



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

By Colonel Scott S. Haraburda

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

Combat the Threat

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

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

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

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

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

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

Terrorist Chemical Attack

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

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

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

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

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

Domestic-Response Casualty Decontamination

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

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

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

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

Casualty decontamination operations serve three purposes:

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

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

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



A CH-47 transports decontamination equipment.



Soldiers prepare decontamination equipment.

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

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

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

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

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

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

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

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

Red Dragon Exercise

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

Lessons Learned

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

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



A decontamination team performs casualty scrub-down operations.

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

Conclusion

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

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

Endnotes:

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

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

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

⁴Ibid.

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

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

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

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

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

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Response Training Facility Scheduled to Open in June 2007

By Ms. Constance L. Singleton

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

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