Decontamination Operations in a Mass Casualty Scenario:

Observations From Ardent Sentry 2007

By Michael L. Snyder and Thomas J. Sobieski

At 10 a.m. on 10 May 2007, a terrorist group smuggled in and detonated a nuclear device, resulting in a 10-kiloton surface blast near Lawrence, Indiana (just northeast of Indianapolis). Local, state, and federal government officials were presented with many complex challenges as a result of this catastrophic event. Among the most challenging tasks was the need to quickly and completely decontaminate much of the population. This was the scenario for the week-long Ardent Sentry 2007 (AS07) exercise.

The Department of Defense (DOD) is capable of providing decontamination in support of civil authorities. However, the effective employment of DOD decontamination capabilities requires a full understanding of the special circumstances surrounding a homeland event and the doctrinal differences between defense support of civil authorities (DSCA) and battlefield decontamination operations.

This article (sponsored by the Joint Requirements Office for Chemical, Biological, Radiological, and Nuclear Defense [JRO CBRND]) focuses on two aspects of the DOD decontamination mission:

- Differences in conducting decontamination operations in a DSCA environment versus a traditional wartime environment.
- Additional considerations for mass decontamination in a DSCA environment.

Background

Since 2004, the JRO CBRND has been providing chemical, biological, radiological, and nuclear (CBRN) and consequence management subject matter experts to support combatant commands and subordinate training and exercise programs. The JRO CBRND has also partnered with several non-DOD government agencies to enhance the knowledge of DSCA procedures.

The AS07 exercise was designated by the Chairman of the Joint Chiefs of Staff, sponsored by the U.S. Northern Command (NORTHCOM), and supported by the U.S. Joint Forces Command (JFCOM). In the months leading up to AS07, the JRO CBRND provided technical assistance to the NORTHCOM Operational Plans and Joint Force Development Directorate (J-7) and JFCOM J-7 in observing battle staff operating procedures at selected command and control locations and developing the effects of the nuclear detonation. Exercise development included collaborating with exercise planners from the Indiana Department of Homeland Security and the Indianapolis Department of Public Safety to build the documents and determine the scenario participants needed to drive DOD responses to federal requests for assistance.

Based on National Planning Scenario 1,[1] AS07 primarily focused on the ability of NORTHCOM to execute DOD chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) response plans at the operational level. For the first time, the Ardent Sentry exercise also included a separate but simultaneous field training exercise designed to allow selected DOD units to train with their civilian counterparts.

CCMRF Soldiers perform decontamination operations during AS07.

The nuclear detonation that occurred at the outset of the AS07 exercise was designed to simulate a "no-notice" terrorist event. Scripted weather, census data from 2000, and computer modeling were used for the scenario. Casualties were estimated at 15,000 dead and 21,000 injured. The injured included those affected by the blast itself and by thermal radiation, prompt radiation, and radioactive fallout.

The nuclear detonation and subsequent effects resulted in the appointment of a principal federal official by the Department of Homeland Security (DHS) followed by a presidential disaster declaration. DHS and the Federal Emergency Management Agency (FEMA) (Region V) established a joint field office (JFO) at Camp Atterbury, which is located about forty-three miles south of Indianapolis. The defense coordinating officer and element from FEMA Region V joined the JFO coordination staff. NORTHCOM Joint Task Force–Civil Support was also deployed to Camp Atterbury to provide command and control of DOD forces deployed to support the local, state, and federal response.

The JRO CBRND is the single office within DOD responsible for the planning, coordination, and oversight of joint CBRN defense operational requirements. The JRO CBRND serves as the Chairman of the Joint Chiefs of Staff single source of expertise to address all issues involving CBRN defense within passive defense, consequence management, force protection, and homeland security.

In addition, elements of the DOD CBRNE Consequence Management Response Force (CCMRF) were deployed to conduct consequence management operations in concert with first responders from Marion County, Indiana; the Indiana Department of Homeland Security; the Indiana National Guard CBRNE Enhanced Response Force Package; and civil support teams. This field training exercise was conducted at the Muscatatuck Urban Training Center, located about twenty-five miles southeast of Camp Atterbury.

It became apparent during the planning process and exercise execution that further discussion of the two aforementioned aspects of the DOD decontamination mission would benefit the CBRN response community in general and emergency responders in particular.

DSCA

In a scenario such as that presented in AS07, DOD is ready to assist with local, state, and federal response efforts. Upon receipt of a request for federal assistance, DOD provides support according to the *Robert T. Stafford Disaster Relief and Emergency Assistance Act* and *The Economy Act*. The *National Response Plan* (which was in effect at the time of the exercise but has since been replaced by the *National Response Framework*) provides the coordinating framework for the support. DOD provides support for all fifteen emergency support functions of the *National Response Plan* and is a cooperating agency for most of the *National Response Plan* support and incident annexes. When requested, DOD (in concert with other federal agencies and possibly federalized National Guard units) supports the primary agency (DHS) by providing the manpower and equipment necessary to quickly mitigate the effects of the disaster and meet the needs of responding local and state officials. The manner in which DOD provides this support is described in NORTHCOM Contingency Plan 2501. The JFO is responsible for coordinating DOD and other existing capabilities.

Decontamination in a DSCA Environment

In the AS07 scenario, DOD was called upon to augment or provide relief in place for decontamination operations that had been initiated by local first responders and National Guard units in state active duty or Title 32 status.[2] Thus, it is important for DOD decontamination units to know and understand the manner in which civilian first responders approach expedient mass decontamination operations.

Before 11 September 2001, a very thorough and capable decontamination process was used when responding to and remediating hazardous materials spills. The procedures and systems used were equipment- and manpower-intensive and had various but limited throughput capacities—usually 50 to 100 people per hour. By comparison, the current decontamination throughput capacities of DOD units such as the Marine Corps Chemical/Biological Incident Response Force and Army Chemical decontamination units vary from 250 to 400 Soldiers per hour.[3]

Recognizing the need to more rapidly perform mass decontamination, civilian first responders developed methods of increasing their decontamination capabilities. Two of the more common approaches include the Emergency Decontamination Corridor System and the

Ladder Pipe Decontamination System (LDS). Both have been documented in publications by the U.S. Army Soldier and Biological Chemical Command (SBCCOM)[4] and the Chemical, Biological, Radiological, and Nuclear Defense Information Analysis Center (CBRNIAC).

In January 2000, SBCCOM published *Guidelines for Mass Casualty Decontamination During a Terrorist Chemical Agent Incident*.[5] Section 4.4 of the guidelines contains excellent schematics; photographs; and descriptions of the Emergency Decontamination Corridor System, LDS, and first-responder equipment commonly used for mass decontamination. Although the mass decontamination capabilities were reviewed with respect to a chemical event, several conclusions also apply to a nuclear detonation scenario, such as—

- Expect an unaffected-to-affected casualty ratio of five to one.
- Perform decontamination as soon as possible.
- Disrobe from top to bottom.
- Flush with water, since it is generally the best method for mass decontamination.
- Self-decontaminate as soon as possible to avoid serious effects after known exposure to a liquid agent.

Similarly, CBRNIAC cites CR-04-12 and SOAR-03-10. As with the SBCCOM guidelines, the focus of SOAR-03-10 is on responding to and decontaminating victims of chemical or biological incidents; however, the sections on general decontamination principles and the setup and management of incident sites are useful for nuclear scenarios as well.

DOD forces are trained and equipped much like their civilian fire department counterparts, and the two entities routinely collaborate through mutual assistance and aid compacts. To adequately fulfill the DSCA role, it is imperative that the DOD response community become familiar with civilian expedient mass decontamination equipment and procedures.

Impact of DSCA on Decontamination Tasks

During development of the exercise scenario, participants discovered that special considerations were required for decontamination efforts in a DSCA environment. Military CBRNE planners must take into account—

- Personnel to be decontaminated.
- Multisite operations.
- Integration of decontamination operations with other plans.
- Disposition of runoff.
- Disposition of personal effects.
- Accountability.
- Crowd control operations.

The CBRNE planner must be keenly aware of the full extent to which DOD decontamination capabilities will be employed in a DSCA environment. Incorporating the special considerations into staff preplanning and command guidelines will strengthen the execution of mass decontamination operations.

An additional source of information that can be used to amplify and support these special considerations is the DHS lessons-learned, information-sharing Web site at <*http://www.LLIS.gov*>. It contains an archive of best practices for subjects of interest to the response community at large. One of the citations, "Radiological Dispersal Device Incident Response Planning: Decontamination," provides insight into the topical discussions presented here.

Personnel to be Decontaminated

In the AS07 scenario, computer modeling indicated that about 21,000 citizens were within the area defined as the "evacuation zone." Some of these citizens would need to be evacuated immediately, while it might be possible for others who were further downwind to find shelter and be evacuated later.

It is reasonable to assume that not all personnel within the evacuation zone were contaminated. Identifying those who were "clean" (not contaminated) would greatly reduce the decontamination resources required and expended. In a no-notice event, such as that of AS07, the prescreening process is complicated by several factors. For example, many actual or potential victims may have self-evacuated, which creates problems such as locating and treating them, communicating with them, and dealing with any cross contamination that may have occurred as a result of their evacuation. Additionally, first responders—some of whom may be victims themselves or become victims through exposure—may arrive late and be uninformed due to degraded communications.

Multisite Operations

Most likely, several decontamination sites will need to be established around the plume perimeter to effectively respond to the magnitude of need at a mass casualty incident. While DOD is not the primary agency responsible for coordinating the operation of multiple decontamination sites, the efficiency and success of the process can be maintained and even improved with the help of military leaders who are prepared to provide

support or relief to any operation or take over the full operation of a particular site.

Integration of Decontamination Operations With Other Plans

Decontamination operations must be integrated into the entire mitigation and recovery process. Successful decontamination operations include planning the initial medical triage; completing follow-on medical care; and providing subsequent transportation, food, clothing, and shelter for all prescreened individuals.

Ambulatory and nonambulatory decontamination lines must be established. The distance from the decontamination area to triage facilities and transportation staging areas should be established in such a manner that wind shifts do not threaten operations. Other provisions that must be planned include food and water for those awaiting transportation, trash collection, and the proper consolidation and disposal of contaminated clothing and personal effects. To prevent overcrowding at the decontamination site, it is recommended that pickup and transportation be conducted according to *National Response Plan* Emergency Support Function #8 (Health and Medical Annex) and in coordination with the American Red Cross.

Disposition of Runoff

During conventional hazardous-materials decontamination operations, runoff is contained to prevent environmental contamination. A hard surface with the proper grade for reducing cross contamination is essential for containing the runoff. There are numerous federal and state laws that govern runoff, and runoff issues must be addressed and coordinated with the proper environmental agencies.

The need to quickly process large numbers of people through the decontamination line makes runoff containment in the DSCA environment particularly challenging. And the ECDS and LDS operate as high-volume/low-pressure systems, generating significant amounts of runoff. Therefore, the selection of a proper location and configuration for the runoff containment system is crucial for enabling continuous decontamination operations and reducing the amount of postdecontamination remediation necessary. When planning and executing decontamination operations in a DSCA environment, CBRNE staff officers must consider laws, policies, and environmental impacts regarding runoff. Environmental Protection Agency (EPA) 550-F-00-009 contains an excellent synopsis of this issue.

Disposition of Personal Effects

The need to quickly and efficiently decontaminate a large number of people also creates the need to handle their personal effects. Jurisdictional decisions regarding the disposition of personal effects must be addressed during the planning stages. Decisions regarding the disposition of identification items such as licenses and credit cards must be consistent with local protocols. In addition, protocols for the screening and disposition of vehicles must also be in place.

Accountability

The magnitude of the event presented in the AS07 exercise most certainly represents a worst-case scenario. But, in every event, ascertaining the disposition of everyone who is affected, displaced, injured, or killed is a major concern. Complicating the need to track a large number of displaced residents through evacuation, decontamination, transportation, and follow-up medical care is the fact that they may have also been stripped of any identification. In the initial chaos of a no-notice event, other priorities may have precluded the establishment of accountability protocols. In any case, although this task is not addressed in typical DOD decontamination procedures, DOD may be expected to provide such support in a DSCA environment.

Crowd Control Operations

Crowd control is essential for effective mass decontamination operations. Local law enforcement personnel direct victims to various mass decontamination sites that have been established upwind of the blast and outside the projected plume path. Victims are informed of the necessity to move through the decontamination process in an orderly and efficient manner. While the *Posse Comitatus Act* prevents Title 10 forces[6] from performing law enforcement duties, the planning and operation of a mass decontamination station must address the need for crowd control and coordination of civilian law enforcement support.

Summary

The capabilities and procedures used to conduct expedient mass decontamination have undergone dramatic changes in recent years. Although DOD is not the lead agency for coordinating the overall decontamination effort in a catastrophic scenario such as a nuclear detonation, DOD forces will likely be called upon to augment existing local or state first-responder operations or establish their own mass decontamination sites.

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Captain Fred Smith

Luckily the injuries were not life threatening and one of my troops ended up in Japan for a month or so for a large burn. He was the one who told us about what had happened as it went up in front of him. [*sic*]"

Captain Smith's decorations and awards included a Silver Star, Bronze Star Medal with oak leaf cluster, Air Medal with three oak leaf clusters, Army Commendation Medal, Good Conduct Medal, National Defense Service Medal, Vietnam Service Medal, Republic of Vietnam Campaign Medal, Parachutist Badge, and Senior Explosive Ordnance Disposal Badge.

Captain Smith was born on 6 March 1946; his hometown was Oklahoma City, Oklahoma. He arrived in Vietnam on 23 March 1970. At the time of his death, Captain Smith was stationed at Phuoc Vinh, Republic of South Vietnam. He served as the Chemical officer and assistant operations and training officer (S3) for 2d Brigade, First Cavalry Division.

While Captain Smith was serving in Vietnam, his wife gave birth to a son who, unfortunately, never had a chance to meet his father.

I am searching for any witnesses to this tragic event. Please contact me at (719) 873-1065 or *mvining@amigo.net* if you have any information.

Endnote:

[1]Matthew Brennan, editor, *Hunter-Killer Squadron: Aero-Weapons, Aero-Scouts, Aero-Rifles, Vietnam 1965–1972*, Presidio Press, Notavo, California, 1990.

Sergeant Major Vining (Retired) is a 30-year Army veteran. From 26 February 1970 through 29 January 1971, he was assigned to the 99th Ordnance Detachment, Explosive Ordnance Disposal Unit, Phuoc Vinh, Republic of South Vietnam.

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This creates the need for DOD to understand the operational employment concepts and equipment that may be employed by civilian first responders. The AS07 exercise provided DOD with that opportunity.

We do not train just for the sake of training. We train because we may actually need to execute the scenario someday.

Endnotes:

[1]The Homeland Security Council, "Scenario 1: Nuclear Detonation—10-Kiloton Improvised Nuclear Device," *National Planning Scenarios*, March 2006.

[2]United States Code (USC), Title 32, *National Guard*.

[3]From a Chemical/Biological Incident Response Force organizational brief and statements made by CCMRF task force response personnel at the CCMRF Commanders' Conference hosted by Joint Task Force–Civil Support, Fort Monroe, Virginia, 28–30 August 2007.

[4] In 2003, SBCCOM was renamed the Natick Soldier Research, Development, and Engineering Center under the U.S. Army Research and Development Command.

[5]SBCCOM, *Guidelines for Mass Casualty Decontamination During a Terrorist Chemical Agent Incident*, January 2000, available at *<http://www.esd.uga.edu/hart/Web%20Page/Publications/Mass%20Cas.%20Decon..pdf>*, accessed on 15 April 2008.

[6] USC, Title 10, *Armed Forces*.

References:

CBRNIAC Number CR-04-12, *Emergency Decontamination Corridor and Ladder Pipe Decontamination Systems*, May 2004.

DHS *Lessons Learned, Information Sharing* Web site, *<http://www.LLIS.gov>*, accessed on 16 April 2008.

DHS, *National Response Framework*, 22 March 2008.

DHS, *National Response Plan,* December 2004.

EPA 550-F-00-009, *First Responders' Environmental Liability Due to Mass Decontamination Runoff*, July 2000.

NORTHCOM Contingency Plan 2501, *Defense Support to Civil Authorities (DSCA)*, 11 March 2006.

Public Law (PL) 93-288, *Robert T. Stafford Disaster Relief and Emergency Assistance Act* (as codified at *42 USC 68*), 22 May 1974.

SOAR-03-10, *Best Practices and Guidelines for Mass Personnel Decontamination*, June 2003.

USC, Title 18, Section 1385, *Posse Comitatus Act*, 16 June 1878.

USC, Title 31, Section 1535, *The Economy Act*, 25 June 2003.

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