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ARMY CHEMICAL REVIEW

PB 3-95-2 July 1995

Identifying BW agents on the battlefield...page 21.

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CML, Army Chemical Review is prepared twice a year by the US Army Chemical School, Fort McClellan, Alabama. *CML* presents professional information about the Chemical Corps functions related to nuclear, biological, chemical, smoke, flame field expedients, and NBC reconnaissance in combat support. Objectives of CML are to inform, motivate, increase knowledge, improve performance, and provide a forum for the exchange of ideas. This publication presents professional information, but the views expressed herein are those of the authors, not the Department of Defense or its elements. The content does not necessarily reflect the official US Army position and does not change or supersede any information in other US Army publications. Use of news items constitutes neither affirmation of their accuracy nor product endorsement. CML reserves the right to edit material.

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SUBSCRIPTIONS: Available through the Superintendent of Documents, US Government Printing Office, Washington, DC 20402-9317, telephone (202) 512-1800.

Third class postage for CML paid at Anniston, Alabama, and additional mailing offices.

POSTMASTER: Send address changes to CML, US Army Chemical School, Fort McClellan, AL 36205-5020.

By Order of the Secretary of the Army:

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CML
ARMY CHEMICAL REVIEW

PB 3-95-2 **July 1995**

Articles

Departments

Cover photo of BIDS by Mike Barnette, CBDCOM.

Chief of Chemical

Greetings to all Dragon Soldiers! These continue to be exciting times for the Chemical Corps. Although we are transitioning through a period characterized by declining resources and fueled by uncertainty, we must keep focused on those things most important.

By the time you read this article, the base realignment and closure (BRAC) decision will have been forwarded to the President for approval, and as I write these words I can only speculate as to what that decision will be. No matter what the final decision, our focus must remain on making America's forces "Chemical Trained and Ready."

Notice, I replaced "Army" with "forces" in that last sentence. We have now stood up the Joint Services Integration Group (JSIG) here at the U.S. Army Chemical School. Based on this charter, the Army, Navy, Air Force, and Marine Corps have jointly submitted an integrated NBC priority list for future program management and resourcing. We have also embarked on a major joint initiative supporting a national NBC counter-proliferation program. This effort involves writing Joint NBC Doctrine and developing joint NBC simulation models to strengthen our abilities to operate under NBC conditions with minimal degradation. We are becoming truly joint.

Among the numerous changes which daily impact our operation, this summer we will see a rotation in leadership of my two largest directorates. I want to publicly express my deepest appreciation for the efforts of COL Chuck Kelly, who leaves the Directorate of Combat Developments (DCD) for a second career as a civilian, and COL Bob Coughlin, who leaves the Directorate of Training (DOT) for a brigade-level command position. Both have served this School and our Corps with great honor and distinction. We wish them both well in the future.

I am pleased to welcome their very capable replacements, both fresh from the U.S. Army War College. COL Rick Jackson is the new DCD and COL Rick Weiner is the DOT. I have also selected COL Dave Harrison, III Corps Chemical Officer, to be the next USACMLS Assistant Commandant. Dave will report later in the year. All are superb soldiers and leaders who will help push the Corps into the next century.

The development and verification of how the Chemical Corps will evolve and support Force XXI is at the heart of our development efforts. We are working a new Combined Arms Training Strategy (CATS), which will form the basis of the Standard Army Training System, or at least that piece of it which addresses operating under the NBC condition.

Our new architecture starts with the strategic national level of tasks and works through the strategic theater, operational, and tactical levels down to the Soldier's Manual of Common Tasks, Skill Level 1. We are looking at innovative ways of moving from doctrine, tactics, techniques, and procedures into training programs featuring virtual, live, and constructive simulations with minimal delay...true state-of-the-art.

CML, Army Chemical Review continues to be a key forum for you to share your thoughts with the community. I solicit your articles, discussions, and ideas for presentation herein; and the concurrent challenge of providing responses/reactions to the articles that do appear. I am considering five thrusts for the Chemical Corps of the 21st Century.

- Deterring NBC Warfare.
- Preserving the Force.
- Supporting Force Protection.
- Executing Military Operations Other Than War Responsibilities.
- Ruling the Battle by Means of the Elements.

The last represents to me the intellectual cornerstone of our Corps. By this I mean the technical and tactical competencies necessary to provide overwatch of worldwide events and provide the infrastructure and units needed to support our national interests. These thrusts are interrelated and mutually supporting.

I look forward to reading your proposals and thoughts on how we shall take our Corps forward. Remember, the focus is to make our forces "Chemical Trained and Ready"...into the 21st century.

One of a Kind

—US Army's Technical Escort Unit

By LTC(P) Kertis D. Peterson and CPT Edwin T. Cotton, Jr.

A call comes in to the battalion staff duty NCO at 0145 hours from the Army Operations Center. It is a request to dispatch a sampling and analysis team to an OCONUS theater to verify use of an NBC weapon by a hostile nation. The staff duty NCO notifies the S3 who briefs the battalion commander and notifies the detachment commander who will lead the team. All agree to meet at 0600 that morning to plan the concept of the operation.

So begins another day in the US Army Technical Escort Unit (TEU), the most diverse, least known about, most decorated, and longest continuously active chemical battalion in the Army. The unit is located at Edgewood Area, Aberdeen Proving Ground, Maryland, under the US Army Chemical and Biological Defense Command. It is the only rapid deployment unit in the US Army Materiel Command, as some of TEU's missions require deployment within hours of notification.

Organization

The battalion consists of a mix of chemical and explosive ordnance disposal (EOD) soldiers and Department of the Army civilians. It is configured as a battalion with a coordinating staff, headquarters and headquarters company, and five detachments.

Three of the detachments and the HHC are collocated with the battalion at Edgewood, and the other two are located at Pine Bluff Arsenal, Arkansas, and Dugway Proving Ground, Utah. On 1 January 1995, the three Edgewood detachments were reorganized into one all military detachment and two predominantly civilian detachments with military command groups.

A TEU soldier (circa 1940s) opens the filling plug on a German mustard bomb to drain the agent into one-ton containers.

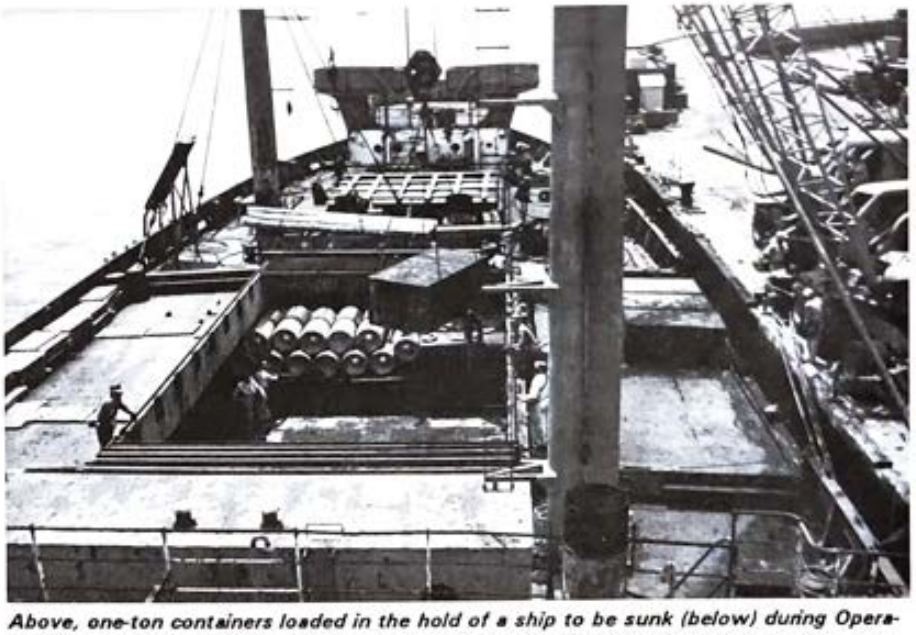
Missions

The battalion's missions clearly convey the uniqueness of this unit. It has five major missions it must remain prepared to execute at all times, in peacetime and wartime conditions. First, we conduct technical escorts of weaponized and non-weaponized chemical and biological materials all over the world. This has been the "bread and butter" of TEU's missions since its activation in 1943 and is where the unit gets its name.

For this reason, all personnel involved in this mission are required to participate in the Personnel Reliability Program. Movements of any type of military chemical or biological materials can be accomplished only by TEU personnel.

Another mission involves providing no-notice, worldwide capability in

CPT Dean Dickey (late 1950s), who later commanded TEU, sits atop a 500-pound bomb at Old O Field at Edgewood.

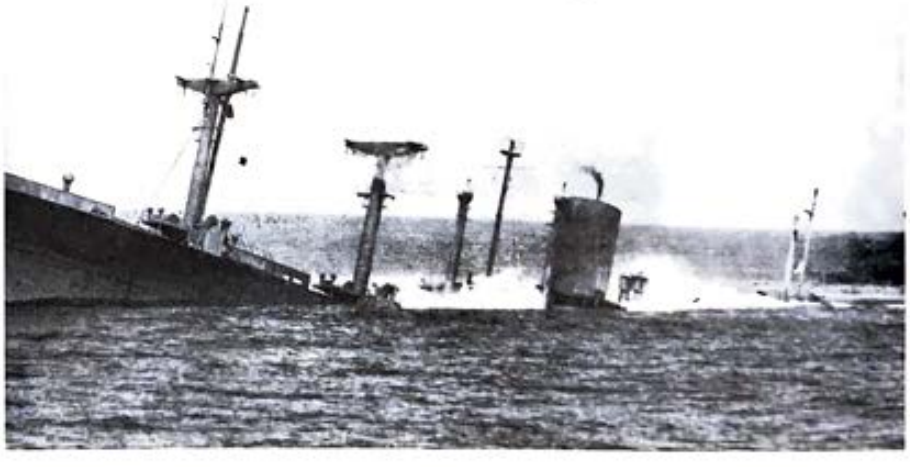


Above, one-ton containers loaded in the hold of a ship to be sunk (below) during Operation CHASE.

identification, sampling, monitoring, verification, neutralization, disposal, and exploitation of weaponized/non-weaponized chemical and biological materials. We use state-of-the-art technologies to accomplish much of this.

Examples include radiographic technology (x-rays and neutron spectroscopy), mass spectrometry, and gas chromatography. Some of these technologies allow us to identify agents within containers without opening them. Others allow the detection of chemical agents far below incapacitating levels.

A third mission is providing chemical and biological response support to Department of Defense and other Federal agencies to support national and international counterterrorism and counterproliferation. This is our "high speed" mission requiring close working relationships with the State Department, Special Operations Forces, the Federal Bureau of Investigation, and so forth. The TEU provides the Army's Chemical and Biological Response Team supporting these agencies. The all military detachment and HHC have the lead in this mission.



Our fourth mission involves supporting the US Army Corps of Engineers in conducting site remediation of Formerly Used Defense Sites, Installation Restoration, and Base Realignment and Closure actions. The two civilian detachments at Edgewood serve as the core of this mission. An interesting point to this mission is that we get paid for doing it. The civilians involved with the Formerly Used Defense Sites mission are reimbursable, which requires us to give customers (for example, the Corps of Engineers) a cost estimate prior to beginning work so we can continue to pay wages. This mission also requires extensive training for TEU personnel because we must conduct these operations within Federal guidelines, such as the Resource Conservation and Recovery Act and the Occupational Safety and Health Act.

Our final mission requires us to be prepared to respond to emergencies all over the world involving chemical and

Above and below, LTC Templeton, TEU Commander, and Chicago's Mayor Daly survey the leaking storage tank situation (April 1974).

toxic material events, such as a large-scale chemical agent spill. Fortunately, we haven't had to perform this mission very often over the years.

Origin, 1940s, 1950s

TEU was established 20 January 1943 as the Guard and Security Division of the Chemical Warfare Service with the mission of safely and securely moving toxic chemical munitions to and from theater during World War II. Originally located at Camp Sibert, Alabama, the unit moved to Edgewood Arsenal, Maryland, in February 1944.

During the war, TEU performed over 1,000 missions escorting over 850,000 tons of chemical munitions. After the war, the unit inherited the mission of demilitarization, decontamination, and disposal of thousands of tons of unused and captured chemical agents and munitions.

Since no procedures existed for disposing of chemical agents and materials, TEU had to develop them as well as first aid procedures and equipment. Although TEU's primary mission continued to be disposal of obsolete stockpiled chemical munitions, it also earned notoriety while serving both government and private organizations in handling emergency decontamination and disposal tasks. Finally, after three names changes, the unit officially became the Technical Escort Unit on 7 August 1957.

1960s

From the late 1950s through the 1960s, TEU escorted many large movements of chemical munitions and many smaller movements of biological agents, radiological wastes, and aerial mines. The unit provided other related services as well, such as pick-up, decontamination, and destruction of hazardous materials and explosives.

It also provided emergency response to hazardous materials accidents in the public domain. The TEU received letters of commendation for its role in removing chlorine cylinders from the Mississippi River in 1962 and for "overtime" work in support of the Cuban missile crisis that same year.

1970s

The 1970s brought about many changes to TEU. The most profound effects were caused by the passage of Public Laws 91-121 and 91-441 (in

LT Marty Weber briefs the media on items recovered during Operation Safe Removal.

1969) which severely curtailed the number of major toxic chemical movements. Even with these new regulations, TEU distinguished itself in six large-scale moves supporting the Army's efforts in consolidating chemical munitions and materials.

Particularly noteworthy among these were *Project CHASE* and *Operation Red Hat*. *Project CHASE* actually began in the late 1960s and consisted of several iterations of disposing of chemical munitions and containers from across the country. Large amounts of VX-filled M55 rockets, chemical-filled one ton containers, and other items were loaded on decommissioned ships, towed to a designated location in the Atlantic Ocean, and sunk. *Operation Red Hat* involved the movement of 13,000 short tons of chemical munitions from Okinawa to Johnston Island in the Pacific Ocean in 1971.

In addition to these movements, TEU was involved in other significant events, as well. In August 1972, the unit responded to Johnston Island to conduct safety and security surveys after a hurricane swept over the atoll. The surveys were completed in four hours, allowing support personnel to land on the island and make it operational. In April 1974, the unit responded to an industrial accident in Chicago, Illinois, in which a chemical storage tank leaked a large amount of silicon tetrachloride.

1980s

The TEU performed two other large-scale chemical agent moves during the 1980s. Most noteworthy was the movement of 888 "Weteye" GB bombs from Rocky Mountain Arsenal, Colorado, to Tooele Army Depot, Utah. The remainder of the 1980s found TEU involved in numerous projects of lesser magnitude and escorts of smaller quantities of chemical agents, and so forth.

1990s

This decade already contains some of TEU's most significant accomplishments in its history. In 1990 the unit distinguished itself during *Operation Steel Box* (also known as *Retrograde)* —the removal of all US chemical munitions from Europe to Johnston Island. This was TEU's last large movement of chemical munitions to date. It also required intense coordination between the Army, Navy, and Air Force, as well as the United States and Germany.

The other highlight of this decade was *Operation Safe Removal*, the removal of 144 World War I chemical munitions from an affluent Washington, DC suburb. This was the Army's first Service Response Force operation and was executed flawlessly largely due to the soldiers and civilians of TEU.

After all these years and often under extremely hazardous working conditions, TEU's safety record remains impeccable. The unit proudly boasts two Department of the Army Meritorious Unit Citations and three Army Superior Unit Awards. Through all the changes in missions and organization, one constant remains: the dedication, professionalism, and pride of TEU's personnel. As long as hazards associated with chemical and biological agents and munitions are present in our world, the US Army Technical Escort Unit will remain prepared to execute its missions safety and securely.

LTC(P) Kertis D. Peterson commanded the US Army Technical Escort Unit from 26 July 1993 to the present. His previous assignments include Division Chemical Officer, 25th Infantry Division (Light); Executive Officer of Johnston Island; Department Head of the Equipment Management Department at the Explosive Ordnance Disposal Technology Center; DIVARTY chemical officer, and battery commander. LTC(P) Peterson spent the first five years of his career in the US Army Technical Escort Unit serving as a detachment commander, platoon leader, and chemical operations officer.

CPT Edwin T. Cotton, Jr. commanded the Headquarters and Headquarters Company of the US Army Technical Escort Unit from 17 November 1993 to the present. His previous assignments include Material Officer, US Army Technical Escort Unit; company commander, training products officer, executive officer, platoon leader, and battalion chemical officer.

The 95th demonstrates mobile smoke for the French.

NBC News from *Atlantic Resolve*

By COL Lawrence S. Sagan

During *Atlantic Resolve*, 251 smoke generator missions were run on the Corps Battle Simulation (CBS) system. The exercise conducted in October 1994 was the first large-scale computer-assisted replacement for Return of Forces to Germany, or REFORGER.

The significant achievement of completing 251 smoke missions was the direct result of the hard work of the members of an all-component combined force. Active Reserve, National Guard, French, German, American, British, Dutch, Army, Air Force, Navy, and Marines all contributed to the success of the exercise. Many of the NBC lessons learned, including multinational MOPP levels, are of practical use in future V Corps multinational operations.

The forces in *Atlantic Resolve* were commanded by the Multinational Joint Force Commander LTG Jerry R. Rutherford. V Corps, commanded by MG Walter H. Yates, Jr., included the 3d (US) Infantry Division, 7th (FR) Armored Division, 5th (GE) Armored Division, and Separate UK and Dutch Brigades.

In the European theater, it has been a challenge to persuade commanders to use smoke in computer-assisted exercises. Previous versions of the CBS computer program did not actually attenuate combat results. Thanks to the US Army Chemical School's efforts, CBS version 1.5 used in *Atlantic Resolve* did attenuate target acquisition systems and proved useful to commanders.

The 32 personnel from the 415th Chemical Brigade (Reserve) and the 4 personnel from the 404th Chemical Brigade (National Guard) were the heart of the *Atlantic Resolve* smoke success story. The 415th Brigade with two battalions and nine companies, under the direction of Major William Humphries, played all the logistical and operational aspects of the exercise and provided the critical smoke liaison officers to the maneuver units.

CPT Harmit Randhawa, LNO to the French; 1LT Alex Acupan, LNO to the Germans; SFC Essie Dowdy, LNO to 3ID; and CPT Richard Garza, LNO to the V Corps Rear were directly responsible for selling smoke. The result of their work is see in Figure 1, page 10.

At the end of the exercise, each LNO submitted comments on the

unit's or commander's perceived value of the use of smoke for their respective units. A sampling of their comments:

CPT Randhawa: "During the move toward Cassis, the 11th Chemical Company provided a smoke screen for the western move. The enemy did not see the French movement. This mission proved to be the best example for smoke as a combat multiplier. The French staff understood that smoke was an extra tool for the commander and found it even better when combined with artillery smoke. The French staff was very responsive and [receptive] to smoke."

1LT Acupan: "I was very pleased to receive thanks from the 14th Armor Brigade (GE) when I employed smoke on their position during an artillery attack. They were receiving heavy casualties until the smoke covered their position. I believe this was when [the 14th Armor] Brigade formally bought into using smoke. After that I was brought into several briefings asking for information on how best to employ smoke during their push north."

MAJ Blazek, Deputy Division Chemical Officer, 3ID/SFC Dowdy: "3ID employed two smoke companies in support of a screening mission for 3-4 CAV. The enemy was deceived as to the unit's composition. The 3-4 CAV commander and the S3 were extremely happy with the operation and fully intend to use smoke in the future."

CPT Garza: "The emphasis during the first day of smoke operations was protecting the patriot batteries from Imaging Satellite overflights. By denying the enemy from targeting key ADA assets, the survivability of those assets increased. No patriot batteries were hit during initial attacks."

While the computer play was extremely realistic, the multi-national gathering was fortunate to have the 95th Chemical Company operating in the area. The 95th, stationed in Vilseck, was performing decontamination training operations with V Corps' 22d Signal Brigade in Grafenwoehr. On short notice, two platoons of the 95th agreed to provide a smoke demonstration for the French staff, including their two NBC officers, CPTs Niess and Deviluer.

Above, the start of a mobile smoke mission at a river crossing site. Right, after several minutes, the cross is obscured.

Two platoon leaders of the 95th, 1LT Duarte and 2LT Milling, led their platoons in a field demonstration. The French NBC officers were very impressed and went on to help plan smoke in the computer exercise. The V Corps PAO staff covered the event in "The Atlantian," a field publication in support of *Atlantic Resolve 94*. In an article and photo by Sgt Andrew Aquino, he stated that during the

MOPP Level	United States*	French	German	Dutch	UK
0	Mask/hood carried, overgarment, gloves, and overboots available	Mask carried, overboots, overgarment, and gloves readily available	Mask/hood carried, overgarment, gloves, and boots readily available.	Mask and NBC cap carried, overgarments, overboots, and gloves readily available.	No NBC IPE worn.
1	Overgarment worn, mask and gloves carried, vinyl boots availble.	Overgarments, overboots, and gloves worn; mask carried.	Overgarments, overboots, and gloves worn; mask/hood carried.	Overgarment worn, mask and NBC cap carried, gloves and overboots readily available.	NBC suit worn with hood down.
2	Overgarment and overboots worn; mask and gloves carried.	A: All worn with hood not covering head. B: All worn with hood covering head.	Overgarment, mask/hood, gloves, and overboots worn.	Overgarment, NBC cap, overboots and gloves worn; hood covering head; mask carried.	NBC suit worn with hood down, overboots worn.
3	Overgarment, overboots, and mask/hood worn; gloves carried.			Overgarment, overboots, mask, and gloves worn; hood covering head; NBC cap carried.	NBC suit worn with hood up; overboots and gloves worn (inner and outer).
4	Overgarments, mask/hood, overboots and gloves worn.				Foxtrot: Wear facelet. Romeo: Wear respirator.

*FM 3-4 (1992)

demonstration "members of the French Army had their first experience riding in the smoke generator-equipped HMMWV."

Members of the 95th are not strangers to multi-national operations. The company has been active in military-to-military exchanges and training exercises with the Czech and Polish NBC organizations. Photos on page 9 show the benefit of mobile smoke that was conducted for the Polish visiting group.

Atlantic Resolve's multi-national character also brought home the differences in mission-oriented protective posture (MOPP) of each country playing in the exercise. As excellent NBC intelligence flowed into V Corps, the NBC section started to upgrade its NBC threat analysis and consider recommending an increase in MOPP posture to Level 1.

Active coordination was necessary to insure that the MOPP posture of each country was understood in order that the Corps commander's intent be understood by each national element. The table above is a summary of MOPP levels for each player element.

With the distribution of this chart to the command elements of V Corps, each national commander could order a national MOPP level that met the minimum requirements of the V Corps commander. Some commands chose to modify their national level to match the US designated level of protection while others implemented a level that equaled or bettered the designated MOPP Level 1.

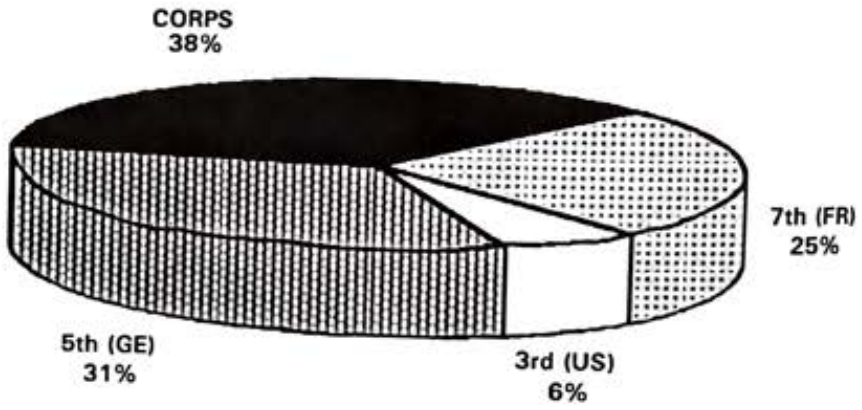


Figure 1. Percent of smoke generator missions conducted by V Corps units of the JTF.

Atlantic Resolve was an excellent opportunity to employ smoke in CBS. Out of 284 planned smoke generator missions, 251 were completed. The "can do" attitude of the outstanding liaison personnel of the Reserve Brigade was directly responsible for the accomplishment, and the lessons learned from coordination of national MOPP levels will significantly help all units in coordinating multinational operations in the future.

The author wishes to recognize the following for their assistance: LTC Art Bland, Deputy Corps Chemical Officer, for technical and computer expertise, and SPC A. M. Scott and E. V. Sagan for editorial support.

COL Lawrence S. Sagan is currently assigned as the V Corps Chemical Officer.

The Chemical Treaties
—What do they mean to you?

By COL(R) Gary Eifried

If you haven't already been involved some way in actions regarding the chemical treaties, you probably soon will be. As a chemical soldier, you will likely be called upon to provide some assistance, information, or training in support of the terms of chemical weapons treaties and agreements that the United States has signed or is expected to ratify in the near future.

The treaties have far-reaching impact on Army doctrine (use of chemical agents is prohibited, period), retaliatory capability (our chemical weapons stockpile must be destroyed), and military and civilian facilities (every one of which, at least in theory, can be inspected by an international team looking for treaty violations). Furthermore, the treaties lessen (but by no means eliminate) the potential for our forces to be exposed to toxic chemical agents, and provide new missions and opportunities for chemical soldiers.

What the Treaties Say

I am using the term "treaty" loosely, to cover three separate agreements which affect chemical weapons. (Strictly speaking, a treaty must be ratified by the Senate and signed by the President. Only the Chemical Weapons Convention will, therefore, be officially a treaty; the other two will remain agreements signed by the President or other official, without Senate ratification).

The first of these, generally known as the "Wyoming Memorandum of Understanding," or MOU, is an agreement between the US and the former Soviet Union to enter a "bilateral verification experiment and data exchange related to prohibition of chemical weapons."

It calls for an exchange of data on CW capabilities and stockpiles followed by a series of mutual visits and inspections on each other's territory. Actions under this treaty are all but completed. An initial data exchange and series of site visits were completed by mid-1991. Detailed data exchange and verification inspections were conducted in 1994-95. The results are now being reviewed. Many chemical soldiers at chemical munitions storage locations and chemical personnel assigned to the On-Site Inspection Agency (OSIA) or MACOM staffs have participated in these activities already.

The second accord, also between the US and the former Soviet Union is usually called the "Bilateral Destruction Agreement." It addresses cooperation regarding the development of CW destruction technologies, agreement not to produce chemical weapons, and calls for destruction of existing chemical weapons. As with the MOU, this agreement has provisions for the conduct of inspections on each other's territory to confirm compliance. Although discussions have taken place, details of the implementation of this document are still being negotiated.

Both of the above agreements have a stated purpose to foster the implementation of the third treaty, the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, generally called the "Chemical Weapons Convention" or "CWC."

The CWC is a multilateral treaty (27 nations have ratified it as of 10 April 1995) which will enter into force six months after the 65th nation ratifies it. Over 150 nations, including the US and Russia, have signed the convention, indicating their intent to ratify. When it goes into effect, the CWC will be the most sweeping arms control agreement ever, with broad application across military and private sectors.

The CWC prohibits development of chemical weapons. It also prohibits the production of chemical agents, munitions and delivery systems—but allows the production of very limited quantities of agent for protective, medical, and other "peaceful purposes" (for example, for use in the Chemical School's Chemical Training Facility).

It prohibits the stockpiling of chemical weapons and requires the destruction of existing stockpiles. The

Scope of Provisions for Declaration and Inspection

	Stockpile		CW Production		Schedule 1 Allowed Production		Schedules 2, 3, and Other Chemicals Production		CW Destruction		CW Development Facilities	
	Decl Req	Type Insp	Decl Req	Type Insp	Decl Req	Type Insp	Decl Req	Type Insp	Decl Req	Type Insp	Decl Req	Type Insp
CWC *	Yes	On-site verification	Yes	On-site verification	Yes	On-site verification	Yes	On-site verification	Yes	On-site verification	Yes	Challenge
MOU Phase I	Yes	Visit	Yes	Visit	No	None	No	Visit	No	Visit	No	None
MOU Phase II**	Yes	On-site verification	Yes	On-site verification	No	None	No	None	No	None	Yes	Challenge
BDA***	Yes	On-site verification	Yes	On-site verification	No	None	No	None	Yes	On-site verification	No	None

* Challenge inspection may be requested and conducted at any declared or undeclared facility.
** Two challenge inspections may be conducted at any facility declared under Phase II declarations and one trial challenge inspection at a production facility.
*** Challenge inspections are still to be determined.

CWC, like the Wyoming MOU and the Bilateral Destruction Agreement, requires declaration of CW production plants, stockpiles, and destruction facilities. It also provides a strong verification regime through the use of on-site inspections by international teams.

These inspections will focus on sites previously or currently engaged in activities covered by the CWC and declared as such. For example, each of the nine US chemical stockpile sites will be declared and inspected. Likewise, each former chemical agent production facility (for example, Rocky Mountain Arsenal, Pine Bluff Arsenal, Newport Army Ammunition Plant, and others) also will be declared and inspected.

Besides these fairly obvious facilities, the CWC also allows inspection of commercial plants. Inspectable commercial facilities are those which produce (or have produced in the recent past) any of the chemicals singled out either for their toxicity (the classical chemical agents and toxins) or because they are key ingredients in the production of chemical agents, or because they have been used in war in the past (for example, hydrogen cyanide and phosgene).

Each of the declared government or commercial facilities can be inspected under routine procedures that the "Verification Annex" to the CWC outlines. These procedures comprise the "trust but verify" approach to assuring that those who sign up for the treaty are indeed following it.

The implementing details for submitting declarations and conducting verification inspections are currently being worked out by a Preparatory Commission (PrepCom) in The Hague, The Netherlands. Chemical personnel assigned to the Office of the Joint Chiefs of Staff, OSIA, the Defense Nuclear Agency, and the Chemical and Biological Defense Command (CBDCOM) are currently involved in or supporting the implementing negotiations at the PrepCom.

The real teeth of the verification provisions of the CWC, however, are contained in the articles that relate to suspected noncompliance or possible use of CW. In these situations, the treaty calls for the conduct of very short notice inspections under procedures called "Challenge Inspection" and "Investigation of Alleged Use" respectively.

In these cases, the international treaty organization can order a team of inspectors to investigate a suspicious facility or event in any country that has ratified the CWC. (This provision also makes every DOD installation subject to a potential challenge inspection.) If a country is found to be in noncompliance or inhibits the investigation, the full force of international law can be applied, and the matter reported to the United Nations Security Council for further action.

The table above summarizes the key provisions of the treaties.

The Key Players

Many government agencies have been involved in negotiating and preparing for implementation of the chemical treaties. The Arms Control and Disarmament Agency (ACDA) exercises overall responsibility and has coordinated actions and policies within the Federal government. Chemical personnel within the Office of the Secretary of Defense have been involved in the negotiation of each agreement and the CWC, and play a key role in developing policy guidance for the DOD.

The OSIA has responsibility to provide escorts and coordinate inspection team support for all inspections of DOD facilities and provide inspection teams for inspections in Russia under the Wyoming MOU and the Bilateral Destruction Agreement. The Defense Nuclear Agency has managed a Chemical Treaty Verification R&D program since 1990. DA appointed an Executive Agent for Chemical Treaty Compliance at CBDCOM, with responsibility to prepare Army installations, both those declared and those with no CW function, to host potential routine or challenge inspections.

CBDCOM has played a key role in the execution of the R&D program, supporting both verification and compliance aspects of the CW treaties. Other government agencies are also involved. The Department of Commerce is responsible for all reporting by industry, including DOD contractors. The Department of Energy is responsible for preparing its sites for the potential of challenge inspection.

Meaning to US Forces

The primary impact of these treaties is to decrease the chance that US forces will be attacked with chemical agents. The CWC in particular is designed to eliminate the proliferation of CW capability that we have seen increase so rapidly since the late 1970s. The verification and challenge provisions of the treaties will go a long way toward providing us confidence in the world's compliance, and will provide strong leverage against those we suspect are cheating.

However, we should not assume that the treaties mean that the threat of CW will no longer exist. No compliance and verification regime can be perfect; a determined country willing to risk detection and subsequent censure can develop a militarily significant CW capability in a very short time.

Therefore, the readiness of US forces to survive and operate effectively in a CW environment remains a critical need. In fact, NBC defense readiness is a key component supporting the non-proliferation goals of the treaty. How many nations will risk the international censure resulting when a covert CW program is detected if the advantage to be gained with CW is minimized against a prepared and ready force?

So, What Does This Mean to Me?

Good question. Actually, what it means to you depends a lot on where you are assigned, and the functions you need to accomplish as part of that assignment.

Chemical treaties have far-reaching impact on Army doctrine, retaliatory capability, and military and civilian facilities.

From the installation perspective, a treaty inspection will start with notification from the Army Operations Center (depending on the type of inspection and other factors, the site may receive less than 24 hours notice before an inspection team arrives). The OSIA and representatives of the Office of National Authority (ONA) will meet the inspection team at the Point of Entry, either Dulles Airport in Virginia or San Francisco Airport.

Following preliminary discussions and inspection of the team's equipment, the team will be transported to the inspection site. Depending on the type of inspection, additional negotiations may take place regarding areas to be inspected. At the site, there will be a three-hour period during which the site may provide orientation, security and safety briefings.

The inspectors will then begin their task, which may include visual observation, taking various measurements, conducting inventory, reviewing records, and interviewing site personnel. The inspection team can also request that photographs and samples be taken and provided. The team could have analytical equipment to perform chemical analysis of samples.

During the on-site inspection period (that may last as long as 84 hours for challenge inspections, longer for others) the team must be escorted, provided security, transported, fed, housed, and provided all other reasonable support. Once the team completes the inspection, they have 24 hours to prepare and present preliminary findings at a debriefing, and then must depart the site.

From this description of the short warning times and the types of activity that occur during an inspection, it is obvious that there is a great deal of planning and coordination that must take place well before an inspection team is on the doorstep.

The table on the next page summarizes the potential functions that you might need to accomplish in preparation for hosting or supporting a chemical treaty inspection.

Training

Training in the rights, duties, and obligations of inspection teams and inspected parties under the CW treaties is important for every chemical soldier. Because we are the commander's resource on all things chemical, we must be ready to advise our commanders on actions that need to be taken before, during, and after CW inspections. As a minimum, we need to all be familiar with the general scope of the treaties, and where we can turn for help (more on that later!).

Chemical personnel at sites that are declared activities, such as CW storage locations, demil facilities, and research sites such as CBDCOM and Dugway Proving Ground, need more in-depth knowledge, since these sites are high-priority inspection locations.

Personnel assigned to MACOM and higher staffs will also need to be well versed in the provisions of the treaty so that they may both advise their commanders and coordinate appropriate action within their commands.

Establish Policy/SOP

All facilities subject to inspection will need to establish local policies and

Summary of Potential Functions, Related to a Chemical Assignment

Assignment Functions	Declared facility	Non-declared facility	Unit Staff	Chem Unit	Chem School	MACOM	DA	DOD	OSIA	ACDA
Training	■	□	□	□	■	□	□	■	■	■
Establish policy/SOP	□	□		■	□	□	■	■	□	■
Prepare declaration	■				■	■	■	■		■
Prepare for inspection	■	□			■	□	□	■	■	■
Prepare contractors	■	□			■	■	■	■		■
Develop requirements	■	■			■	■	■	■	■	■
Coordinate	■	□			■	■	■	■	■	■
Program funds	■	□			■	■	■	■	■	■
Check readiness	■	■			■	■	■	■	■	■
Host inspection	■	□			■					
Assist inspected site	□		□	■	□	■	■	■	■	■
Provide escorts	■	□	□		■	□	□	□	■	■
Provide equipment	■	■	□	■	■	■			□	
Provide inspectors	□			■	■		□	□	■	■
Negotiate	□	□			□	□	□	□	□	■
Conduct studies	□	□			■	□	■	■	□	■

■ Essential activity/high potential

— Probable activity/moderate potential

SOPs concerning their obligations under the treaties, and the procedures that they will use to maintain compliance and provide support to inspection teams.

At higher headquarters, particularly DA and DOD, policy guidance has been formulated, and issues will continue to be addressed. Although the text of the treaties is voluminous (the CWC, for example, is 186 pages), there are many important details that require interpretation. In addition, policy guidance regarding treaty responsibilities across the services and relationships with other Federal departments continues to be developed and distributed.

Prepare Declarations

Installations that store or destroy CW material, or have been involved with CW production, must submit written declarations annually. Certain research facilities must do so also, as do commercial chemical plants that produce any of the chemicals named in the treaties. There is a declaration reporting system in being for the MOU and Bilateral Destruction Agreement, and the system for the submission of CWC declarations is being established. Generally, reporting is coordinated by treaty compliance offices that have been established at each level and reported through the normal chain of command.

DA and DOD are responsible for coordinating and compiling input for submissions to the Office of the National Authority, which will be established within the Arms Control and Disarmament Agency as the national focal point for all CWC actions.

Prepare for Inspection

Declared sites must be prepared for inspection any time. Since there will be very short notice, even for routine inspections (for example, the US National Authority may receive only 48 hours notice of a routine storage site inspection). This means that plans must be developed, kept updated, and exercised to ensure that all personnel know their responsibilities. OSIA and ACDA have sponsored many training exercises and mock inspections at various sites subject to inspection.

Because each DOD installation is potentially subject to a challenge inspection, installation commanders and staffs need to be familiar with the treaties and have contingency plans in being. With this in mind, the EA-CTC has published the Chemical Weapons Treaty Challenge Inspection Operations Plan for Army Installations, a generic OPLAN that provides guidance in a user-friendly, off-the-shelf format.

Prepare Contractors

In the execution of its mission, the DOD contracts with over 70,000 contractors. A few of these were involved in the production of chemicals or other materials designed for use specifically in chemical weapons. These contractors are to be declared and subject to inspection. Producers of certain chemicals, whether for DOD or not, are also subject to treaty provisions. Contracts and statements of work need to contain provisions related to CWC compliance. Because any question regarding a chemical producer's activities, or for that matter, any DOD contractor's activities, will ultimately reflect on the DOD, it is in our best interest to advise and assist the Department of

Commerce, which has responsibility over CWC implementation related to US industry, in their efforts to prepare US industry. This is especially necessary regarding contractors executing classified programs for DOD.

Develop Requirements

All activities involved in support of on-site inspections will need to develop the requirements necessary to provide that support. Inspectable sites will probably need additional equipment to adequately support the inspection team. For example, CW storage facilities have been issued mobile analytical vans to speed up the performance of first-entry monitoring during inspections. Requirements for transportation support need to be determined. Additional capability to fit and test individual protective equipment used by inspectors may be necessary.

Just as the Chemical School, through the Directorate for Combat Developments, determines operational requirements for equipment used in combat, a similar opportunity exists for determining functional requirements of special inspection equipment. It is in the national interest to support the international organization with the very best verification technology available. CBDCOM, with its technical history and expertise, is at the forefront of technology in this area.

Coordinate

The treaties are complex, which means that complying with them is also complex. There needs to be extensive coordination at all levels, particularly between installations (whether declared or not) and their higher headquarters. Coordination between and among government agencies and departments is also essential to ensure that the US presents "one face" to inspection teams. The ONA has a critical responsibility in that regard. Even at the unit level, responsibilities and actions in support of the installation need to be well planned and coordinated.

The treaties are complex, which means that complying with them is also complex.

Program Funds

Preparation of declarations, planning and preparing for inspections, the conduct of training inspections, and hosting actual inspections require resources. Naturally, declared sites will expend the greatest amount of effort and funds, but all installations and units will require some, depending on their probable degree of involvement. MACOMs and higher staffs need to program required funds and resources in annual budget submissions.

Check Readiness

Readiness for a treaty inspection has two goals. The first of these is to be able to demonstrate compliance with the terms of the treaties. The second is to prevent the loss of critical information *not* related to the treaty. The treaties are very specific on the protection of information, either military or civil, which is not necessary to decide treaty compliance. It is an absolute right of the inspected party to protect critical information. Shrouding of sensitive items, turning off computers, negotiating access to facilities, and similar measures are allowed and need to be planned and coordinated *before* the inspection team arrives.

Host Inspection

Those of you assigned to a declared site have likely already experienced an exercise or actual inspection. You understand the many activites that go into the support of an inspection team, which includes medical, security, housing, subsistence, transportation, and escort aspects in addition to facilitating the actual conduct of the inspection. During the inspection, every reasonable effort needs to be made to facilitate the activities of the inspection team, within the bounds and protocols outlined in the treaties. The installation commander and staff need to make sure that everyone understands that planning for and hosting of a chemical treaty inspection team is a priority effort.

Assist Inspected Site

Likewise, chemical personnel at all levels may be called upon to help an inspected site by providing inspection escorts, facilitators, or equipment. CW inspections are high-intensity, short-duration activities that require significant personnel resources to support. With drawdown and other resource constraints, there is a high probability that inspected sites will require help from other installations during an inspection.

Personnel at staff level are especially likely to be involved in the coordination of assistance to an inspected site.

Provide Escorts

Generally during an inspection, one US escort accompanies two inspectors, for security and safety reasons. The OSIA has the mission to provide escorts to these teams on government sites. However, because they are not intimately familiar with every potential installation that might be inspected, particularly under a challenge inspection, escort assistance from local personnel may be required. Even during routine inspections, site personnel will likely be involved in escort duties.

Provide Equipment

Just as inspection host sites may require some personnel support, they may also need to borrow equipment. Vehices, individual protective gear, analytical instruments, and special sampling equipment are among the items that might be needed. If you are at a location that has the items needed, you may become involved in equipment assembly, preparing the items for operation, and shipping them to the requesting site. You may also be involved in providing training, or sometimes providing equipment operators.

Provide Inspectors

The OSIA also has the mission to provide inspectors under the MOU and Bilateral Destruction Agreement for those inspections conducted in Russia. Depending on the number of inspections taking place or on the need for specific expertise, chemical personnel at high-density locations, such as the Chemical School, may be called upon to participate on inspection teams. Under the CWC, inspection teams consist of full-time inspectors employed by the international organization. However, special expertise may be required on a short-term basis on occasion.

Negotiate

Key individuals from the inspected facility will be included in negotiations led by a representative of the ONA during on-site inspections. One of the requirements of the CWC is that facility agreements are negotiated for each declared site soon after the treaty goes into effect. Many details will be discussed on site for finalization in The Hague (headquarters of the treaty organization). The facility agreement will address many aspects of the conduct of an inspection at that site, and will guide the conduct of all future inspections. In addition, numerous issues are expected to be raised during an on-site inspection. These generally will be resolved at the lowest level possible, through *ad hoc* negotiation between the ONA representative and the Inspection Team Chief.

Conduct Studies

A tremendous number of lessons have been learned since 1990 as the result of field inspection exercises, training, and preliminary inspections conducted under the Wyoming MOU. These lessons have been used by negotiators drafting the CWC. As the inspection procedures and implementing protocols are being finalized, there will be requirements to conduct optimization studies and analyses to determine the best way to accomplish the requirements at minimum cost. Following implementation of the CWC, the international organization will continue to require technical assistance in the conduct of its verification mission. The US is expected to provide continued technological support.

Points of Contact

Where do you turn for policy guidance or answers to your treaty qustions? There are a number of sourses (see reference 8). Your first stop should be at the Treaty Office at your installation, if one has been established. If not, try at your next higher headquarters for the individual assigned chemical treaty compliance responsibilities. Within the Army, the Executive Agent for Chemical Treaty Compliance (DSN 584-3915, Commercial (410) 671-5432) has the ultimate responsibility to coordinate all compliance activities, and will either help you or direct you to the best source.

References

1. Memorandum of Understanding between the Government of the United States of America and the Union of Soviet Socialist Republics Regarding a Bilateral Verification Experiment and Data Exchange Related to Prohibition of Chemical Weapons, September 23, 1989.

2. Agreement Between the United States of America and the Union of Soviet Socialist Republics on the Destruction and Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons, June 1, 1990.

3. Protocol on Implementation Measures Relating to the Agreement Between the United States of America and the Union of Soviet Socialist Republics on the Destruction and Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons, March 26, 1993.

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Force XXI Chemical Support
—fighting in the next century

By MAJ Valentin Novikov

With the 21st Century rapidly approaching, the Army has designated the 2d Armored Division as Force XXI to test the emerging doctrine of how to right in the next century. Consequently, it is necessary to examine the chemical force structure necessary to provide highly responsive support to the lethal Force XXI brigade combat team and division.

Airland Battle Doctrine

Under current airland battle doctrine, the division's chemical company normally is "retained for GS missions unless specific units require a higher degree of responsiveness."[1] If supported unit commanders require greater responsiveness, some of the platoons may be placed in a DS role to the supported unit "usually for a single operation or a short period" of time.[2]

This allows the chemical platoons to remain under the control of the parent chemical unit where they work most efficiently. "This organization permits close control and the most productive use of all chemical assets. The commander continuously monitors the progress of assigned tasks and shifts elements where the need is greatest throughout his area of operations."[3] Second, "the company is the lowest chemical echelon that can plan and execute continuous operations in support of tactical forces."[4]

Based upon the tactical situation, a division may be supported by a corps chemical battalion that is "task organized to support the commander's intent and in a command or support role appropriate for the mission."[5] Corps "chemical units normally are retained for GS missions."[6] This is predominantly due to the fact that "there are not enough chemical assets on the battlefield to handle all tasks."[7] As a result, chemical units are not spread evenly across the battlefield, but are "concentrated with the main effort to ensure its success."[8] "If the chemical battalion will support the division for a prolonged time, the division chemical company could be attached to the chemical battalion."[9] Lastly, if more than two chemical platoons are allocated to support a unit with no organic headquarters, the supporting chemical battalion should consider designating a chemical company headquarters to act as the company team headquarters...This provides increased command, control, and communications. Administration and logistical support is provided to the chemical platoons through the team headquarters."[10]

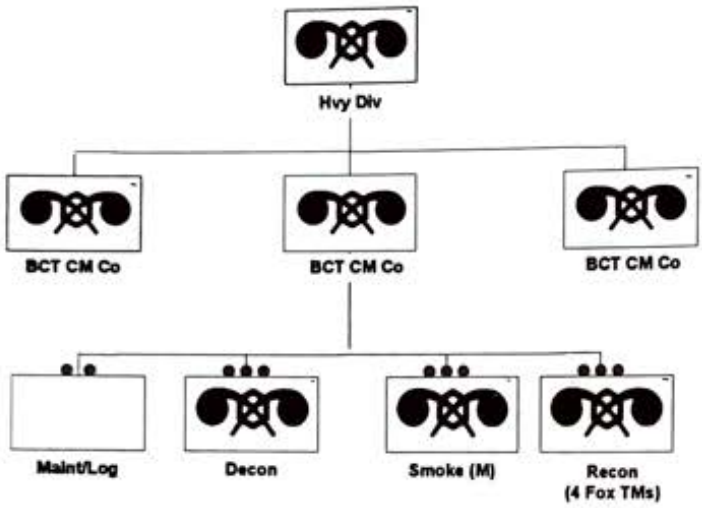
Heavy Division Chemical Company Employment

The heavy division chemical company had great difficulty supporting the division in a GS role which requires the company to retain C^2, and administrative and logistical support of its platoons. The company will task out its decon platoons and recon squads to support the BCTs for pre-planned or requested missions; the smoke platoon will usually support the BCT which is the division's main effort, The two major difficulties that the company has in supporting the division in the doctrinal GS role are the lack of responsiveness of support to the BCT and the lack of adequate C^2 and administrative and logistical support for the chemical assets.

If the chemical assets are not pre-positioned with the BCTs, they will have great difficulty moving across the battlefield in a timely manner to perform the requested missions. The optempo of the heavy division will make it difficult for the limited chemical assets, especially in the mechanized smoke platoon, to keep up with the maneuver forces if it is required to move laterally across BCTs to provide support.

Furthermore, if the platoons are pre-positioned and support the BCTs in a DS role to improve responsiveness, the heavy division chemical company will not be able to maintain adequate C^2 with all of the platoons due to the typical width and depth of the heavy division MBA which can range from 30 to 40 kilometers in width and

Heavy Division Chemical Battalion



depth. The company will not be able to adequately provide administrative and logistical support to its platoons due to the distances between the company headquarters and all the platoons which are dispersed throughout the division.

The chemical assets can be placed under the operational control of the BCT to ensure that the BCT receives responsive support. This type of command relationship, however, still requires the chemical company to provide logistical support to and maintain communications with its subordinate assets. Since the company cannot adequately accomplish these requirements, this type of command relationship is unsatisfactory.

If the chemical assets that support the BCT are attached, the chemical assets will provide the BCT with responsive support, and the chemical assets will be provided administrative and logistical support through the BSA. There are two major deficiencies with this relationship despite the fact that this command relationship appears to be better than the other possible command/support relationships.

First, the chemical assets lack adequate C^2. Chemical units work most efficiently under the control of a parent unit which understands how to best employ the assets. Even though each BCT and battalion task force is authorized chemical officers, these staff officers usually lack the experience necessary to properly command and control the BCT chemical support assets.

If these staff officers are successful, they will not only serve as the command's chemical advisors, but also as an assistant S3. As a result, they will have adequate time to provide C^2 for the BCT's chemical assets. To eliminate this problem, the BCT often further task organizes the chemical assets. This often causes major disruptions to the chemical assets' logistical support.

For example, the mechanized smoke platoon often will be initially attached to the battalion task force providing the main effort. As the flow of the battle changes, the smoke platoon will often be attached to another task force. As a result, the repair parts, supplies, and fog oil that were ordered through one battalion task force will no longer be available to the smoke platoon once it is cross-attached to another battalion task force.

BCT Chemical Company Team

All the command and support relationships that are available to the heavy division chemical company to support the BCTs are ineffective and problematic. As a result, the optimal solution is to provide each BCT with a DS chemical company. This will provide the BCT's chemical assets with adequate C^2 and administrative and logistical support. The BCT will receive the responsive and flexible support that it needs since the direct support BCT chemical company can task organize its chemical platoons and NBC recon reams based upon METT-T and the tactical situation to provide direct support to each battalion task force.

The current doctrinal method to achieve this solution is to have the corps chemical battalion, which is supporting the division, task organize chemical company teams to support each of the BCTs. This is generally not a satisfactory solution to the problem.

First, there is no requirement for the battalion commander to form chemical company team since the battalion doctrinally provides only general support to the division. Second, the corps chemical battalions are reluctant to task organize their companies into DS company teams. This is because the battalions do not have habitual relationships with the heavy divisions.

As a result, there is a lack of mutual confidence, understanding, and respect since the corps chemical battalions are not used to the support requirements of the heavy division and its lethal BCTs.[11] Third, with the exception of the corps dual-purpose companies, the battalion's chemical companies are usually homogeneous; they are either pure: decon, motorized smoke, mechanized smoke, or recon.

As a result, the company commanders often do not understand how to adequately employ the chemical assets or now to provide the logistical and maintenance support for all the different types of platoons that usually support the BCT. The dual-purpose motorized smoke/decon company cannot adequately support the BCTs. They are best used to support the heavy division's rear area. Lastly,

since the chemical battalion's support is usually only temporary, the heavy division cannot rely on this solution to provide adequate C^2 for the BCT's chemical assets.

The optimal solution is to completely reorganize the organic chemical task organization within the division to create three BCT chemical companies. The companies should be heterogeneous and should consist of at least a company headquarters, a maintenance/logistics section, a decon platoon, a mechanized smoke platoon, and a recon platoon with four Fox recon vehicles. The chemical company should support the BCT in a DS role. Based upon the tactical situation, any corps chemical assets that are provided to support the BCT usually should either be attached to or placed under operational control of the BCT chemical company.

The heavy division BCTs currently train at the National Training Center with the heavy division chemical company that consists of a company C^2 element, a maintenance slice, a decon platoon, a mechanized smoke platoon, and an NBC recon squad.

The BCT training using the chemical company team concept works extremely well. The heavy divisions are currently training the way they would like to fight and not the way they will be forced to fight due to the limited heavy division chemical force structure. As a result, the chemical force structure and doctrine should be modified to support the way the war fighters have become accustomed to training.

Heavy Division Chemical Battalion

If the heavy division has three organic BCT chemical companies, who will be responsible to provide the C^2 and administrative and logistical support to the companies? Doctrinally, the companies could fall under the C^2 of a corps chemical battalion. This, however, is far from an adequate solution since the battalions usually only provide temporary GS to the divisions. These battalions are not habitually associated with nor habitually train with the heavy division.

The optimal solution is to completely reorganize the organic chemical task organization within the division to create three BCT chemical companies.

The optimal solution is to create a modified heavy division chemical battalion headquarters that is organic to each heavy division. The mission of the heavy division chemical battalion will be to provide C^2 and administrative and logistical support to the BCT chemical companies and to advise the division commander on NBC defense measures, employment of chemical units, and the conduct of smoke and flame operations in the division area.

The chemical battalion commander, like the signal battalion commander, will be required to wear two hats: division chemical officer and heavy division chemical battalion commander. The battalion commander would be assisted by his staff in providing C^2 for the companies.

The battalion S2/S3 with the operations/intelligence section would operate out of the division tactical command post. The S2/S3 would be responsible to provide NBC defense advice for the ADC(M) and NBC battlefield management for the battalion's chemical assets in support of the close operations. (The S2/S3 would replace the tactical chemical operations officer and would serve in a similar role in the division tactical command post as the engineer brigade S3).

Similar to the heavy division signal battalion, the chemical battalion would also have an assistant division chemical officer who operates out of the division's main command post. He would be responsible to provide staff supervision for the division NBC center and to serve as the division chemical planner. He would be responsible to develop the division's NBC defense and chemical unit employment plan to support the division scheme of maneuver.

Lastly, the battalion executive officer would be responsible to ensure that the companies are provided adequate logistical and administrative support. He would provide staff supervision of the battalion S1 with the administrative section and the battalion S4 with the maintenance and supply sections.

The primary focus of the heavy division chemical battalion should be on providing chemical support for the division's close battle operations and NBC defense planning of the entire division. The assistant division chemical officer plans the chemical support necessary to support the division's scheme of maneuver (24-72 hours prior to execution).

The executive officer obtains the necessary logistical and administrative support necessary to carry out the assistant division chemical officer's plans (during the final 12 hours prior to execution) based on the changes in the tactical situation and supervises/monitors the execution of the plan in support of close operations.

If a corps chemical battalion is provided in a GS role to the division,

...there would be no overlap of responsibilities between the heavy division and corps chemical battalions.

its focus should be to provide support to the division rear area and to the corps as a whole.

As a result, there would be no overlap of responsibilities between the heavy division and corps chemical battalions. Plans for the employment of the corps chemical battalion assets will be conducted at the DMAIN between the assistant division chemical officer and the corps chemical battalion liaison.

If the corps chemical battalion is provided in a DS role to the division, the battalion's S2/S3 should work closely with the division's assistant division chemical officer and RTOC/DISCOM chemical officers to plan support for the division rear area. If corps chemical battalion support is unavailable, then the heavy division chemical battalion will also be responsible to provide rear area chemical support. This can be accomplished through the support of a corps dual purpose (smoke/decon) chemical company, if available, or with the reserve BCT's chemical company.

Conclusions

To adequately provide responsive chemical support to the BCTs and to adequately provide C^2 and administrative and logistical support to the chemical assets task organized to support the heavy division and its three BCTs, the heavy division chemical force structure should be redesigned to include an organic heavy division chemical battalion. The battalion should consist of an HHD and three BCT chemical companies. The chemical companies should each contain at least one mechanized smoke platoon, a decon platoon, and an NBC recon platoon with four Fox recon vehicles.

The mission of the heavy division chemical battalion should be to provide chemical support and NBC defense planning for the heavy division. The battalion's support focus should primarily be on close battle operations. Its secondary focus should be on the rear battle chemical support operations. The Chemical Corps force structure in the Army should be realigned to support this concept. The focus of the Chemical Corps in the next century should be to provide adequate chemical support to the lethal warfighting maneuver force commanders. This will enable the Chemical Corps to fully realize its role as combat multipliers.

Notes

[1] FM 3-100, p. 8-4
[2] Ibid, p. 8-4
[3] Ibid, p. 8-4
[4] Ibid, p. 8-6
[5] Ibid, p. 8-4
[6] Ibid, p. 8-4
[7] Ibid, p. 8-4
[8] Ibid, p. 8-4
[9] FM 3-101, p. 4-1
[10] Ibid, p. 4-2
[11] Ibid, p. 3-3

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Photographer, Mike Barnette, CBDCOM

BIDS

—identifying BW agents on the battlefield

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The purpose of this article is to expand on a recent article published in the January 1995 CML, Army Chemical Review titled "BIDS - What is it? How does it work?"

—The authors

In recent years an increasing number of countries have been pursuing the capability to develop and employ biological warfare (BW) agents. BW agents offer an attractiveness that is unmatched by other weapons of mass destruction.

Generally, a relatively small amount of BW agent can inflict heavy casualties and cause mass disruption of a campaign. BW agents can be delivered to virtually anywhere on the battlefield, are difficult to detect, normally are invisible to the senses, and have delayed effects.

During *Operation Desert Storm*, the US faced an enemy with the capability and the perceived willingness to use BW agents. With only a limited BW detection capability, US forces could have been vulnerable to an attack. In an attempt to mitigate this vulnerability, the Army deployed a limited aerosol BW agent detector. Since the war, the Army has worked quickly to develop, test, and produce a state-of-the-art, integrated detection system to fill this urgent need. After just two and one-half years, the first platoon of the Biological Integrated Detection System (BIDS) will be delivered to the 11th Chemical Company to provide an initial biological defense capability. In late FY96, the system will be fielded to an America's Army Biological Detection Company, consisting of four reserve platoons and one active platoon.

The primary purpose of the BIDS is to detect and identify, quickly and accurately, large-scale biological

attacks. The presumptive identification of the BW agent is then reported to higher headquarters. A sample containing the suspected BW agent is collected by the BIDS and evacuated to the rear for further verification analysis.

BIDS are point detectors. They are employed as an operational-level integrated detection and warning array based on METT-T (see figure, next page). The Corps staff uses reported system results, other intelligence, and medical data to decide whether a BW attack has occurred. The staff then recommends the appropriate contamination avoidance and protective procedures.

Studies have shown that without an effective detection capability, a successful, large-area dissemination can make a Corps combat ineffective. However, for many agents, by detecting and identifying the attack, and dispensing the appropriate medical treatment before the onset of symptoms, almost all casualties from BW agent exposure can be prevented.

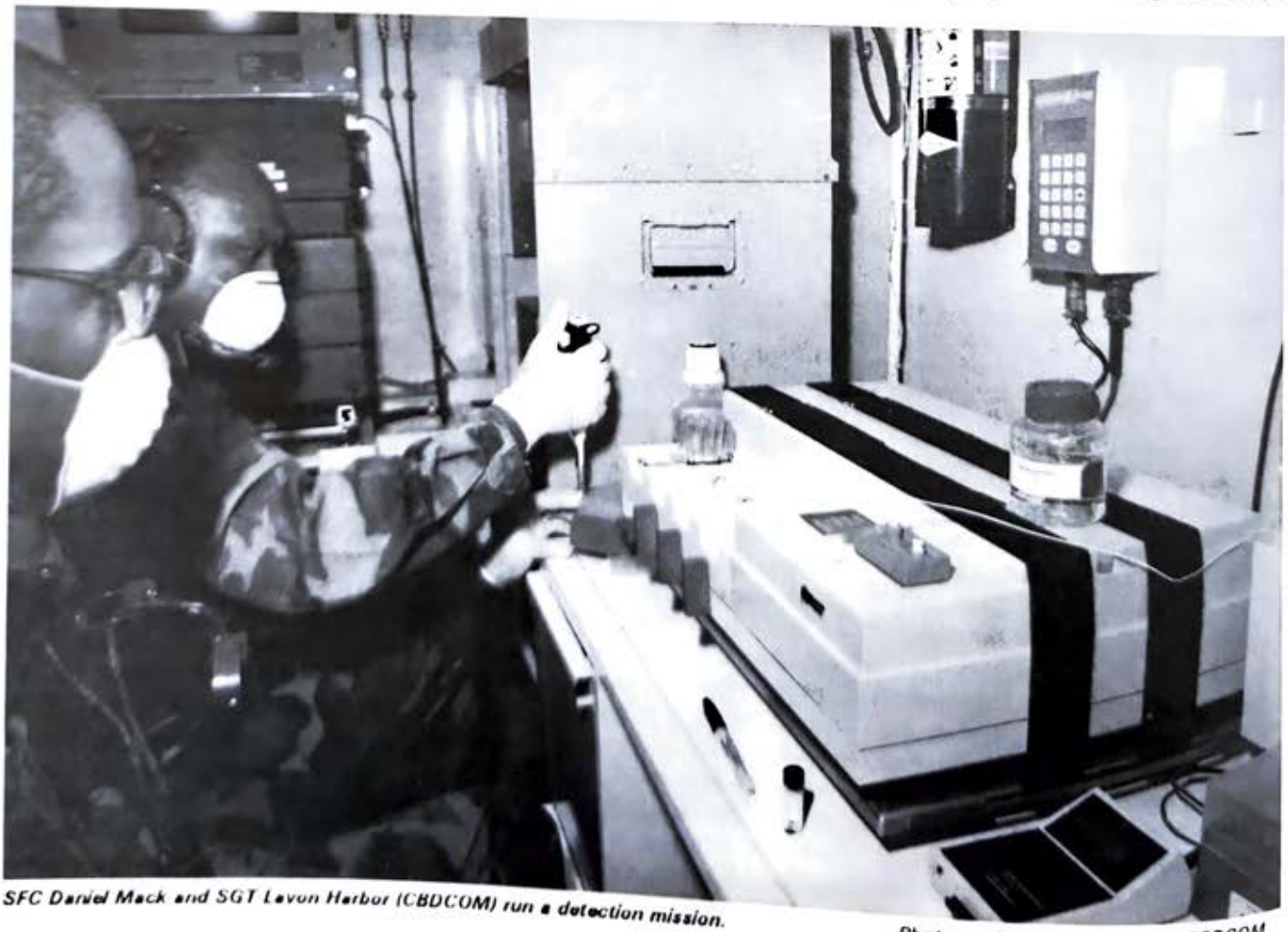
The BIDS is a collectively protected S-788/G lightweight shelter (LMS) normally mounted on a dedicated heavy HMMWV (M1097), but may be dismounted for fixed site applications or transported by a UH-60 helicopter. The system is also C-130, LACV-30, and CH-47D transportable. Electrical power is provided by a towed 15 KW tactical quiet generator (PU-801).

The heart of the system is the biological detection suite within the shelter. It is designed to detect key physical and chemical characteristics of a BW aerosol cloud consisting of 2-10 micron-sized solid particles of a distinct "synthetic" aerosol profile.

The BIDS biological detection suite consists of three detection components, two identification components, and two sampling components. These are the High Volume Aerodynamic Particle Sizer (HVAPS), Microluminometer, Flow Cytometer (FCM), Threshold Device (THS), and Sensitive Membrane Antigen Rapid Test (SMART).

The sampling components consist of a Carousel Sample Liquid Collector (Liquid Sampler) and a Single Sample Liquid Collector (Biological Sampler). In addition, the detection suite contains both standard military and commercial auxiliary equipment. This equipment consists of the SINCGARS and HF radios, an environmental control unit, a meteorological sensor, and refrigeration containers.

A BIDS team consists of two vehicles, the BIDS and its support vehicle, and four soldiers. Two soldiers are required to perform the analytical duties within the detection suite. The other two are required to perform support duties. Duties of the support personnel include packaging and evacuating the collected



SFC Daniel Mack and SGT Levon Harbor (CBDCOM) run a detection mission.

Photographer, Mike Barnette, CBDCOM

sample to the rear, resupply, and providing security for the BIDS.

Continuous monitoring of the atmosphere is provided by the Aerosol Particle Sizer (APS). If the ambient "background" (particle size and concentration) changes within a short amount of time, it triggers an alert indicator to prompt the operators to start both the Liquid and Biological Samplers.

The Biological Sampler collects a sample for subsequent laboratory analysis, and the Liquid Sampler collects samples for immediate analysis within the BIDS. The operators first test the sample for non-specific BW indicators using the Microluminometer and the FCM.

Each test requires approximately three minutes to do. The Microluminometer will suggest whether Adenosine Triphosphate (ATP) is present in the sample. Since ATP is a universal energy source associated with all living cells, it will provide an indication as to whether the aerosol is composed of "living" (pollen, molds, BW agents) or nonliving materials (smoke, dust, and so forth).

The FCM indicates if the sample contains above normal levels of bacteria rather than molds or pollen. If either the APS, Microluminometer, or FCM are positive, the operator then attempts to identify the agent using the antibody-based THS and SMART.

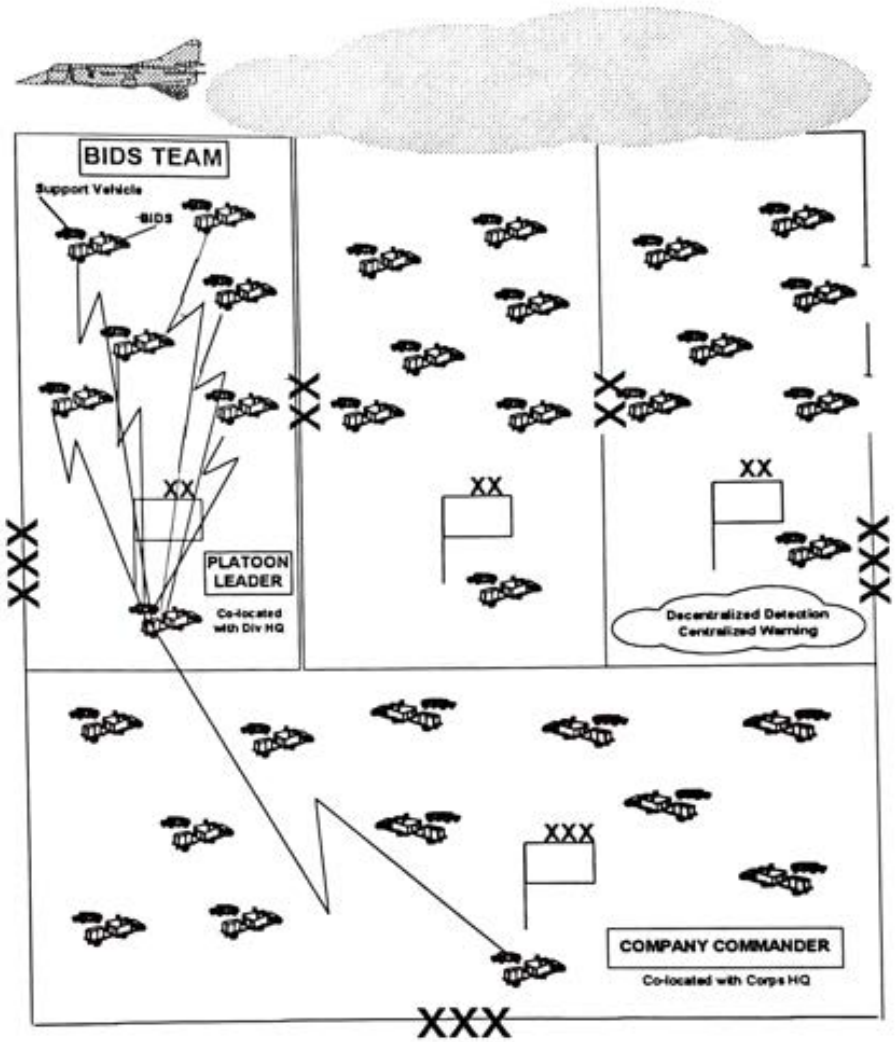
SMART tickets are used only as a backup for the Threshold Device. These tests require approximately 15 minutes to do. Detector results are transmitted using the high frequency radio to the BIDS platoon leader. Normally, the entire process, that is from alert to identification to reporting of the results, occurs with 35 to 40 minutes.

The decision whether a biological attack has occurred is not made by the operator but in conjunction with the Corps Nuclear, Biological, and Chemical Center (NBCC) and other staff members. Multiple BIDS data are collected by the company commander and the NBCC, and correlated with other battlefield indicators such as friendly activity, weather, enemy capability, and recent actions. Based on this information, the Corps staff will recommend to the commander the appropriate contamination avoidance and protection procedures for the situation to mitigate the effects of the attack.

Future plans for the BIDS include a preplanned product improvement phase (P^3I) and an objective BIDS. The P^3I BIDS will feature an expanded, more sensitive and semi-automatic detection capability, incorporating advance detectors such as a biological mass spectrometer, and an automatic biological detector to detect and identify additional biological agents at lower sensitivities and in less time than the Non-Development Item (NDI) BIDS.

This system will be fielded to a total of three Biological Detection Companies around FY99. The objective system will be a fully automated broad spectrum biological detector and should begin replacing P^3I BIDS in FY03.

BIDS Employment Array Long Spray Line Attack



CPT(P) Mark L. Malatesta is assistant program director for Biological Defense Systems and has served 10 years in the Chemical Corps.

SFC Daniel F. Mack is Operations NCO for Biological Defense Systems and has served 19 years with the Chemical Corps.

SGT Lavon Harbor is also an Operations NCO for Biological Defense Systems and has served 5 years as a biological science assistant.

BIDS TRAINING

—identifying training for the units

By Courtney Durham

With the approaching deadline for the first Biological Integrated Detection System (BIDS) units to be fielded, a training plan had to be developed.

Training Parts

The training of the BIDS crew has five parts. First the new crew must meet certain prerequisites. These include basic tasks in NBC, communications, map reading, and land navigation as well as being a licensed driver on an HMMWV with trailer. These are the basic 54B10 skills needed by the crew members so they can apply these skills to more advanced task requirements. This part must be completed by the unit before the soldier begins the course.

Having verified that the student meets the prerequisites, he/she is ready to go through the resident training (Table 1)

Table 1.

Seven Weeks Active Duty				
Part 1	Part 2	Part 3	Part 4	Part 5
Prerequisite Unit Responsibility	General Subjects	Equipment	Systems	FTX
0	48 hours (1 week)	108 hours (3 weeks)	56 hours (2 weeks)	32 hours (1 week)

Table 2.

Three Weeks Active Duty				
Part 1	Part 2	Part 3	Part 4	Part 5
Prerequisite Unit Responsibility	General Subjects	Equipment	Systems	FTX
IDT	IDT	AT	AT	IDT
0	48 hours (3 weekends)	108 hours (2 weeks)	56 hours (1 week)	32 hours (2 weekends)

Table 3.

Two Weeks Active Duty				
Part 1	Part 2	Part 3	Part 4	Part 5
Prerequisite Unit Responsibility	General Subjects	Equipment	Systems	FTX
IDT	IDT	AT	IDT	IDT
0	48 hours (3 weekends)	108 hours (2 weeks)	56 hours (4 weekends)	32 hours (2 weekends)

AT = Annual Training
IDT = Inactive Duty Training

One week is spent on general subjects which includes an introduction/overview of the BIDS course, basic biology/immunology, biological environment, and computer training. This will be taught in the BIDS applied classroom, BIDS Analysis Center, and the computer classroom.

For the next three weeks the crew trains on equipment. This involves training on the detection, identification and sampling components. These include the Liquid Sampler, SMART ticket, Microluminometer, Flow Cytometer, bio sampler, Aerodynamic Particle Sizer, and Threshold. This equipment is located in the BIDS Lab.

Students rotate in a round robin, going through each component at least once

When the instructor feels that the students are ready to perform as a crew member, the students rotate into the simulator room, BIDS Training Center—a two-simulator room that accommodates two students, each with observer facilities all around. If more simulators are needed, the overflow can use the three BIDS on the hard stand. Students also train (round robin rotation) on the Global Positioning System, M93 Gas Particulate Filter Unit, Portable Refrigerator, Environmental Control, TACMET Weather Sensor, PU-801 Diesel Generator Set, and the Harris Radio.

Towards the end of the last week of the equipment training, the crew learns Data Analysis and how to interpret the information gathered. Data analysis is the transition from the equipment training into the systems Training. This instruction is taught in the BIDS Analysis Center and Applied Classroom.

Having spent one week on general subjects and three weeks on equipment, we now to move into systems training. This consists of Operators 1/2/3/4 duties, support vehicle, collecting the sample, evacuation of the sample, camouflage, and SINCGARS/Harris Radio usage. This is crew drill and is taught in the BIDS on the hardstand and the simulators where possible.

Up to this point, we have been training mostly on classroom environment. Now we are ready to put it all together to function as a team or platoon. This is done in an FTX.

The FTX is the real test (driven by a written scenario) using the BIDS in a simulated "real world" exercise. Again, students first practice on the simulator, followed by using the BIDS out in a training area.

Training Strategy

Initially, the designated units are four reserve and one active platoon that require a mixed component training strategy. To meet this challenge we must have at least four phases of training. Phase I will be Equipment Familiarization and Individual and Key Personnel Training. This includes the training of instructors, maintenance personnel, training developers, and the 11th Chemical Company replacements. Phase II is the training of the first Reserve Platoons, Phase III the training of the Active Platoon. Finally, Phase IV takes care of the training of the remaining units/personnel who come on line and the replacement soldiers lost through attrition.

Training the Active Components

The five parts plus review, reinforcement, and retraining will be seven weeks in length (Table 1, page 24).

Training the Reserve Components

Reserve Components usually cannot come on active duty for a full seven weeks because of budget constrains and civilian job requirements. Keeping this in mind, but not compromising the integrity of the course, we've developed two plans for them. One plan calls for three weeks active duty or annual training (AT) and the remaining time inactive duty training (IDT) (Table 2, page 24). The other plan calls for two week annual training with the remaining time inactive duty training (Table 3, page 24).

Courtney Durham is currently a training developer assigned as BIDS and NBC reconnaissance POI manager, Functional Courses Branch, Directorate of Training, US Army Chemical School.

Chemical Officer Advanced Course (COAC) —Reserve Component

A reminder that effective 1 October 1994, officers in the rank of major or below desiring to branch transfer to the Chemical Corps must first take the resident NBC Defense Officer/NCO Course (80 hours) prior to attending the Resident Phase of the Reserve Component Chemical Officer Advanced Course (RC-COAC).

The Chemical Branch Transfer Phase of the COAC, which was conducted in FY94, is no longer available. Officers who completed the Branch Transfer Phase must attend Phase III of the Chemical Officer Advanced Course NLT FY95. The NBC Defense Officer/NCO Course and Phase I (correspondence) of the COAC may be taken in any order; however, both must be completed prior to attending Phase III of COAC.

Officers at the rank of major(P) or above will still be required to complete the Chemical Senior Leader Qualification Course. Phase I is available through correspondence only and consists of 16 subcourses listed in DA Pam 351-20. Phase II is the Joint Senior Leader/Chemical Officer Course (JSLCOC), which is a three-day course conducted at the Chemical School. The next JSLCOC is scheduled for 17-19 November 1995.

Reserve Component 54B10 and 54B20/30R Courses

Units are reminded that enrollment in the Reserve Component 54B10 Course, Chemical Operations Specialist, is limited to soldiers in grades E4 and below. Enrollment in the 54B20/30 Reclassification Course is limited to soldiers in the grade of E5 and above. Soldiers in the grade of E4 are eligible to attend if in a promotable status or are recommended by their commander.

Reserve Component Configured Course (RC^3)

Personnel who have questions about Chemical RC3 products are encouraged to contact the Reserve Component Training Management Division. For RC^3 courses, phone Mr. Don Crow, DSN 865-3476 or commercial (205) 848-3476. For correspondence courses, phone Mrs. Donna Butner, DSN 865-5023 or commercial (205) 848-5023.

Deputy Assistant Commandant—Reserve Component LTC Randy Kennedy

Please feel to contact me if I can be of assistance. I welcome your thoughts and suggestions. My address is Commandant, US Army Chemical School, ATTN: ATZN-CMN-RC, Fort McClellan, AL 36205. I can also be reached at DSN 865-5005, commercial (205) 848-5005.

Supporting Peacekeeping Operations
—the Chemical Corps' role

By CPT Vincent F. Johnston

The decline of communism has forced the United States to shift its attention from the traditional mechanized battlefield toward peacekeeping and other contingency operations. Not surprisingly, many combat units are experiencing problems restructuring training to best support these new missions. Unfortunately, current chemical doctrine does not address peacekeeping operations.

As a result, most combat units leave chemical assets out of their operational plans. This wastes a valuable resource. It's up to Chemical Corps officers to develop new techniques and integrate chemical capabilities into these operations. In the past we've ruled the battle through the elements. Now and in the future, I believe the Corps can support peacekeeping operations through its control of the elements.

In response to the military's shift toward contingency operations, planners at the Combat Maneuver Training Center (CMTC) in Hohenfels, Germany, developed a realistic peace-keeping training program. In the fictitious scenario, the training unit is part of a United Nations Peacekeeping Force (UNPF) deployed to the new country of Vilslakia. The UNPF's mission is to monitor the borders and to prevent open hostilities between Vilslakia and two newly independent nations. Besides multinational politics, the UNPF has to cope with six warring factions, hundreds of refugees, famine, and disease. The one item the UNPF does not have to deal with is nuclear, biological, or chemical warfare.

One of the first units in Europe to undergo peacekeeping training at CMTC was the Berlin Brigade. As the only chemical platoon leader for the brigade, it became my responsibility to incorporate my platoon's capabilities into the brigade's peacekeeping plan. This article explains some of the missions my platoon planned and executed during a four-week deployment to CMTC.

I also address planning considerations necessary for integrating chemical capabilities into peacekeeping operations. Procedures explained here are based on research and my experiences at CMTC and do not constitute official Chemical Corps doctrine. I hope they'll prove a useful reference for other officers for integrating chemical assets into future contingency operations.

Positioning Chemical Units

The peacekeeping force must first determine a target population the chemical unit can best support. When selecting this population, consider the following factors: the capabilities and limitations of the particular chemical unit, the resources available in the area of operations, and the possible political gains for the UNPF. Chemical units are few and must be carefully positioned where they can provide the best support and achieve the greatest gains for the peacekeeping force.

For example, my platoon's target population was Ubungsdorf. Politically, Ubungsdorf was the seat of power in Vilslakia, and the hometown of the Vilslakian President. The township of Ubungsdorf owned the land the UNPF needed to establish operations, including the only serviceable airfield in the country. The demographics of the town fell within the parameters that my platoon was capable of supporting. The town had a small population and there was a vast water source (non-potable) which my platoon could utilize for shower and delousing operations. Prior to our arrival in town, a UNPF liaison team drafted an agreement; in return for showers and delousing support, the UNPF would be given unconditional use of the land and airstrip.

Shower Operations

In the above scenario, my platoon was capable of providing showers for the local populace. However, circumstances may prevent a chemical unit from providing local shower support—the area may have an enormous population or an insufficient amount of water to conduct shower operations. In these cases, the UNPF may direct the use of showers for its own soldiers only, especially when the

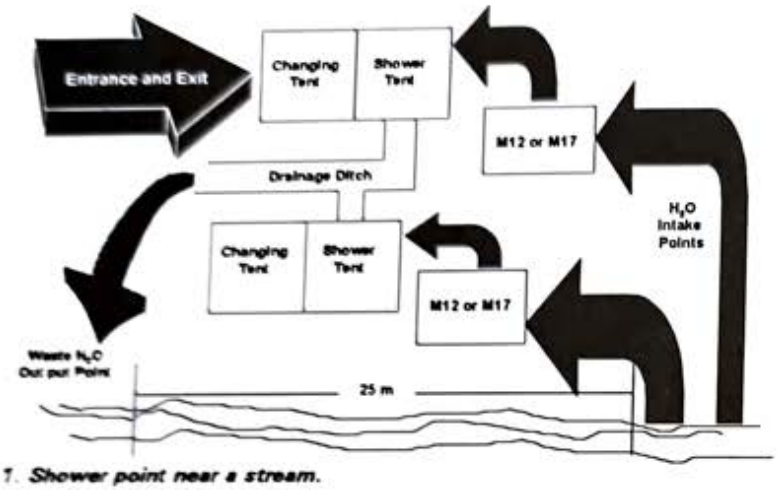


Figure 1. Shower point near a stream.

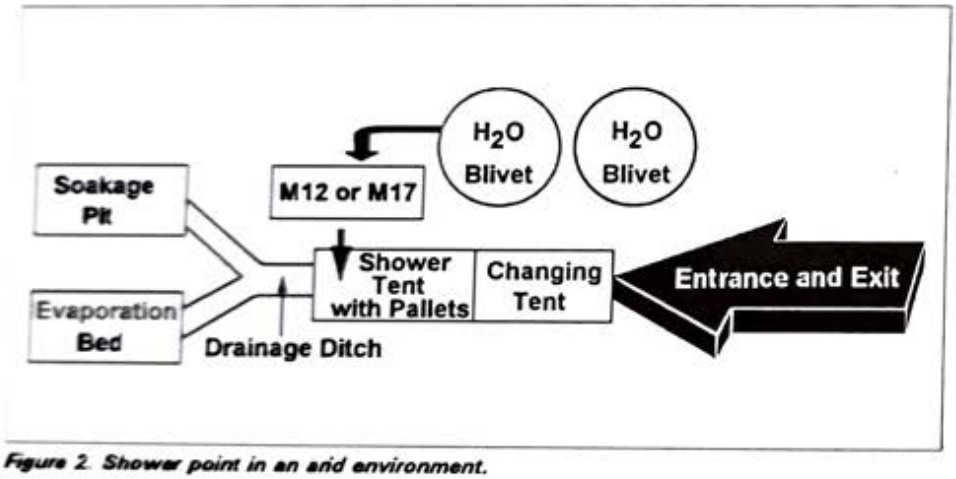


Figure 2. Shower point in an arid environment.

UNPF deploys to areas where the spread of disease is common. History has shown that more soldiers die from disease than bullets.

A case in point was the Berlin Brigade's deployment to Macedonia in support of *Operation Able Sentry* from July to December 1993. Before the operation began, the brigade's medical section identified a number of endemic diseases in Macedonia that represented a significant threat to the health of the peacekeeping force. As a result, when soldiers from the 6/502 Infantry Battalion deployed, they brought their power driven decon equipment (PDDE) with them. This PDDE provided troop showers for over 8 weeks, until permanent shower facilities were built.

Whether providing showers for the local population or for force protection, the chemical officer must consider a number of factors.

Decon equipment. How many M17 Sanators or M12 decon apparatuses does the unit possess, and what are their fuel consumption rates? Is there a method for Class III resupply? In our case, we had two M17 Sanators; each consumed 9 gallons of diesel fuel per hour for the heater and 1 gallon of 2-cycle fuel per hour for the engine. The brigade Class III yard was located close to our position, so quick and easy resupply was available.

Tentage requirements. If possible, establish shower points inside a well-ventilated building or other unoccupied facility. These areas are easier to clean, there is no need to provide additional wood flooring, and they can be used indefinitely in all types of weather. We used an abandoned garage. If a building or other structure is not available, the chemical unit must provide tentage.

The configuration of the shower point operation determines the number and type of tentage required. A unit operating one shower point for each M17 Sanator requires two general purpose (GP) small tents, one for bathing and the other for changing and drying off. If a unit operates one shower point with two M17 Sanators, then it requires two GP medium tents. The latter set-up allows more people to channel through the shower point and is generally more efficient. The same requirements apply if the unit uses the M12 decontaminating apparatus.

Flooring requirements. If flooring is required, place wooden pallets (easily obtained through food service or logistics channels) on the floor of the shower tent. A GP small tent takes 6 pallets to adequately cover the floor. Plan for 12 pallets. This allows the unit to daily rotate pallets for cleaning and drying without disrupting operations. Showers operating out of a GP medium tent require 24 pallets for sustained operations.

Water requirements. If the target population is located near a river, water won't be a concern. If water must be transported into the area, plan on 125 gallons of water for every 10 people for a 5-minute shower. The average water flow rate for an M12 or M17 two-bar shower is 25 gallons per minute, or 125 gallons of water.

Chlorination. To prevent the spread of microorganisms, chlorinate water between 1 part-per-million (ppm) and 2 ppm. Use a chlorination kit (described later). Water for showers does not have to meet drinking water standards, but should not impair the health of personnel.

Waste water removal. Waste water must be channeled from the shower area. If the shower point is near a

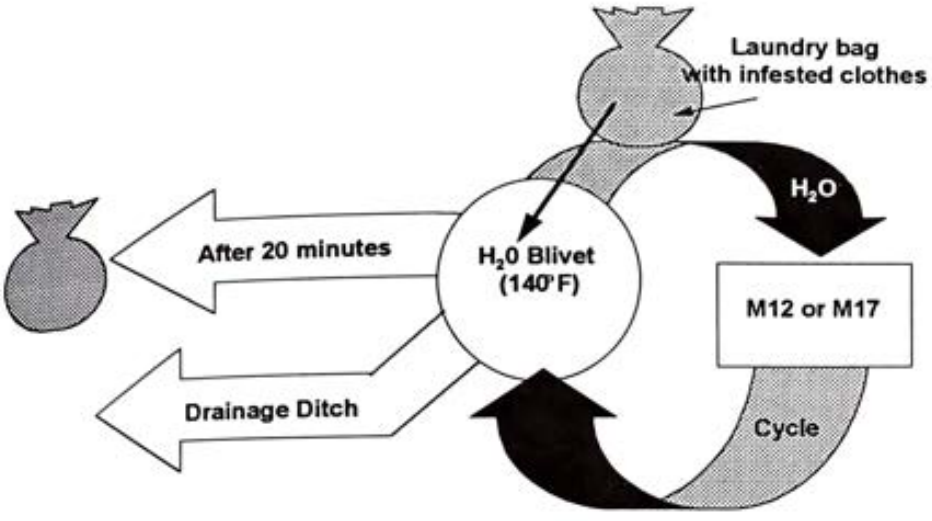


Figure 3. Clothing delousing point program.

river, the waste water must be discharged into the river 25 meters downstream from the last water intake point (see figure 1). If the shower area is not located near a stream, construct drainage ditches to prevent the formation of puddles which lead to insect breeding areas (see figure 2). Build soakage pits or evaporation beds (see FM 21-10-01 for more details). When constructing these drainage points, remember to build two or more for each shower point. This enables the unit to rotate their use and allows sufficient time for the waste water to evaporate in each drainage area and prevents the growth and spread of microorganisms.

Delousing Operations

Before a chemical unit begins delousing operations, they should contact preventive medicine personnel to thoroughly discuss the plan. These experts will provide valuable information and may be able to coordinate with outside units to assist in the effort. In general, they will inform the chemical unit that lice are blood-sucking and disease-carrying insects found on humans. Lice usually spread by direct contact with an infected individual and do not jump from person to person. Finally, to kill lice, both the person and his clothing must be treated or else the problem will continue.

Incorporate the treatment of personnel into shower operations. First, the unit must coordinate through their unit supply or medical channels for a delousing shampoo that is applied every few days. This medication is very potent and must be used as directed. Order and distribute Lindane powder to the people. Lindane (generic name) is a dusting powder which kills lice living in mattresses and carpets. Instruct the local populace to dust their bedding or living areas with this powder.

Now the clothing must be deloused. First, coordinate for quartermaster laundry. These units are equipped to deal with lice, and can delouse a greater amount of clothing than a chemical unit. If this service isn't available, use an M17 or M12 decon apparatus, water drum, and standard laundry detergent to construct a field clothing delousing point. Set up the operation according to figure 3. To avoid confusion in returning clothing, place the clothes in marked laundry bags before delousing and give the owner the ID number of the bag containing his clothing.

Fill the drum with water and add the laundry detergent. Using the M12 or M17, pump water from the water drum through the heating unit and return it to the water drum again. This closed cycle pumping system will get the water very hot. To kill lice, the temperature of the water must be 140 degrees Fahrenheit or greater. If an M12 decon apparatus is used, adjust the temperature gauge to 140 degrees. If an M17 Sanator is used, turn the heat pump selector switch to WAND. Be careful, the temperature of the water will exceed 190 degrees! While the water is hot, place the infested clothing into the water drum for at least 20 minutes. After 20 minutes, remove the clothing and return it to owners.

At 140 degrees, the lice and eggs are completely destroyed, so the water in the drum can be reused for additional delousing operations. However, do not use this water for showering. As with shower operations, drainage ditches must be built for waste water removal. Finally, instruct the soldiers operating this point to wash their clothing at the end of every day and to shower using delousing shampoo. Monitor the health of these soldiers and have them checked at least once a month by medical personnel.

Water Transportation

Depending on the availability of water transportation assets, a chemical unit may be called upon to transport potable water. Hauling water requires the unit to possess either water trucks, water trailers, or Army-approved collapsible water tanks. Open water drums cannot be used to transport or store drinking water. If the chemical unit assumes this responsibility, it must ensure that every person in the target population receives water. This equates to an average of 2 gallons of water per person per day. Further-

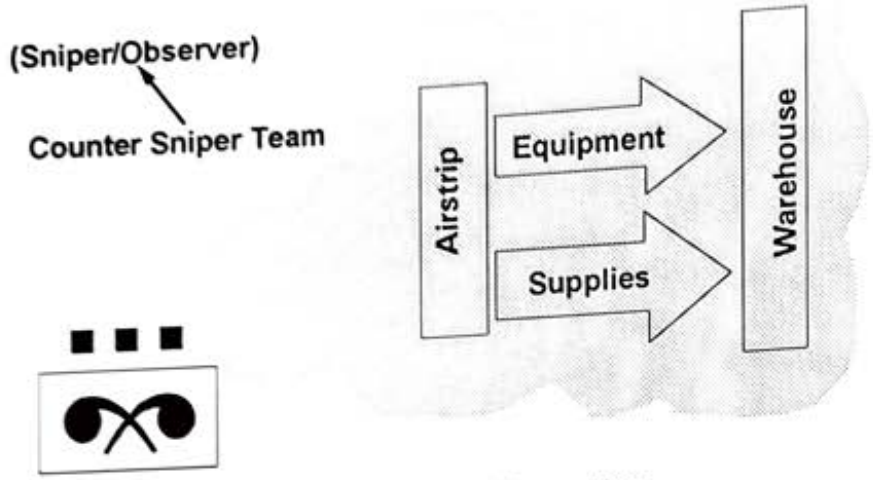


Figure 4. Smoke conceals airfield loading and unloading operations.

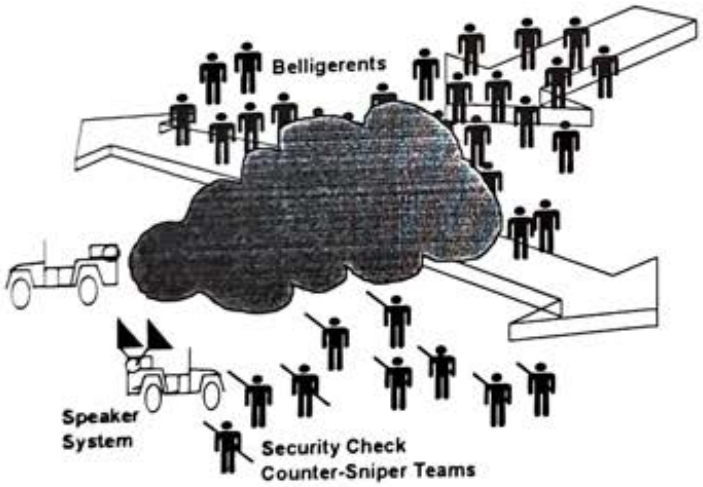


Figure 5. Employment of smoke to separate belligerents.

more, the chemical unit must ensure the water is sufficiently chlorinated to prevent the spread of disease.

Prior to hauling water, the storage tanks must be cleaned and sanitized. To clean trucks and trailers, one soldier climbs into the tank and, using potable water with a mild detergent, scrubs the inside. Another soldier stays at the manhole opening as a safety observer until the scrubber climbs out of the tank. Once the tank is cleaned, rinse thoroughly and drain. Repeat several times. Cleaning a collapsible water tank is slightly different. Fill the tank one-fourth to one-half full of soapy water and seal the opening. Next, have two soldiers walk on the tank for 10-15 minutes. Drain the tank; repeat the procedure several times.

Sanitizing water storage tanks requires chlorination kits. Order these kits through medical channels. The kits come with calcium hypochlorite ampules, a water tester, and instructions. Follow the instructions in the kit to chlorinate the water to at least 5 ppm; typically add 54 chlorine ampules for every 1,000 gallons of water. This chlorine dose is the minimum Army standard for potable water. Medical authorities may direct a higher dosage based on endemic disease producing organisms.

Once the equipment is sanitized and certified by preventive medical service personnel, the unit can begin transporting water. Water can be distributed directly from the storage tanks to the populace or deposited into lister bags. The latter method reduces the risk of contamination to the storage tanks. Using the water tester in the chlorination kit, test the water in the lister bags at least every two days and sanitize the bags every two weeks. Also check the cover on the bags to ensure insects do not get inside and contaminate the water. If this happens, clean and sanitize the bags before using them again.

Concealing Airfields

Peacemaking missions are resource intensive; therefore, it's crucial for the UNPF to maintain uninterrupted resupply operations. Because of their importance, airfields become primary targets for sniper, artillery, and mortar attacks. The purpose of these attacks is to close down the airfields and to disrupt sustained UNPF operations. In the past these attacks have proven to be very effective. A smoke generator unit can disrupt these attacks by providing concealing smoke around the airfield (see figure 4). This smoke impedes the enemy's ability to acquire targets, thereby reducing the attack's effectiveness.

This type of operation requires constant communications and tight command and control. The smoke unit must communicate and operate directly under the control of the airfield commander. The airfield commander must pass updated wind direction to the smoke unit so its commander can properly place his

smoke generators.

Additionally, the airfield commander must monitor the air traffic, directing the smoke unit to initiate and terminate smoke operations without interfering with the air flow. Remember, the purpose of the smoke is to conceal the aircraft from enemy assaults, not to shut down the airfield.

There are a number of items the smoke unit must consider before conducting this type of operation. First, a POL and fog oil resupply point must be established near the airfield. Second, the smoke unit must continuously rehearse its movement techniques to avoid possible collisions and other accidents. Third, the smoke unit must learn to conceal itself with its own smoke during these operations. Once they begin, the smoke generators become the primary targets for the enemy's fire. Fourth, the smoke unit or the airfield commander should coordinate for counter-sniper teams.

Because of the concealing smoke on the airfield, it will take a longer time for the sniper to acquire his targets. This longer engagement time might allow the counter-sniper teams sufficient time to locate and destroy the enemy. Finally, the smoke unit should plan for operations using pre-positioned smoke pots to conceal the airfield and smoke generators from enemy fire.

Separate Belligerents

Agreements under the UN charter may prohibit the UNPF from using CS gas to quell riots or to disrupt unruly crowds. If restricted to non-violent measures, the UNPF may want to employ a smoke unit to deal with these belligerents (see figure 5). The employment of smoke in these situations is effective in three ways.

First, smoke use is non-violent; no one is directly harmed during this operation. Second, the blinding effect of smoke disrupts movement in the cloud. The belligerents shift from violence to finding a way out of the cloud. Lastly, the physical properties of smoke produce a non-harmful but irritating response in the human respiratory system. Most people will not reenter the smoked area once they exit the cloud. Hopefully, they'll leave the area; however, crowds are unpredictable so peacekeepers must stay alert for further hostilities.

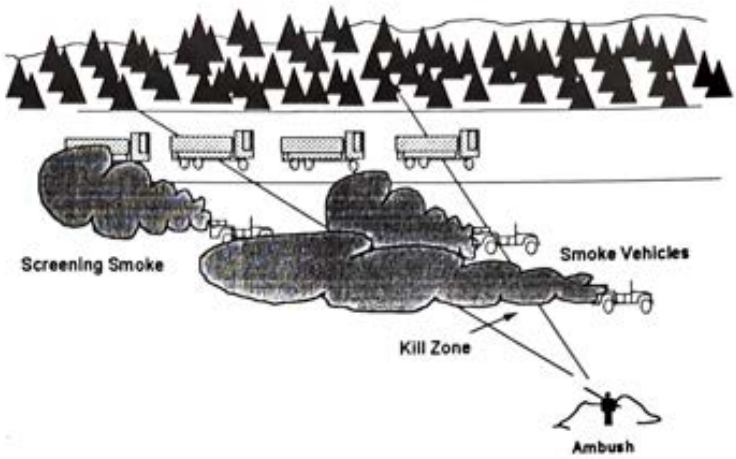


Figure 6. Screening convoy from an ambush.

Unfortunately, smoke alone will not always work. To improve the effectiveness of this operation, the smoke unit should coordinate for the assistance of a psychological operations team or a linguist with a speaker system to talk to the crowd. They must first explain that the smoke is not a lethal gas. Then they must try to calm the rioters and persuade them to leave the area. The smoke unit commander must closely monitor the situation, periodically terminating the smoke to allow the people in the cloud a chance to leave the area.

Finally, because of the unpredictability of the belligerents, the smoke unit must coordinate for additional security forces. These security forces must prevent a direct assault on the smoke unit by the rioters. This includes counter-sniper teams. Recent lessons in peacekeeping indicate that snipers may hide in the crowd. Finally, they must be prepared to assume command of the situation and increase the use of force if hostilities escalate and the smoke unit is forced to evacuate the area.

Convoy Operations

Convoy operations are a critical task and they present the greatest challenges to the force. Convoy commanders must deal with ambushes, sniper attacks, restrictive terrain, and checkpoints. Through detailed coordination and planning, convoy commanders can utilize smoke assets to conceal the convoys from attacks, screen danger areas along convoy routes, and shorten delays at checkpoints (figures 6 and 7).

In all of these operations the smoke unit must work directly for the convoy commander; maintaining close communications so as to avoid confusion, accidents, and fratricide. The convoy and the smoke unit should rehearse all actions prior to deployment.

Smoke units are especially useful to the convoy commander in dealing with legal checkpoints. At these locations the convoy must halt and allow the inspectors to check their cargo. Checkpoint inspectors are often afraid to leave their shelters and risk sniper fire during daylight hours. While these inspectors wait for nightfall, the convoy experiences hours of delays and an increased risk to attack. A smoke

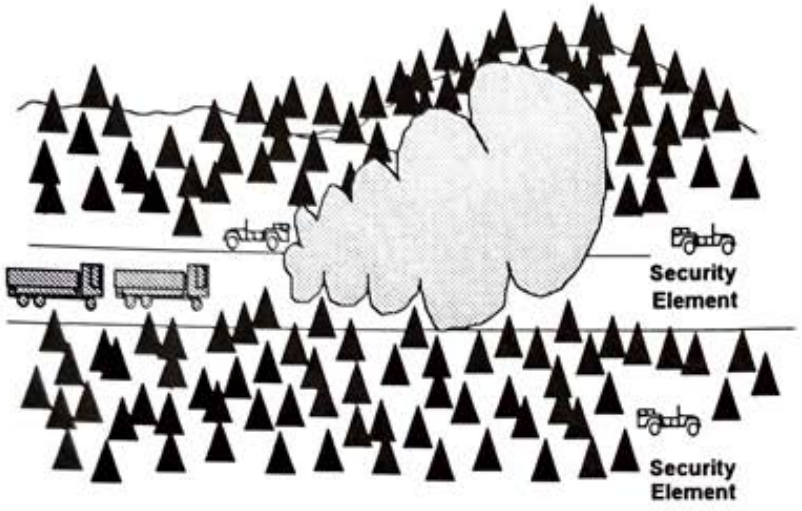


Figure 7. Screen critical terrain ahead of a convoy..

unit can quickly screen the convoy; degrading the ability of a sniper to acquire targets. Once the smoke screen is in place, the inspectors can safely check the convoy and allow it continue its mission.

Illegal checkpoints also present a challenge to the convoy. These points are typically comprised of hastily constructed obstacles with a few individuals trying to extract a "toll" from the convoy for passage. These bandits normally do not use force, but simply stay in front of the convoy so it cannot bypass. This is especially true when the UN charter prevents the convoy commander from using force unless the convoy itself is under direct assault.

The smoke unit can quickly maneuver to a position near the checkpoint and place an obscuring cloud around the area. The intent of the smoke is twofold. First, it blinds the road blockers so the convoy can bypass the checkpoint; and second, the irritating effects of the smoke deter the bandits from further harassing the convoy. The smoke unit and convoy commander must be prepared to defend themselves with their crew-served weapons should these harassers escalate hostilities.

Additionally, security elements must be placed in overwatch positions outside the smoke. If hostilities increase, the security forces engage all hostile targets outside of the smoke and those enemy targets emerging from the smoke cloud.

If the convoy is ambushed, the smoke unit can maneuver and immediately produce screening smoke around the convoy. The smoke obscures the ambushers' visibility; degrading their ability to place accurate fires on the convoy. This provides concealment and time for the convoy to maneuver out of the kill zone. The convoy's survival may depend on quick action; therefore, it's crucial that the convoy and the smoke unit practice these immediate action drills prior to deployment.

Finally, smoke units can conceal critical terrain ahead of the convoy, screening it from possible ambush sites along the route. Prior to deployment, the convoy, smoke, and security commanders conduct a recon of the route. They note the critical points along the route and determine which areas the smoke unit will screen. The smoke unit and a security force pre-position themselves in these areas and await the arrival of the convoy. As the convoy approaches, the convoy commander directs the smoke unit to begin screening operations. After the convoy passes, the smoke unit and security force quickly maneuver to the next critical point. Communications between the convoy commander, the smoke unit, and the security force is critical to the success of these operations.

Conclusion

The Chemical Corps' potential for supporting peacekeeping operations greatly exceeds current doctrinal guidelines. Whether operating shower and delousing points or concealing aircraft and convoys from enemy attacks, chemical units stand ready to conduct a myriad of tasks critical to the success of the Army's future contingency operations. I have explained a few ways to incorporate chemical units into peacekeeping operations, but this article is not complete for these missions present unknown challenges to the Army.

It's the responsibility of every chemical officer to step forward and develop new procedures for incorporating the capabilities of chemical units into future peacekeeping missions. They must then pass along their knowledge so others can learn from their experiences and we as a Corps can grow. After all, the support the Chemical Corps can provide is only limited by the ingenuity of its leadership. Now and in the future, the Army will find the Chemical Corps ready and willing to support any contingency mission through its control of the elements.

At the time this article was written, CPT Vincent Johnston was a student of the Chemical Officer Advance Course. His past assignments include platoon leader, company executive officer, and battalion chemical officer for the Berlin Brigade, Berlin, Germany. Additionally, CPT Johnston served as an S3 air and planned deployments in Operation Provide Hope and Operation Able Sentry. After the Advance Course, CPT Johnston's next assignment will be in the 1st Armored Division, Bad Kreuznach, Germany.

Force XXI Battlespace

—Chemical and biological hazards

By MAJ John C. Sees Jr.
United States Army Nuclear and Chemical Agency

When viewed from the receiving end, once unleashed, early twenty-first century American military operations will appear as one seamless, fully synchronized, and multifaceted strike, involving all elements of American and coalition military power.
—TRADOC Pam 525-5

Leaders planning military operations will face many constraints. To provide them maximum flexibility on the future battlefield, they must have a realistic picture of the battlespace. This article explains how technology will help leaders reduce battlespace constraints through realistic chemical and biological hazard predictions.

Background

Since *Operation Desert Storm* and the end of the Cold War, changes in doctrine emphasizing the use of technology have radically altered our perspective on warfare. Future battles will require a smaller U.S. force to operate in an extended battlespace. More information will be available to lower levels of command. Processing and distribution time will decrease. Advances in information technology will provide more information about the enemy and about the physical characteristics of the multidimensional battlespace.

Under the guidance of Army Regulation 5-5, *Studies and Analyses*, the United States Army Nuclear and Chemical Agency (USANCA) is taking on this information-age, future battlespace challenge by developing software that will provide more realistic hazard predictions. This product will be a seamless part of the Army's vision of future battle command.

This software will increase the realism associated with a chemical or biological hazard prediction. It will do this by predicting the wind speed and the wind direction at various elevations, and then overlaying these predicted wind fields on three-dimensional terrain. With this information, soldiers can produce more realistic hazard predictions than manual, triangle-shaped templates or simple computer models. Leaders can then examine these digitized, hazard predictions and their impact. This enhancement to the commander's view of the battlespace will significantly benefit force protection and maneuver.

Let's examine this new capability.

More Realistic Predictions Possible

The Chemical and Biological Defense Integrated Meteorological Prediction and Contamination Transport (CBD-IMPACT) software is a state-of-the-art hazard prediction model. It estimates hazards by simulating the transport and diffusion of chemical and biological contaminants over complex terrain by the predicted local winds. Because the software considers complex terrain and dynamic meteorology, it provides more realistic hazard predictions than the standard geometric-shaped hazard predictions of Allied Tactical Publication 45 (ATP 45) or any of the "flat earth," single meteorology computer models.

Figure 1 illustrates the historical development of hazard prediction models. The ATP 45 hazard prediction considers few variables and prescribes

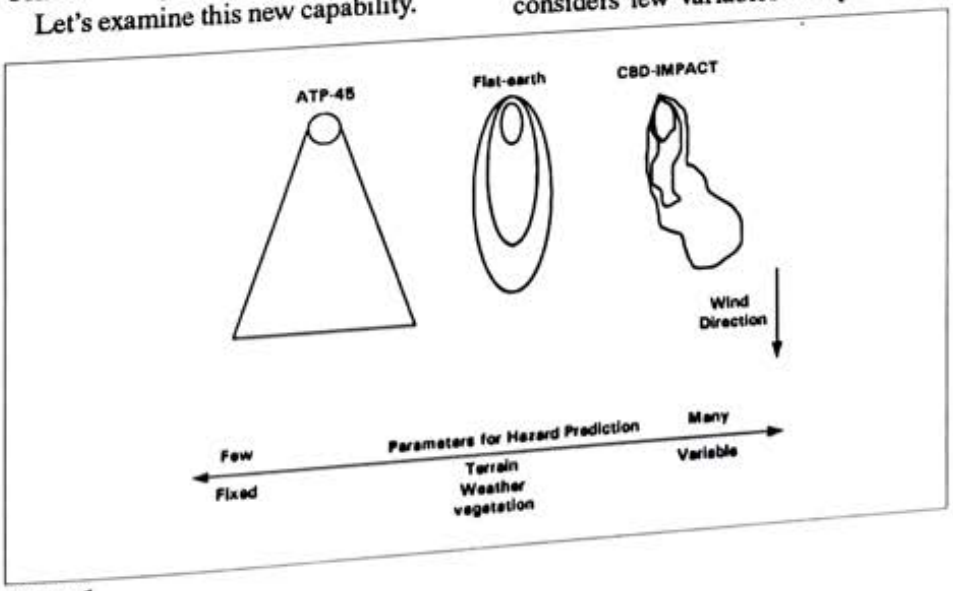


Figure 1.

geometric-shaped hazard predictions for classes of weapon systems and meteorological conditions. The "flat earth" models consider more variables, but limit themselves to simple meteorological conditions and flat terrain. The state-of-the-art models incorporate many more variables in an attempt to provide a more realistic hazard prediction. Current work in model hazard prediction development is clearly toward more complexity and realism.

CBD-IMPACT Software

The CBD-IMPACT software takes advantage of the newest technologies (Figure 2). The components in the figure represent information requirements or computer programs. The external components define the battlespace conditions and the release scenario, and the internal components contain the prediction software. Let's see how the system operates.

One component is current weather data—wind speeds, wind directions, and so forth. To meet this data requirement, the Army will be using the Integrated Meteorological System. This system takes global weather information from a satellite and provides local weather data. If weather information is not available from a meteorological system, the CBD-IMPACT system also allows manual data entry.

Another component is terrain and vegetation data. Digitized Terrain Elevation Data (DTED) and Land Satellite (LANDSAT) data are available from the Defense Mapping Agency and the Geological Survey Office, respectively. The DTED provides information on terrain relief. This product is essentially elevation readings at grid coordinates—graphically, the contours of the standard paper map. The LANDSAT data provides information on the terrain surface characteristics (such as grass, sand, forest, and so forth). These products are available on compact disk read only memory disks (CDROM). Unit leaders would have these on hand for possible contingency opera tions or would receive emergency issue during crises. When required, the user would upload the appropriate data.

Using the current local weather, terrain and surface characteristics as inputs, the CBD-IMPACT system predicts local wind speeds and directions throughout the battlespace as defined by the user. The Higher Order Turbulence Model of Atmospheric Circulation makes these predictions and produces a picture of the result (Figure 3, next page). The figure shows small arrows overlaid on contour lines. These arrows represent predicted wind speed and direction. The length of the arrow is proportional to the wind speed, and it points in the direction the wind is blowing.

The system can also overlay the arrows on the terrain surface characteristics (LANDSAT data). This would appear as arrows over shades of blue (water), green (vegetation), and brown (desert).

The system operator can update the wind speed and direction predictions any time. Because of periodic updates, the wind field predictions are the most current at any given time and are available for assessing the effects of a planning scenario or attack. During operation planning or when an attack occurs, the user can define the situation by using pull-down menus in the CBD-IMPACT software. Then, the computer processes the scenario. This action defines the attack location within the predicted wind fields.

The model then simulates the movement of the CB agent downwind and disperses it in the air. The Vapor, Liquid, and Solid Tracking model is the CBD-IMPACT software component that does this function, and the output is a hazard prediction.

The user can then examine the hazard prediction ("hazard footprint") over digitized terrain or over terrain surface characteristics. Later, the user can overlay this hazard prediction on the tactical situation graphics.

Benefit to the Commander

Figure 4 shows an example situation. The figure compares the predicted hazard areas for a single, small area coverage munition. The ATP 45 and "flat earth" predictions use a single wind speed and wind direction estimate, while the CBD-IMPACT prediction uses the wind speed and wind direction estimates already presented (Figure 3). The figure highlights the different impacts each hazard prediction could have on maneuver. For example, each prediction provides different information for a commander wanting to occupy the hilltop south of the attack.

The ATP 45 requires a specific hazard area template for a given

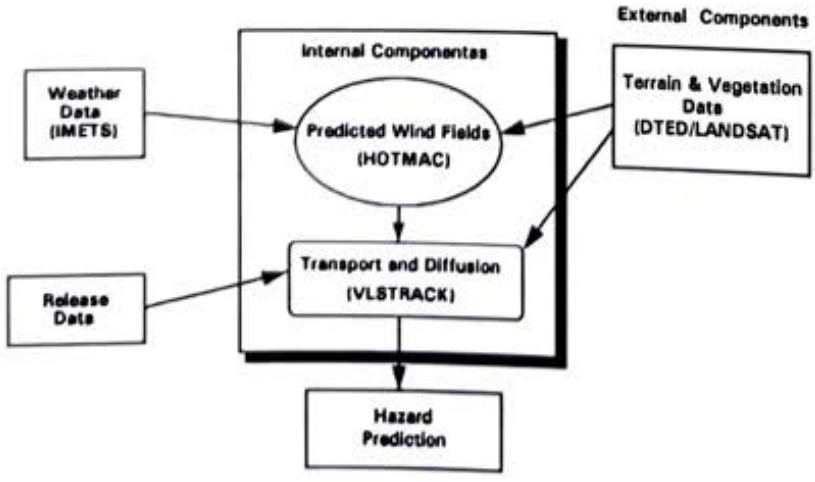


Figure 2

delivery system category, stability class, and so forth. This template represents the hazard area. The weather information (wind speed, wind direction, and so forth) is from the chemical downwind message and may be up to six hours old. The ATP 45 custodian working group designed these templates with a 99 percent probability that the actual hazard will be within the template. The resulting standard templates that meet these criteria are large and therefore cover a significant area.

"Flat earth" hazard prediction models consider the unique characteristics of the munition—specific agent type, agent fill weight, and so forth. They do not, however, consider the influence of terrain features or varying weather conditions when arriving at the predicted hazard area. Generally, these hazard predictions, like the ATP 45 templates, consider only one wind speed and wind direction. Based on the model input values, these flat earth models produce an expected hazard area. These models provide no associated probability that the actual hazard will be within the predicted hazard area. To associate probabilities with the predictions from these models, the operator would have to run the model with varying possible conditions. He could then associate each prediction with the probability of the conditions occurring.

The CBD-IMPACT software accounts for the characteristics of the munition, the terrain, and the vegetation. It also considers predicted wind speeds and wind directions at various elevations in the area of interest. Although it is still only an estimate, the CBD-IMPACT software will provide commanders hazard predictions based on specific weapon characteristics, current predicted local weather conditions, and over specific terrain. These additional considerations provide more realistic information to assess risk.

Before completion of the CBD-IMPACT software, USANCA will add error brackets or probability contours to the graphical display of the predicted hazard area. USANCA will base these confidence bounds on the variability of the hazard predictions associated with the modeling techniques and on the results of the software validation—model performance versus actual field data, meteorological measurement device tolerance, sampler tolerance, and so forth. Additionally, before the software's fielding, the Chemical School will write doctrine and provide training to users on the CBD-IMPACT software and the interpretation of the predicted hazard areas.

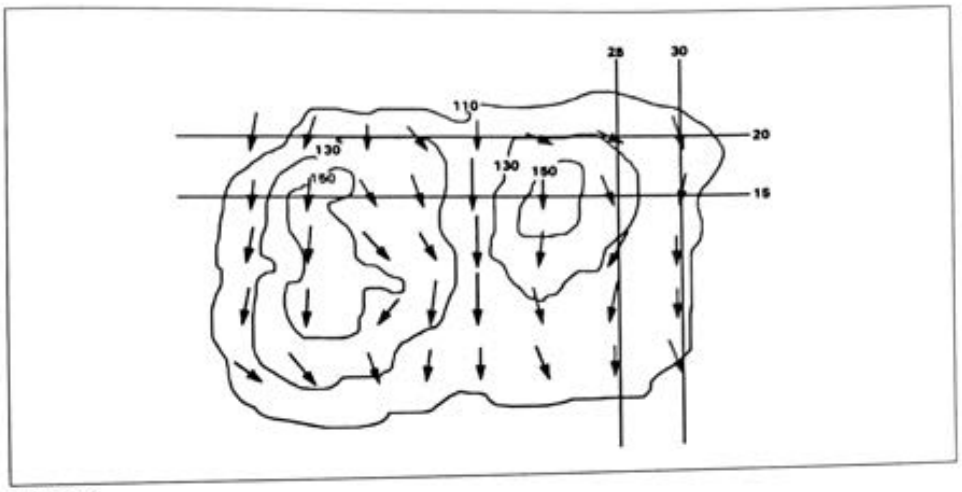


Figure 3

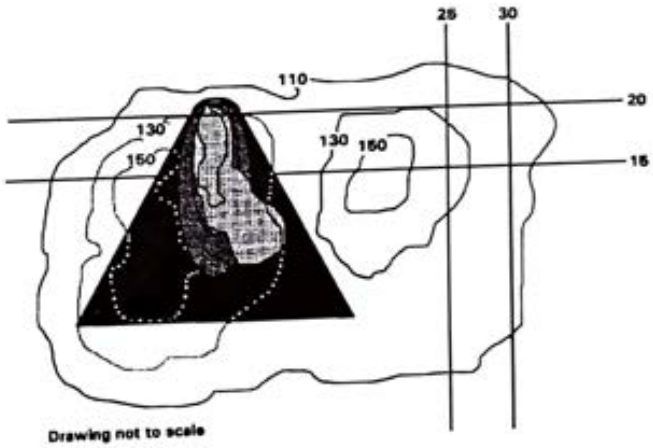


Figure 4

With this additional information, the chemical staff can develop estimates and recommendations to the commander with greater confidence to protect the force and with fewer restrictions on maneuver.

Conclusion

With a shared common and timely perception of the battlespace, a relatively unconstrained framework—a digital framework—will organize the battlefield and control operational tempo.

—TRADOC Pam 525-5

As the Army Battle Command System evolves, the networked organizations will immediately share this digitized, hazard prediction. Leaders at all levels can then quickly analyze the risk of different courses of action, maintain the operational tempo, and focus the unit's elements of combat power.

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Joint Service Materiel Programs Groups

—why they haven't worked

By CPT Al Mauroni

The Army is the DoD's executive agent for chemical-biological research, development and acquisition. In this role, the Army is the lead proponent for joint service chemical-biological (CB) defense programs. Despite the creation of four joint panels and two joint program groups since 1984, the record— on joint CBD programs is not good. After the Persian Gulf War, Congress mandated that there will be changes, either voluntarily or by their decree. I will relate some history to show how we arrived at this situation, and what the services are proposing to correct the past difficulties.

One humorous story of a joint program runs like this: A DoD official calls for a joint program meeting in the Pentagon. He briefs his program before the four services to develop a purple widget in 10 years with one million dollars as an annual budget. The Air Force sent two colonels who agreed the program had merit, but could be done better if they were in charge. The Army sent a lieutenant colonel who complained that compliance to the joint charter requirements would be too difficult, but he could do it in 15 years. The Marine Corps sent a gunnery sergeant who stated that his office could develop it in five years for 500 thousand dollars annually, but generally would do whatever the Army did. The Navy sent a captain, who stated simply, "Hell no, we're not joining your program. We're developing our own widget for our ships."

Obviously, each service has its own ways of doing business in the acquisition world, but the rivalry seems to run deeper than a personal disagreement at times. Most of the public has never seen the uglier side of the inter-service rivalries, which extends deeper than the visible Army-Navy-Air Force Academy football games.

The Rivalries Begin

For the most part, the Army and Navy ignored each other up to World War II. Both could afford to run their own operations without involving the other, until MacArthur and Nimitz clashed in the Pacific theater. After World War II, the National Defense Act of 1947 reorganized the new DoD along the Army staff model (centralized) instead of the proposed Navy staff model (decentralized). The Navy has always fought a strong Joint Chiefs of Staff and the unified commands such as CENTCOM, since they sometimes subordinated Navy assets under a ground commander's command. This difference of opinion between the two services has always caused tensions during any "joint" program discussion.

The Army-Air Force rivalry began during World War II, as the Army Air Corps began to resent their perceived role as "flying artillery." In their view, strategic bombing and air superiority were the tickets to defeating the enemy. This view was especially well received after Hiroshima and Nagasaki, and strategic bombing supporters kept the banner alive through the Korea and Vietnam Conflicts.

The Navy-Air Force rivalry began immediately after Billy Mitchell sank a battleship with bombers, proving that air power had an equal place at the table. The Strategic Air Command was successful in taking the lion's share of the budget in the late 40s and 50s, while the Navy, lacking any post-war fleets to fight, saw its fleet reduced by half.

Last, the famous Army-Marine Corps rivalry began in World War I, when a brigade of Marines attached to the 2nd Division successfully threw back a German attack at Belleau Woods. The newspapers made heros of the Corps, which, prior to then, were limited to Navy ship and port defense. In World War II, the Army conducted more amphibious assaults than the

Marines's six divisions, but everyone remembers Iwo Jima as a Marine victory.

When the 1947 reorganization was taking place, both Truman and Eisenhower (then Chief of Staff) were planning to eliminate the Corps—until MG Vandegrift (Marine Commandant in 1947) told Congress, in public testimony, of the plans and reminded them of the heroic deeds of the Corps in the Pacific. Since then, the two services have both taken a light infantry role.

The services began cooperating more after the 1968 defense downsizing began. The services agreed that, instead of eliminating redundant capabilities, they would complement each others's missions. But when it comes to joint program management, the differences emerge again. The inter-service rivalries manifest themselves as irreconcilable technical and operational differences in equipment development, resulting in unnecessary duplication of effort.

Joint Chemical History

During World Wars I and II, the Army took the lead for equipment research and development. The Army included the other services' officers and test fields in most chemical-biological munitions development and defensive equipment development through both wars.

During World War I, the Navy established a field office at Edgewood Arsenal and coordinated their shipboard protection programs with the Army Chemical Warfare Service as the lead agency. In 1935, the Navy expressed dissatisfaction with the arrangement, stating that the Chemical Warfare service did not have the capacity to meet all the requirements of the Army, Navy, and Marine Corps. The Joint Board decided that the Navy could seek out agencies other than the Chemical Warfare Service to develop their chemical defense equipment.

During World War II, the Navy returned, working with the Army labs developing chemical defensive equipment and medical treatments. The Army Air corps received much the same support, since air-delivered chemical and biological agents were considered the most effective form of delivery system. After the war, the services paid more attention to tactical and strategic nuclear weapons, and let the Army continue its offensive and defensive CB program. In 1960, the Kennedy administration decided that there was too much reliance on nuclear retaliation, which limited tactical military responses. Chemical and biological munitions were seen as the ideal solution. The Air Force and Navy announced their own offensive/defensive chemical-biological programs, to be coordinated with the Army effort.

Between 1969 and 1976, the DoD NBC program had lain dormant. The political climate, environmental movements, and public outcry over chemical incidents (such as the accidental nerve agent spraying of sheep in Utah) had created an overall climate that effectively stopped all NBC programs, offensive and defensive, in 1969. In 1977, in part due to the Arab-Israeli War of 1973 and early reports of Soviet-sponsored chemical agent use by the Vietnamese and Laos armed forces in Southeast Asia, Congress approved the re-initiation of defense funds for the services' NBC defense programs.

To better coordinate this effort, the DoD crafted directive for Chemical Warfare/Chemical Biological Defense Research, Development, Test and Evaluation that named the Army as the DoD executive agent for NBC defense on March 30, 1976 (DoD Directive 5160.5).

This subordinated the Air Force and Navy research and development (but not acquisition) to the Army,, who had retained the subject matter experts at the Chemical Research and Development Laboratory at Edgewood. Procurement of NBC defense equipment was left to the prerogatives of the individual services. In 1984, the Air Force and Navy complained that the Army was not adequately meeting their requirements. The DoD Directive 5160.5 was rewritten to become a guideline on Chemical Warfare/Chemical Biological Defense research, development, and acquisition (including procurement this time) with one major loophole—all services would be responsible for their own service-unique programs, while the Army would continue to lead all joint programs.

Differing Requirements

The issue of requirements boiled down to these differences. First, none of the other three services put the same emphasis on NBC warfare as the Army (witness the lack of dedicated chemical personnel). Second, there was a major difference of opinion in what an NBC environment would look like. The Navy focused on ship survivability, and discounted the threat of CB munitions at sea, believing that an enemy would rather target a ship with an HE warhead. Chemical agent detectors and collective protective systems had to be developed and installed into ships, not developed separately.

The individual protective clothing did not have to be as heavy as for ground forces, since they could button up the ships. The Air Force focused on air base operability and survivability, emphasizing high-tech, low-manpower solutions. They also felt that they would be spared constant heavy chemical attacks that the front line units might see. The Marine Corps, sharing much of the same viewpoint as the Army, usually agreed with Army equipment design. However, because the Army is more mechanized and mobile than the Marines, the Army might procure equipment too heavy, too dependent on logistics, or too expensive.

The service-unique loophole became a carte blanche for the Air Force, Navy, and Marine Corps to create whatever requirements were

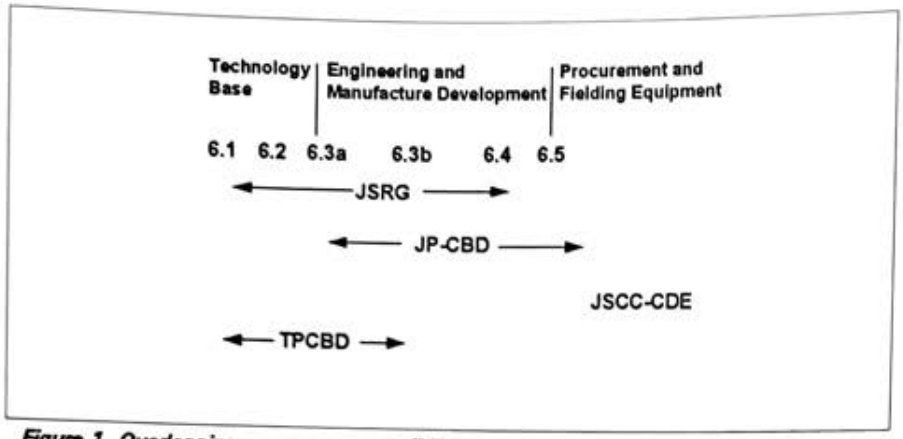

Figure 1. Overlapping program responsibilities of the joint panels.

necessary to ensure they had a distinct program effort separate from the Army. The three services accused the Army of making budget cut allocations that had benefitted Army chemical-biological defense programs over joint programs. They also felt that the time to field CBD equipment took far too long and cost too much, and that the Army was generally unresponsive to their needs. The Army retorted that the three services' parent organizations did not fund their share of the requirements, leading to an excessive drain on Army funds for joint programs that shortchanged the Army's service-unique programs. The other services' requirements were often not in agreement with the Army's.

Two Joint Service Groups

Obviously, the services could not afford to be perceived as all wanting their own unique programs. No service had sufficient funds to meet all their requirements for CB defense. Cooperation, in some degree, became an objective for joint service groups, even if it meant just meeting to discuss the issues.

In 1984, the revised DoD Directive 5160.5 became the basis for a Joint Service Agreement, which called for the creation of a Joint Service Review Group to oversee the coordination of all four services' CB defense programs, to include medical programs. This group would be composed of both combat and materiel developers of all four services, as well as one medical representative from each service. The Army would chair the group with a member from the Office of the Deputy Chief of Staff for Plans and Operations' Space and Special Weapons branch.

Their duties included formulating and recommending a biennial joint service CB defense research, development and acquisition plan that listed all the four services' efforts (joint and service-unique), who the lead materiel developer was, and what special programming and budgeting requirements were necessary to execute the plan. The programs included all CB defensive and chemical munitions programs, medical treatments, training devices, and threat assessments. The Joint Service Review Group would meet several times a year to discuss how to integrate service-unique programs into a joint development cycle.

At the same time, the Joint Logistics Commanders had a special action group examining the same problem of duplicative fielded NBC defense programs. The Joint Logistics Commanders are a group of four-star general officers who lead their services in logistics acquisition. They charter a number of joint groups to work on logistics and procurement issues. This special action group had recommended 10 categories of CB defense programs be examined for cooperative efforts, to include protective gloves and boots, collective protection shelter components, and agent detectors. The Joint Logistics Commanders authorized this group to begin their coordination efforts under a charter for the Joint Panel on Chemical and Biological Defense.

This group has only materiel developer representatives, and no medical representatives from each service. Their duties include overseeing the development and acquisition of all the services' non-medical CB defense programs, reducing the unnecessary duplication of effort within the services' developmental efforts, and recommending potential interservice cooperation and coordination on CB defense programs to the Joint Logistics Commanders. The Army generally chaired the Joint Panel on Chemical and Biological Defense since 1984, with the lead chemical officer in Army Materiel Command acting as chair.

Both groups (the Joint Panel on Chemical and Biological Defense and Joint Service Review Group) had representatives from the same offices attending both groups' meetings. Yet still, the challenges of joint program coordination and reduction of duplication of effort were hard to accomplish. One reason was the lack of authority in each group. Neither group had the authority to impose solutions on another service. Neither group had any budget authority to change the funding on any program. And neither group was comfortable going to the boss (i.e., general officers) to tell them that the services could not agree on program requirements. The result was status quo: no visible progress in furthering joint program efforts, and more duplicative programs being fielded.

More Joint Service Groups

Well, when a group isn't accomplishing its mission, one creates more groups. The Program Manager for Clothing and Individual Equipment (PM-CIE) had control of the protective

clothing program, in conjunction with the Natick Research, Development and Engineering Center. They had fielded the Battle Dress Overgarment in 1984, and were in the process of developing the Advanced Battle Dress Overgarment.

The Marine Corps did not agree with the Army's heavy protective suit, and claimed that the British Mark IV suit, and later the German Saratoga suit, were superior in design and weight, but did cost more per unit. The Army's tests showed the Mark IV to be of a lower capability than the Battle Dress Overgarment, and the Saratoga not better enough to offset the unit cost increase.

This confrontation quickly boiled down to a debate over differing test procedures. To develop closer cooperation between the two services, the PM-CIE formed a Joint Service Coordinating Committee for CIE. This committee would develop the next joint groundsuit requirements.

When Iraq invaded Kuwait in June 1990, actions within this group were suspended in favor of procuring chemical protective suits and fielding them to the troops. After the war, the services realized that they all needed a lightweight and a standard chemical protective suit. The Joint Service Coordinating committee-CIE became the Joint Service Lightweight Integrated Suit Technology program, and the Navy and Air Force soon joined the program. The Joint Service Lightweight Integrated Suit Technology is currently chaired by the commander of the Marine Corps Systems Command, with most of the technical effort and funding coming through the PM-Soldier (previously PM-CIE).

The Gulf War had a second effect on the DoD chemical community. all four services realized, in June 1990, that they had no idea of the number of chemical defense equipment, where it was, or how quickly it would be consumed in an NBC environment. The Assistant Deputy Chief of Staff for Logistics ordered his chemical section to develop and chair a Joint Service Coordinating Committee for chemical defense equipment, and, in coordination with the chemical section in ODCSOPS, ensure that critical chemical defense equipment got to the Gulf in time.

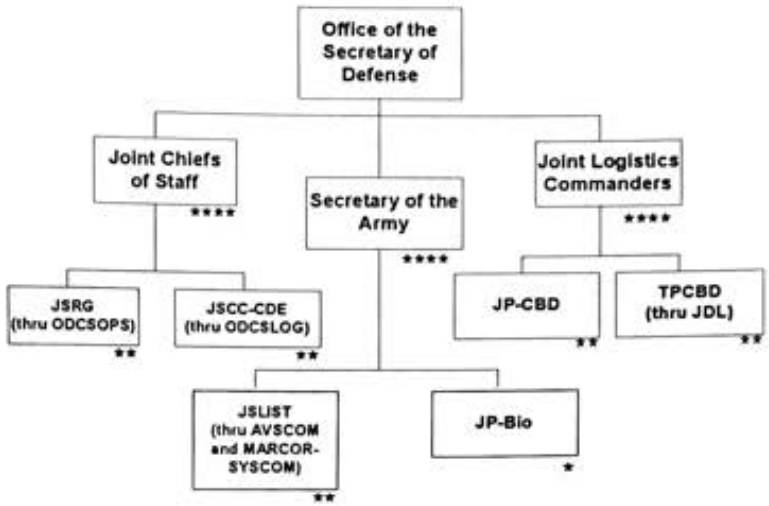

Figure 2. Joint panel/group reporting chains.

All four services put their efforts together to ensure that "War Stopper" programs such as atropine injectors, chemical protective suits, and protective gloves were procured and shipped in quantity for all four services' use. The Joint Service Coordinating Committee-chemical defense equipment developed a consumption rate for all chemical equipment, and identified funding necessary to meet the requirements. After the war ended, the Joint Service Coordinating Committee-chemical defense equipment continued to meet to develop the logistics issues raised during the war.

The lack of a biological defense program in 1990 created a sudden urgency in the DoD. Because no service had a biological agent detector, decontamination system, or adequate vaccine program in place, the ODCSOPS was ordered to chair a temporary panel titled the Joint Service Coordinating Committee on Biodefense. The Army Program Office for Biodefense Systems chaired the group, with materiel and combat developers from all four services included.

Initially, their group focussed on developing a defensive capability for *Operation Desert Shield/Operation Desert Storm*, comprised of older, previously mothballed programs. After the war, the group developed further to form a joint Mission Needs Statement for biodefense, though not necessarily for a joint program. As a result of this focus, DoD authorized the group to become a Joint Program Office for Biological Defense. the Joint Requirements Oversight Council recommended the group focus on a biological detection capability and a strong vaccine development effort. They now have a goal of fielding an interim capability for all four services by 1996.

One last joint group needs to be mentioned. The Joint Logistics Commanders has a strong two-star general officer panel titled the Joint Directors of Laboratories. These three heads of the services' R&D laboratories coordinate their resources and share information under the

program titled Project Reliance. Around 1990, the JDL were concerned that the technology base area around NBC programs was not being coordinated properly among the services' labs, as the other R&D program areas were.

To respond to this, the Edgewood RD&E Center, the Air Force's Armstrong Labs, and the Navy Research Laboratory formed the Technical Panel on Chemical/ Biological Defense. This panel formed subpanels to guide technology programs of multiservice interest and utility, and optimized use of laboratory resources. They would provide technical assistance to the JDL on CB joint service and technology base issues, and coordinate joint service tech base programs. As with the other panels, the Army chairs the group (executive director for Edgewood RD&E Center).

These four groups have all strayed significantly from their paths. The Joint Service Lightweight Integrated Suit Technology continues to develop a joint technology and agreements on testing methodology, and will soon pick the one agreed best technology. All four services continue to insist on specific and unique requirements, however, leading one to envision a future with four groundcrew ensembles, three aviation ensembles (Marine Corps aviation mimics the Navy), and at least two lightweight ensembles.

The Joint Service Coordinating Committee-chemical defense equipment has made significant progress toward identifying logistical needs, but has no authority or resources to continue its efforts and may soon be dissolved. Nor does the TPCBD have authority to do other than discuss joint ventures and recommend coordination. The Joint Program Officer for Biological Defense began with good intentions, but, as with the Joint Service Lightweight Integrated Suit Technology, all four services now plan different biological detectors developed under the "umbrella" MNS.

By now, you probably need a scorecard to keep track of the players. Figures 1 and 2 show areas of responsibility and reporting channels of the various groups. The end result of this proliferation is a chorus of conflicting voices, all claiming to represent one service or another, while duplicative detection, individual and collective protection, and decontamination programs abound.

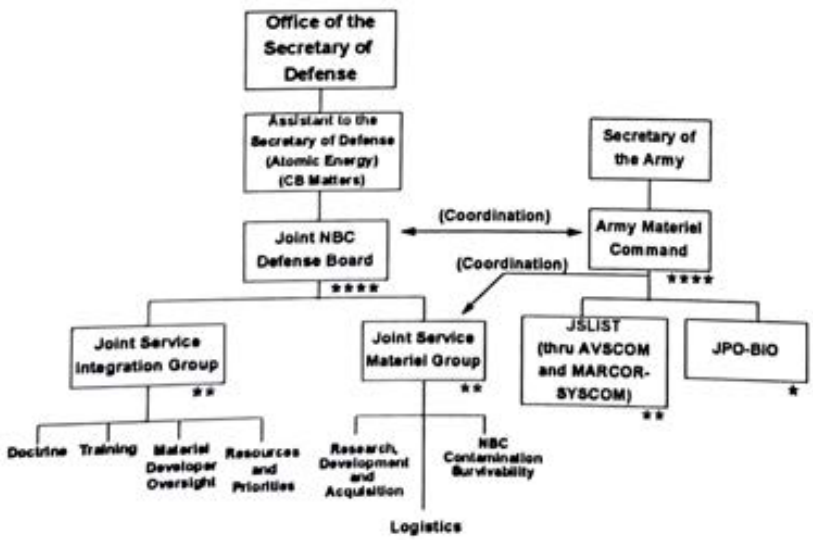

Figure 3. Potential future joint service groups.

The Future Vision

Congress took a dim view of the services' problems in procuring CB defense equipment during *Operation Desert Shield/ Operation Desert Storm*. After reviewing the CB defense issues, they passed legislation that demands a correction to the problem, and tighter oversight is expected over the next few years. This legislation, Title XVII-Chemical and Biological Weapons Defense, calls for improved DoD oversight over the Army's Executive Agent role, consolidated chemical-biological defense training activities, and an annual report to Congress on the status of the DoD NBC defense program.

This has given rise to a concept of two groups replacing all current joint panels, one for doctrine and training, titled the Joint Service Integration Group; and one for research, development and acquisition, titled the Joint Service Materiel Group. The Joint Service Integration Group would be chaired by the Chemical Corps commandant, and include representatives of the doctrinal centers of the other service. The Joint Service Materiel Group would be chaired by the Commander, Chemical Biological Defense Command, who is now the Deputy of Chief of Staff for Chemical Matters for Army Materiel Command. Both would have the authority to speak for their services' respective NBC program, with a Joint NBC Defense Office, chaired by the services' Vice Chiefs, arbitrating any disagreements. The Assistant to the Secretary of Defense (Atomic Energy) (Chemical-Biological Matters) would work between this group and the Secretary of Defense.

Other changes that would take place reflect the budgetary control measures, such as one budget line for all NBC programs, not to be diluted by other services' programs. In addition, the

Joint Service Integration Group and Joint Service Materiel Group would work together to ensure all programs are funded in a manner fair to all services. This would require a joint Program Operations Memorandum strategy, developed by these two groups for DoD approval. The various joint panels and program groups may still exist, supervised under the two major groups, although some will be absorbed into the new organization. The new organization might look like Figure 3.

The services have initiated some steps towards rejuvenating the joint NBC program, and making it more effective and responsive to future contingencies. This is a tough challenge, however. It demands that bureaucracies change and give up power, budget control, and potentially, reduce their staffs. It also assumes the Army becoming more receptive to other service requirements, treating them as customers and not poor cousins coming to stay at their "house."

Already, the training and doctrine schools are coming closer by the Air Forces's moving the Disaster Preparedness School to Fort McClellan in 1993. Since the Navy and Marine Corps already train there, this gives the services an opportunity to develop doctrine, training, and materiel requirements together. The three service laboratory commands have all undergone massive changes since 1991, which will help in the coordination of resources and technology efforts. The Air Force has moved a small liaison group to CBDCOM in order to work closer with the technology base effort. The Marine Corps has given up all technology base work,and will work with the other services to identify opportunities to develop that meet their requirements. In all, this could enable the services to come closer than ever before in running an effective joint service NBC program.

Conclusions

The Joint Service Integrated Group/Joint Service Materiel Group concept has been under constant discussion, revisions, staffing, and change since 1992. The fact that it has not been implemented yet shows that the bureaucracies are indeed, still fighting for their last gasp of life. The new structure will entail many changes within the Army as well as within DoD, and not all welcome the changes. I believe the people involved within the NBC defense community understand that this is not a "let's be joint because joint is good" movement. There will continue to be programs that need to be service-unique. Hopefully, through better management and closer cooperation, the new joint NBC community will be able to field equipment more quickly and more frugally.

In late January of this year, BG Ralph Wooten (now Commandant, US Army Chemical School) and MG George Friel, as the Joint Service Integrated Group and Joint Service Materiel Group chairs, respectively, briefed the Honorable Gilbert Decker (Asst. Secretary of Acquisition RDA) and GEN John Tilelli, Jr. (Vice Chief of Staff of the Army) on the new joint concept. Other representatives from the Air Force, Navy and Marine Corps attended as well. The Joint NBC Defense Board (headed by those two Pentagon VIPs) approved the charters of the Joint Service Integrated and Joint Service Materiel Groups, after concurrences from the other services. The first scheduled meetings for the new joint panels began in April. With a new stronger joint panel able to implement its decisions with real authority, there just may be some hope yet for joint program initiatives.

All the services, Army included, need to change their past ways of business to correct the problems discovered in *Operation Desert Shield/Operation Desert Storm*. The services simply cannot afford to ignore these reforms, given the increasing proliferation of CB weapons. There is the strong likelihood that, if reforms are not made voluntarily, Congress will impose them soon. Worse yet, we may be challenged again by another country with NBC weapons, and once again, scramble madly for chemical defense equipment because the same problems that occurred in 1992 still exist. Then, paraphrasing Benjamin Franklin, "we will all surely hang separately" as a result of not hanging together.

CPT Al Mauroni, USAR, received his commission through ROTC at Carnegie-Mellon University in 1985. He is currently a management consultant with Booz-Allen & Hamilton, Inc. His previous assignments include battalion chemical officer, 10th Mountain Division, and 197th Infantry Brigade (M) (S), and chemical staff officer at the former Chemical RD&E Center. At CRDEC he spent 18 months as the Army JP-CBD action officer.

Seeking Operation Desert Storm Accounts

The author seeks accounts from chemical soldiers and chemical defense units deployed to Southwest Asia during the Persian Gulf War. Help detail the unrecorded exploits of chemical soldiers in Operation Desert Storm. Any anecdotes or information from other soldiers welcome. Please contact me at (410) 569-1448 or write to: Al Mauroni, 2832 Dainaway Court, Abingdon, MD 21009.

Directorate of Chemical Branch Readiness

Director	DSN 865-3855
Proponency	DSN 865-4036
Threat	DSN 865-6454
Doctrine Development Center	DSN 865-4080/5531
Analysis	DSN 865-5071
TAQ/E	DSN 865-6124
Media	DSN 865-5928
Library	DSN 865-4414

The newest directorate continues to evolve as a synchronization tool of the Commandant. Several changes in structure will occur at the end of this FY. Due to program changes at DA and TRADOC all positions coded MDEP TAEV will be eliminated. This zeroes out the old DOES portion of our organization and moves the Accreditation Program into the Directorate of Training. To help make that an executable mission Title XI NCOs will be assigned in FY 96, the Program itself will take a one-year hiatus, and then resume in FY 97. By then the RC Schools will have reorganized into a seven region "Total Army School System" and we will be responsible for accreditation of seven Chemical Training Battalions scattered across the US.

Several personnel changes are in the process of happening over the summer. Our best guess at who will be sitting in each of the leadership positions as you read this:

Director—Mr. Roy Williams
Personnel Proponency—CPT(P) Terrill Robinson
Threat—CPT Frank Sokol
Doctrine—LTC Krisma Dewitt
Analysis—Mrs. Judy Carter
Media—Dr. JoJo Corkan
Developing Systems—Tim McGuirk
Library—Mr. Richard Pastorett

Much of our effort is focused on Warfighter XXI and Warrior XXI as we look at how the Army of tomorrow will train. A comprehensive review is underway that starts with a task-based combined arms training strategy which drives unit, institutional, and self-development training.

From that framework we are looking at a Standard Army Training System (SATS); with access to an inter-active library containing doctrinally correct Training Support Packages (TSP); supported by Training Aids, Devices, Simulants, and Simulations (TADSS); and integrated Standardized Army After-Action Review System (STAARS) which feeds data back into the library. We are involved with all components to ensure that NBC is addressed as both task(s), and condition(s) for the performance of other tasks, throughout the system.

Personnel Proponency Office keeps the Chief of Chemical Personnel Functional Assessment Reviews and Chemical Maxi-Laydowns that lay out the health of the Corps in recruiting, retention, promotions, strength management, and assignments.

Threat Office serves as the authority and focal point for all matters pertaining to intelligence and threat support to combat developments, training developments, and doctrine developments for the School and Center. They establish and maintain an intelligence and threat reference library. This includes reviews and validating threat content of all School and Center instruction, doctrinal literature products, and material acquisition requirements documents. They review doctrinal products from other TRADOC Schools. The classified monthly message on NBC Threat which goes to the major field unit G-2s, Corps, Division and Separate Brigade chemical officers, is prepared here.

Doctrine Development Division is responsible for development and publication of all Chemical Corps Field Manuals and Training Circulars. We are currently working on revisions of FMs 3-100, 3-21, 3-14, and 3-11. Changes to FMs 3-4 and 3-5 are also works in progress. Brand new is FM 3-101-14, *Biological Detection Platoon Operations (Tactics, Techniques, and Procedures).* We solicit your help from the field in terms of suggestions and current information on all chemical related subjects. Your valued input will make our publications viable tools to aid in mission accomplishment. You may contact the Doctrine Development Division at DSN 865-5531/4080, Commercial (205) 848-5531/4080, FAX—5058.

Analysis Division conducts top-down analysis of the Chemical Corps units' missions, collective tasks, and individual tasks. This leads to a definition of conditions and standards for successfully completing those tasks, and ensures that all combat critical tasks are identified and developed. We maintain the Chemical Corps collective and individual critical tasks lists, produce the Combined Arms Training Strategy (CATS), Individual Training Plans (ITPs), ARTEP Mission Training Plans (AMTPs), Drill Books, and the Soldier Training Publications (STPs). Some of the major actions we are currently working include the horizontal/vertical task identification and analysis of Chemical officer and enlisted tasks; developing an MTP for the Biological Integrated Detection Systems (BIDS) Platoon; developing the MTP for the Fox Recon Platoon; conducting a BIDS Platoon job analysis and task identification; revising the 54B STP soldier's manuals (all skill levels); and, developing task summaries for the Officer Foundation Standards common core revision.

Media Division, DCBR, produced the following doctrinal/training products since we last published *CML Army Chemical Review:*

- STP 54B1, Chemical Operations Specialist
- GTA 3-6-7, M21 User's Guide
- CAM User Guide GTA

We also finalized the following video tapes:

- Depleted Uranium Awareness
- M43 Preventive Maintenance Checks and Services
- M43 Components and Use

Developing Systems Division currently works for DCD to ensure that all new equipment is adequately supported by the training system. Movement of this division will provide greater interface with doctrine, ARTEP MTP, and STP writers. Key programs being worked include the Biological Integrated Detection System, and new detection and warning systems.

Fisher Library is the multi-media library for the Chemical School. The collection consists of classified and unclassified books, magazines, technical reports, video tapes, computer software, and current and obsolete DA publications. The library serves as the NATO control point and subregistry, and the MOS library, for the post; and maintains archives for the Chemical School.

The Directorate has a wide-ranging mission, our success is tied to how well we are able to synchronize the USACMLS products. We believe in the tenets of AR 5-1 you are our customer and you set the standard for our work!

Directorate of Training

Director	DSN 865-4522
Ch, Chem Defense Trainng Facility	DSN 865-3786
Ch, Technical Training Department	DSN 865-5006
Ch, Reserve Components Tng Mgt Div	DSN 865-5005
Ch, Course Development Division	DSN 865-3451
Ch, Tng Devices & Simulations Div	DSN 865-5780
Ch, Training Support Division	DSN 865-5854
Ch, Chemical Training Dept	DSN 865-5962

The latest reorganization of the USACMLS and the Directorate of Training (DOT) has resulted in the establishment of the Functional Course Development Branch. The primary responsibilities of this organization are, as the name would suggest, associated with the development of programs of instruction (POIs)for the functional or specialty courses which the USACMLS conducts in support of the Chemical Corps, The Department of the Army, and the Department of Defense. Additionally, a significant part of the branch is responsible for the development of training associated with chemical weapons treaties and agreements.

The USACMLS has long been the Army's designated proponent for radiological safety training. Training is provided for active duty and civilian personnel to provide them with the skills and knowledge required to perform duties as a radiation protection officer (RPO) at installation level through the three-week Radiation Safety Course. Training for unit level RPOs is available through attendance at the Operational Radiation Safety Course and the Calibration Custodian Course, both one week in length. The POIs for these courses are managed by SFC Francisco Huertas.

The NBC Reconnaissance Course is a relatively new course specially developed to train crew members for the XM93 Fox NBC Reconnaissance Vehicle. This five-week course is for active component soldiers assigned to NBC recon platoons only. The newly developed Master Fox Scout Course was conducted for the first time in May 1995. The course was developed to supplement the NBC Recon Course by training NCOs and officers in advanced procedures enabling them to utilize the Fox to its greatest potential. The course also contains a week of training on hazardous material handling. The POI Manager for these courses is Mr. Courtney Durham.

At the present time, the Functional Course Development Branch is in the middle of an extensive effort to design and develop a training program for soldiers to be assigned to units responsible for operating the Biological Integrated Detection System (BIDS). This new system will be fielded primarily in the US Army Reserve with one platoon in the Active Army.

One of the USACMLS' most visible missions is also one of its newest—chemical weapons treaty training. The School conducts a course for the On-Site Inspection Agency to train selected personnel in personal safety and protection while working around chemical weapons. This one-week course includes an exercise at the Chemical Defense Training Facility and in the storage bunkers at Anniston Army Depot. Under provisions of the Bilateral Destruction Agreement, personnel trained in this course could be assigned to conduct inspections at Russian CW sites or as escorts for Russian inspectors at US CW sites. Mr. Maceo Henderson serves as the POI and course manager for this course.

As the number of countries ratifying the Chemical Weapons Convention grows, the finalization of the several courses the US has offered to teach also progresses. The seven-week Basic Course will be taught at USACMLS. Specialty courses will also be taught, with Pine Bluff Arsenal being the site for Conventional and Chemical Munitions, and Inactivation, Conversion, and Destruction of Chemical Warfare Production Facilities. Demilitarization and Destruction of Chemical Weapons will be taught at Edgewood

using the Chemical Demilitarization Training Facility.

Additionally, the Chemical Weapons Convention personnel within the Functional Course Development Branch are working with several chemical warfare sites to finalize preparations for the conduct of Inspection Team Training Exercises. Anniston Army Depot has agreed to assist in the training of storage facility inspectors; Pine Bluff will assist in the training of CW production facility inspectors; and Tooele Army Depot, using the Chemical Agent Munition Disposal System, will assist with the training of destruction facility inspectors. Mr. Cleve Bagley and Mrs. Susan Hiner have the very difficult task of managing these various courses.

As is evident by the number of courses for which the Functional Course Development Branch has responsibility, the reorganization of the Directorate of Training has resulted in a significant and meaningful mission for the branch. Anyone wishing to obtain more information concerning the POIs of the courses described above may reach the appropriate POI manager at DSN 865-4779 or commercial (205) 848-4779.

E. F. Bullene Chemical Defense Training Facility

The E. F. Bullene Chemical Defense Training Facility (CDTF) continues to prepare United States, Allied, Department of Defense Civilians, and local government emergency response personnel for operations in a toxic chemical environment. The CDTF achieves this unique training through a dual mission approach to operations.

The primary mission of the CDTF is to train chemical defensive skills in an environmentally controlled toxic training facility utilizing GB and VX nerve agents. The unique positive engineering controls and emphasis by cadre on safety has led directly to over 35,000 personnel trained without a single incident. The facility does not focus its training directly on teaching soldiers and civilians on how equipment works, but on the utilization of equipment for the detection, identification, and decontamination of toxic chemical agents. The ultimate goal of training at the CDTF is to install confidence and credibility in our chemical soldiers and civilians.

To further achieve this goal, the training mission of each type of class, whether officer, enlisted, or civilian, is tailored to meet the specific needs of the class. The unique mission, prior training, and expertise level are all factored into developing a specific training scenario to maximize the toxic agent training at the CDTF. This allows the CDTF to offer the widest range of chemical agent training to a vast array of student groups.

The second mission of the CDTF is to conduct toxic agent training in an environmentally safe manner to ensure no damage is realized to water, land, or the air. While maintaining its high training standards, the CDTF was presented with the 1993 Department of the Army Pollution Prevention Award—Team Effort. This award was presented to the Chief of the CDTF on 22 April 1994 at the Pentagon by the Honorable Lewis D. Walker, Deputy Assistant Secretary of the Army for Environment, Safety, and Occupational Health. This award recognizes the cooperative efforts by the military and civilian unit members, EG&G civilian contractors, and the Installation Environmental Office in preventing environmental pollution.

With the use of a redundant filtration system utilizing two banks of a three-stage filtration process for cleaning the air from the toxic training building, no detectable release of contaminants has ever occurred from the site. Protection of water is achieved by all waste water from decontamination operations being thoroughly monitored to ensure all nerve agent has been neutralized prior to the atomization of the wastewater in the CDTF's incinerator. Finally, all solid waste generated inside the training building is decontaminated by incineration at 1700 degrees Fahrenheit to ensure no harmful chemicals from decontamination solutions are placed in sanitary landfills. All of these measures initiated by military and civilian personnel have led to the environmental excellence the site has demonstrated.

Weapons of mass destruction still exist at alarming levels throughout the world with unstable regimes who hope to gain international credibility through fear and intimidation. These weapons pose a significant threat to US and allied forces alike. The CDTF remains committed to both meeting this threat as the premiere trainer in NBC defense and fulfilling its role of environmental stewardship.

Directorate of Combat Developments

Director	DSN 865-6476
Ch, Concepts, Studies & Org Div	DSN 865-6556
Ch, Materiel Systems Div	DSN 865-6609
Ch, Battle Lab Integration Ctr	DSN 865-6549

The directorate of Combat Developments (DCD) at the US Army Chemical School, fort McClellan, Alabama, is the DA's agency responsible for identifying, designing, and integrating future nuclear, biological, and chemical defense requirements, as well as future requirements in the smoke and obscurants arena. In order to project such requirements, DCD is continually assessing the growing worldwide threat for potential use of weapons of mass destruction. Additionally, and as important, DCD also keeps abreast of

developing technological trends that may have an impact on the capabilities and designs of new NBC requirements. In short, DCD's mission is to predict the future of NBC warfare and to ensure that the US soldier is prepared to survive on the battlefield.

The directorate accomplishes its mission by studying and analyzing NBC issues in light of their impact on the Army as a whole. This often requires extensive modeling efforts and coordination with other DA, DoD, and allied agencies. DCD examines the doctrinal, training, leadership, organizational, and materiel dimensions of these issues to determine the best approach to satisfy identified requirements.

DCD is comprised of the Program Management Office; the Concepts, Studies, and Organizations Division; the Materiel Systems division; and the Battle Lab Integration Center.

The Chemical School's Battle Lab Integration Center is the School's contribution to TRADOC's revolutionary advance in warfighting capability focused on lethality, survivability, and increased optempo.

Over the course of the next two years, the Chemical School will participate in four Advanced Warfighting Experiments (AWE), beginning with the theater Missile Defense (TMD) AWE in April 1995 and culminating in Task Force XXI, a brigade rotation at Fort Irwin, California, in January 1997. As a result of these experiments, we will begin to field, in the year 2000, a capability that dominates battlespace in our proponency areas of avoidance, protection, decontamination, obscuration, and flame/non-lethal technologies.

The first AWE, *Theater Missile Defense,* will be conducted during April 1995. During this experiment we shall examine the application and design of a new organizational structure, the Army Theater Missile Defense Element (ATMDE) and the Chemical Corps' TMD proponency area, Passive Defense. As the land component commander's focal point for TMD operations, all passive defense operations will be conducted at the ATMDE with the other TMD functionalities—Attack Operations and Active Defense. In addition to Chemical Corps staffing, the ATMDE will use a redesigned version of ANBACIS integrated into a novel communications architecture to warn the land component commands of both conventional and NBC theater missile threats. The experiment will provide feedback to determine if the ATMDE and new communication architecture provide a "value added" for the commander in terms of survivability without disrupting optempo.

The second AWE, *Prairie Warrior 95*, will be conducted in May 1995 at Fort Leavenworth, Kansas. It represents our best opportunity to explore the application and effects of 2010 technology, realistic modeling of NBC weapons effects, and innovative chemical unit design in a simulated high intensity conflict. As part of the Mobile Strike Force, the "Innovative Chemical Unit" will be a representative composite of our proponency capabilities—smoke, reconnaissance, and decontamination—tailored to support a division of heavy, light, and aviation brigades. Biological defense enhancements, including the Biological Integrated Detection Systems (BIDS), biological standoff detection, and newly formulated doctrine in the form of a biological defense handbook will be examined in concert with application of CB JANUSA simulations during the play of the exercise.

The last of the FY95 AWEs will be *Warrior Focus*, sponsored by the dismounted Battlespace Battle Laboratory, and conducted during JRTC rotation 96-02 at Fort Polk, Louisiana. During this experiment, we shall evaluate a digitally linked NBC detection, warning, and alerting system composed of the Lightweight Standoff Chemical Agent Detector (LSCAD) the Multi-Purpose Individual Chemical Agent Device (MICAD), and a re-coded version of the Automated Nuclear, Biological, and Chemical Information System (ANBACIS) that will be resident on the same platform with the Brigade and Below Command and Control System (B^2C^2). This will represent our first step toward shared NBC situation awareness, and will provide a springboard into the "smart-push, warrior-pull" information architecture of the 21st century.

Our culminating event will be an experiment in January 1997, using a brigade of the EXFOR (2d Brigade, 2d Armor Division). During this AWE we shall, within budget and technology constraints, examine the Improved Fox, the Light NBC Reconnaissance System, LSCAD (to include UAV employment), MICAD, ANBACIS, and ACADA to define synergistic applications and optimum force protection "values added." While not all items may be supportable from a fiscal vantage point, we are endeavoring to center our efforts on digitized connectivity, the consequent shared situational awareness, and force protection.

While this is a very aggressive program, it is synchronized with the Chemical Corps Modernization Plan and the Functional Area Analysis. As a result, the first Army 21 division, to be fielded in the year 2000, will reflect a revolution in NBC technology, structure, and doctrine that will give the Chemical Corps soldier the ability to "Rule the Battle with the elements."

We welcome ideas and suggestions from all Dragon Soldiers throughout the Army.

A tank? A HMMWV? See page 19.

Photographer, Mike Barnette, CBDCOM

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