded corner of the farmers’ market, located on the southern boundary of the French Quarter. The site was situated about 10 miles forward of the naval base command post (over the Mississippi River) and in a severely damaged part of New Orleans. The site was centrally located in the city, close to civilian emergency support personnel, close to the flood waterline, and near one of the major boat-launching points.

It was also able to accommodate large equipment and personnel decontamination operations.

In the farmers' market, where fruit and vegetable stands once stood, canvas tents with attached shower pipes were erected. Sandbags covered with trash bags provided a rudimentary means of preventing contamination spread by channeling contaminated water away from the decontamination site and into the city sewer system. The parking lot and the traffic lane that ran along the site were cordoned with metal barriers to guide vehicles through the equipment decontamination site. Any available space was taken up by decontamination equipment, water blivets, and bottles of soap and bleach mixtures. With M17 Lightweight Decontamination Apparatuses, 3,000-gallon water blivets, maintenance tents, and 20 paratroopers, the 21st Chemical Company opened the division's first urban decontamination site.

Water, electricity, and latrine availability created obstacles that needed to be addressed immediately. Finding an adequate water supply was a critical and constant issue. Initially, the decontamination platoon coordinated with the New Orleans Fire Department to receive a daily supply of potable water. Although very efficient, this method of water resupply was only available the first three days. Due to an overwhelming demand, the fire department began limiting water distribution to their organic units. The second option was to tap into a fire hydrant. So with a borrowed wrench and improvised M17 hose adapters, water was pumped into blivets. Since the water was clearly nonpotable, it was treated with a 0.5 percent bleach solution, heated to 120 degrees in the M17, and pumped through shower heads for personnel decontamination operations.<sup>1</sup> To create a decontamination solution, generous amounts of antibacterial soap were also added to water blivets.

Company personnel were assigned specific areas of responsibility. The decontamination platoon operated two decontamination stations. Personnel decontamination was handled by 1st Squad; equipment decontamination was handled by 2d Squad. One paratrooper in each squad performed unit and personnel accountability operations. The platoon sergeant was responsible for the overall site management and distribution of personnel and resources. The platoon leader handled the coordination for resources, missions, media coverage, and quality assurance. The maintenance section of Headquarters Platoon ensured that the M17s and generators remained operational.

Individuals and units requiring decontamination reported to the personnel decontamination station where they were given a safety briefing that included the purpose for decontamination, how to minimize cross contamination

while showering, and the type of decontamination solution being used. Individuals entering the shower area removed their contaminated clothing and were given 5 minutes to wash it in trash cans filled with hot, soapy water (changed every tenth decontamination). Individuals were then instructed to take "combat showers"—2 minutes to get wet, 2 to 3 minutes to lather in solution, and 2 minutes to rinse. After showering, individuals moved to a dressing area where towels, trash bags for wet clothing, and hand sanitizer were available. Groups of 8 to 10 individuals could be showered and have their clothing washed in about 8 minutes (60 to 70 individuals per hour).

For equipment decontamination, vehicles were lined up just east of the site, accounted for, and positioned in one of two equipment lanes. Passengers were offloaded and directed to the personnel decontamination site, while the driver remained with the vehicle. Vehicles were washed with hot, soapy water for 2 to 3 minutes to remove surface contamination, scrubbed with long-handled brushes, and rinsed for 2 to 3 minutes. The vehicles then moved to a staging area or continued to their final destination.

As waters receded, boat and vehicular traffic increased to assist survivors trapped in homes and businesses. With the increased amount of activity in the water already polluted by oil and fuel products, debris, and decomposing organic material, medical facilities reported an increase in illnesses among relief workers. Biological threats in the water were confirmed when four civilians died from *Escherichia coli* (*E. coli*) bacteria. The need for immediate decontamination of all personnel and equipment touching the water was soon realized, and word quickly spread about the decontamination site operated by the 21st Chemical Company. By the third day of operations, the site was processing more than 50 personnel and 100 pieces of equipment daily. Additional tents and



**A civilian relief worker showers after his shift.**



Total Decontamination Site Operations			
Organization	Vehicles and Equipment	Boats	Personnel
82d Airborne Divison	274	34	344
National Guard, Army Reserve, Navy, and Coast Guard	193	36	37
Emergency medical service	62	0	2
Police, fire department, border patrol, and U.S. marshals	146	1	11
Department of Homeland Defense, Department of Transportation, Drug Enforcement Administration, and Federal Emergency Management Agency	59	2	0
Other agencies	7	0	0
Civilian	36	0	3
Media	3	0	0
<b>Total</b>	<b>780</b>	<b>73</b>	<b>397</b>

pallets of bleach, soap, and hand sanitizer arrived on the fifth day of operations in support of the effort.

To accommodate the increased traffic, the company began operating the site 24/7. Additional decontamination sites were discussed, but a number of issues arose regarding the separation of personnel and equipment operations due to limited manpower. With only 18 people to operate the personnel and equipment facilities, rotating work cycles was impossible. And splitting up equipment needed for decontamination operations opened the door to potential problems. If the backup M17 failed to work, a replacement would be needed. Also, contaminated personnel who arrived in dirty trucks and boats would still be contaminated when they returned to their vehicles and proceeded to the personnel decontamination site, causing vehicle recontamination. Separating the facilities would have been counterproductive. Maintaining operations at the farmers' market location presented the best solution. And the site had already developed an excellent reputation!

Additional decontamination missions were being requested daily. Though most requests could not be fulfilled due to around-the-clock operations and limited personnel and equipment, the company did commit squads to help bleach the emergency rooms of Charity and Tourro Hospitals during the last five days of operations.

When the decontamination site closed after eight days and more than 160 hours of operations, the 21st Chemical

Company had decontaminated 780 vehicles and pieces of engineer equipment, 73 boats, and 397 people. 🇺🇸

**Endnote:**

<sup>1</sup>For a full 3,000-gallon water blivet, 6 to 7 gallons of 0.5 percent bleach solution was added. Though the bleach solution was highly diluted, it was still potent enough to fade uniforms and leave a persistent scent on personnel.

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*Captain Hemery is the assistant intelligence staff officer for the 82d Sustainment Brigade. She has a bachelor's degree in psychology from the University of Arizona.*





# Regimental Week Agenda



The 2007 U.S. Army Chemical Corps Regimental Week will be conducted at Fort Leonard Wood, Missouri, in June. The following schedule is provided for planning purposes, but is subject to change due to ongoing operational commitments. For additional information and last-minute changes, please visit the Chemical School's Web site at <http://www.wood.army.mil/usacmls/>.

Time	Event	Location
<b>Saturday, 23 June 2007</b>		
0445–Until complete	Dragon's Peak Noncommissioned Officer (NCO) and Soldier of the Year (SOY) competition	Fort Leonard Wood
<b>Sunday, 24 June 2007</b>		
0700–1800	Dragon's Peak NCO and SOY competition	Fort Leonard Wood
0800–1700	Warfighter Seminar (by invitation only)	Lincoln Hall Auditorium
1800–2100	Commandant's Icebreaker	Pershing Community Club
<b>Monday, 25 June 2007</b>		
0800–1500	Sergeants' Major Conference	Audie Murphy Club
0900–1130	Colonels' Conference	Pershing Community Club
1130–1300	General Officers' and Colonels' Combined Luncheon	Pershing Community Club
1300–1530	General Officers' Conference	Pershing Community Club
1430–1530	Allied Visitors' Tour	Fort Leonard Wood
1500–1700	National Defense Industrial Association (NDIA) Joint Chemical, Biological, Radiological, and Nuclear Conference (JCBRNC) Registration and Exhibit Opening	Exhibit pavilion
1730–1900	NDIA Reception (exhibit exposition will be open)	Exhibit pavilion
<b>Tuesday, 26 June 2007</b>		
0700–0900	NDIA JCBRNC Registration and Continental Breakfast	Exhibit pavilion
0700–1800	NDIA JCBRNC Exhibit Exposition	Exhibit pavilion
0800–0900	Regimental Review	Gammon Field
0930–0945	Opening Ceremonies	Baker Theater
0945–1600	NDIA JCBRNC	Baker Theater
1145–1300	Lunch	Exhibit pavilion
1600–1645	First Lieutenant Joseph Terry Chemical, Biological, Radiological, and Nuclear (CBRN) Weapons of Mass Destruction (WMD) Response Training Facility Ribbon-Cutting Ceremony	Terry CBRN WMD Response Training Facility
1900–2200	Chemical Corps Regimental Association (CCRA) Barbecue Social	St. Robert American Legion
<b>Wednesday, 27 June 2007</b>		
0530–0630	"Honor to Our Fallen" Sunrise Service	Memorial Grove
0700–0830	CCRA Corporate Members' Breakfast	Pershing Community Club
0700–0900	Registration and Continental Breakfast	Exhibit pavilion
0700–1600	NDIA JCBRNC Exhibit Exposition	Exhibit pavilion
0900–1500	NDIA JCBRNC	Baker Theater
1030–1130	Allied Visitors' Tour	Fort Leonard Wood
1130–1300	Lunch	Exhibit Pavilion
1300–1400	Hall of Fame/Distinguished Members of the Corps Induction Ceremony	Baker Theater
1430–1530	Allied Visitors' Tour	Fort Leonard Wood
1600	NDIA JCBRNC Exhibit Exposition Closes	
1830–2300	Green Dragon Ball	Davidson Fitness Center
<b>Thursday, 28 June 2007</b>		
0800–1500	Regimental Golf Tournament (sponsored by the CCRA)	Piney Valley Golf Course
<b>Friday, 29 June 2007</b>		
0500–0700	Regimental Run	Gammon Field

# CBRN

## Battle Management Tools

*By Major Mollie Pearson, Mr. Greg Dent,  
Ms. Jane Thorpe, and Sergeant First Class Derrick Williams*

The purpose of this article is to clarify the employment of chemical, biological, radiological, and nuclear (CBRN) battle management programs: Joint Warning and Reporting Network (JWARN), Joint Effects Model (JEM), and Joint Operational Effects Federation (JOEF). In a system-of-systems (SoS) design, JWARN, JEM, and JOEF interoperate and reside on command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems that provide tactical, operational, and strategic commanders with full-spectrum CBRN situational awareness (SA).

- JWARN provides an operational capability at all levels to employ accredited CBRN warning technology for collecting, analyzing, reporting, identifying, locating, and disseminating CBRN, environmental, and toxic industrial material (TIM) information. This information is an integral element to C4ISR systems using near real-time information.
- JEM is an accredited, predictive, modeling and simulation (M&S) capability (located at battalion level and above) that portrays the effects of CBRN and TIM hazards to support the decisions of operational commanders for mitigating operational degradation and vulnerabilities.
- JOEF is an accredited, predictive, M&S capability that supports deliberate and crisis action planning, dynamic and collaborative staff actions, and additional analytical activities (primarily at the operational and strategic levels).

### **Warning and Reporting Capabilities and Prediction Overviews**

The CBRN Warning and Reporting System (CBRNWRS) provides operational commanders with a comprehensive analysis, response, and predictive capability to mitigate the effects of CBRN attacks and accidents in the operational environment while conducting full-spectrum operations. CBRNWRS is an automated function generated

by JWARN. It enables CBRN specialists and other designated personnel to update the common operational picture (COP) with CBRN weapon- and TIM-related information. JWARN functionality can be used at all echelon levels—from the individual Soldier to national command authority—to provide a means of informing friendly units about possible contamination. For JWARN to be an effective tool in CBRNWRS, users must understand how it works and the importance of the different messages and use at each echelon level. The JWARN program is based on Standardization Agreement (STANAG) 2103 (under Allied Tactical Publication [ATP] 45) and specific standardized nuclear, biological, and chemical (NBC) report formats. These standardized reports include—

- Observer's data.
- Evaluated data.
- Immediate warning data of predicted contamination and hazard.
- Reconnaissance, monitoring, and survey results.
- Areas of actual contamination.
- Detailed information.

Each report has a specific use at different levels within the tactical and operational environments.

The distribution of NBC reports is made by the host system using the Battle Command System. These reports must be in the format specified in STANAG 2103. NBC report formats consist of the—

- **Observer's data (NBC 1).** The NBC 1 report is the most widely used report. This report can be created and used at all levels (platoon through echelons above corps [EAC]). Individuals observing CBRN events use this report to provide data to higher headquarters and warning notification to subordinate and adjacent units. Sensors are connected to C4ISR systems via direct serial connections or to a JWARN component interface device (JCID) connected



to C4ISR systems via a direct serial or network connection. JWARN enables the management of sensor configuration, testing, monitoring, and security for operational support. Sensors are usually mounted but must accommodate the possibility of being dismounted for use in an encamped mode. JCID accommodates mounted and dismounted configurations. JWARN receives sensor data, treats the information as being from an observer, and uses it to create an NBC 1 report. JWARN also has the capability to prepare and distribute the NBC 1 report quickly, accurately and, when connected to sensors, automatically.

- **Evaluated data (NBC 2).** The NBC 2 report is based on one or more observer reports. After the NBC 2 is posted to the COP, all associated NBC 1 reports must be removed. This report is created by battalion through corps level CBRN staffs (74A and 74D). It is distributed to all higher, subordinate, and adjacent units (through platoon level). The NBC 2 is used by units to determine if mission-oriented protective posture (MOPP) levels or other individual and collective protection measures must be adjusted. It is also used to assist with planning future operations.
- **Immediate warning of predicted contamination and hazard (NBC 3).** The NBC 3 report is generated by the CBRN control center (CBRNCC)—using JWARN and JEM—at brigade, division, and corps levels. CBRNCC uses threat and meteorological data to generate immediate warnings for predicted contamination. Additionally, a JEM plume is generated to provide a more detailed analysis of a contaminated area. This information is distributed to all higher, subordinate, and adjacent units (through platoon level) as an NBC message or overlay. NBC 3 reports are reevaluated as conditions change (or at least every two hours).
- **Reconnaissance, monitoring, and survey results (NBC 4).** The NBC 4 report is generated by reconnaissance personnel to identify contaminated locations. This report is sent to JWARN users at the CBRNCC to develop contamination reports.
- **Areas of actual contamination (NBC 5).** The NBC 5 report is generated by the CBRNCC and uses the information contained in NBC 4 reports to display contaminated areas. Additionally, decontamination platoons and other units conducting decontamination operations generate

this report to identify the closure of a decontamination site. This information is distributed to all higher, subordinate, and adjacent units (through platoon level) as an NBC message or overlay display.

- **Detailed information (NBC 6).** The NBC 6 report summarizes attack information and is prepared by battalion level CBRN staffs (as requested by higher headquarters). The NBC 6 is written in narrative form and includes as much detail as possible.

### Planning Concept Overview

The primary purpose of CBRN planning is to support a commander's military decision-making process (MDMP). The basic CBRN planning process remains the same across the spectrum of military operations; however, specific planning varies considerably between tactical, strategic, and operational levels. At the strategic and operational levels, there are typically more resources available for planning.

- **Tactical level.** CBRN units (reconnaissance, surveillance, decontamination, and obscuration) conduct planning operations (route, decontamination, reconnaissance survey, and nuclear crossing; stay, smoke, MOPP, and heat stress analyses; and flame field-expedient plans), use JWARN capability to notify personnel, and distribute gathered information to higher headquarters. JWARN provides the capability to conduct analyses of CBRN incidents, ensuring that SA provides minimal risks to friendly forces. Commanders and unit CBRN planners rely on higher headquarters and CBRN staffs to provide them with additional operational planning information. Additionally, JEM is used by CBRN reconnaissance and surveillance units at the tactical level.
- **Operational and strategic levels.** CBRN staff planners are primarily responsible for planning. JEM and JOEF are planning tools hosted on C4ISR systems to assist planners with critical facts required for planning and MDMP.

JEM provides CBRN staffs (battalion through EAC) and CBRN reconnaissance units with advanced CBRN and TIM modeling scenarios. This capability provides commanders with an analysis of CBRN and TIM hazards, predictions, and effects in their operational environment. JEM simulates hazards in a variety of scenarios, including—

- Counterforce.
- Interdiction.
- Elimination.

- Active and passive defense.
- Accidents and incidents.
- High-altitude releases.
- Urban environments.
- Building interiors.
- Personnel performance degradation.

Additionally, JEM is capable of processing weather data from multiple sources, including—

- Historical records.
- Current forecasts (obtained via Web services).
- Integrated Meteorological System data.
- JWARN reports.
- Meteorology and oceanography data from local and strategic sources.

CBRN staff planners integrate weather, terrain, and personnel information with JEM and conduct automated analyses, evaluations, and impact predictions of CBRN and TIM threats to develop contingency and operation plans. CBRN reconnaissance units can use weather plumes to define their reconnaissance efforts. CBRN staff planners can produce event templates using JEM and send the results to subordinate and adjacent units.

JOEF provides CBRN staff planners (brigade through EAC) with M&S capabilities, planning templates, and mitigation planning tools. As a battle management tool, JOEF automates portions of the MDMP to support planning operations in dynamic and continuous environments, while incorporating risk reduction measures. CBRN planners use JOEF to assist them with the CBRN portion of the—


- Intelligence preparation of the battlefield.
- Mission analysis.
- Development of adversary and friendly courses of action.
- Vulnerability assessments.
- Probability impact of casualties (using JEM).
- Technical advice and recommendations on MOPP or other personal protective equipment.
- Personnel safety criteria.
- Operational exposure guidance.
- Reconnaissance and surveillance assessments.
- Obscuration operations (as applicable).
- Defense measures.
- Risk reduction assessments.
- Mitigation techniques and sensor emplacement.

- Requirements for health support and medical coordination.

CBRN staff planners use JOEF and JEM to develop contingency and operation plans. This enables the commander to better evaluate time-phased force and deployment data requirements in light of the threat and the potential impact on protecting forces. These products are sent to higher headquarters, subordinate units, and adjacent units.

## Logistics and Security

Software is distributed as part of C4ISR host systems and fielded as part of Army software blocking (testing to ensure that software is interoperable in an SoS environment). Normal software upgrade maintenance patches are coordinated with C4ISR host systems, fielded as part of Army software blocking, coordinated as emergency software upgrade maintenance patches, and fielded with C4ISR host systems.

All systems will operate at the current level of security classification. Authorization for data access will operate at the classification level of its host C4ISR system. All classified information, documents, and electronic transmissions will be assigned an appropriate level of protection as required by Department of Defense regulations. For more information, contact Major Pearson at <[mollie.pearson@us.army.mil](mailto:mollie.pearson@us.army.mil)> or Mr. Dent at <[gregory.dent@us.army.mil](mailto:gregory.dent@us.army.mil)>. 

## More on JWARN...

There are two versions of JWARN being used in the field: Block 1D and Block 1E. However, JWARN 1D is no longer a supported program. Users who have JWARN 1D should upgrade to JWARN 1E. Features available with JWARN 1E include—

- Updates to the hazard prediction assessment capability (NBC analysis).
- Automatic-fill options for messages.
- An online emergency response guide.
- Medical surveillance data integration.
- Biological incident reports.
- Hazardous-material spot reports.

JWARN Block II is currently under development and will supersede JWARN 1E in Fiscal Year 2010. This version builds on JWARN 1E and adds the following features:

- An interface with JEM for advanced hazard prediction.
- A direct connection to CBRN sensors.
- Incorporated ATP 45 requirement updates.
- Event data relative to the COP.

For support information, contact the Joint Program Management Information Systems help desk at 1-877-328-0371.

**Reference:**

STANAG 2103 (Edition 9). *Reporting Nuclear Detonations, Biological and Chemical Attacks, and Predicting and Warning of Associated Hazards and Hazard Areas (Operators Manual)–ATP-45(C)*. 14 December 2005.

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Major Pearson is the Assistant Director for Acquisition and Chief of Chemical Information Systems, Weapons of Mass Destruction–Requirements Determination Division (WMD-RDD), Capability Development and Integration Directorate (CDID), Fort Leonard Wood, Missouri. She has a bachelor's degree in psychology from Pennsylvania State University and master's degrees in human resource management from

George Washington University, Washington, D.C., and information management from Webster University, Missouri.

Mr. Dent is a combat developer at the WMD-RDD, CDID. He retired from the U.S. Army with 20 years of service. Mr. Dent is completing his bachelor's degree in liberal arts from Park University, Missouri.

Ms. Thorpe is a research scientist for Battelle Memorial Institute. She has a bachelor's degree in business management from California State University, Bakersfield.

Sergeant First Class Williams is a combat developer at the WMD-RDD, CDID. He has an associate's degree in general studies from Columbia College, Missouri.

## A Farewell to a General

Major General David William Einsel, Jr. (Retired), a decorated Army officer instrumental in guiding the country's efforts to develop chemical and nuclear weapon systems, died on 30 October 2006 in Tiffin, Ohio. He was 77.

General Einsel was born in Tiffin on 4 November 1928. He graduated from Ohio State University in 1950, with a bachelor's degree in chemistry and a master's degree in physical chemistry. He also received a master's degree in physics from the University of Virginia in 1956.

Major General Einsel began his Army service in September 1950, serving in a variety of field artillery command positions. In Korea, Major General Einsel participated in the fierce fighting at Heartbreak Ridge. During the 1960s, he served as the Assistant Professor of Chemistry at the U.S. Military Academy at West Point, New York. In Vietnam, he served in the First Cavalry Division (Airmobile), where he was directly involved in the tactical use of riot control agents and herbicides. During the 1970s and early 1980s, he commanded the Harry Diamond Laboratory in Adelphi, Maryland, where he was responsible for the development of new electronic fuzes for artillery, rockets, bombs, special-purpose radar, and fluidic sensors (the type now routinely used on aircraft). He later became the deputy commander of the Army's largest research and development organization—the U.S. Army Armament Research and Development Command.

Major General Einsel held a number of staff assignments in Washington, D.C., including nuclear advisor to the Deputy Chief Chemical Officer; deputy assistant to the Secretary of Defense; executive secretary to the Military Liaison Committee, Department of Energy; and Chief of the Nuclear-Chemical Office for the Deputy Chief of Operations, where he played a significant role in reversing a decision by the Secretary of the Army to abolish the Chemical Corps. During this period, he was a principal player in obtaining chemical research and development funding, preparing presidential decision memorandums that initiated the production of the binary chemical weapons program, and reinitiating U.S. participation in the Geneva negotiations and international chemical arms control treaties.

After retiring in 1985, Major General Einsel was selected by the Director of Central Intelligence to serve as a consultant to firms involved in chemical, biological, and nuclear matters of interest to the United States.

Major General Einsel is survived by his wife, two daughters, and four grandchildren.





Family, friends, and Chemical Corps Soldiers gathered to watch as Colonel Thomas Spoehr, Commandant of the U.S. Army Chemical School and Chief of the Chemical Corps, was promoted to the rank of brigadier general. The ceremony was held at the Maneuver Support Center at Fort Leonard Wood, Missouri, on 27 November 2006.

Obtaining the rank of brigadier general is a pivotal turning point in an officer's life. Certainly, the leadership role changes and the responsibility increases, but receiving a star represents so much more. "Generalship is more than wearing a belt, more than a fancy star and a flag. It is something that says this man has unique vision, unique courage, and the ability to communicate with others," said Major General Stephen Speakes, Force Development Director, Office of the Deputy Chief of Staff.<sup>1</sup>

With 27 years of Army service, obtaining the rank of brigadier general was something that the Chemical Corps' top Soldier thought would never happen. "My beginnings in the Army were not particularly promising. In fact, one of my [Reserve Officer Training Corps] ROTC instructors commented in my written records that 'Cadet Spoehr shows little to no aptitude for military service,'" Spoehr said. But Major General Speakes reiterated that the Army made the right decision. "Our Army has made an important decision and an important commission. When we have taken a look at him and all of the Army's leaders, we have elevated him to a very new and significant rank. It is one that he will wear proudly. It is a great day for our Army." Major General Speakes also identified numerous qualities that Brigadier General Spoehr possesses that will help him transition to his role as general. "We will, in this Army, continue to make hard choices. We have to. We are a nation at war. The choices that generals make these days are not easy. Tom has the ability to balance things and the ability to think things through with a sense of dignity. These are all qualities of generalship that I see in him."

Brigadier General Spoehr thanked everyone for attending the ceremony, but he also thanked the numerous people he has encountered during his career. "When I look back on the years in the Army, I see an unbroken chain of leadership lessons. Individuals like these and the examples they have lived have, over the years, instilled in me the understanding that this rank is not a symbol of privilege and entitlement, but rather symbols of responsibility and obligation," Spoehr said.



*By Ms. Allison Choike*



**Mrs. Spoehr replaces wings with a star.**

After Brigadier General Spoehr's wife removed the rank of colonel and replaced it with a star and his daughter and son presented him with a new beret and his general officer belt, Brigadier General Spoehr gave a pledge: "As Spiderman's uncle, Uncle Ben, once said, 'With great power comes great responsibility.' I pledge to you that with this bigger responsibility that the Army has invested on me, I will help Soldiers to make our Army and Chemical Corps as strong as possible to protect our nation." 🐭

**Endnote:**

<sup>1</sup>Major General Speakes has since been promoted to lieutenant general.

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*Ms. Choike is a staff writer for the Guidon newspaper at Fort Leonard Wood.*

# Providing CBRN Support to Domestic Disasters

By Mr. Jacques A. Walden Sr.

*Imagine that you are working at your desk at a military installation and you hear an explosion. Five minutes later, you notice a strong chemical smell that burns your throat and eyes. Many of your coworkers are covering their noses and eyes for protection from the irritation. You know that something is very wrong, but what you don't know is that a detonation has occurred at an industrial chemical plant just 5 miles downwind from your office, and toxic chemicals are spreading through the atmosphere. Your first thoughts are of your children attending school and your spouse working near the detonation site. Even before you have a chance to regain your composure, you hear a second explosion. You immediately think of the nuclear power plant 15 miles from your office. You are aware that an incident at the plant could create a downwind hazard area of 25 miles and expose up to 15,000 people to radiation particles.*

This is a horrific scenario that we hope never plays out, but one for which we must remain vigilant. To ensure the safety of its citizens, the leaders of the U.S. Armed Forces must ensure that the appropriate tactics, techniques, and procedures (TTP) are in place to support chemical, biological, radiological, and nuclear (CBRN) operations in and around military installations in the continental United States (CONUS). Currently, the Joint Requirements Office for CBRN Defense (JRO-CBRN Defense) is sponsoring the revision of Field Manual (FM) 3-11.34, *Multiservice Procedures for Nuclear, Biological, and Chemical (NBC) Defense of Theater Fixed Sites, Ports, and Airfields*. The current publication, dated August 2000, focuses on operations outside the continental United States (OCONUS), but the events of 11 September 2001 redefined the likelihood of an attack and redirected focus on CONUS attacks.

The services are in agreement that the new title—*Multiservice Tactics, Techniques, and Procedures for Installation Chemical, Biological, Radiological, and Nuclear Defense*—reflects the essence of current MTTP operations. In the new publication, the term “installations” will refer to military bases and fixed sites, ports, and airfields. The completed publication will provide examples of installation descriptions recognized by the Army, Marine Corps, Navy, and Air Force and will create a common multiservice reference for planning, resourcing, and executing TTP for CBRN defense at CONUS and OCONUS installations. The primary users of this publication will be CBRN staff officers and noncommissioned officers, personnel assigned to perform collateral CBRN duties, commanders and staffs at tactical through operational levels, and civilian agencies. The MTTP is currently in the signature draft phase of the development process and is scheduled to be published during the third quarter of Fiscal Year 2007.

Army, Marine Corps, and Navy doctrine action officers have agreed to adopt a modified version of the Air Force counter-chemical warfare (C-CW) concept of operations (CONOPS). This agreement comes following approval from the Combating Weapons of Mass Destruction (CbtWMD) Issue Team, Force Protection Functional-Capabilities Board. The CbtWMD Issue Team was briefed by the Joint CBRN Combat Developments (JCCD) Experimentation and Analysis Branch in February 2006 reference the split mission-oriented protective posture (MOPP) concept experiment.

The JRO-CBRN Defense, through the JCCD, sought to validate the use of Air Force CONOPS for split MOPP operations on joint installations. Split MOPP and C-CW operations were reviewed during the literature search—the first step in conducting the concept experiment. Split



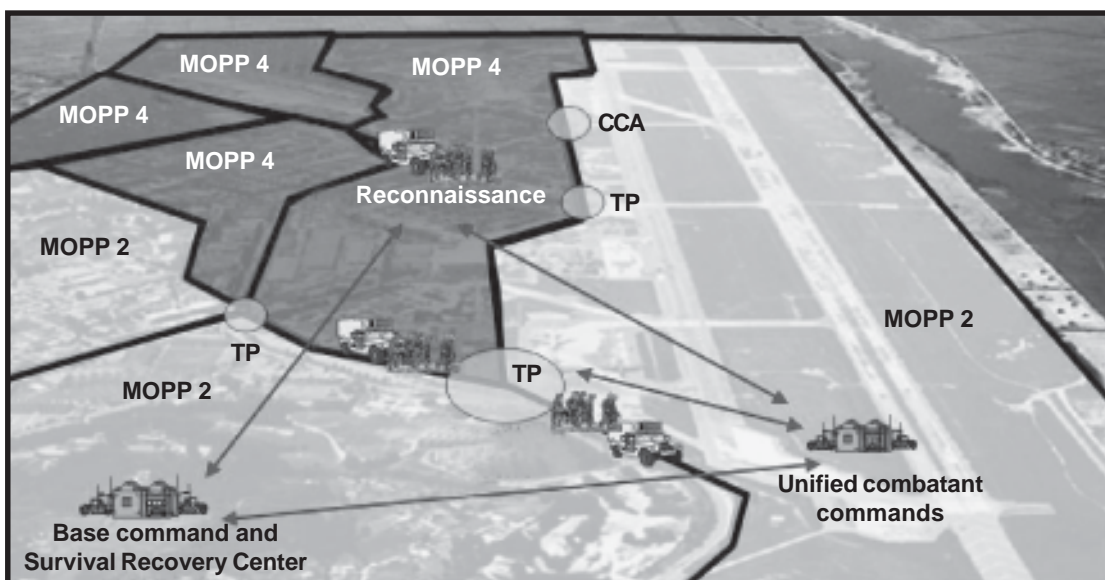
MOPP and C-CW CONOPS were reviewed in detail during a three-day, scenario-driven seminar and tabletop exercise in which Air Force personnel assisted representatives from the joint forces (including the Coast Guard) to apply the Air Force CONOPS to seaport and joint forward-operating bases. The results of the exercise were used to frame the scope of a live experiment with warfighters and subject matter experts. The results of the experiment demonstrated that the Air Force C-CW CONOPS is based on sound doctrinal principles of contamination avoidance that will work for all U.S. forces on multiservice and joint installations. Split MOPP—defined in Air Force Manual (AFMAN) 10-2602 as “a tactic that divides an airbase or operating location into two or more sectors or zones to enable a commander to tailor mission oriented protective posture (MOPP) levels and alarm conditions within each sector to reflect the current hazard and mission priorities within that area”—is part of Air Force fixed-base C-CW CONOPS.

Split MOPP TTP information includes guidance on contamination control areas (CCAs), chemical-defense transition zones, and transition points. Additionally, it details standardized marking procedures for processing contaminated vehicles through transition points (TPs). Installation commanders with joint or multiservice forces must consider whether or not to implement split MOPP TTP. The procedures for implementation include—

- Making preattack preparations.
  - Developing a plan that divides the installation into zone sectors which mirror base installation defense sectors.

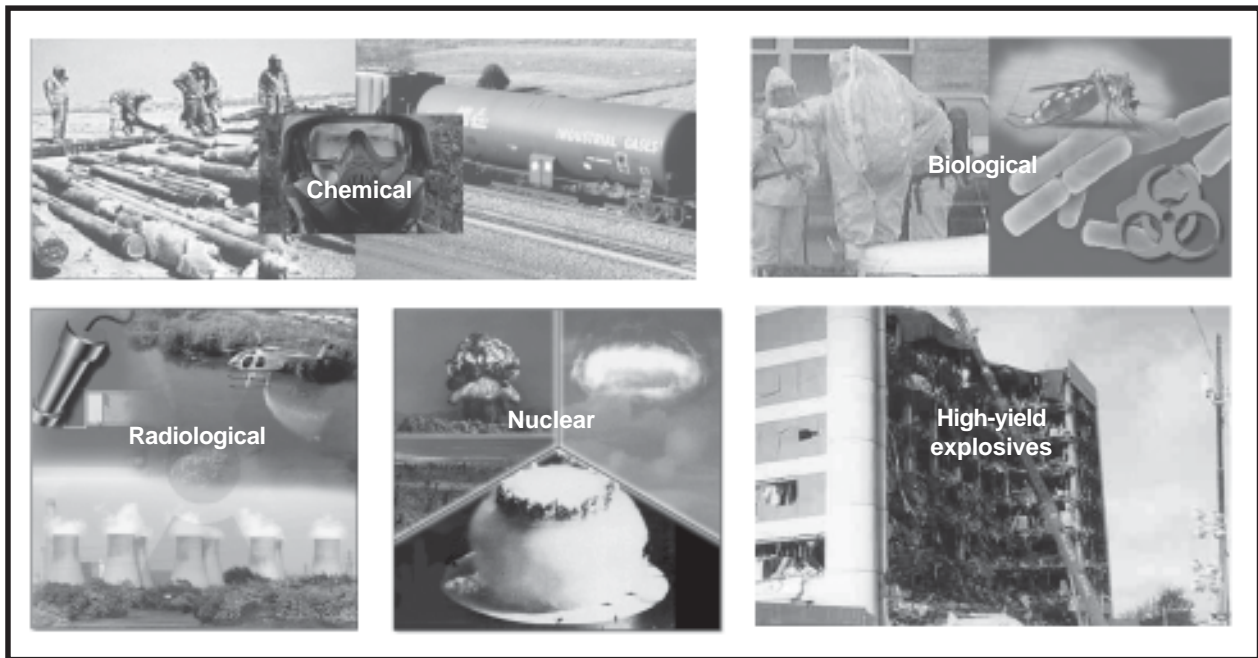
- Providing guidance on contamination avoidance, including instructions on donning MOPP gear and seeking protection with overhead cover.
- Making postattack preparations.
  - Organizing reconnaissance teams for each zone to determine contaminated and uncontaminated areas.
  - Designating guidance for lowering MOPP levels in zones free of contamination.
  - Establishing possible locations for TPs and CCAs between hot and cold zones.<sup>1, 2, 3</sup>

The JRO-CBRN Defense also has the lead on the revision to FM 3-11.21, *Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Aspects of Consequence Management*. Joint Publication (JP) 3-41 defines chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) consequence management (CM) as “actions taken to address the consequences from all deliberate and inadvertent releases of chemical, biological, radiological, nuclear agents or substances, and high-yield explosives with potential to cause mass casualties and large levels of destruction.” The U.S. Army Chemical School staffed the revised document to Army, Marine Corps, Navy, and Air Force doctrine action officers for service distribution and comments. The service comments were adjudicated during a multiservice working group in November 2006. This publication, scheduled for completion in November 2007, will be designed for use from the joint task force (JTF) level to the tactical unit leaders performing CBRN CM.



Split MOPP scenario





### CBRNE consequence management

It will also support functional and service staffs in foreign and domestic locations that are tasked with planning, preparing, and conducting CBRN CM operations. The revised FM 3-11.21 will—

- Define the roles of military units and staffs involved in planning and executing integrated CBRN CM in foreign and domestic environments.
- Consider a large spectrum of CBRN potential incidents, whether the result of natural, deliberate, or accidental release (including toxic industrial material).
- Address the integration of active and reserve component forces in conducting CBRN CM.
- Address the employment of military CBRN defense capabilities (as authorized) in support of federal, state, and local civil authorities.
- Fill the gap between MTTPs and joint doctrine publications (such as JP 3-40 and JP 3-41).

The new FM 3-11.21 will include chapters on the doctrinal aspects of planning, preparation, and response and recovery operations, while the appendices will include TTP. The TTP information will consist of Department of Defense CM assets, vulnerability reduction measures, CBRN incident site assessment, and decontamination operations. The JRO-CBRN Defense looks forward to comments from Army, Marine Corps, Navy, and Air Force CBRN subject matter experts on the final coordination draft. This input will assist service-appointed CBRN doctrine action officers in developing a quality publication

which ensures that our military has the appropriate MTTP required to respond to a CBRN CM incident. 🚒

#### Endnotes:

<sup>1</sup>TPs are used to admit uncontaminated personnel into MOPP 4 zones and to transition personnel with minimal contamination between hot and cold zones (following the decontamination of boots and gloves and the completion of cleanliness verification). TPs are also used to partially decontaminate mission-essential vehicles that move between hot and cold zones to perform specific missions.

<sup>2</sup>CCAs are used to perform a thorough decontamination on personnel who have been grossly contaminated and cannot be cleaned at the TPs. A thorough decontamination of vehicles and equipment is not performed during a split MOPP operation.

<sup>3</sup>Additional split MOPP TTP will be written into the revised FM 3-11.34.

#### References:

AFMAN 10-2602, *Nuclear, Biological, Chemical, and Conventional (NBCC) Defense Operations and Standards*, 29 May 2003.

FM 3-11.21, *Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Aspects of Consequence Management*, 12 December 2001.

FM 3-11.34, *Multiservice Procedures for Nuclear, Biological, and Chemical (NBC) Defense of Theater Fixed Sites, Ports, and Airfields*, 29 September 2000.

JP 3-40, *Joint Doctrine for Combating Weapons of Mass Destruction*, 8 July 2004.

JP 3-41, *Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives Consequence Management*, 2 October 2006.

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# OPERATION SNOOPY: THE CHEMICAL CORPS' "PEOPLE SNIFFER"

By Mr. Reid Kirby

During World War II, the German Navy invented a means to evade Allied antisubmarine patrols. Unlike the nuclear submarines of today, the diesel submarines of the World War II era used battery power to run submerged and, most often, diesel engines to run on the surface. The snorkel—a small pipe extending above the waves—enabled German U-boats to run submerged longer on diesel power. The almost nonexistent cross section of the snorkel made visual detection of submarines nearly impossible from any reasonable distance. To combat this threat, the U.S. Navy implemented a new means of detection—the “people sniffer.”

Even though submarines were running submerged, a trail of diesel exhaust followed. The Navy began missions of flying aircraft low and periodically collecting samples of air through a dampened felt filter to a chamber. The pressure and temperature in the chamber were then lowered by increasing the chamber volume, thus creating a cloud from the moistened air. The air samples containing diesel exhaust particles formed a substrate for water moisture to condense and form fog. The more exhaust particles, the more condensation nuclei. Changes in the voltage of the cloud counted the number of these condensation particles.

Navy patrol planes flew upwind in a zigzag pattern over an expanse of ocean using the effluent sniffer tool until the tool found a submerged submarine. The Navy maintained this detector method for antisubmarine warfare well into the 1970s, despite the bad reputation it had among patrol crews, who often were unable to distinguish any trails along well-traveled commercial shipping routes or spent hours tracing an effluent trail only to locate a commercial cargo vessel. Nonetheless, when a P2 Neptune located a Soviet submarine using the sniffer during the Cuban Missile Crisis, the device was again recognized as a required tool of the trade.<sup>1</sup>

During the Vietnam War, the United States pledged its support for South Vietnam and offered the latest security technologies. In addition to the use of herbicides to defoliate infiltration routes, the United States had a series of programs intended to detect and monitor North Vietnamese and Vietcong troop movements. In the area termed the *McNamara Line*, a zone of intensive observation was set up along the Ho Chi Minh Trail, with a command center located in Thailand. Numerous research and development projects, including Operations Igloo White and White Cloud, used an array of detection devices to identify activity along the trail and coordinate airpower interdiction.

At the tactical level, the Chemical Corps used people sniffer interdiction to locate the enemy. The detection methods used to locate people depended on effluents unique to humans. Sweat is partly composed of ammonia. Ammonia, when combined with hydrochloric acid, forms ammonium chloride. Ammonium chloride, a particulate, is detectable in a cloud chamber. Using these processes, scientists at General Electric developed people sniffer



Operation Snoopy patch

detection capabilities for the Chemical Corps in 1965. While Chemical officers planned detection missions, Chemical Soldiers learned how to conduct detection operations—later termed “Operation Snoopy.” The crews who flew Snoopy missions wore a distinctive arm patch.

The first version of the people sniffer was a configuration called the XM2 personnel detector manpack—a backpack sensor with an air intake tube mounted on the end of a rifle. The main problem with this type of detection configuration was the confusion between the effluents produced by the Soldiers operating the equipment and that of the enemy. Additionally, Soldiers were not fond of operating a device that made a distinct “ticka-ticka-ticka” sound as they entered possible ambush sites.

The second version of the people sniffer was a helicopter-mounted configuration called the XM3 airborne personnel detector. This detection device used two identical, independent units that operated in two separate modes. The helicopters with XM3s flew missions in 300-foot swaths, perpendicular to the wind, 50 feet above the ground or trees, and accompanied by two helicopter gunships (flying behind and at higher altitudes). After establishing a background level of 30 to 40 units, the sniffer operator communicated the readings using a set of alpha codes—ALPHA, BRAVO, CHARLIE, and DELTA. The ALPHA and CHARLIE readings indicated if people were present. If necessary, crews could use XM2s for missions if XM3s were not available.



**XM2 Manpack Sniffer**



**XM3 Airborne Personnel Detector**

Obtaining the best results from the sniffer required winds under 10 miles per hour and a neutral temperature gradient. Under the early morning sun, the sniffer operated best on flat terrain and poorly in jungle conditions. At midday, jungle conditions were preferred over flat terrain. Detection improved during the rainy season because background effluents that could interfere with the readings were washed out. The sniffer also operated best in areas free of smoke, motor vehicle exhaust, and other battlefield effluents. The Army considered the people sniffer a valid indicator of enemy occupation in bunker complexes and other hard targets. Next to visual sighting, it was the second most reliable means of detecting enemy troops.<sup>2</sup>

In 1970, the XM3 became the M3 personnel detector, a standard-issue item used almost daily in LOH-6, OH-58, and UH-1 helicopters. The usual flight formation consisted of a gunship (flying 500 feet above the sniffer) and a command ship (flying 1,000 feet above the sniffer) providing cover for the detector. The command ship logged results and controlled the formation maneuvers, while the gunship dropped smoke grenades to identify the wind direction in preparation for delivering E158 CS (riot control agent) bomb clusters on identified personnel locations.

Personnel had great success using the people sniffer to detect smoke (such as from cooking fires). However,





### Chemical officer fuzing E158 CS clusters

there was a problem with distinguishing between occupied areas and recently abandoned areas since effluents hung in the air for many hours. The discovery of dead enemy personnel and destroyed bunkers usually validated the belief that the people sniffer was a reliable asset.

The enemy became familiar with the M3 and attempted to avoid detection by not firing on Snoopy missions. The enemy also hung buckets of mud with urine and started fires in an attempt to create decoys and confuse readings. Since herbicide missions normally encountered ground fire, sniffer helicopters periodically fashioned fake spray bars to provoke the enemy into firing, thus creating effluents to aid in the detection process.<sup>3</sup>

Snoopy missions were dangerous, but necessary. When Air Force photographic and infrared equipment indicated the possibility of two North Vietnamese army divisions in Cam Duc, the Army used a Snoopy mission to confirm. A Snoopy mission flew to Dak To valley, just past Dak Pek, to the border of II Corps' location. When the mission was complete, all ordnance had been expended and one helicopter was heavily damaged, but the United States confirmed the presence of enemy troops. U.S. and South Vietnamese forces were evacuated from the area, avoiding a standoff similar to the battle at Khe Sanh.<sup>4,5</sup>

The Army Scientific Advisory Panel sent Dr. John D. Baldeschwieler of Stanford University on a technical mission to Vietnam in 1967. He observed several Snoopy missions and conducted controlled experiments to confirm the ability of the sniffer to detect ammonia. Until these tests were conducted, the sniffer had not been tested on known ammonia releases. Flying helicopters under these controlled conditions demonstrated that the people sniffer responded randomly to ammonia indicators, making it subjective as an indicator of personnel presence.<sup>6</sup> Even with the ammonia detection mode proven unreliable, the sniffer was capable of detecting other effluents (such as smoke) and remained a valuable capability for the U.S. Army during the Vietnam War. 🇺🇸

#### Endnotes:

<sup>1</sup>William Kirby (former P2 Neptune pilot, U.S. Navy Reserve), personal interview, 26 October 2006. The patrol plane was forced to use its effluent sniffer because all other equipment on the aircraft failed to function.

<sup>2</sup>The 25th Infantry Division, "Operational Report: Lessons Learned," Headquarters, 25th Infantry Division, 1 August 1969, pp. 209–217.

<sup>3</sup>M. M. Michie and B. Botwinick, "Vietnam After-Action Conference, Held 12–13 January 1971," Edgewood Arsenal Special Publication 600-13, October 1971.

<sup>4</sup>Colonel Thomas Matthews, interviewed by General Joseph T. Palastra, Jr., 1996, U.S. Army Military History Institute, Senior Officer Oral History Program Project 1996-6, Vol. 1, pp. 207–208.

<sup>5</sup>Khe Sanh was a U.S. Marine base in South Vietnam near the border of Laos, south of the border with North Vietnam. It was the location of a large offensive operation—one of the most bitterly fought battles of the Vietnam War—by the North Vietnamese Army in January 1968. Khe Sanh was abandoned by the U.S. military in July 1968, citing the vulnerability of the base to enemy artillery.

<sup>6</sup>David C. Brock and Arthur Daemmrich, interviewed by John D. Baldeschwieler, Chemical Heritage Foundation, Philadelphia, Pennsylvania, 13 June 2003, Chemical Heritage Foundation, Oral History Transcript #0280, pp. 29–31.

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### U.S. Army Chemical School Web Site

Do you need up-to-date information about chemical career management, courses, equipment, doctrine, and training development? All of this information and more is available at the U.S. Army Chemical School Web site. Visit <<http://www.wood.army.mil/usacmls/>> to check out this great resource.



# **How The Chemical School Quality Assurance Element Can Help Improve Training**

*By Mr. Robert Davis*

The staff at the U.S. Army Chemical School Quality Assurance Element (QAE) is dedicated to promoting the highest standard of training. Whether we are conducting evaluations, providing consulting services, attending conferences, or participating in assessments and information exchanges, enhancing Army combat readiness remains our focus. Our mission is to provide oversight of and support for the development and integration of training and professional military education to meet the needs of the unit, the Soldier, and the Army.

At the QAE, we provide assistance with producing training and doctrine publications and with training Soldiers and leaders to support the Army's transformation mission. To support this mission, we provide a variety of services.

## **Internal Evaluations**

During an internal evaluation, we gather data focused on the training development (TD) process and the training program and provide this data to decision makers so that they can make sound, informed decisions about how to improve the quality and effectiveness of the instructional system. Internal evaluations are performed to identify weaknesses and strengths in TD and instructional systems. They are not only performed to check an instructor's technique and method of instruction, but to also check the quality of the material being taught and measure what students are learning. In an internal evaluation, comparisons are made between the course objectives and standards applied in the training and the objectives and standards specified in course development documents. Each evaluator in the QAE conducts two internal evaluations per week and provides this data to the appropriate course manager or training developer.

## **External Evaluations**

During an external evaluation, we gather data from the field to determine if Soldiers' instruction meets their job performance requirements, if additional instruction is required, or if the instructional material was applicable to their duties. External evaluations ensure that the training our Soldiers receive is effective, is cost-efficient and, most importantly, meets the needs of the operational Army. External evaluations are quality improvement checks which ensure that graduating students use their knowledge to accomplish tasks and make improvements to future operations.

External evaluations are conducted on Soldiers and/or their supervisors six months following graduation. They are contacted by e-mail and directed to a Web site to complete a survey that measures how they are using their course knowledge to complete their missions. The feedback from the surveys ensures that our Soldiers are trained to meet the needs of the operational force.

## School Accreditation

Accreditation is the U.S. Army Training and Doctrine Command (TRADOC) Commander's formal recognition of a school's excellence in training. It is the result of an evaluative process which certifies that an institution's training program, processes, personnel, administration, operations, and logistical support are adequate to support course standards. Accreditation affirms that training institutions are adhering to TRADOC training guidance and directives. Additionally, it ensures that—

- Standardized training and training products are doctrinally correct.
- Staff and faculty personnel are trained to standard and provide quality instruction to their students.
- The institutional infrastructure meets the required standards.
- The training program provides relevant and realistic training to meet opposing forces (OPFOR)/contemporary operational environment (COE) requirements.
- The school is prepared to meet the training and educational needs of Stryker and future forces.
- Feedback is provided to senior leaders regarding significant training issues.

The Chemical School received full accreditation in March 2006 (refer to the evaluation standards used in the gray box). The accreditation of all Active Army and reserve component (RC) training institutions is reevaluated every three years. TRADOC accreditation standards are used to evaluate training, training support and, where applicable, proponent functions.

## TASS Battalion Accreditation and Staff Assistance

The Total Army School System (TASS) is comprised of accredited and integrated Active Army, Army National Guard, and U.S. Army Reserve schools. TASS battalions are divided into regions and functionally aligned with their training development proponent. At present, the Chemical Corps has six TASS battalions, geographically divided into six regions throughout the United States, that teach military occupational specialty (MOS) 74D reclassification and Noncommissioned Officer Education System (NCOES) courses.

Chemical TASS battalions are accredited every three years, and the Chemical School QAE serves as the primary agency responsible for conducting the evaluations. During an accreditation year, we travel to approximately 80 percent of the battalion training locations to evaluate courses. We also evaluate the two-week annual training conducted at Fort Leonard Wood, Missouri. The year prior to accreditation recertification, we visit training locations and provide staff assistance to prepare for the upcoming event.

The following standards were used by TRADOC to evaluate and accredit the Chemical School. These standards included compliance with—

- **Conduct of training.**
  - Maintained the proper instructor-to-student ratio and equipment requirements.
  - Maintained required instructor qualifications and proponent technical certification requirements.
  - Used current and approved course materials (including tests) that train Active Army and RC Soldiers to the same task performance standards.
  - Conducted training and operations that minimized accident risks.
  - Conducted training that protected the environment from damage.
  - Scheduled and conducted sequential, progressive training according to a mandatory training sequence.
  - Ensured that instructors and cadre performed their instructional duties and responsibilities according to regulatory guidance and lesson objectives.
  - Ensured that students performed tasks to the prescribed learning objective standards.
  - Presented opportunities for students to develop and demonstrate their leadership skills and knowledge in a performance-based environment.
  - Used required ranges and training areas as prescribed.
- **Training support.**
  - Made corrections to shortcomings identified during previous accreditation evaluations.
  - Managed manpower effectively to meet mission requirements.
  - Maintained the required equipment; training aids, devices, simulations, and simulators (TADSS); ammunition; pyrotechnics; training materials; consumable supplies; and references (as prescribed).
  - Evaluated and tracked instructor and cadre performance abilities and took action, as appropriate, to sustain and improve those abilities.
  - Maintained facilities that promoted a learning environment and met learning objectives (including barracks, classrooms, ranges, training areas, and learning facilities).
  - Instituted policies, procedures, and oversight practices to ensure that effective training and administrative support was provided.
- **Proponent functions.**
  - Maintained a quality assurance program that included internal and external evaluations to improve, sustain, and develop effective education and training.
  - Instituted an effective system to forecast, update, and monitor training and leader development-related resourcing requirements.
  - Developed and maintained training products based on current and approved critical tasks and task analysis data.
  - Designed and developed efficient, effective, and relevant Active Army and RC training to the same task performance standard, using (as appropriate) live, constructive, and virtual training.
  - Developed and provided valid and reliable criterion-referenced tests.
  - Maintained training that reflected current joint, Army, and branch doctrine at the appropriate level and incorporated lessons learned from combat training centers, unit operational deployments, and the Center for Army Lessons Learned.
  - Instituted a staff and faculty development program to meet regulatory, institutional, and career development requirements.
  - Developed, published, and followed command training guidance according to Army doctrine.



## End of Course Questionnaires

We develop and conduct end-of-course questionnaires for all courses taught by the Chemical School. These questionnaires were developed to provide Soldiers an opportunity to present their perspectives about their training experiences. The information they provide is analyzed and presented to Chemical School leadership to help them make informed decisions for training improvement.

### Conclusion

There seems to be a misconception that the QAE is an outside inspection team who wears black hats and shows up to ruin everyone's day. This is not the case! We are not the enemy. We are Chemical School personnel who work directly with training developers and course managers to identify ways to improve training for Chemical Soldiers. If you are experiencing any training problems, let us assist you; we will go out of our way to help! So the next time you see one of our evaluators in the back of your classroom, try to look at us differently; we are there to help you. 🙏

### References:

- TRADOC, "TRADOC Quality Assurance Program and Accreditation of Army Education and Training," memorandum, 20 January 2004.  
TRADOC Pamphlet 350-70-4, *Systems Approach to Training: Evaluation*, 12 January 2004.  
TRADOC Regulation 350-18, *The Army School System (TASS)*, 26 May 2000.

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*Mr. Davis is a training specialist for the U.S. Army Chemical School, TASS Accreditation and QAE. He has a master's degree in training and organizational development and is a retired Chemical Sergeant Major with 26 years of military experience.*

## Honoring Our Fallen Dragon Soldiers



**Sergeant Jonathan E. Lootens**  
Hometown: Lyons, New York  
Unit: 2d Battalion, 35th Infantry Regiment, 3d Brigade, 25th Infantry Division, Schofield Barracks, Hawaii  
Killed: 15 October 2006

**Specialist Elias Elias**  
Hometown: Glendora, California  
Unit: 3d Squadron, 61st Cavalry Regiment, 2d Brigade Combat Team, 2d Infantry Division, Fort Carson, Colorado  
Killed: 23 December 2006



**Sergeant Marco L. Miller**  
Hometown: Longwood, Florida  
Unit: 3d Battalion Support Company, 20th Special Forces Group (Airborne), Camp Blanding, Florida  
Killed: 5 December 2006

**Specialist Ignacio Ramirez**  
Hometown: Henderson, Nevada  
Unit: 1st Battalion, 37th Armor Regiment, 1st Armored Division, Friedberg, Germany  
Killed: 9 August 2006



*This casualty list from the ongoing Global War on Terrorism was current as of the publication date.*

# The Chemical Corps of the Future— From Apprentice to CBRN Expert

*By Major John Shank*

*The Chemical Corps “Center of Gravity” is the education we provide our officers, noncommissioned officers (NCOs), and enlisted personnel. The education system at the U.S. Army Chemical School, Fort Leonard Wood, Missouri, is effective in training the Chemical Soldiers of today, but improvements must be made to further implement Brigadier General Spoehr’s Chemical Corps Vision (see inside back cover) and transform today’s Chemical Soldiers into the chemical, biological, radiological, and nuclear (CBRN) warriors of tomorrow. The Chemical Corps needs a document that defines the Vision and provides detailed ways of moving the Corps forward to total Vision implementation. This implementation document would focus Corps efforts and help transform Soldiers into the CBRN warriors that our field commanders need to complete missions. To develop a branch of highly trained CBRN experts, the Chemical Corps must provide professional military education (PME) opportunities and an online CBRN resource center. Offering training and resource opportunities would accomplish three objectives:*

- *Maintain the CBRN band of excellence throughout the Army.*
- *Increase the level of expertise that Chemical Soldiers provide to commanders and staffs at all levels in the Department of Defense (DOD).*
- *Provide standardized and certified CBRN information and resources.*

*This access to timely and accurate information will empower our Chemical leaders to overcome the systemic challenges of the past and provide a vital and relevant capability for combatant commanders, the joint warfight, and homeland defense missions.*

When Brigadier General Thomas Spoehr became the Chief of Chemical, the U.S. Army Training and Doctrine Command (TRADOC) Commander, General William Wallace, provided him with a certificate of charter. The charter appointed Brigadier General Spoehr as Chief and provided him with focus and direction to “lead amidst change and uncertainty and provide a steady course for the Soldiers and families entrusted to your care.” General Wallace laid out three main directives in the charter:

- Provide trained and ready forces to combatant commanders to sustain global operations.
- Foster a culture of innovation that significantly increases Army institutional agility.
- Adapt the institutional Army to meet the needs of the future force.

Brigadier General Spoehr was challenged to improve the current system to support commanders in the field and to aggressively mold the Chemical Corps to fill a critical role for the Army and DOD. A key part of the Chemical Corps mission is providing the Army with highly trained CBRN experts that can advise commanders and staffs at all levels in DOD. The challenge for Corps leadership is identifying how to accomplish this mission in the fluid environment that the Army faces. If the Corps can find a more effective way to accomplish this mission, it will truly have provided a valuable service to our Nation.

The Chief of Chemical envisions “a Corps and Army capable now of countering the entire range of CBRN threats and effects to protect our Nation, operating seamlessly with military and civilian partners, while

conducting simultaneous operations from civil support to war.” The Chief of Chemical wants all Dragon Soldiers—from offices to foxholes—to help implement the Vision. The ultimate measure of success will be future battlefield assessments—where quality training and resources enable Dragon Soldiers to provide accurate CBRN assessments and recommendations when needed the most.

After taking command in October 2005, General Wallace sent a memorandum to all Soldiers in TRADOC. In the letter, he said that TRADOC was “admired for its imaginative, innovative solutions to tough problems” and that “. . . we should preserve our focus on Soldiers, the centerpiece of our formations.” General Wallace encouraged us to “continue to grow leaders who are innovative and adaptive—leaders who deserve the Soldiers they are blessed to lead.” He went on to say that “we will continue to surround the centerpiece of our formations, our Soldiers and leaders, with the best doctrine, organizations, training, and materiel that we can find.” And we need to “listen to the deployed formations when they tell us what they need from us, for those are the formations that we serve.”

I believe that the Chemical Corps needs a paradigm shift to fully implement the Chemical Corps Vision and meet General Wallace’s challenges. This shift will change how we train, educate, and resource our Corps. By changing the education and resources for our Chemical leaders, we can help them meet the needs of the combatant commander and our deployed formations. A Chemical Soldier doesn’t become a CBRN expert on his own. It takes a formalized and deliberate training program and the availability of professional materials to help a Soldier grow and develop from the apprentice level, through the journeyman level, to become a true subject matter expert (SME).

### **Challenge: Establish an Implementation Document**

The Chemical Corps needs a detailed implementation document that supports the Vision and elevates the Corps to a tactically and technically unsurpassed CBRN force. Many Chemical leaders don’t understand their personal roles in helping implement the Vision. They are missing the critical details. There are many intermediate objectives along the way, and it will take many people, working from their individual fighting positions, to ensure mission success. The implementation document must articulate intermediate objectives; specify the task, purpose, and end state for each subordinate unit or organization; and provide a common operational picture. All Chemical Soldiers must understand their role in the Vision and how

### **All Chemical Soldiers play a part in strengthening the Corps. They may do this by—**

- Sharing lessons learned and other information following training events.
- Working with Reserve Officer Training Corps (ROTC) cadets or Soldiers in initial-entry training.
- Working as training developers, doctrine writers, combat developers, or high-level staff officers or NCOs.

they are building on the foundation set by the expertise of Dragon Soldiers before them.

### **Challenge: Establish Sustainment Training**

There is currently a lack of CBRN sustainment training and initial training on new doctrinal concepts after an officer completes the Chemical Captains Career Course (CMC3). The Chemical School provides lieutenants and captains with quality training in the Chemical Basic Officer Leader’s Course (BOLC) and CMC3 but, over the course of a 20-year military career, does not provide additional branch-specific training. It is incumbent upon individual officers to maintain CBRN warfighting skills and expand expertise levels through self-study initiatives. This method and frequency of training creates problems in obtaining current and new information and skills. For example, consider sensitive-site exploitation (SSE). Current division level Chemical officers and their deputies graduated from CMC3 before the Chemical School began training SSE as part of the approved curriculum. Should we expect these officers to be prepared to properly advise their commanders on SSE? What should we expect them to know about SSE? The Infantry Corps would not require an infantry Soldier to shoot the enemy if it didn’t provide a rifle, bullets, and basic instructions on firearm use. Similarly, it is absurd to expect a Chemical Soldier to be an SME in an area where the Corps has not provided him training. We don’t even tell him where to go to obtain needed information. There is a lot of information on the World Wide Web—some good but also some incomplete, inadequate, or incorrect. The infantry Soldier’s weapon is his rifle; the Chemical Soldier’s weapons are his knowledge of and access to accurate CBRN information and his ability to advise his commander. How Chemical Soldiers advise their commanders significantly impacts mission operations.



Organized and certified CBRN information and resources are often not available to Chemical Soldiers. When a Soldier has a question on a CBRN subject, he turns to field manuals (FMs). While FMs offer a good guidance foundation, it is often necessary to obtain additional information from other sources. Chemical officers should have an online location that provides this information. Field commanders rely on Chemical officers and NCOs to properly advise them on responding to CBRN incidents. Are we providing the resources that our Dragon Soldiers need to meet this requirement? Do Chemical officers and NCOs truly grasp the big picture before making recommendations to their commanders?

At the battalion and brigade levels, most Chemical officers and NCOs serve in unit operations centers, where a majority of their time is consumed by nonchemical tasks. If a CBRN event occurs, they must quickly switch their focus from operational matters to advising commanders on response missions. Since speed and accuracy are vital to CBRN response missions, we must provide personnel with the tools necessary to quickly gather information and make educated assessments and recommendations.

The availability of organized and certified CBRN information and resources is evident when we look at after-action reports for units that rotate through the Army's primary training grounds—the combat training centers. Each center provides periodic briefs and updates based on activity trends observed during training rotations. Many of the areas with shortcomings are systemic. The same challenges Chemical leaders faced 15 years ago are still occurring. Do Chemical officers fully understand the trends so they can develop a training program to mitigate the challenges?

### **Recommendations**

We need to draft an implementation operation order (OPORD) that supports the Corps Vision. We write OPORDs for everything that we do in the Army—from conducting battalion runs to participating in major combat operations—so why wouldn't we write an OPORD that supports implementing the Vision? This OPORD would create focus within the Corps and formalize General Wallace's directive to provide a steady course for Soldiers.

The Vision implementation OPORD should address how the Chemical Corps is integrated into DOD's overall national military strategy for combating weapons of mass destruction. What are the links between the Chemical Corps and other CBRN experts within DOD? What other DOD assets and capabilities are out there that can support us? The Chemical Corps is an important piece in a large operation, and our efforts should be synchronized with

and supportive of the overall DOD plan. The OPORD should identify where our efforts overlap other DOD programs and where there are gaps. This will educate Chemical Soldiers on other organizations that have CBRN expertise.

We must provide Dragon Soldiers with additional PME to maintain the CBRN band of excellence. Investing in our promotable captains and sergeants first class to prepare them for field grade rank and senior NCO leadership roles is a wise investment. PME for majors—officers who have advanced from the apprentice level of lieutenant and through the journeyman level of captain—would be a giant step forward in building a Corps of CBRN experts. Considering the fiscal and personnel constraints the Corps and the Army face, increased PME may present challenges. But it should not stop us from taking the required actions to provide needed training.<sup>1</sup> CBRN skills are perishable, and we need to keep them sharp and prepared for use.

PME should not focus solely on technical aspects of chemical missions but also on leader development. An example of great leadership material for Chemical officers is a mini course called "Great Commanders," offered by the Command and General Staff College (CGSC). The course highlights nine great commanders—who they were, what type leadership styles they applied, and what command philosophy they implemented. Some of the men profiled include George Washington, Douglas MacArthur, George Patton, and Dwight Eisenhower. This existing resource is a great information tool for commanders and division Chemical officers as they train the next generation of Chemical leaders. I believe Chemical leaders would readily accept these materials and incorporate them into their professional development training programs.

The Chemical Corps should integrate intermediate-level education (ILE) into its CBRN sustainment training plan.<sup>2</sup> The ILE program (offered at CGSC) provides a CBRN elective course (typically run by a Chemical lieutenant colonel). To ensure that critical CBRN sustainment information is included in the course, the Chemical Corps should provide CGSC with a list of commandant-approved recommendations.

Chemical Soldiers would benefit from an online CBRN resource center. We need something more than the current Blackboard distributed-learning portal. Since the "Center of Gravity" for the Corps is the resources and education we provide our Dragon Soldiers, the Corps must develop and maintain a Web-based information site with consolidated, indexed, and approved information that is current, accurate, and complete. The CBRN resource center could be accessed through the Army Knowledge

Online Web portal to provide a secure repository setting for sustainment training, advanced professional education, and reach-back support. The online CBRN resource center can be the means to help maintain the CBRN band of excellence and transform the “centerpiece of our formations” to CBRN subject matter experts. Chemical Soldiers would benefit from access to the most up-to-date information to help them solve problems and properly advise their commanders. Units in the field would benefit from the availability of training products and the shortened time required to accurately perform CBRN tasks. Commanders don’t just need one Chemical officer working for them, they need an Army. With an online CBRN resource center, they have that Army.

Classes from Chemical BOLC (Phase III) and CMC3 should also be available in the online center to provide resources for sustainment training. Having the opportunity to go back and review these classes would afford Chemical officers with a great opportunity to maintain their proficiency.

There are many good CBRN annexes and tactical standing operating procedures (TACSOPs) out there. The best should be consolidated and used as examples in the resource center. Since unit-of-action annexes are interchangeable, the basic information they track should be similar. Standardized formats and a base list of items are good ways to help increase the quality of battle tracking.

### Conclusion

We have very dedicated Dragon Soldiers in the Chemical Corps. They are on the front lines and are serving as true combat multipliers for their commanders. We need to continue to look for ways to resource our Soldiers by providing them the education and information necessary to be successful on the battlefield. An online resource center would position the Corps “to meet future challenges” as General Wallace directed, provide Soldiers with the knowledge needed to implement the Chemical Vision, and create an environment where Soldiers could move from apprentices to true CBRN subject matter experts. The efforts that we make today will outlast the current force. We are setting in motion the basis for the battlefield victories of tomorrow. 🎧

#### Endnotes:

<sup>1</sup>The method of training could be determined by using the wargaming process. PME could be crafted in a fashion similar to that of medical departments, where approved lists of civilian and military courses are available onsite or via distributed learning. The training should contain information that could be used by individuals or presented in small group settings to accommodate the multitask environment of Chemical Soldiers.

### ***The online CBRN resource center should be the number one source for Dragon Soldiers to access—***

- 🎧 CBRN instruction taught in resident PME courses.
- 🎧 Current manuals (such as Army regulations, Department of the Army pamphlets, Army training and evaluation programs, FM’s, and graphic training aids).
- 🎧 Corps and division level TACSOPs and annexes.
- 🎧 Battalion and brigade level CBRN unit-of-action annexes and standing operating procedures (SOPs).
- 🎧 Standardized operations center CBRN tracking charts.
- 🎧 Advanced resources to assist with training for and responding to CBRN incidents.<sup>3</sup>
- 🎧 Recommended nongovernment Web sites with verified current and reliable CBRN information, including civilian and military CBRN equipment capabilities and limitations.<sup>4</sup>
- 🎧 Chemical staff military decision-making process instruction and CBRN OPOD annex examples.
- 🎧 Radiation safety SOPs.
- 🎧 CBRN logistics information.
- 🎧 Combat training center lessons learned and recommended corrective-action plans for common problems.
- 🎧 Battle drills.
- 🎧 Hazardous material team training and equipment updates.

<sup>2</sup>ILE refers to the third tier of the Officer Education System and is linked directly to Army transformation. Under ILE, officers attend school and subsequently receive assignments based on the needs of their respective career fields, branches, and functional areas.

<sup>3</sup>The Chemical officer is not alone on the battlefield. He is not solely responsible for advising his commander on all the aspects of a CBRN incident. Personnel in preventive medicine, industrial hygiene, environmental preservation, safety, intelligence, and other governmental agencies have various responsibilities (some of which overlap). They also have additional resources that can be used to solve problems.

<sup>4</sup>Deployed units are using military and civilian equipment. The resource center should list equipment capabilities and limitations.

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*Major Shank is the CBRN officer in the U.S. Army European Command. His past assignments include executive officer for the 84th Chemical Battalion, chief of staff at the U.S. Army Chemical School, and Chemical officer for the 2d Armored Cavalry Regiment during Operation Iraqi Freedom. Major Shank has a bachelor’s degree in biology from Wheaton College, Illinois, and a master’s degree from CGSC.*

# Chief of Chemical's Recommended Professional Reading List

By Brigadier General Thomas Spoehr

There are three critical factors to address in our continuing competence as Dragon Soldiers: institutional training, practical experience in units, and self-development. Because our fellow Soldiers, our families, and all American citizens are counting on us, we cannot afford to neglect any of the three. A key piece of self-development is professional reading. It builds an independent basis of knowledge upon which to form opinions and make judgments.

The following list of books has been selected based on their currency, accuracy, readability, and subject interest. These books pertain to countering chemical, biological, radiological, and nuclear (CBRN) threats and hazards and directly support my Corps Vision (see inside back cover). I have made no attempt to place any general military books on this list; for those, refer to the Army Chief of Staff's professional reading list at <http://www.army.mil/cmh-pg/reference/CSAList/CSAList.htm>.

Before placing a book on the reading list, I read it. Hopefully, you will encounter other books that you believe deserve a place on the list. I encourage you to identify them as candidates for inclusion. This list will be updated annually, generally in December, so I ask you to submit your suggestions, prior to 1 October, to the following address:

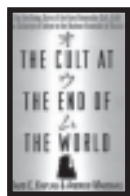
Mr. David Chuber  
Chemical School Historian  
401 MANSCEN Loop, Suite 1041  
Fort Leonard Wood, MO 65473-8926  
E-mail: [chuberd@wood.army.mil](mailto:chuberd@wood.army.mil)

Finally, if you read all of my suggestions, I would like to know. I encourage you to drop me a note (at the above address) so that I can recognize your professional development efforts. But be forewarned, I might ask you to discuss the material. Enjoy!

## CHEMICAL WARFARE



*War of Nerves: Chemical Warfare From World War I to Al-Qaeda*, Jonathan B. Tucker, Pantheon, 2006, ISBN 0375422293. This recently published (February 2006) account of chemical warfare from World War I to the present is a winner. Particularly useful are the details on U.S. chemical warfare programs.



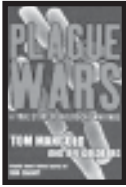
*Cult at the End of the World, The Terrifying Story of the Aum Doomsday Cult, From the Subways of Tokyo to the Nuclear Arsenals of Russia*, David E. Kaplan and Andrew Marshall, Crown, 1996, ISBN 0517705435. This book is a wake-up call that cults can be both kooky and exceptionally dangerous. Was this a onetime unfortunate confluence of money, crazy ideology, and lax governmental oversight that will never be repeated? Or is it a blueprint for future acts of terror by cults and extremists? You decide. This book is out of print, but try to find a copy. It is worth the effort!



## BIOLOGICAL WARFARE



***Biohazard: The Chilling True Story of the Largest Covert Biological Weapons Program in the World—Told From Inside by the Man Who Ran It***, Ken Alibek with Stephen Handelman, Random House, 1999, ISBN 0375502319. This is one of the classics; all CBRN professionals should read (and probably own) a copy. Written by Ken Alibek, a former second-in-command at Biopreparat—the Soviet Union’s primary organization for producing biological weapons—this book illustrates what a well-financed, state-sponsored biological weapons program can achieve.



***Plague Wars: A True Story of Biological Warfare***, Tom Mangold and Jeff Goldberg, Macmillan General Books, 1999, ISBN 0333716140. This book offers a comprehensive tour of the world of biological warfare, including a large amount of background information. Since the book was written in 1999, a perspective on the events of 11 September 2001, Operation Iraqi Freedom, and the anthrax attacks of 2001 is not included, but the shortfalls are minor. The book remains relevant today.



***Germs: Biological Weapons and America’s Secret War***, Judith Miller et al., Simon & Schuster, Reprint edition, 2002, ISBN 0684871580. Although the primary author, Judith Miller, is a controversial figure lately, that does not diminish the value of this book. Written in early 2001, this book also lacks perspective on the events of 11 September 2001, Operation Iraqi Freedom, and the anthrax attacks, but is nevertheless easy to read, accurate, and essential.



***Factories of Death: Japanese Biological Warfare, 1932-45, and the American Cover-Up***, Sheldon Harris, Routledge, 2001, ISBN 0415932149. Following World War II, the U.S. Government made the conscious decision not to pursue charges for war crimes against the individuals most responsible for this biological warfare program in favor of exploiting the intelligence potential of the Japanese research findings. Officials in the Chemical Warfare Service were directly involved in making this decision; you decide for yourself whether it was the right call. At the time, tensions were high with the Soviet Union.



***The Anthrax Letters: A Medical Detective Story***, Leonard A. Cole, Joseph Henry Press, 2004, ISBN 0309525845. This book provides a wealth of background information on the anthrax attacks of 2001. And until the culprit(s) are identified, this book may remain the only credible work available.

## RADIOLOGICAL AND NUCLEAR OPERATIONS



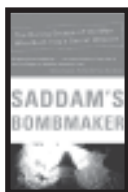
***The Making of the Atomic Bomb***, Richard Rhodes, Simon & Schuster, Reprint edition, 1995, ISBN 0684813785. With a hefty total of 928 pages, this book is not for the faint of heart. And, like me, if your physics days are long past, you will struggle through parts of this book, particularly in the early stages when Mr. Rhodes takes you through the discoveries in subatomic research. But for those who persevere, the rewards are tremendous.



***The Four Faces of Nuclear Terrorism***, Charles D. Ferguson et al., Routledge, First edition, 2005, ISBN 0415952433. This book provides extensive discussions on what the authors believe are the four possible means of nuclear terrorism: theft of an assembled nuclear weapon, construction of an improvised nuclear device, damage to a nuclear facility, and construction of a radiological dispersal device. This book is out of print, but used copies are available.



***Ablaze: The Story of the Heroes and Victims of Chernobyl***, Piers Paul Read, Random House, 1993, ISBN 0679408193. This book provides an excellent account of the 1986 Chernobyl disaster, the biggest nuclear consequence management event ever to take place. At Chernobyl, the Soviet Union's Chemical Defense Forces carried the burden of conducting initial reconnaissance and cleanup operations. The chief of the Soviet Chemical Corps, General Pikalov, personally conducted one of the first radiological reconnaissance missions in the area surrounding the burning reactor—in a reconnaissance vehicle he personally designed! This book is out of print, but used copies are available.



***Saddam's Bombmaker: The Terrifying Inside Story of the Iraqi Nuclear and Biological Weapons Agenda***, Khidhir Hamza with Jeff Stein, Scribner, 2000, ISBN 0684873869. Although Iraq has undergone a profound change since the start of Operation Iraqi Freedom, this narrative, by the man who was at the center of Saddam Hussein's efforts to produce a nuclear weapon, remains a must-read selection. This book clearly describes the challenges involved for a state to obtain fissile material and key weapon components and is, therefore, very useful in understanding nuclear proliferation.

## OTHER WORKS AND CHEMICAL CORPS HISTORY



***America's Struggle with Chemical-Biological Warfare***, Albert J. Mauroni, Praeger Publishers, 2000, ISBN 0275967565. This book provides great background information for those closely engaged in the CBRN business, but it is not for the casual or typical reader. Particularly interesting is the description of the near death of the U.S. Chemical Corps and how circumstances and the actions of key leaders helped preserve this key capability for the U.S. Army. This book is out of print, but do try to find a used copy.



***The Chemical Warfare Service: Chemicals in Combat (United States Army in World War II)***, Brooks E. Kleber and Dale Birdsell, University Press of the Pacific, 2003, ISBN 1410204855. This book is an essential reference for chemical operations during World War II. There are two other books in this series: Organizing for War and From Laboratory to Field, but this is the best of the three and the most recommended. This book is not a read-through, but it is a key reference source.



***Chemical-Biological Defense***, Albert J. Mauroni, Praeger Paperback, 1999, ISBN 0275967654. This book contains important information and history on how U.S. forces prepared for and conducted CBRN operations during Operations Desert Storm and Shield—the biggest post-World War II CBRN operations. Included are insights on how the United States allowed chemical and biological readiness to slip and the Herculean efforts it took to regain readiness in equipment and training.

### ***Care to Comment?***

The *Army Chemical Review* welcomes letters from readers. If you have a comment concerning an article we have published or would like to express your point of view on another subject of interest to Chemical Soldiers, let us hear from you. Your letter must include your complete address and a telephone number. All letters are subject to editing for reasons of space or clarity.

Our mailing and e-mail addresses are—

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# The U.S. Army Chemical Corps: Serving a Nation at War, Today and Tomorrow

By Brigadier General Thomas Spoehr  
Chief of Chemical

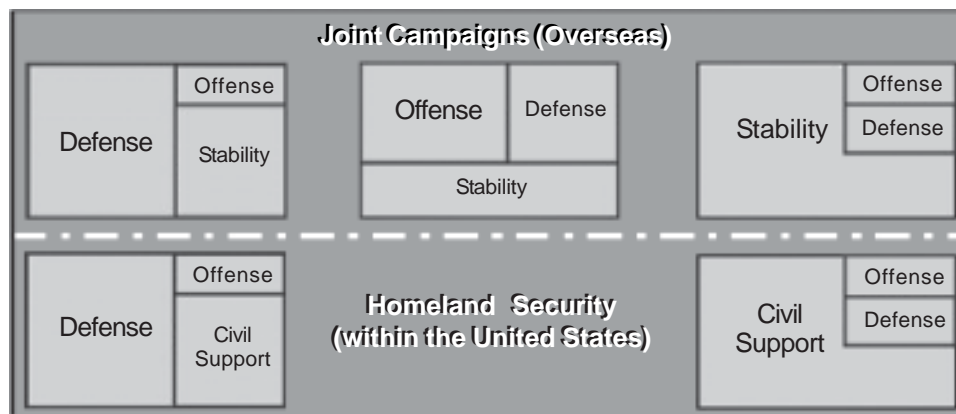
Fellow Dragon Soldiers, as busy as we are, it is difficult for us to pause, step back, and consider how we, as a Corps, are doing in our mission to protect the Army and our Nation. But it is vitally important that we do so. And after we assess our status, we need to ask ourselves where we want to take our Corps in the future and how we intend to take it there.

It's important for you to know, as members of the Chemical Corps, that our Nation is demanding our skills and training now more than ever before in our history. Our President has affirmed that the greatest danger this country faces "lies at the intersection of technology and radicalism." It is at this dangerous juncture that the Chemical Corps brings its unique talents to bear.

As we near the 89th anniversary of the Chemical Corps (in June 2007), I am proud to report that because of your efforts and the efforts of the heroes that have gone before us, our Corps and our capabilities are stronger than ever before. Today, Chemical Corps units and leaders are serving everywhere the U.S. Army is operating—from the sands of Iraq, to the mountains of Afghanistan, to the frozen hills of Korea. Our Active Army enlisted strength recently surpassed 7,000 Soldiers for the first time since 1992, and our total authorized Corps strength exceeds 22,000. The U.S. Army Human Resources Command recently informed us that 47 percent of the Active Army Chemical Corps is either deployed or fenced for deployment reasons.

**A graphic illustration of full-spectrum operations from the soon-to-be published FM 3-0, Operations. It illustrates the challenge facing the Chemical Corps—the need to be capable of conducting simultaneous CBRN operations in all situations ranging from offense to stability to civil support.**

Army forces combine offensive, defensive, and stability or civil support operations simultaneously as part of an interdependent Joint force to seize, retain, and exploit the initiative. They employ synchronized action—lethal and nonlethal—proportional to the mission, and informed by a thorough understanding of all dimensions of the operational environment. Mission command that conveys intent and an appreciation of all aspects of the situation guides the adaptive use of military forces.



Full-spectrum operations—the Army's operational concept



Over the next few years, vast organizational changes will sweep through the Chemical Corps. We will modularize most of our units, resulting in more capable and adaptable formations (such as combining decontamination; chemical, biological, radiological, and nuclear [CBRN] reconnaissance; and biological surveillance in the same unit). In September 2007, we will activate our first-ever Active Army modified table of organization and equipment (MTOE) Chemical brigade, the 48th Chemical Brigade, at Fort Hood, Texas. This brigade is poised to assume command and control (C2) over all Active Army MTOE Chemical battalions and separate companies. The 48th will be subordinate to the 20th Support Command (Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives [CBRNE]). The 22d and 110th Chemical Battalions (Technical Escort) will be redesigned to make them more capable of worldwide deployment and C2 functions in operational and tactical level weapons of mass destruction (WMD) elimination operations. Our Special Forces Chemical Reconnaissance Detachments are larger and better able to perform their important missions. Chemical staffs, in warfighting formations from battalion to Army level, have been redesigned to optimize their abilities. A total of 55 WMD civil support teams (CSTs) (enough for one in every state and territory and two in California) have been activated and are on track to soon be 100 percent certified and deemed ready for operations

by the Secretary of Defense. The 20th Support Command (CBRNE), an organization which will provide C2 for most Active Army Chemical forces, has been reorganized and tasked with increased capabilities to act as a Joint Task Force and conduct WMD elimination operations.

Our U.S. Army Reserve (USAR) and Army National Guard (ARNG) formations are also undergoing monumental changes. Due to the results obtained from the Army's last force structure analysis, we are slated to lose four brigade headquarters in the Total Force. We will retain at least two others in the force structure—one in the USAR and one in the ARNG. The USAR brigade, the 415th Chemical Brigade, will be the primary focal point for all Chemical units in the USAR. The ARNG will retain the 31st Chemical Brigade to serve as the lead Chemical organization in the ARNG. Other USAR and ARNG Chemical units will also change in the same manner as our Active Army units.

Selected USAR Chemical companies have been fielded. These companies have specialized equipment that enables them to support domestic CBRN reconnaissance, extraction, and casualty decontamination. The Stryker Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV), the most advanced and capable CBRN reconnaissance platform in the world, is being fielded to Chemical units and is on the cusp of a full-rate production decision. After years of setbacks, the Joint Warning and



**In order to achieve our vision, we must better equip and train our general-purpose Chemical Corps units to be able to combat the full range of CBRN hazards. Our recent Joint CBRN Dismounted Reconnaissance Limited-Objective Experiment confirmed that this concept of equipping general-purpose forces with advanced detection and identification equipment is viable.**

**Members of a WMD-CST on a training mission**

**The 329<sup>th</sup> Chemical Company was given missions to perform convoy security and hazardous material response operations. This type of flexibility will be essential for the future Chemical Corps.**



**Brigadier General Spoehr and Regimental Command Sergeant Major Alston with members of the 329th Chemical Company, Camp Victory, Iraq, in November 2006**

Reporting Network (JWARN) and the Joint Effects Model (JEM), the most capable CBRN hazard warning and analysis tools ever developed, are scheduled to be approved for full-scale fielding to the Joint Force.

We have formed partnerships with the explosive ordnance disposal (EOD) community. EOD officers and noncommissioned officers are embedded within the CBRN sections of major warfighting unit staffs, making our organizations capable of total CBRNE operations. All courses at the U.S. Army Chemical School and position titles within the Corps have been renamed from “Chemical” to “CBRN” to more accurately reflect the skills and capabilities we bring to the fight.

Great initiatives are underway at the Chemical School and in the field to increase the support we provide the force. Training on equipment that can detect and identify the full range of CBRN hazards has begun in certain courses at the Chemical School and is taking place in selected units. Selected Chemical Corps personnel are extending their competencies into areas of countering WMD operations (including consequence management, nonproliferation, and elimination).

When viewed in its totality, the improvements that the Chemical Corps and the Nation have made to counter CBRN attacks are dramatic. So the question is: Where do we go from here? We go where we need to. Much work remains to be done.

In Proverbs 29:18, we are advised that “where there is no vision, the people perish.” With your assistance, we have developed and approved a new Chemical Corps Vision (see also the inside back cover). A successful Vision must be believable, positive, and appealing to all members of the community. Our new Vision meets these goals and

is a great beacon to guide future efforts. The approval of our Vision is just the start. What must follow—for the Vision to hold more value than just another document hung in the lobby—is our plan to achieve that Vision. For the rest of this article, I would like to address the major strategies that we will use to implement our Vision.

In “countering the entire range of CBRN threats and effects,” Chemical Corps Soldiers must—

- Develop new doctrine and tactics, techniques, and procedures (TTP).
- Receive enhanced equipment.
- Institutionalize the necessary training to respond to full-spectrum hazards.

Chemical Corps Soldiers are generally proficient in the use of standard detection and identification systems

**A Corps and  
Army capable now of  
countering the entire range of  
CBRN threats and effects to protect  
our Nation, operating seamlessly with  
military and civilian partners, while  
conducting simultaneous operations  
from civil support  
to war.**

**Chemical Corps Vision**

like the Automatic Chemical-Agent Detection Alarm, Improved Chemical-Agent Monitor, and AN/VDR-2 Radiac Set. Some specialized units have more advanced capabilities; however, as a Corps, we generally lack the necessary equipment to detect, identify, sample, and protect ourselves against the complete family of emerging threats (such as toxic industrial chemicals, specific radiological isotopes, and others). Most of the equipment necessary to respond to these hazards is available in the form of commercial, off-the-shelf equipment (which leverages cutting-edge technology such as Raman spectroscopy). The Chemical School is actively working with the Joint Chemical and Biological Defense Program to rapidly acquire this equipment and field it to specified units, including Chemical companies and reconnaissance platoons in Infantry brigade combat teams and Special Forces Chemical Reconnaissance Detachments. However, without the appropriate training and doctrine, we won't have a full capability; these training efforts must be integrated with all equipment fielding plans. We must fully integrate this equipment into our courses, alongside the training on our current equipment, not segregated and placed in "special" blocks. Sustainment training in units will be an initial challenge, but we must resist the temptation to rely

on mobile training teams from contractors or manufacturers to sustain our skills. This is a unit responsibility and manageable by unit cadre when properly trained and supplied with the necessary training materials.

As Dragon Soldiers, we must also understand the basic science that underlies CBRN hazards. Our initiatives to increase education in this area must continue. Chemical Soldiers in the field must also have a clearly identified, reliable, 24/7 reach-back mechanism for technical advice and assistance. Our recently concluded memorandum of agreement with the Edgewood Chemical and Biological Center will assist us with these initiatives by giving us access to a group of professionally credentialed scientists. We are working on a similar agreement with Dugway Proving Ground.

To achieve our goal of "operating seamlessly with military and civilian partners," we must thoroughly understand the differing standards and procedures that govern domestic and warfighting CBRN operations and the capabilities of the organizations tasked to respond to either situation. Domestic operations are governed by federal statute and regulation and are characterized by almost zero willingness or ability to accept risk to either civilians or responders. Chemical Soldiers must completely understand the procedures, the differing technical terms and language, and the manner in which domestic-response operations are conducted. Our Chemical School must provide the necessary initial certifications and training in this area. But we must be capable of making a concurrent transition to countering WMD missions in wartime environments where our actions are normally not governed by law or regulation, but rather by the



**The U.S. Army Chemical School must produce adaptive, technically qualified Dragon Warriors ready for the challenges to respond to all situations ranging from homeland security to war.**

**Above, initial-entry Soldiers in Chemical Advanced Individual Training; right, Chemical lieutenants in training**



application of Joint and Army doctrine. And a certain level of risk must usually be accepted in order to ensure mission accomplishment. This movement along a sliding scale of law, regulation, doctrine, risk acceptance, and differing priorities is a difficult concept to master but is absolutely critical for us to succeed. Our equipment must be flexible enough for all mission sets. The concept of maintaining one set of equipment for wartime and another for consequence management in the continental United States is unmanageable and unacceptable. Equipment requirements must be fully integrated.

We must work more closely with other military forces that have capabilities in CBRN response. An excellent start in that endeavor is conducting more Joint-oriented training activities with Marine Corps, Navy, and Air Force personnel training at Fort Leonard Wood, thus capitalizing on similar training requirements for equipment and missions. Closer relationships with other friendly nation CBRN forces are also crucial for future coalition success.

Nowhere has the importance of “conducting simultaneous operations from civil support to war” been more vividly demonstrated than in current operations in Iraq where, in one province, the Army is able to focus on helping the Iraqi people establish a functioning government while, one province away, offensive operations are underway. Similarly, Chemical Corps units and Soldiers must be trained, equipped, and ready to conduct C2 concurrent with counter-CBRN missions that run the gamut from support to civil authorities, to WMD elimination, to nonproliferation efforts, to the non-negotiable mission of protection and support of our Army in the face of a CBRN attack. This is a huge challenge that requires the development of doctrine and training

programs to enable this type of flexibility. Our training in the institutional base, in units, and in self-development initiatives must broaden to incorporate these missions. Additionally, we must develop adaptive leaders who are comfortable moving smoothly between differing missions. Demonstrating their flexibility, Chemical Corps units are often called upon to perform missions other than those dealing with CBRN operations. We must maintain our competencies as “Soldiers first” and be ready to respond when the Army calls us in that manner.

As our Vision begins, I bring this article to a close with the challenge for our Corps and Army to be capable now! That is the logical conclusion when one considers the threats we face at home and abroad. We will not have the luxury of months of training and preparation before we are called upon to protect our Nation. The Chemical Corps must maintain itself, its units, and the Army in constant readiness against CBRN threats. This implies a consistent level of emphasis and places a burden on all of us to be relentlessly uncompromising in our drive to protect our Army and Nation through CBRN defense readiness.

Our Vision is powerful! We have charted a course toward increased CBRN protection and response for the Army and our Nation. I ask for your support to continue to advance our Vision and goals. And as always, I remain open to your ideas and suggestions. Command Sergeant Major Alston and I could not be more proud to serve as the leaders of your Regiment. Take care of any and all Dragon Soldiers that you can. We hope to see you during Regimental Week, 24–28 June, to celebrate the 89th anniversary of the Chemical Corps.

*Elementis, Regamus, Proelium!*

**In all respects, we must ensure that our training base prepares CBRN Soldiers for success by providing them with the best training possible.**



**Chemical lieutenants boarding a UH-60 helicopter to conduct a training aerial radiation survey**

# Equipment in

*Compiled by Colonel*



**Name:** POA-CWS-H5A (75)

**Type:** Main armament flamethrower tank

**Main weapon:** Flamethrower, tube-mounted coaxially to a standard tank gun

**Range:** 40 meters (with liquid fuel) and 60–80 meters (with thickened fuel)

**Fuel capacity:** 290 gallons, located in four carbon dioxide pressurized tanks in the hull (protected by armor)

**Total firing time:** 2 1/2 minutes

**Ignition system:** Gasoline, electric

**Secondary weapon:** 75-millimeter gun (with 40 rounds)

**Tertiary weapon:** Browning machine guns (.30-caliber) mounted coaxially in the turret and in the bow machine gun port and a Browning M2 anti-aircraft machine gun (.50-caliber)

**Chassis:** M4A1 Sherman tank with track extenders to improve mobility

## **History:**

Developed by the Chemical Warfare Service for the Tenth Army to use in the projected invasion of Japan during World War II, the POA-CWS-H5A (75) was designed for use with the flamethrower or the main gun. Two versions were developed:

- A 75-millimeter gun (with 40 rounds), mounted on an M4A3 tank. Forty-seven vehicles were produced.
- A 105-millimeter howitzer (with 20 rounds), mounted on an M4A3 tank. Twenty-five vehicles were produced.

A total of 72 vehicles were produced in 1945. The vehicles were not used operationally during World War II, but they were used effectively by the U.S. Marine Corps during the Korean War.

This vehicle is on display at the Chemical Corps Museum, Fort Leonard Wood, Missouri.

# Our History

*Robert Walk*



**Name:** M67A1 Tank Flamethrower

**Type:** Main armament flamethrower tank

**Main weapon:** An M7A1-6, turret-mounted, main armament, mechanized flamethrower (replaced the 90-millimeter main gun)

**Range:** 180 meters (with thickened fuel)

**Fuel capacity:** 325 gallons, located in one pressurized tank in the hull (protected by armor)

**Total firing time:** About 60 seconds

**Ignition system:** Gasoline, electric

**Secondary weapon:** 7.62-millimeter, M73 machine gun, mounted coaxially in the turret

**Chassis:** M48A2 Patton tank

## **History:**

Developed to provide the Army and Marine Corps with a modern armored flamethrower to replace the World War II vintage systems used in Korea, the M67 series was first fielded to the Army and Marine Corps in the mid-1950s. Quickly phased out by the Army, the system was retained by the Marine Corps, modernized, and used in combat during the Vietnam War. The system consisted of an M7A1 fuel and pressure unit, an M6 flamethrower gun, and a control unit. The M7A1 held thickened fuel and pressurized air at 3,000 pounds per square inch. A secondary container held 10 gallons of gasoline to ignite the thickened fuel. A high-tension electrical system provided a spark for ignition.

This vehicle is on display at the Chemical Corps Museum, Fort Leonard Wood, Missouri.



# DOCTRINE UPDATE

## U.S. Army Chemical School Directorate of Training and Training Development Doctrine Development Division

Publication Number	Title	Date	Description
<b>Current Publications</b>			
FM 3-11 MCWP 3-37.1 NWP 3-11 AFTTP(I) 3-2.42	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Defense Operations	10 Mar 03	A multiservice tactics, techniques, and procedures (MTTP) manual which provides commanders and staffs a key reference for the planning and execution of service chemical, biological, radiological, and nuclear (CBRN) defense operations, with focus on the passive-defense component of counterproliferation. <b>Status:</b> Scheduled revision FY 07.
FM 3-11.3 MCRP 3-37.2A NTTP 3-11.25 AFTTP(I) 3-2.56	Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance	2 Feb 06	An MTTP manual for conducting CBRN contamination avoidance. This revision combines Field Manual (FM) 3-3 and FM 3-3-1 into one publication. <b>Status:</b> Current.
FM 3-11.4 MCWP 3-37.2 NTTP 3-11.27 AFTTP(I) 3-2.46	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection	2 Jun 03	An MTTP manual which establishes principles for CBRN protection and addresses individual and collective protection (COLPRO) considerations for the protection of the force and civilian personnel. <b>Status:</b> Current.
FM 3-11.5 MCWP 3-37.3 ATTP 3-1.26 AFTTP(I) 3-2.60	Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination	4 Apr 06	An MTTP manual which addresses the principles and levels of CBRN decontamination operations in a tactical environment. <b>Status:</b> Current.
FM 3-6 (FM 3-11.6) AFM 105-7 FMFM 7-11-H	Field Behavior of NBC Agents (Including Smoke and Incendiaries)	3 Nov 86	An MTTP manual which addresses the battlefield influences of weather and terrain and the use of smoke and obscurants on CBRN operations. <b>Status:</b> Under revision FY 07 (will be renumbered FM 3-11.6).
FM 3-11.9 MCRP 3-37.1B NTRP 3-11.32 AFTTP(I) 3-2.55	Potential Military Chemical/Biological Agents and Compounds	10 Jan 05	An MTTP manual which provides commanders and staffs with general information and technical data concerning chemical-biological (CB) agents and other compounds of military interest, such as toxic industrial chemicals (TIC). <b>Status:</b> Current.
FM 3-11.11 MCRP 3-3.7.2	Flame, Riot Control Agent, and Herbicide Operations	19 Aug 96 C1 10 Mar 03	An MTTP manual which describes the tactics, techniques, and procedures (TTP) for employing flame weapons, riot control agents (RCAs), and herbicides during peacetime and combat. <b>Status:</b> Current.
FM 3-11.14 MCRP 3-37.1A NTTP 3-11.28 AFTTP(I) 3-2.54	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Vulnerability Assessment	28 Dec 04	An MTTP manual for conducting CBRN vulnerability assessments; analyzing, managing, and assessing risks; and measuring, mitigating, and reducing vulnerabilities. <b>Status:</b> Current.
FM 3-11.19 MCWP 3-37.4 NTTP 3-11.29 AFTTP(I) 3-2.44	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Reconnaissance	30 Jul 04	An MTTP manual for planning and conducting CBRN reconnaissance operations to detect, define, limit, mark, sample, and identify CBRN and toxic industrial material (TIM) contamination. <b>Status:</b> Current.
<b>NOTE: Current CBRN publications can be accessed and downloaded in electronic format from the Reimer Digital Library at &lt;<a href="http://www.adtdl.army.mil/">http://www.adtdl.army.mil/</a>&gt; or at the USACMLS Doctrine Web site at &lt;<a href="http://www.wood.army.mil/cmdoc/index.htm">http://www.wood.army.mil/cmdoc/index.htm</a>&gt;.</b>			

# DOCTRINE UPDATE

## U.S. Army Chemical School Directorate of Training and Training Development Doctrine Development Division

Publication Number	Title	Date	Description
<b>Current Publications (Continued)</b>			
FM 3-11.21 MCRP 3-37.2C NTTP 3-11.24 AFTTP(I) 3-2.37	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Aspects of Consequence Management	12 Dec 01	An MTTP manual which provides commanders and staffs a key reference for mitigating the CBRN aspects of consequence management. <b>Status:</b> Under revision FY 07.
FM 3-11.22	Weapons of Mass Destruction–Civil Support Team Tactics, Techniques, and Procedures	6 Jun 03	An Army-only manual which provides the suggested doctrinal TTP for use by weapons of mass destruction–civil support teams (WMD-CSTs), which are designed to provide support to local, state, and federal response systems. <b>Status:</b> Under revision FY 07.
FM 3-11.34 MCWP 3-37.5 NTTP 3-11.23 AFTTP(I) 3-2.33	Multiservice Procedures for Nuclear, Biological, and Chemical (NBC) Defense of Theater Fixed Sites, Ports, and Airfields	29 Sep 00	An MTTP manual which provides a reference for planning, resourcing, and executing CBRN defense of theater fixed sites, ports, and airfields. <b>Status:</b> Under revision FY 07.
FM 3-50 (FM 3-11.50)	Smoke Operations	4 Dec 90 C1 11 Sep 96	An Army-only manual which provides the TTP for using smoke and obscurants to attack and defeat specific enemy targets, sensors, target acquisition systems, weapon guidance systems, and other enemy electro-optical devices. <b>Status:</b> Under revision FY 07 (will be renumbered FM 3-11.50).
FM 3-11.86 MCWP 3.37.1C NTTP 3-11.31 AFTTP(I) 3-2.52	Multiservice Tactics, Techniques, and Procedures for Biological Surveillance	4 Oct 04	An MTTP manual for planning and conducting biological surveillance operations to monitor, detect, sample, identify, report, package, and evacuate samples of biological warfare agents. <b>Status:</b> Current.
FM 3-101	Chemical Staffs and Units	19 Nov 93	An Army-only manual which provides fundamental principles for chemical staff functions, command and control of Chemical units, and Chemical unit employment. <b>Status:</b> Under revision FY 07 to consolidate with FM 3-11.6.
FM 9-20 (FM 3-11.20)	Technical Escort Operations	3 Nov 97	An Army-only manual which provides the TTP for the employment of technical escort battalions. <b>Status:</b> Under revision FY 07 (will be renumbered FM 3-11.20).
<p><b>NOTE: Current CBRN publications can be accessed and downloaded in electronic format from the Reimer Digital Library at &lt;<a href="http://www.adtdl.army.mil/">http://www.adtdl.army.mil/</a>&gt; or at the USACMLS Doctrine Web site at &lt;<a href="http://www.wood.army.mil/cmdoc/index.htm">http://www.wood.army.mil/cmdoc/index.htm</a>&gt;.</b></p>			
<b>Emerging Publications</b>			
FM 3-11.23	Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives (CBRNE) Handbook for Installation Commanders	N/A	This manual will not be published. Information has been migrated into FM 3-11.21. <b>Status:</b> N/A.
FM 3-11.24	Chemical, Biological, Radiological, and Nuclear (CBRN) Handbook for Sensitive-Site and Hazardous-Site Assessment Operations	To be determined	An Army-only manual which provides the TTP for the conduct of sensitive-site and hazardous-site assessments by conventional Army Chemical units. <b>Status:</b> Under development FY 07.
<p><b>NOTE: To access CBRN draft publications, contact the Chief of Doctrine Development Division at &lt;<a href="mailto:ATSNCMDD@wood.army.mil">ATSNCMDD@wood.army.mil</a>&gt; to request access instructions.</b></p>			



## Initial Tests Completed on Stryker NBCRV by the U.S. Army Operational Test Command

*Army News Service, 14 December 2006*—Dugway Proving Grounds [sic], Utah—Initial operating tests were completed on the Stryker Nuclear, Biological and Chemical Reconnaissance Vehicle at Dugway Proving Grounds [sic] last month.

The Stryker NBCRV will detect and identify biological, chemical, radiological and toxic industrial chemical/material hazards on the battlefield, according to Maj. Joseph Giese, test officer for the Engineer and Combat Support Test Directorate.

The vehicle provides ballistic protection to a crew of four. In addition, the driver, vehicle commander and two surveyors are protected by a positive overpressure system that allows them to wear limited protective gear while operating on contaminated battlefield for extended periods of time.

Forty-four members of the 4th Brigade, 2nd Infantry Division, I Corps, from Fort Lewis, Wash., participated in the test under the direction of [Engineer and Combat Support Test Directorate] ECSTD. ECSTD is part of the U.S. Army Operational Test Command, West Fort Hood, Texas. The Soldiers prepared for the test with 10 weeks of crew training at Yakima, Wash., last March.

“The intent of the evaluation was to examine the ability of the Stryker NBCRV to survive and perform reconnaissance and surveillance missions in a variety of threat environments,” said Giese. “Test players executed route, area and zone reconnaissance, and search and survey missions to detect, identify, locate, sample and mark the various threats.”

Testers were looking at the ability of the Stryker NBCRV to perform missions under battlefield conditions in the presence of non-ballistics threats, to use its vehicular collective protection capability, and to not endanger the crew or nearby forces by unreasonable exposure to enemy observation, Giese said.

There were more than 200 support personnel on site for the test, said Sgt. 1st Class Mark Sury, ECSTD research, development, test and evaluation NCOIC.

“TESCO (Test Support Contractor) provided instrumentation for data collection and analysis,” he said. “We conducted a 72-hour scenario pilot test and two 216-hour scenario record tests.”

The NBCRV is . . . produced by General Dynamics Land Systems Corporation. Powered by a 350 horsepower diesel engine produced by Caterpillar, the Stryker NBCRV has eight run-flat tires, a Central Tire Inflation System and a Height Management System, allowing it to traverse the harshest terrain.

The Stryker NBCRV is equipped with a remote weapons station that supports the M2 .50-caliber machine gun, an M6 smoke grenade launcher and an integrated thermal weapons sight. It also hosts the common Stryker communications suite. The suite integrates the Single-Channel Ground-to-Air Radio System, the Enhanced Position Location Reporting System, the Force XXI Battle Command Brigade and Below System and the Global Positioning System.

“The NBCRV will allow commanders to shape the battlefield by developing and providing NBC situational awareness,” said Giese, “and contributing to the common operational picture, specific to NBC contamination.”

“Most importantly,” Giese said, “it provides an element of NBC force protection to the maneuver force.”

“A system of systems, the Stryker NBCRV represents a significant improvement to existing NBC reconnaissance and surveillance systems within the Army,” said Sury. Improvements over the battle-proven M93A1 FOX NBC Reconnaissance System include on-the-move standoff chemical detection capability, biological-detection capability, on-the-move meteorological system capability, and electronic-mapping capability, he explained.

“The mission of Dugway is to test U.S. and Allied biological and chemical defense systems and perform nuclear-biological-chemical survivable testing of defense material,” said Sury. “Different types of chemical and biological simulates were released into the various training areas, and after each mission where a simulate release occurred, the Stryker NBCRVs were required to undergo an operational decon prior to continuing the mission.”

The test was conducted at Dugway Proving Grounds [sic], located 80 miles west-southwest of Salt Lake City, Utah, because it provided the perfect testing environment,” said Sury. ●●●



# Anniston Chemical Activity Stores and Demilitarizes Weapons of Mass Destruction

*By Mr. Michael B. Abrams*

The U.S. Army Chemical Materials Agency (CMA), the organization responsible for the safe storage and disposal of the U.S. stockpile of chemical munitions in seven locations, is overseeing operations at the Anniston Chemical Activity (ANCA) in Anniston Army Depot (ANAD), Alabama.

A cloak of secrecy over the U.S. chemical munitions stockpile was lifted in 1996 when the Department of Defense publicly announced the distribution makeup. The announcement detailed the distribution of stockpiles at eight sites in the continental United States and a ninth site on Johnston Atoll, 800 miles southwest of Hawaii.

More than seven percent of the Army's chemical and munitions stockpile is at ANAD, including rockets, artillery shells, mortars, land mines, ton containers (for storing bulk supplies of agent), nerve agents sarin (GB) and VX, and sulfur mustard blister agents (H, HD, and HT).

Storage operations began at ANAD in the early 1960s. Munitions were maintained for 20 years, but a series of events and national policy decisions in the 1980s changed the focus of the mission from stockpile to safe storage until the munitions could be safely demilitarized. A lengthy research and development effort led to the construction of a disposal facility at Johnston Atoll and later in Utah. Subsequent facilities were constructed in Maryland, Oregon, Arkansas, and Alabama. Chemical munitions at Johnston Atoll and Aberdeen Proving Ground, Maryland, are complete. Disposal operations are continuing at other locations, including ANCA. Disposal facilities are currently under development in Colorado and Kentucky.

Lieutenant Colonel Phillip M. Trued, Jr., ANCA commander, and Sergeant First Class Richard LaMonica, senior enlisted advisor, are responsible for the safe storage of stockpiles at ANCA. With more than 180 civilian employees, they oversee storage requirements imposed by the Department of Defense, Department of the Army, federal and state environmental laws and regulations, and

the Chemical Weapons Convention (an international treaty that mandates the destruction of chemical munitions and production facilities). Treaty provisions are overseen by the Organization for the Prohibition of Chemical Weapons. Treaty teams regularly inspect storage activities, and inspectors monitor demilitarization operations.

The Anniston Chemical Agent Disposal Facility (ANCDF)—a facility designed, built, and tested to safely destroy chemical munitions—is now in its second phase of operations. Workers have been processing VX-filled munitions since July 2006 and have safely disposed of 26,491 M55 rockets and 30,301 gallons of liquid VX. VX-filled artillery shells and land mines are scheduled for disposal next.

The focus of the first phase, which ran from August 2003 to March 2006, was GB-filled munitions. Operators demilitarized 142,428 rockets and artillery shells and 96,246 gallons of liquid GB. The third (final) phase will involve the disposal of mustard-agent artillery shells, mortars, and bulk containers.

The most recent accomplishment at ANCA was the conclusion of the VX trial burn.



**A systems equipment mechanic at ANCA repairs a miniature chemical-agent monitor.**



**Workers at ANCA load a pallet of VX-filled rockets for transportation to ANCDF.**

Agent trial burns, required by the Alabama Department of Environmental Management, required a series of tests on the emissions from two furnaces, the liquid incinerator, and the Deactivation Furnace System (DFS). The liquid incinerator destroyed liquid VX at 2,700 degrees. The DFS destroyed M55 rockets after they were drained of agent and cut into eight pieces. The DFS will also be used to destroy explosives from projectiles and mines (at 1,300 degrees).

When destroying nerve agents, ANCDF managers are required to show that the facility destroys 99.9999 percent. Test results demonstrate that operations at ANCDF exceed that requirement. ANCDF managers say that the data proves the facility is safe for workers, the local community, and the environment. Similar trial burns during a GB disposal campaign demonstrated that operations at the ANCDF were also compliant with all mandated regulations. ANCDF managers and employees have a reputation in the industry for a very strong safety program. ANCDF and its site contractor, Washington Group International, have performed more than 9.5 million safe work hours. In recognition, the Occupational Safety and Health Administration awarded ANCDF "Star" status under the Voluntary Protection Program.

Chemical munitions storage and disposal operations at ANAD are expected to be ongoing for another four to six years. The facility will be decommissioned at the end of operations.

For more information about the U.S. Army's chemical munitions disposal program, go to Web site <[www.cma.army.mil](http://www.cma.army.mil)>.

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*Mr. Abrams is a CMA public affairs officer at ANAD. He holds a bachelor's degree in radio and television from Southern Illinois University—Carbondale. Mr. Abrams previously served as a public affairs specialist at Fort McClellan, Alabama, and as an Army broadcaster and journalist in Alabama, Germany, and Washington, D.C.*

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## 86th Chemical Mortar Battalion Web Site Update

Dear Members, Family, and Friends of the 86th Chemical Mortar Battalion:

Since 1998, I have maintained a personal Web site about the 86th Chemical Mortar Battalion. My father, Harold (Mat) Matson (Company B), has supplied me with much of the information from his memory and from the Battle History book. I have recently updated the site, and it now has a new address: <<http://web.mac.com/barbcooper/iWeb/Site/Welcome.html>>. I intend to add several more pages to the Web site, including a roster of current members of the 86th.

If your name is included on the list of current association members, I need to know if you want to be included on the new Web page. Please provide the information requested on the form to the following address or e-mail me at <[bcooper@cinci.rr.com](mailto:bcooper@cinci.rr.com)>:

Mat Matson  
12816 Dornoch Court  
Fort Myers, FL 33912

Sincerely

Barb Cooper



**Yes, include the following information on the 86th Chemical Mortar Battalion Web site:**

Name \_\_\_\_\_

Street address \_\_\_\_\_

City, state, and zip code \_\_\_\_\_

Telephone number \_\_\_\_\_

E-mail address \_\_\_\_\_

**No, do not include me on the Web site.**

Name \_\_\_\_\_

# The Roles of a Chemical Officer in Iraq

*By Captain Andrea M. Tix*

While deployed to Iraq for Operation Iraqi Freedom (OIF), I served in two positions in the 4th Infantry Division (Mechanized): support platoon leader and battalion logistics staff officer (S-4). These positions were not the traditional roles that Chemical officers fill, but I am grateful for the opportunity that I was presented. The experience has given me a broader perspective as a leader and a greater appreciation for the duties of all Soldiers—regardless of their military occupational specialty (MOS).

After arriving in Iraq, I was tasked to reorganize my platoon to form a battalion quick-reaction force (QRF). The QRF had to be capable of conducting combat patrols and first-response missions, in addition to providing battalion maintenance, recovery operations, and logistics support. The support platoon contained the largest diversity of MOSs in the battalion, ranging from cooks, fuelers, and truck drivers to specialized mechanics. Within two weeks of receiving my mission, my platoon was conducting successful operations in sector. The missions ranged from QRF operations to security checkpoint guards on a roadway known to have improvised explosive devices. All the while, I still had a team of mechanics and a recovery team working relentlessly in the motor pool to ensure that all battalion vehicles were operational. Every day was a learning experience! Although my Soldiers were not assigned to combat arms MOSs, they were completing tasks in a combat role. As a leader, I had to ensure that they were trained and ready to meet the challenge.

Because training time was limited, it was vital to conquer critical tasks first. And we had to continually change our tactics, techniques, and procedures to ensure that our actions were not predictable to the enemy. I cannot emphasize enough the importance of rehearsals and thorough precombat checks and inspections. I also had to empower my noncommissioned officers (NCOs) because it was just not possible for me to be everywhere leadership was needed. The operating tempo in the platoon was high, and personnel knew how to work well under pressure to excel in the highly fluid combat environment of Iraq. I learned so much as a leader!

After a few months in theater, I was reassigned to the battalion S-4 position. Again, I was placed in a nontraditional Chemical role. Because I had no formal

logistics training, I relied on my past experience as a support platoon leader to help me integrate into my new position. The duties of the S-4 section were diverse, so I valued the experience and expertise of my staff (three NCOs and one enlisted Soldier) and the crucial role they played in completing the battalion mission. As the principal staff element responsible for coordinating supply, maintenance, and transportation for the battalion and its augmenting units, we ensured that all units and sections had the assets they needed to operate. Due to the nature of the battalion mission and the uniquely skilled sections, we had to support many uncommon and complex unit requirements.

Even though we were not directly involved in combat patrols, each day brought new challenges and requirements to the S-4 section. Our days consisted of coordination with our companies and staff, other battalions and, particularly, the brigade support battalion. I quickly learned how crucial it is to network and coordinate with your counterparts. I also learned how critical it is to trust and empower NCOs. The years of experience and knowledge that my noncommissioned officer in charge brought to the table were vital in making our section successful. Without my staff, I could not have stayed on top of the numerous daily requirements necessary to resource the battalion with mission-essential items.

Having occupied the position of battalion S-4, I can now view the role from a new perspective. I fully understand how a unit operates. There are so many moving “pieces” on so many levels. It is necessary for personnel at all levels—enlisted Soldiers, NCOs, and officers—to work together and share knowledge. All personnel are vital to accomplishing the mission in Iraq!

All officers should be prepared to fill roles wherever their leadership is needed, regardless of the branch worn on the uniform. I never imagined that a Chemical officer would have the opportunity to serve in so many different roles. But I am grateful for the experience and will carry the knowledge I gained with me to future assignments. 🇺🇸

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*Captain Tix is a Chemical officer in the 1st Special Troops Battalion, 1st Brigade Combat Team. She is currently deployed to Taji, Iraq, in support of OIF 05-07. Captain Tix has a bachelor's degree in biology from the University of Minnesota.*





# U.S. Army Reserve Support for Domestic Response to a Chemical Incident

By Colonel Scott S. Haraburda

All U.S. citizens should be alert to the possibility that terrorists could use chemical weapons against our country. Chemical agents may come from weapons developed for use on the battlefield or from toxic industrial chemical stocks commonly found in our communities. Historically, terrorists have avoided the use of chemical weapons; however, since the 1995 sarin gas attack on a Tokyo subway, there has been growing concern that this could change. In response, Congress passed laws directing the Department of Defense (DOD) to implement a program to train civilian agencies on responding to incidents involving chemical agents.<sup>1</sup> In addition to training civilian agencies, the DOD identified functions that could be used during a chemical attack. For example, several military agencies began looking into ways to improve their capabilities to support a domestic chemical incident.<sup>2</sup> U.S. Army Reserve (USAR) Chemical units began fielding equipment and training Soldiers to perform mass casualty decontamination operations. The USAR capstone unit training event for this type of decontamination operation is the annual Red Dragon exercise conducted at Fort McCoy, Wisconsin.

## Combat the Threat

DOD officials and U.S. Government reports indicate that chemical warfare is a potential threat. This is not hard to imagine. Consider the following excerpt from *U.S. News and World Report*:

“The poisonous nerve gas that killed . . . nine . . . Japanese [citizens] and injured more than 5,000 was sarin (GB), invented by the Nazis and applied with deadly efficiency, suggested Japanese authorities, by members of Aum Shrinrikyo, an apocalyptic religious sect. . . . For the rest of the world, the deadly Tokyo attack was yet another shocking reminder of how vulnerable most societies are to terrorism.”

Reports also indicate that military forces, such as medical and Chemical units, should be configured and trained to support responses to chemical attacks. Specifically, the *Robert T. Stafford Disaster Relief and Emergency Assistance Act* states that the federal government has the authority to respond to disasters and emergencies and provide assistance to save lives and protect public health, safety, and property.

The *Chemical Weapons Improved Response Program* is designed to prepare the United States for chemical acts of domestic terrorism by increasing the

response capabilities of civilian emergency responders. Most civilian hospitals in the United States would be overwhelmed by an influx of casualties from a chemical incident. In the Tokyo incident, more than 5,000 people were sent to local hospitals for medical care and decontamination treatment. A Chemical company could decontaminate about 100 casualties an hour, freeing up valuable health care personnel to administer necessary treatment.

Some states have been proactive in updating staffing and training requirements for chemical response teams within local agencies. However, prior to 2001, the military had not reviewed the staffing of medical and Chemical units trained to respond to chemical warfare scenarios. Although a chemical attack has a very low probability of actually occurring, an incident could have a devastating effect on the population. We must be prepared at all levels (local, state, federal, and military) to respond to such attacks.

## Terrorist Chemical Attack

Attention is being given to the threat of terrorists using chemical weapons against civilians in the United States. Most of the public believes that this is a new phenomenon; however, the first known chemical weapons were used in ancient Greece. They were also used extensively during World War I. Historically, terrorists have avoided using

chemical agents because they did not want to alienate their own constituents or they did not have the expertise to develop effective weapons. A terrorist's decision to use chemical weapons may be divided into four major categories:<sup>3</sup>

- Increased numbers of international militant religious groups, unconstrained by the earthly consequences with an incentive to kill large numbers of people.
- Increased availability of information and resources for building chemical weapons that were only available for nation states in the past.
- Increased destructive capabilities.
- Increased knowledge and know-how to obtain chemical weapons.

Alternatively, a terrorist's avoidance of chemical weapons can be divided into four major categories:<sup>4</sup>

- Significant technical difficulties, to include—
  - ✓ Acquiring material.
  - ✓ Maintaining storage locations.
  - ✓ Converting agents to effective weapons.
  - ✓ Developing delivery methods.
- More effective alternative methods (such as those used in the 11 September 2001 plane crashes).
- Varied incentives and deterrents (much different than those for the use of conventional weapons).
- Past success and failure rates.

### Domestic-Response Casualty Decontamination

Lessons learned from past terrorist events have provided first responders with valuable knowledge. Three incidents involving chemical weapons have provided insight on the type and quantity of medical treatment that may be required:

- Antidote (atropine) overdose—the result of actions taken because of suspected chemical exposure.<sup>5</sup>
- Wide-spread panic in response to suspected chemical exposure.<sup>6</sup>
- Overload on medical facilities due to mass casualties.<sup>7</sup>

The *U.S. Government Interagency Domestic Terrorism Concept of Operations Plan* states that local government emergency response organizations will respond to incident scenes. Control of the scene must be established by local authorities (such as senior law enforcement or fire officials). State and federal responders may be used to augment local first-responder organizations. According to Department of Defense Directive (DODD) 3025.15, *Military Assistance to Civil Authorities*, the

Army must provide essential support, services, assets, and resources to help civil authorities deal with situations beyond their capabilities (such as casualty decontamination operations). USAR Chemical units use civilian trailers to move military equipment to incident sites. These trailers are designed to be transported in aircraft, resulting in a timely response to disasters (within 24 hours). On the scene, Soldiers can quickly set up equipment and begin decontamination operations.

Casualty decontamination operations serve three purposes:

- Remove chemicals from a victim's skin and clothing.
- Protect emergency first responders and medical personnel from chemical exposure.
- Comfort victims, psychologically or physiologically, while reducing the chance of spreading contamination.

Decontamination should be done quickly to save lives. With practice, mass casualty decontamination operations can be quickly and effectively performed using a shower system. Three types of water-based decontaminants can be used:

- **Water.** Flushing and showering with water dilutes chemicals and physically removes agents.
- **Soap and water.** By adding soap, improvement in results can be achieved by ionic degradation to the chemical (such as dissolving oily substances).
- **Bleach and water.** This combination is the best decontamination solution. In addition to the physical removal of contaminants, the solution neutralizes remaining contaminants.



A CH-47 transports decontamination equipment.



**Soldiers prepare decontamination equipment.**

Combining soap with bleach and water offers the most thorough removal of contaminants; however, it normally results in time delays due to supply issues. Decontamination procedures should never be delayed to wait for supplies. If only water is available for immediate use, personnel should remove contaminated clothing and begin flushing or showering the skin with large amounts of water.<sup>8</sup>

Both liquid and vapor hazards must be considered during decontamination operations. The Army decontamination process is divided into three decontamination zones:

- **Hot zone.** The hot zone is the area immediately surrounding the chemical release; it is presumed to pose an immediate health risk to all personnel.
- **Warm zone.** The warm zone surrounds the hot zone. Primary contamination is not expected; however, secondary contamination exposure from victims or the risk of inhaling vapors emanating from remaining residual liquid contamination is a possibility.
- **Cold zone.** The cold zone is the area surrounding the warm zone. There is expected to be no risk of exposure in this area.

Additionally, the Army assembles functions in these zones into five decontamination stations:

- **Station 1.** This station (located in the hot zone) is a medical triage area used for initial casualty examination. The prioritization of decontamination is

determined at this location using the Simple Triage and Rapid Treatment (START) System. Operators wear Occupational Safety and Health Administration (OSHA) Level A protective clothing.<sup>9</sup>

- **Station 2.** This station (located between the hot and warm zones) is used for initial scrub-down and shower operations. Operators wear OSHA Level B protective clothing.
- **Station 3.** This station (located in the warm zone) is used to neutralize remaining contaminants. Personal items are removed from casualties, bagged, and secured at this station. Operators wear OSHA Level B or C protective clothing.
- **Station 4.** This station (located in the warm zone) is used to provide a final water rinse. Casualties remove clothing at this location and are monitored for vapor contamination before moving on to Station 5. Operators wear OSHA Level B or C protective clothing.
- **Station 5.** This station (located in the cold zone, at the entrance to the warm zone) is the final decontamination location. Operators wear OSHA Level C protective clothing as extra protection against the transfer of hazardous material.

START Priority Decontamination Table			
START Category	Priority	Classic Observations in Patient	Chemical Observations in Patient
Immediate (red tag)	1	Respiration is present only after repositioning the airway. Respiratory rate is more than 30. Capillary refill is delayed more than 2 seconds. Consciousness is at a significantly altered level.	Serious signs and symptoms. Known liquid chemical contamination.
Delayed (yellow tag)	2	Injuries can be controlled or treated on the scene.	Moderate to minimal signs and symptoms. Known or suspected liquid contamination. Known aerosol contamination. Exposure to agent close to the point of release.
Minor (green tag)	3	Patient is ambulatory, with or without minor traumatic injuries requiring immediate or significant treatment.	Minimal signs and symptoms. No known or suspected exposure to agents.
Deceased/expected fatality (black tag)	4	No spontaneous effective respiration is present after attempting to reposition the airway.	Very serious signs and symptoms. Grossly contaminated with liquid nerve agent. Unresponsive to injections.



## Red Dragon Exercise

The Red Dragon exercise is a U.S. Army Reserve Command annual training event to train Chemical units (with support from Army medical units) in decontamination methods and to develop doctrinal guidance to standardize these methods. The first Red Dragon exercise took place in 2004. The exercise, conducted with the 472d Chemical Battalion and four Chemical companies, included more than 200 Soldiers and was the first Chemical battalion level exercise conducted with a civilian agency. The 2005 exercise was conducted with the 479th and 490th Chemical Battalions and included eight Chemical companies and more than 500 Soldiers. In 2006, with more than 1,000 Soldiers in 12 Chemical companies, the 485th Chemical Battalion incorporated the support of chaplain, quartermaster, military police, engineer, and aviation units. Cargo helicopters were used to bypass blocked roads and improve equipment transport. The 2005 and 2006 exercises simulated chemical releases and nuclear detonations to test the operational response levels of civilian first responders, including police, fire, and emergency medical services.

### Lessons Learned

There is no single method for USAR support that automatically fits every domestic chemical emergency. It is vital that USAR Chemical companies coordinate with local first responders and emergency operations centers now. Prior coordination will ensure that valuable time is not lost educating local officials about the capabilities of Chemical units during an actual emergency. Timeliness is crucial. Every minute lost following a chemical incident could cause an increase in the number of casualties. Chemical units in support of an emergency response cannot usually mobilize more than one fourth of their unit in less than a couple of hours (about 30 Soldiers to perform a 150-person mission). Unit commanders must consider using on-scene volunteers to perform nontechnical tasks (such as litter transport and casualty registration). Additionally, units should train Chemical Soldiers in the supervision of nonchemical Soldiers performing collective chemical, biological, radiological, and nuclear (CBRN) tasks.

Command and control operations during a homeland defense mission can become complicated. The on-scene commander is normally a civilian first responder, such as the local fire chief. During these missions, the military is not in charge of the CBRN defense activities, but instead acts in a support role. Establishing liaisons and communicating information between military units and local organizations are critical to successful operations. Procedures for issuing and transmitting orders must be established, as they may



**A decontamination team performs casualty scrub-down operations.**

differ significantly from the systematic military troop-leading procedures common in operation orders.

### Conclusion

The true test of a Chemical unit's response capability will include the collaborative efforts of numerous agencies, each with unique operating procedures. USAR Chemical units must establish common terminologies and mechanisms for interagency communications. To improve readiness, Chemical units must train on responses to domestic chemical incidents and casualty decontamination operations by simulating real-life scenarios. A significant challenge in meeting this goal is balancing domestic chemical preparedness training with wartime requirements. Chemical units need to continue working with civilian emergency responders and other nonchemical units to ensure familiarization with capabilities, limitations, and operating procedures. 🚫

**NOTE:** Colonel Haraburda wishes to acknowledge the Soldiers of the 472d, 479th, 485th, and 490th Chemical Battalions during the past several years for their efforts in making the Red Dragon exercises a successful capstone training event.

#### Endnotes:

<sup>1</sup>A key law passed by Congress was the *Defense Against Weapons of Mass Destruction Act of 1996* (also known as the *Nunn-Lugar-Domenici Amendment*).

<sup>2</sup>DOD agencies, such as the U.S. Soldier and Biological Command, also initiated scientific research, workshops, and technical investigations centered on enhancing and improving the capability of civilian emergency personnel in responding to chemical attacks.

<sup>3</sup>Audrey K. Cronin, "Terrorist Motivations for Chemical and Biological Weapons Use: Placing the Threat in Context," Congressional Research Service, Library of Congress, 28 March 2003.

<sup>4</sup>Ibid.

<sup>5</sup>During Operation Desert Storm, about 1,000 casualties were treated for chemical-agent exposure even though no chemical agents were found to be present in the attack.

<sup>6</sup>During the nerve gas attack in the Tokyo subway system, 5,000 people were believed to have been exposed to a toxic agent. In reality, only 80 percent of the victims had exposure significant enough to require medical treatment. However, the incident created an overwhelming burden on the local medical system.

<sup>7</sup>In 1984, an accidental release of methyl-isocyanate from a pesticide plant in Bhopal, India, resulted in more than 200,000 people being exposed to toxic gas.

<sup>8</sup>The skin should be washed in a water stream with a minimum pressure of 60 pounds per square inch (psi). Standard household showers average 60 to 90 psi.

<sup>9</sup>Soldiers wear mission-oriented protective posture (MOPP) 4 protection in all stations if OSHA protective clothing is unavailable.

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## Response Training Facility Scheduled to Open in June 2007

*By Ms. Constance L. Singleton*

Progress continues in the construction of the First Lieutenant Terry Chemical, Biological, Radiological, and Nuclear (CBRN) Weapons of Mass Destruction Response Training Facility. The \$15 million facility will provide training for Army National Guard civil support teams, U.S. Army Chemical units with homeland security missions, Department of Defense emergency response teams, and other Dragon Soldiers. A ribbon-cutting ceremony is scheduled for 26 June during the Joint CBRN Conference at Fort Leonard Wood, Missouri.

The facility is named in honor of World War II hero and Distinguished Service Cross awardee, First Lieutenant Joseph Terry, who was assigned to D Company, 86th Chemical Mortar Battalion. First Lieutenant Terry is credited with saving the lives of six Soldiers following a prolonged artillery barrage. He is one of only nine members of the Chemical Corps to receive the Distinguished Service Cross during World War II.



# The Use of Riot Control Agents During the Vietnam War

By Mr. Kip Lindberg

*“I just wish they were as concerned with our Soldiers who are dying as they are with someone’s eyes who watered just a little bit.”*

—President Lyndon B. Johnson  
White House press conference, April 1965

Responding to repeated inquiries concerning the reported use of riot control agents (RCAs) during the Vietnam War, President Johnson stated that the South Vietnamese government had set the policy for their use. Although the U.S. Government supplied RCAs as part of its military assistance program, U.S. advisors had not ordered their use.

The report of RCA use in Vietnam resulted in worldwide protest. The United States was charged with violating the 1925 Geneva Protocol (established by the League of Nations) for its use of gas agents during World War I. The Protocol forbids the use of “asphyxiating, poisonous, or other gases and biological methods of warfare” in international conflicts. Further, by violating this international agreement, the United States was labeled the first nation to engage in chemical-agent aggression since the 1930s.<sup>1</sup> The reports also added fuel to the expanding antiwar movement. To protestors, it was further proof of U.S. barbarism against Vietnamese civilians, akin to the Nazi use of poison gas against death camp inmates.

The immediate and widespread outcry caught the Johnson administration off guard. The Departments of State and Defense felt the use of RCAs was an acceptable form of warfare. Field Manual (FM) 27-10, *The Law of Land Warfare*, specified that the United States was not a party to “. . . any treaty, now in force, that prohibits or restricts the use in warfare of toxic or nontoxic gases . . .” The United States had not ratified the Geneva Protocol of 1925 and was not bound by its treaties. Further, the U.S. policy of “no first use” of chemical weapons, adopted during World War II, was still secure because RCAs were not chemical weapons.<sup>2</sup>

The use of RCAs in warfare was not a new concept, as they had been used extensively during World War I. Lachrymators (tear-producing agents) like chloroacetone (CA), xylol bromide (white cross), and chloroacetophenone (CN), along with vomiting agents diphenylaminearsine

(DM and adamsite) and chlorpicrin (PS) were used in hand grenades, mortar rounds, and artillery shells. Used by French and German forces as early as 1914, these agents were used for harassment and casualty functions. Even in small quantities, these agents forced Soldiers to don protective masks and, due to agent persistency, wear them for long periods. The tearing, coughing, mucus discharge, and vomiting produced by inhalation often forced previously exposed personnel to remove their protective masks to prevent fouling, thus exposing them to additional toxic gas. This led to decreased Soldier efficiency and increased panic, demoralization, position abandonment, and death.

Following World War I, the United States, under the guidance of the Chemical Warfare Service, developed “harassing agents,” with focus on CN and DM lachrymatory and irritant smoke agents. While both types of agents were stockpiled for possible retaliatory use during World War II, neither saw use beyond familiarization exposure for Soldiers undergoing gas warfare training. In the 1950s, the Army upgraded riot control capabilities by initiating a program called *Black Magic*. Under *Black Magic*, new dispersal systems were developed and an additional lachrymatory agent, ortho-chlorobenzylidene-malononitrile (CS), was added. CS quickly became the standard agent in the Chemical Corps’ inventory of RCAs.

All RCAs worked in a similar fashion. When released, they resulted in irritation to the eyes, nose, and respiratory tract, causing burning of the eyes, tearing, sneezing, coughing, and mucus and salivation secretions. However, CN and CS also irritated exposed skin and, based on conditions, could produce reactions ranging from a prickly feeling to edema or blisters.

DM was more likely to cause gastrointestinal problems than CN or CS. While the nearly instantaneous reaction to CN and CS exposure was immediately recognizable, exposure to DM was more subtle, taking several minutes to produce sufficient inhalation and physical symptoms.



Also, while the symptoms of CN and CS exposure were short-lived (dissipating 10–15 minutes after source removal), the effects of DM could remain for hours. Although exposure to CS, CN, or DM in sufficient quantities could be fatal, CS was considered the fastest-acting, most effective, and least toxic agent. And it required the shortest recovery time following exposure.

In temperate conditions, CS agent is a fine, white, crystalline powder. When released as an aerosol, as in a pyrotechnic explosion (such as a grenade) or by burning, CS absorbs moisture. The resulting agglomeration and rapid agent breakdown made for a short persistency duration. Improved versions of CS—CS1 (a finer particulate powder blended with silica gel) and CS2 (a powder further refined with a liquid silicone aerosol)—were developed to increase long-term agent effectiveness. Both versions limited moisture absorption and increased agent persistency from hours to weeks for CS1 and nearly a month for CS2.

Beginning in 1962, RCAs were supplied to the government of the Republic of Vietnam for use in civil disturbances and against the insurgent Viet Cong. In fact, the Army of the Republic of Vietnam (ARVN) had been utilizing RCAs in a battlefield role, with the knowledge of U.S. military advisors, for several months prior to the news report which initiated the controversy. Military advisors noted the effectiveness of the agents and the dispersal systems used. Based on these reports, the Chemical Corps initiated a series of tests at Army installations within the continental United States (code name *Water Bucket*) to evaluate RCAs and dispersal systems under battlefield conditions. But a number of problems emerged from these tests, most concerning dispersal systems. Hand grenades and backpack dispersers worked well at short ranges but not at long ranges. Additionally, filling standard munitions with CS was not effective, as the large bursting charges tended to ignite the CS fill, leading to limited dispersal and decreased persistency effectiveness. Finally, weapons systems did not exist to allow effective delivery of RCAs over a large area. The Chemical Corps developmental efforts in these areas continued even as large numbers of U.S. Soldiers were deployed to Vietnam and engaged in combat with the Viet Cong and North Vietnamese Army (NVA) forces.

With the escalation of U.S. involvement in Vietnam came an increase in the battlefield use of RCAs. Initially, any use of RCAs by U.S. forces was strictly controlled. Stung by the backlash of protests, the Johnson administration was cautious about providing more ammunition to the antiwar cause. RCAs were authorized only in self-defense situations. In several cases, U.S.

forces used CS to separate Viet Cong suspects from women and children being used as human shields. In other instances, enemy combatants were forced from tunnels and hiding spaces by CS grenades. The use of conventional munitions in these situations would have likely resulted in fatalities. Giving the enemy an option of “crying or dying” presented a humanitarian angle to lessen the initial visceral response of the public to RCA use. When additional incidents reported by the press failed to reignite widespread protest, greater latitude was given to field commanders for discretionary offensive use of RCAs in tactical situations.

RCAs were used tactically to accomplish several objectives:

- Force enemy personnel into the open to engage in a battle using conventional operations.
- Disorient enemy assaults.
- Neutralize enemy defenses and suppress enemy fire during assaults.
- Restrict enemy use of terrain, infiltration routes, and tunnel complexes.
- Minimize noncombatant casualties and property destruction by forcing the enemy from built-up areas.

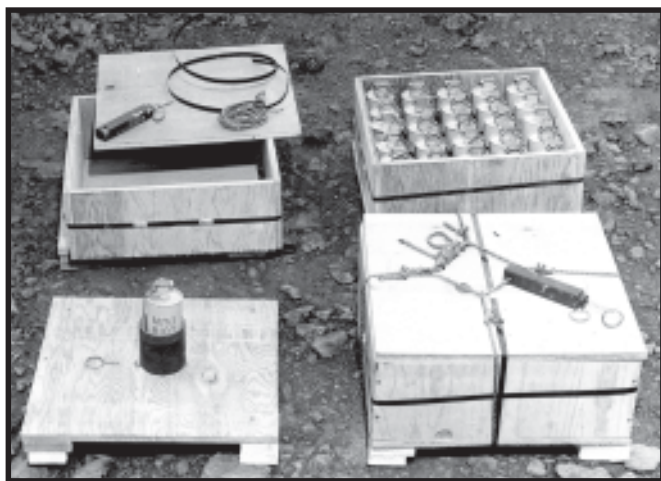
During 1965 and 1966, U.S. forces were limited in their use of RCAs, not by policy dictates but by the limited means of deploying CS. Soldiers used CS-filled hand grenades or bulk powder. The M7 series grenade had a cylindrical, “beer can” body and held 3.5 to 4.5 ounces of CN, CS, or CS1. It could be thrown up to 35 meters, remained burning for 45 seconds, and emitted a dense cloud of agent. However, since the grenade body did not fragment, the enemy often recovered the cylinders and reused them as antipersonnel grenades. The M25 CS hand grenade negated this concern, as its baseball-shaped body was manufactured from plastic or compressed fiber and disintegrated on detonation. The M7 and the M25 had roughly the same range and capabilities, but the range on the M7 could be increased by 200 yards when attached to a finned adapter and the grenade launcher on an M14 rifle. However, most CS grenades were used at close range to clear huts, bunkers, and tunnels. CS bulk powder was used in the M3 portable RCA disperser. Using the same fuel and pressure tanks as the M2 flamethrower, the M3 disperser contained 20 pounds of CS or CS1. The backpack type M3 could be used to clear tunnels and buildings, but it was also effective for laying an agent barrier around defensive positions. CS1 sprayed in and around the perimeter aprons of barbed wire provided an invisible defense against enemy sappers. Enemy personnel attempting to breach the perimeter would crawl through the

CS1, activate it, and create an immediate physical reaction, alerting U.S. sentries to enemy presence. When firebase positions were abandoned, large amounts of CS1 and CS2 were used to saturate the site, deterring enemy forces from searching for abandoned munitions and equipment.

Powdered CS agent was also sprayed from helicopters using M4 and M5 aerial dispersers, but problems were soon encountered with this method of delivery. If aircraft flew too high, the rotor wash and winds dispersed the agent over an area that was too large; if aircraft flew at optimum altitude for agent delivery, they became vulnerable to ground fire. Helicopter smoke ships accompanying the missions denied the enemy a clear target, but spraying remained a dangerous enterprise.

Small packets of CS1 and CS2 were used by long-range reconnaissance patrols (LRRPs). Often tasked with operating deep within hostile territory, LRRP Soldiers had to secretly dispose of empty ration packets. When burying this trash, CS powder was mixed with the soil to discourage animals from digging and alerting enemy personnel to the presence of forces in the area.

Field-expedient munitions were also devised for operations too large for standard hand grenades and dispersers. Large bunkers were often attacked using the bunker use restriction bomb (BURB). Manufactured in the field using spent 2.75-inch rocket shipping containers, the BURB contained about 1 pound of CS2 and a timed, nonelectric blasting cap detonator. When detonated, the explosion dispersed agent throughout the bunker, where it remained a persistent deterrent for enemy reoccupation for up to a month. Helicopter crews manufactured the “box full of grenades” for aerial delivery of CS on enemy positions. An entire box (25) of M7 CS grenades was prepared by pulling the pins (the spoons were held in place



**Improvised CS aerial bomb known as the “box full of grenades”**



**Chemical Corps Soldier preparing a 55-gallon drum of CS for aerial delivery, Vietnam, 1967**

by the bottom half of the shipping tubes), placing the grenades in a plywood box, strapping the box lid in place, and placing a time delay detonator on the closure strap. Upon spotting an enemy target, the crew chief activated the detonator and kicked the box from the aircraft. As the box tumbled through the air, the detonator exploded, releasing a shower of M7 grenades to burst on the target. In similar fashion, large areas of dense jungle suspected of shielding enemy base camps or infiltration routes were bombarded from the air using 55-gallon shipping drums. A length of detonation cord was taped along the tops and sides of the CS-filled drums. The drums were then placed on a specially constructed rack inside the cargo bay of a CH-47 Chinook helicopter, and the detonators were linked to the rack using long, wire lanyards. Over a selected target area, crewmen rolled the drums off the rear cargo ramp. The lanyards ignited the detonators as the drums fell free of the aircraft. Ideally, the detonating cord ruptured the drums just above the jungle canopy and distributed agent over a wide area.

By 1967, the first of the newly designed RCA systems, tested by the Chemical Corps under the *Water Bucket II*



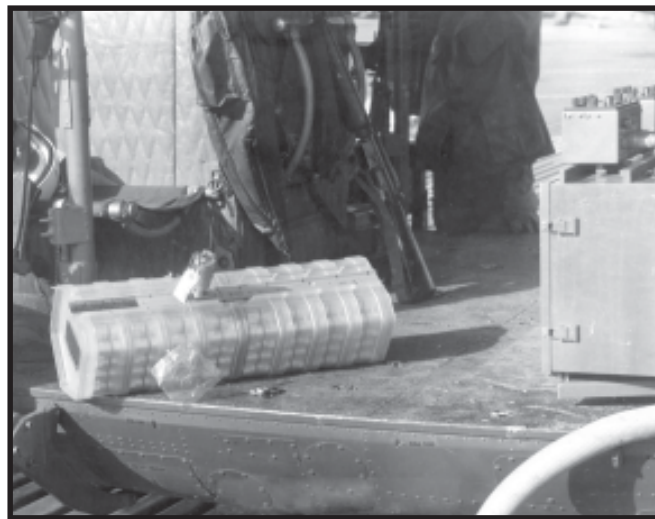
program, began arriving in Vietnam. An improved version of the M7 CS grenade, the XM54, was produced specifically for aerial deployment. A longer fuse provided additional time for the grenade to reach a target before bursting, creating a better concentration of agent. Several versions of a 40-millimeter CS grenade were produced for use in the M79 grenade launchers, providing a rapidity of fire and accuracy unobtainable with previous rifle grenades. The M106 “Mighty Mite” portable blower allowed Chemical Soldiers to disseminate large amounts of CS1 and CS2 through tunnel systems used as sanctuaries and operating bases by the Viet Cong and NVA. The E8 tactical CS launcher—a backpack, multitube CS system—was also used in Vietnam. The E8 could launch 64 cartridges from its 16 tubes within 1 minute and blanket a target area at ranges of 250 yards forward, 40 to 75 yards wide. Offensively, the E8 could be used as a weapon to break away from enemy contact or to clear enemy personnel from a defensive position, as Marines demonstrated during the fighting in Hue following the Tet Offensive in January 1968. However, the best use of the E8 was in perimeter defense where, in overlapping fields of fire, the munition was used to deter infiltration.

Bursters for air-dropped CS drums were more reliable and effective than the jury-rigged, detonation cord-wrapped drums used previously. Standard napalm bombs were adapted to carry several hundred pounds of CS2. Additionally, cluster assemblies for aerial delivery of CS munitions were produced for use with rotary and fixed-wing aircraft. The E158 tactical CS cluster bomb contained 264 CS-filled canisters and could be armed as the munition was released from the aircraft or at a preselected height. The E158 was considered the best system for aerial delivery of CS during Vietnam.

By 1969, a dozen new RCA delivery systems had been developed, tested, and fielded—an impressive statistic



**E8 tactical CS launcher in the firing position**



**E158 CS cluster munition prepared for deployment from a “people sniffer” helicopter**

given that only four years had passed since the need was identified. Additionally, many other munitions—rocket warheads, mortar rounds, artillery shells, and aerial bombs—were tested and issued for field trials. To counter U.S. efforts, Viet Cong and NVA forces obtained or manufactured protective equipment. Equipment recovered from NVA personnel involved in the Tet Offensive indicated an increased presence of Soviet- and Chinese-developed respirators designed to offer protection against CS. Viet Cong forces were also using self-manufactured masks and respirators, many constructed from spent U.S. equipment.<sup>3</sup>

The Viet Cong and NVA occasionally retaliated by using RCAs against U.S. and South Vietnamese forces but, unable to manufacture RCAs, they were limited to using captured and recovered agent (from unexploded munitions). Unexploded, air-dropped drums provided much of the CS1 used in grenades, rockets, mortar rounds, and booby traps. Enemy forces spread CS along roadways to initiate ambushes. When convoy traffic stirred up the agent, unprotected drivers lost control of their vehicles. During one well-publicized attack on a U.S. firebase, members of the 409th Viet Cong Sapper Battalion used CS grenades to disorient, panic, and overrun its defenders.

An estimated 18 million pounds of RCAs were sent to Vietnam between 1962 and 1972, most in the form of bulk CS1 and CS2. When used effectively, they forced enemy personnel into the open and created disorder in enemy assaults, but some factors of successful dispersal (such as wind and weather) were out of the commander’s control. RCAs were an aid in suppressing enemy fire, but the ability to exploit a situation with a quick assault was often limited by the small supply of protective masks.



And the reluctance of Soldiers to carry the “superfluous equipment” led to a reduced use of CS and apprehension about occupying areas saturated by the agent. Evidence suggests that widespread aerial delivery of CS<sub>2</sub> did temporarily deny terrain and infiltration routes and canalize enemy movement in selected areas, but it is difficult to evaluate its effectiveness. While an effective CS dispersal could make passage through an area difficult and painful, it would not prevent a determined enemy from making the effort. CS seemed to work best in the close confines and microenvironment of tunnels. In tests, tunnels salted with CS<sub>2</sub> and sealed were reopened six months later for evaluation. When the CS was disturbed, it became active again.

Throughout the Vietnam War, CS was used to clear enemy personnel from congested areas, no doubt preventing civilian casualties and unnecessary property destruction. But the use of RCAs in Vietnam remained controversial. Although most of America’s military presence was withdrawn from Vietnam in 1973, ARVN forces continued to use CS until the communist victory in April 1975. In the months before the victory, the U.S. Senate, with presidential urging, ratified the Geneva Protocol of 1975. Coupled with President Ford’s Executive Order 11850 (8 April 1975), the United States officially acknowledged RCAs as prohibited war gases and renounced their use in Vietnam—with reservations. These reservations included the right to use RCAs in retaliation for enemy use, in defensive modes to save lives, and to quell civil disturbances in U.S. lines. The use of RCAs was further limited by prohibiting any use without express advance approval from the President. Thirty years later, RCAs remain in the Army inventory much as they did during World War II, stocked mainly for use in Soldier training and protective mask familiarization. ☹☹

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*Mr. Lindberg is the curator of collections at the U.S. Army Chemical Corps Museum.*

**Endnotes:**

<sup>1</sup> During the 1930s, Italy deployed mustard gas in its campaign in Abyssinia. Additionally, Japan used chemical and biological agents against China.

<sup>2</sup> Most RCAs were commercially available and successfully used by civilian law enforcement agencies. The incapacitating effects of

these agents were temporary and, when used correctly, nonlethal. Therefore, RCAs were incomparable to vesicant, choking, and nerve agents, all of which were designed to produce casualties and fatalities.

<sup>3</sup> Testing performed on recovered, self-manufactured masks showed that the masks were not effective against CS.

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## ***CCRA 2006 Writing Contest***

The 2006 Chemical Writing Contest, sponsored by the Chemical Corps Regimental Association, has been suspended due to ongoing commitments in Operation Iraqi Freedom. Details on the 2007 Writing Contest will be announced in the July–December 2007 issue of *Army Chemical Review*.



## Soldier Qualification Training

There are currently three courses being taught through six Total Army School System (TASS) battalions. The scheduled dates and times for these courses can be found by accessing the Army Training Requirements and Resources System (ATRRS) at <https://www.atrrs.army.mil/>. A brief description of each course follows:

- **74D10 Military Occupational Specialty Training (MOS-T) Course.** The 74D10 MOS-T course has four phases. Phase I is offered via distributed learning (DL). But don't try to complete it in one weekend—it cannot be done. Phases II and IV are offered as resident training at Fort Leonard Wood, Missouri. Phase III is offered as nonresident instruction and is provided in the TASS battalion regions.
- **Basic Noncommissioned Officer Course (BNCOC).** The 74D BNCOC has four phases. Phase I is common to all MOSs. Phases II and IV are 74D-specific, resident training at Fort Leonard Wood. Phase III is 74D-specific, nonresident instruction provided in the TASS battalion regions.
- **Advanced Noncommissioned Officer Course (ANCOC).** The 74D ANCOC has three phases. Phases I and III are resident training at Fort Leonard Wood. Phase II is nonresident instruction provided in the TASS battalion regions.

Instructors at the TASS battalions access the courseware for the proponent schools through the Digital Training Access Center (DTAC) Web site. TASS courseware is accessible as a downloadable file stored in the Blackboard learning management system. The chemical Quality Assurance Element contacts the instructors at the TASS battalions by e-mail and provides them with instructions on how to access the courseware.

## Officer Training

The Reserve Component Chemical Captains Career Course (RC-CMC3) is a five-phased course. Phase I covers common-core material and is required for all Army captains. Phase II covers chemical technical material and is offered via DL. The U.S. Army Chemical School has successfully funded the complete revision of Phase II, and work is expected to be completed by November 2007. Phase III, a two-week resident phase at Fort Leonard Wood, focuses on branch-specific training for conducting chemical, smoke, radiological, and toxic-agent operations; managing the effects of biological agents; learning and developing defense concepts; and inciting hazardous material (HAZMAT) awareness.

Phase IV is the DL portion of the combined arms exercise (CAX) program. The tasks in this phase prepare officers for company command and brigade staff assignments. Phase V, also conducted at Fort Leonard Wood, is the CAX resident portion. Phase V training culminates in a military decision-making process that uses state-of-the-art battle simulation equipment. In October 2007, military police and engineer students will begin training with chemical RC-CMC3 students.

Officers transferring to the Chemical branch after attending another branch's officer basic course must attend the Chemical, Biological, Radiological, and Nuclear (CBRN) Defense Course to provide them with basic CBRN defense training. Other required training will depend on the officer's level of education. Contact RC personnel at the Chemical School for specific details (see the point of contact list on the next page).

## Army Reserve- and National Guard-Specific Training

**Civil Support Skills Course.** The Chemical School continues to provide National Guard Soldiers and Airmen initial weapons of mass destruction—civil support team (WMD-CST) training. The course is eight weeks long and covers training in HAZMAT, site entry, sampling, and survey operations and offers practical exercises in commercial, off-the-shelf detection equipment (including the self-contained breathing apparatus [SCBA], the HAPSITE® Gas Chromatograph/Mass Spectrometer, the MultiRAE Combustible Gas Indicator/Detector, and colorimetric tubes).

**Domestic-Response Reconnaissance Training.** The Chemical School offers the CBRN Responder Course. This intensive, 2 ½-week course provides certification training in HAZMAT awareness, mission operations, technician sampling, and entry operations. The course includes training on the SCBA, MultiRAE Combustible Gas Indicator/Detector, and colorimetric tubes. The course is open to Army Reserve Soldiers, Army National Guard CBRN enhanced response force package (CERFP) Soldiers, Active Army Chemical Soldiers, and Army civilians with a professional requirement.



**Mass-Casualty Decontamination Training.** In the second quarter of Fiscal Year (FY) 2007, the Chemical School will pilot the mass-casualty decontamination training program to expand the original domestic-response casualty decontamination training program and ensure that the necessary certification training is covered. This course is available to Army Reserve and National Guard CERFP Soldiers. More information will be published as it becomes available.

## Courseware Development

The Chemical School is developing Web-based courseware to support increased scientific foundations in CBRN educational opportunities.

**Basic Chemistry for CBRN Responders.** This course will be a fully operational, Web-based, basic-chemistry DL product, 50–55 hours long. The objective of this course is to provide students with a chemistry foundation that can be applied to their missions as CBRN responders. The chemistry portion of this courseware was developed to meet an undergraduate level of academics in basic chemistry or general science. Additionally, the course includes awareness level instruction (as defined in 29 Code of Federal Regulations 1910.120). The final course module offers students the opportunity to test their newly learned skills and knowledge of basic chemistry using one of three randomly selected scenarios. These scenarios synthesize the roles and responsibilities of Soldiers at the awareness level and initiate an emergency response sequence. Do not let the “basic” in the course name fool you—THIS IS NOT AN EASY COURSE. Many reserve component Soldiers participated in the October 2006 pilot of this course, but only a few individuals completed all modules during the allotted time. This course will be fully fielded in late FY 07.

**Analytical Laboratory System (ALS) Course.** This course is designed to provide initial and replacement training for primary and alternate ALS operators. Due to the logistical requirements required to conduct this course, the training will be provided by contract personnel and conducted in Lexington, Kentucky.

**Unified Command Suite (UCS) Course.** This course provides initial and refresher training for primary and alternate UCS operators. Due to the logistical requirements required to conduct this course, the training will continue to be offered through the Naval Air Systems Command by contract personnel in St. Inigoes, Maryland. Validation will occur during pilot courses conducted in August 2006 and March 2007.

**CST Operations Course.** The target audience for this course is senior leadership in state WMD-CST, CERFP, and joint force headquarters organizations. Validation of this course is expected in the first quarter of FY 07.

## Chemical School Personnel Issues

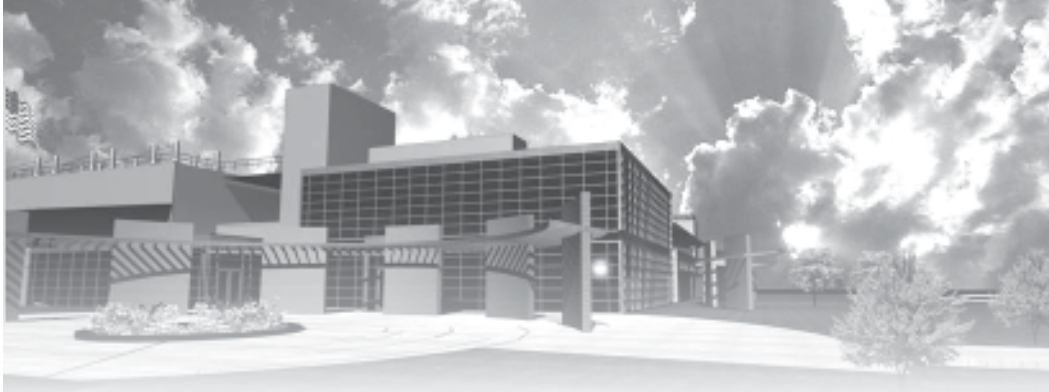
There are currently six authorized Active Guard and Reserve positions. Five of these positions are filled—the Deputy Assistant Commandant–Reserve Component (DAC-RC) (a USAR colonel position), the Deputy Assistant Commandant–National Guard (DAC-NG) (an Army National Guard lieutenant colonel position), two training developers (USAR major and master sergeant positions), and two combat developers (USAR lieutenant colonel positions).

The USAR has twenty authorized drilling individual-mobilization augmentee (DIMA) positions in the Chemical School—twelve officer slots (captain through lieutenant colonel) and eight noncommissioned officer slots (sergeant first class through sergeant major). Our mission is to expand school training capabilities during mobilizations. The USAR currently supports the RC-CMC3 training mission. Our goal is to achieve 100 percent coverage of authorized instructor positions with qualified personnel. We strive to improve CMC3 and RC-CMC3 training through our work. We are always looking for qualified Soldiers to fill these positions, so contact us if you are interested!

For additional information, contact any of the following personnel at the Chemical School:

- Colonel Robert Walk (DAC-RC), telephone (573) 563-8050, e-mail <[robert.d.walk@us.army.mil](mailto:robert.d.walk@us.army.mil)>.
- Lieutenant Colonel Christian Van Alstyne (DAC-NG), telephone (573) 563-7676, e-mail <[christian.vanalstine@us.army.mil](mailto:christian.vanalstine@us.army.mil)>.
- Ms. Sandy Meyer (DAC secretary), telephone (573) 563-6652, e-mail <[sandy.meyer@us.army.mil](mailto:sandy.meyer@us.army.mil)>.





## Sample Receipt Facility Under Construction

*Compiled by the Public Affairs Office at the Edgewood Chemical Biological Center,  
Aberdeen Proving Ground, Maryland*

Construction is underway at Aberdeen Proving Ground on the Sample Receipt Facility (SRF). With multiagency-funded construction costs totaling \$27 million (\$15 million from the Department of the Army, \$9.6 million from the Federal Bureau of Investigation [FBI], and \$2.4 million from the Department of Homeland Security), the SRF will be the only full-range national resource facility with the capability to receive, triage, sample, and screen unknown agents from units or organizations anywhere in the world (such as military units in theaters of operation and intelligence and law enforcement organizations). The U.S. Army Corps of Engineers worked with experts and scientists from various agencies to design this one-of-a-kind facility.

The facility is a giant leap forward in enhancing the Nation's capability to deal with potential weapons of mass destruction (WMD) attacks. The FBI will have the capability to safely analyze WMD-related evidence using specialized chemical and biological forensic laboratories designed to protect personnel from contamination during forensic examinations. Simultaneously, personnel at the Edgewood Chemical Biological Center will identify and render-safe hazardous materials and explosives while personnel at the Chemical Security Analysis Center integrate combined laboratory results with information from knowledge databases to characterize materials or conduct investigative leads.

Construction completion is expected in the summer of 2008. 🗓️



**Aerial view of the new facility**

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**ARMY**  
**CHEMICAL**  
**REVIEW**  
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Recent issues of *Army Chemical Review* are now available online at <<http://www.wood.army.mil/chmdsd/default.htm>>. If you are interested in an article that is not on the Web site, send your request to <[acr@wood.army.mil](mailto:acr@wood.army.mil)>. Type "Army Chemical Review" in the subject line, and list the article(s) requested in the body of the message. Include your name, unit, address, and telephone number with your request.

# Lineage and Honors

## 68th Chemical Smoke Generator Company

**Activated:** 1 June 1942 at Edgewood Arsenal, Maryland  
**Campaign during World War II:** Ryukyu Islands, Japan  
**Decoration:** Combat Streamer  
**Deactivated:** 25 January 1946

**Activated:** 14 April 1949 at the U.S. Army Chemical Center, Maryland  
**Campaign during Korea:** Pusan Perimeter  
**Decoration:** Nine campaign streamers, Meritorious Unit Citation, and two Korean Presidential Unit Citations  
**Redesignated:** 68th Chemical Company, 4 March 1954  
**Deactivated:** 15 June 1959

**Activated:** 25 March 1963 at Fort Hood, Texas  
**Campaigns during Vietnam:** No overseas assignments  
**Deactivated:** 24 June 1966

**Activated:** 1 July 1977 and assigned to the 1st Cavalry Division, Fort Hood, Texas  
**Campaign during Operation Desert Storm:** Engaged in deceptive maneuvers along the Saudi Arabia/Iraqi border  
**Campaign during Operation Iraqi Freedom:** Provided concealment for the 3d Infantry Division operations while crossing the Iraqi border  
**Deactivated:** 15 September 2005

Following World War I, the Chemical Warfare Service (CWS) studied what part chemicals would play in future conflicts. However, when war broke out in Europe a second time, the United States was reluctant to unleash agents. The prospect of a chemical attack was on the horizon, and the CWS (now renamed the Chemical Corps) was tasked with ensuring that U.S. forces were obscured from attacks. One of the units formed to perform this mission was the 68th Chemical Smoke Generator Company. Following training and construction missions, the 68th was reassigned to Camp Sibert, Alabama, for training on the M2 mechanical smoke generator in preparation for deployment to the Pacific Theater. In June 1945, the 68th arrived in Okinawa to provide cover and concealment operations for combat units under the threat of Japanese air attacks.

During a period of increased hostilities with Korea, the 68th Chemical Smoke Generator Company was again called to service. The unit trained on smoke operations and domestic training maneuvers until the outbreak of war. In October 1950, the 68th was attached to the 4th Chemical Smoke Generator Battalion, where it performed traditional smoke operations in conjunction with units from X Corps. In July 1951, the 68th was transferred to the Pusan area, where it provided cover and surveillance for combat units. The Pusan Perimeter was a major site of contention during the Korean War due to its significance as a strategic launching point and symbol of U.S. presence. In May 1952, the 68th was assigned responsibility of an area known as “Artillery Valley,” a vital supply route and avenue of troop movement subject to enemy surveillance and artillery attacks.

During the Vietnam era, the 68th participated in training exercises, ensuring that the force was trained and ready for chemical threats; however, the unit was not deployed overseas.

In August 1990, the 68th (then a company in the 1st Cavalry Division) was deployed to Saudi Arabia.

The mission of the 1st: Deter Iraqi incursion into Saudi Arabia. With a history of chemical weapon use, the threat of an enemy chemical attack was high as the division engaged in deceptive maneuvers—designed to resemble a main invasion route—along the Iraqi border. The 68th played a major role in protecting the division from a chemical attack.

In January 2003, the 68th Chemical Company deployed to the Middle East. Elements of the company were attached to the 3d Infantry Division and served among the first units to cross the Iraqi border. On 2 April, the 68th executed the longest concealment operation in a combat zone since 1942 as two battalions entered Baghdad. In subsequent maneuvers, the 68th was among the units to seize Baghdad International Airport—a hotly contested objective subject to heavy fire and mortar attacks.

Throughout history, the 68th continued its heritage of completing missions without fail. ●●●

### References:

- Museum of the 1st Cavalry Division, <[http://www.first-team.us/journals/div\\_artty/68\\_ndx01.html](http://www.first-team.us/journals/div_artty/68_ndx01.html)>, accessed on 25 January 2007.
- Lineage and honors information, <<http://www.army.mil/cmhl/lineage/branches/chem/068cmco.htm>>, accessed on 25 January 2007.
- Major Charles E. Heller, “Chemical Warfare in World War I: The American Experience, 1917–1918,” Combat Studies Institute, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, September 1984.

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Compiled by Second Lieutenant Russell Milazzo.

Archive information for Chemical units is maintained at the U.S. Army Chemical School History Office. Veterans are encouraged to send oral interviews, photographs, and documents to help us preserve the rich history of the Corps. For additional information or to submit information, contact the History Office by telephone at (573) 563-7339; by e-mail at <[david.chuber@us.army.mil](mailto:david.chuber@us.army.mil)>; or by mail at 401 MANSCEN Loop, Suite 44, Fort Leonard Wood, Missouri 65473-8926.

# V Corps Conducts CBRNE Conference at Camp Victory, Baghdad

By Staff Sergeant Cristian A. Diaz

On 17 October 2006, the Chemical section of Multinational Corps–Iraq (MNC-I) (V Corps) hosted a chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) conference at MNC-I headquarters in Al Faw Palace, Camp Victory, Baghdad. The purpose of the conference was to exchange mission and capability information, discuss lessons learned, and receive updates from warfighter support organizations. More than 40 individuals attended the event, including representatives from major support commands in Iraq, the U.S. Central Command, and the Coalition Forces Component Command.



**Chemical Soldiers participate in the CBRNE conference at MNC-I headquarters in Al Faw Palace, Camp Victory, Baghdad.**

“It is very important that deployed [chemical, biological, radiological, and nuclear] CBRN warfighters are resynchronized from time to time,” stated Lieutenant Colonel Bill Hibner, MNC-I Chemical Officer and host of the conference. “We need to be as proactive as possible in dealing with changing CBRN threats in theater.”

Two individuals were recognized during the conference: Master Sergeant Bronte Stewart and Mr. Dwayne James. Master Sergeant Stewart, sergeant major for the Inspector General, MNC-I, was inducted into the Order of the Dragon (Honorary Order of the Dragon) for his outstanding career service to the Chemical Corps. The Chemical Corps Regimental Association awards the Order of the Dragon to individuals who have served the Corps with distinction. Mr. James, an employee of AMIC Group, Incorporated, received a certificate of appreciation for providing outstanding toxic industrial chemical protection and detection equipment support during Operation Iraqi Freedom, 1–31 October 2006. 🇺🇸 🇮🇶

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*SSG Diaz is assigned to Headquarters, V Corps, Heidelberg, Germany. He previously served as the operations/CBRN warning and reporting noncommissioned officer during Operation Iraqi Freedom where he received the Bronze Star for standing up Joint Warning and Reporting Network (JWARN) software and providing support to all major support commands on JWARN and hazard prediction and assessment capability.*

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## Address Corrections Requested

If your military unit has experienced difficulties receiving *Army Chemical Review*, please send us your correct, complete mailing address. We frequently receive returns when no street address is listed for the organization, so **please include a street address for your office**. E-mail <acr@wood.army.mil> with “Address Correction” in the subject line.

Address changes for personal subscriptions should be sent to Superintendent of Documents, ATTN: Mail List Branch, Mail Stop: SSOM, Washington, D.C. 20402.



# DARPA Operational Immune Building Opens

*Compiled by Ms. Kimberly Whitacre*

A ribbon-cutting ceremony for the first operational immune building (IB) was conducted on 11 October 2006 at Fort Leonard Wood, Missouri. The new IB is equipped with sensor and filtration systems designed to protect building occupants from the full spectrum of chemical and biological agents. The IB, installed in Nord Hall, is the first demonstration of an integrated protection system in an occupied building under real-world operating conditions. The completion of the Defense Advanced Research Projects Agency (DARPA)-led IB effort represents a major milestone in building protection and decontamination efforts.

The DARPA IB Program is a research effort to develop, integrate, and demonstrate building protection systems against chemical and biological warfare agent attacks. The program is spearheading advancement in building protection research and design.

Plans are ongoing for Fort Leonard Wood to maintain ownership of the IB and conduct follow-on testing, operations, and maintenance. The U.S. Army Chemical School is considering the possibility of using the system as a test platform for future technology development and training.

The implementation of future IB systems will make military buildings (such as barracks, offices, and command and control centers) less desirable targets for terrorist attacks. 🚫

## Desired IB Objectives

- **Protect human occupants by minimizing the spread of aerosolized agents.**
- **Rapidly decontaminate and restore buildings to function.**
- **Preserve forensic evidence.**



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## Submitting an Article to *Army Chemical Review*



Articles may range from 2,000 to 4,000 words. Send a paper copy along with an electronic copy in Microsoft Word on a 3½-inch or compact disk to *Army Chemical Review*, 464 MANSCEEN Loop, Suite 2661, Fort Leonard Wood, Missouri 65473-8926 or e-mail <acr@wood.army.mil> with “Submit an Article” in the subject line.

Contributors are encouraged to include black-and-white or color photographs, artwork, and/or line diagrams that illustrate information in the article. Include captions for any photographs submitted. If possible, include photographs of Soldiers performing their missions. Hard-copy photographs are preferred, but we will accept digital images in TIF or JPG format originally saved at a resolution no lower than 200 dpi. Please do not include the images in the text. If you use PowerPoint, save each illustration as a separate file and avoid excessive use of color and shading in graphics and slides. Please do not send photographs embedded in PowerPoint or Microsoft Word documents.

Articles should come from contributors with firsthand experience of the subject being presented. Articles should be concise, straightforward, and in the active voice. Any article containing information or quotations not referenced in the text should carry appropriate endnotes.

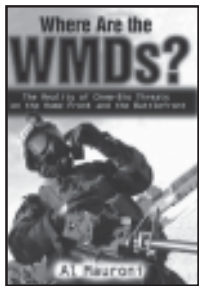
Include your full name, rank, current unit, and job title. Also include a list of your past assignments, experience, and education and your mailing address, fax number, and commercial daytime telephone number. **Include a statement from your local security office stating that the information contained in the article is unclassified, nonsensitive, and releasable to the public.**

All submissions are subject to editing.

# Book Reviews



By Mr. Reid Kirby



*Where are the WMDs? The Reality of Chem-Bio Threats on the Home Front and the Battlefield*, Albert J. Mauroni, Naval Institute Press, 13 June 2006.

During World War I, before the formation of the Chemical Warfare Service, our Nation was in disarray in its approach to chemical warfare. Dividing tasks among numerous offices, many without the complements necessary to execute their functions, proved ineffective. Reading Al Mauroni's book leaves one with the impression that we are in even more peril.

For the novice reader, the unfortunate part of this book is the use of "Pentagon-speak" terminology. Numerous acronyms are embroiled in the book, often accompanied by parenthetical acronyms. Nonetheless, for Chemical Soldiers looking at future assignments at the Pentagon, this is an inside look and an essential orientation tool.

The term *weapons of mass destruction* (WMD) has been around since World War II. It was a problematic term during the Cold War, with the Department of Defense at one point officially declaring it a misnomer not fit for use. Later, it was identified as a dangerous term that allied U.S. capabilities into a Soviet doctrinal framework. Mr. Mauroni's book is far more contemporary in its treatment of the term, noting the recent proclivity and how it is isolated to nuclear weapons by policy makers. Discussions on WMD lead to natural debates regarding CBRN threats from terrorists and military forces.

The subterfuge of the book is the preventative war in Iraq and the worst-kept secret in Washington on prewar intelligence. While many will dwell on this plot alone, the author returns the focus to chemical-biological security and the problems our Nation encounters. The book is replete with recent debacles on Decontaminant Solution 2 (DS-2), Sandia decontamination foam, and other issues.

This book is for Chemical Soldiers, demanding leadership regarding a national problem. Will the Chemical Corps return as the leader and provide the simplicity and unity in command that is needed against CBRN threats?



*Preventive Attack and Weapons of Mass Destruction: A Comparative Historical Analysis*, Lyle J. Goldstein, Stanford University Press, 2005.

One of the most controversial aspects in the national security strategy of the Bush administration has been the concept of preemptive war. Lyle Goldstein examines this concept using examples from the Cold War era. He correctly clarifies the concept of preemptive war as preventive war, with a perfunctory caveat that timing is the main distinguishing feature.

This book is a scholarly study that many may find difficult to read. Numerous examples of crises during the Cold War are revealed, showing several instances when war was narrowly averted. The discussion and examples on the true nature of the Cold War and the likelihood of a nuclear conflict are interesting and thought-provoking.

Mr. Goldstein examines the policy options considered when China, Iraq, and the former Soviet Union attained nuclear weapons. The recurrent theme demonstrates that planning preventive attacks is commonplace, but execution of those attacks is almost nonexistent. In the United States, preventive war plans failed to reach maturity due to conflicts with American values, the marginal payoff potential, or other deterring factors.

Unlike Ingrid Detter's *The Law of War* and Michael Walzer's *Just and Unjust Wars*, Goldstein more or less ignores the legal and ethical arguments against preventive war. While he seems to favor the policy of the Bush administration, his study is intellectually honest and reveals some surprising results. While the moment immediately surrounding a nation's acquisition of nuclear weapons is tense and unstable, there is evidence that supports the notion that counterbalancing nuclear arsenals is stabilizing.

The term *weapons of mass destruction* is almost exclusively used to describe nuclear weapons. It is unclear if the lessons in "Preventive Attack and Weapons of Mass Destruction" are transferable or even applicable to chemical and biological weapon proliferation.

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*Mr. Kirby is a project manager for Strategic Staffing Solutions (S3). He holds a bachelor's degree in valuation science from Lindenwood College, with a minor in biology and special studies in behavioral toxicology and biotechnology.*



Chemical Corps Regimental Association

## 2007 Nominations for the Hall of Fame and Distinguished Member of the Corps Honors



Nominations are being accepted for the Chemical Corps Regimental Association (CCRA) Hall of Fame and Distinguished Member of the Corps honors.

- ⚔ **Hall of Fame.** This award is extended to Chemical personnel (living or deceased) who have spent their professional careers serving the Chemical Corps. Their service to the Corps must be extraordinary.
- ⚔ **Distinguished Member of the Corps.** This award is extended to living members who served the Corps in their professional lives and continue to serve it in their personal lives. Active Army military and current federal civilian personnel are not eligible for the program. The nominations are

limited to personnel who have been retired for at least two years.

For nomination criteria and submission requirements see <<http://www.chemical-corps.org/honors>>. Nomination packets should be sent to:

Commandant  
U.S. Army Chemical School  
Regimental Historian  
ATTN: ATSN-CM-CS-H  
Fort Leonard Wood, MO 65473-8926

All packets must arrive by 1 May 2007. The selections will be announced by 15 June 2007. For more information, call (573) 563-7339 or e-mail [chuberd@wood.army.mil](mailto:chuberd@wood.army.mil) or [lindbergc@wood.army.mil](mailto:lindbergc@wood.army.mil).





# The Chemical Corps Vision



## Capability

A professional U.S. Army Chemical Corps, expertly manned, equipped, and trained...

preparing all U.S. Army organizations at all echelons through technical expertise...

at the peak of readiness to perform immediately when called upon.

## Effect

Proactively execute our role in combating weapons of mass destruction (WMD)...

where chemical, biological, radiological, and nuclear (CBRN) are inclusive of traditional weapons and toxic industrial materials...

and contribute to the protection warfighting function as it applies to people, equipment, and information.

*A Corps and  
Army capable now of  
countering the entire range of  
CBRN threats and effects to protect  
our Nation, operating seamlessly with  
military and civilian partners, while  
conducting simultaneous operations  
from civil support  
to war.*

## Partnership

Develop an understanding of the key and enabling experts...

and an ability to collaborate effectively with them...

to include joint, interagency, intergovernmental, and multinational (JIIM)...

and civil authorities, either domestically or within host nations abroad.

## Operational Environment

Execute simultaneous full-spectrum operations (offense, defense, and stability or civil support)...

within the homeland and in an operational theater...

across the spectrum of conflict, from permissive to hostile environments.



