

# The Impact of Weapons of Mass Destruction on Battlefield Operations

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*Weapons that through use or the threat of use can cause large-scale shifts in objectives, phases, and courses of action.*

—FM 100-5, *Operations*, 1993

**I**N APRIL 1988, Iraq began Operation *Blessed Ramadan* to retake the Al Faw peninsula. The attack began on the morning of 17 April. Armored forces of the Republican Guard conducted the main attack. The Iraqi 7th Corps conducted a supporting attack along the west bank of the Shatt-al-Arab channel. The Iraqis also conducted two amphibious assaults along the western coast of the peninsula. The Iraqi plan called for a three-phase operation lasting four to five days. The employment of chemical weapons was an integral part of the Iraqi plan. Non-persistent nerve agent was used on the defending Iranians. Reports indicate that front-line forces, command and control (C<sup>2</sup>) sites and artillery positions were targeted.<sup>1</sup> Both artillery and aircraft delivered the chemical agent on the intended targets. Only 35 hours were required to complete the operation. The Iranians never recovered from the initial assault and were unable to reestablish an effective defense. The Iranian retreat across the Shatt-al-Arab turned into a complete rout, with the Iranians abandoning most of their equipment. The Iraqis did not

win this battle solely by employing chemical weapons, but their impact was significant.<sup>2</sup> The use of chemical weapons in this battle caused casualties, disrupted operations, hindered battle command and allowed the Iraqis to retain the initiative throughout the attack.

Lesson from the Iran-Iraq War show that the employment of chemical weapons did have tactical significance during several battles. One analyst felt that the employment in the Iran-Iraq War was an example of "low-level, sporadic use of chemical weapons." He concluded that this "was far less devastating to those involved than it might have been or could be in a future conflict."<sup>3</sup> Yet, this limited usage was a major contributor to Iraq's successes against an otherwise superior force. The Iraqi use of chemical weapons during its war with Iran clearly demonstrates the impact that weapons of mass destruction can have on the battlefield.

One of the significant factors affecting today's national security environment is the proliferation of weapons of mass destruction.<sup>4</sup> The revised edition of US Army Field Manual (FM) 100-5, *Operations*, establishes that the Army must be capable of waging war under any condition, including those created by weapons of mass destruction. There is a need to reassess the

implications and impact of these weapons on future military operations. FM 100-5 gives the term *weapons of mass destruction* a rather broad definition. Currently, only three weapon types—nuclear, biological and chemical (NBC)—meet the criteria because of their large area coverage or long-lasting effects.

A recent congressional inquiry determined that the chemical and biological warfare “threat has increased in terms of widespread proliferation, technological diversity and probability of use.”<sup>5</sup> The proliferation of NBC weapons has increased over the past decade. Today, more than 24 countries are confirmed or suspected of having an offensive chemical warfare program. Fourteen countries have, or are suspected of having, an offensive biological warfare program. Sixteen countries have confirmed or suspected nuclear weapons programs. One thing is certain, these weapons will continue to pose a threat to US forces facing future contingency requirements regardless of the region or level of conflict.

Nations seek to obtain these weapons as low-cost alternatives to expensive conventional weapons that provide an added measure of political leverage in dealing with their neighbors. Some nations seek these weapons as status symbols to gain acceptance as world or regional powers. Whatever the reason, nations seeking or already having NBC weapons believe in their utility as force multipliers.

When ratified, the new Chemical Warfare Convention (CWC) is expected to limit the growth of chemical weapon stockpiles and reduce the likelihood of conflicts with massive

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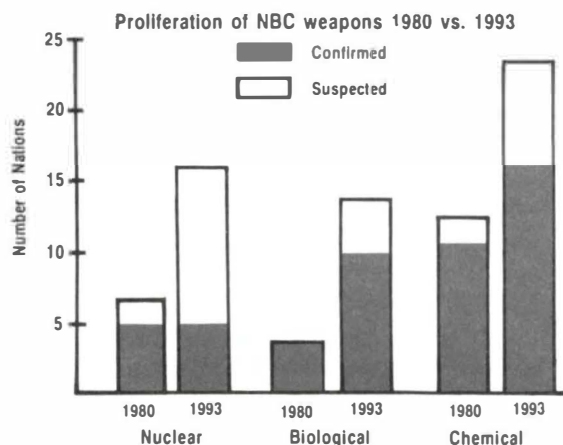
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employment of chemical weapons. However, the risk of employment on a reduced scale will grow as rogue nations seek to take advantage of the battlefield asymmetry that one-sided use of chemicals can create. Several countries thought to possess chemical weapons, such as North Korea and Iraq, have refused to sign the convention. Others that have signed it have a history of disregarding international accords. As with the 1972 biological weapons ban, the CWC can, at best, be expected to “keep honest people honest.” It will not deter use of this kind of weaponry by a strong-willed aggressor.

Since the United States no longer allows itself to use chemical weapons in retaliation, chemical defense takes on greater importance. Further, the growing biological threat and the spread of nuclear weaponry increases the importance of both passive and active defense against these weapons as well. US forces must do more than survive an NBC attack—we must be trained and equipped to continue the mission under NBC conditions. Maintaining a robust NBC defense capability is the only way to ensure that the Army is ready to face an opponent who possesses an offensive NBC capability. NBC defense on a power-projection battlefield is necessary to deter and, if necessary, counter an enemy’s use of weapons of mass destruction.



## Impact on Tactical Operations

Our experiences, both in training and actual combat, demonstrate the debilitating impact of NBC weapons. Continued observations from our combat training centers show that the introduction of NBC into a training scenario contributes to mission degradation or failure. In other

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words, NBC affects the outcome of battles. The effects of these weapons rarely involve heavy attacks with massive casualties. Rather, they cause the disruption of operations through the performance degradation caused by adopting protective measures and the burden of added leader tasks. Typical comments from unit after-action reviews show that NBC conditions impair synchronization, diminish agility, slow the tempo and disrupt battle command.

In one such battle at the National Training Center, Fort Irwin, California, a brigade conducting a deliberate attack encountered a chemically contaminated area. While only one platoon actually entered the contamination, the forward momentum of the brigade was halted. Once forward movement was regained, the brigade conducted a piecemeal assault. The tempo of the attack was never fully restored; massing of combat power at the decisive point was never achieved. While the brigade suffered very few casualties from contamination, the unit never reached its objective. In this case, the effect on the operation was profound.<sup>6</sup>

The key point is that the unit was not prepared to perform its mission in a chemical environment. To overcome this commanders must understand the impact that weapons of mass destruction will have on battlefield operations and take the necessary steps to prepare their units for such situations. During the Army's Combined Arms in a Nuclear/Chemical Environment (CANE) tests, force-on-force evaluations showed unit performance was degraded in operations under NBC conditions. For attacks and defenses, units were required to operate in the highest protective posture, mission-oriented protection posture (MOPP4). During offensive operations it was noted that:

- Attacks and engagements lasted longer.
- Fewer enemy forces were killed.
- Friendly forces suffered more casualties.
- Friendly forces fired fewer rounds at the enemy.
- Fratricide increased.
- Terrain was used less effectively for cover and concealment.<sup>7</sup>

Many of the same observations held true for defensive operations. Throughout the CANE tests, it was noted that performance of routine tasks and those tasks in which the unit was well trained suffered the least degradation. While a unit cannot win a battle through NBC defense, it can lose a battle through the inability to conduct its mission in an NBC environment.

## Battlefield Effects

The effects of NBC weapons on the battlefield are unique. They will produce extensive casualties against an unprotected force. It is particularly crucial to consider the impact on allies and coalition members who may be less well-protected than our forces. The effectiveness of weapon systems and battle command is degraded. Operations under NBC conditions can decrease weapon systems' effectiveness by up to 60 percent.<sup>8</sup> Leaders are less effective, communication is more difficult, and critical tasks are neglected. To achieve the same objective, operations under NBC conditions require more combat power than operations not under NBC conditions.





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NBC contamination will limit the consumption of supplies and the use of weapons and equipment, and decontamination operations are extremely resource intensive. Long-lasting contamination on terrain can severely limit friendly use of key terrain.

The operational tempo of battles and engagements slows because of the effect on battle command, degradation from protective equipment and battlefield contamination. The speed, cohesion and flexibility of movement is reduced. Contaminated areas and debris from nuclear detonations make movement more difficult. Attacks may take up to twice as long under NBC conditions. Because battles and engagements last longer, more supplies are consumed. Additionally, equipping and maintaining a force in an NBC-protective posture increases the burden on the logistics system.

The effects of weapons of mass destruction in combination with conventional munitions creates a synergistic effect. The effect of other munitions is enhanced. Psychological casualties will increase because of the fear and fatigue arising from the nature of the killing agent and the

need to conduct operations for extended periods of time in burdensome protective equipment. Soldiers are fearful of the effects from weapons of mass destruction, and prolonged operations in protective equipment produces numerous physiological effects on soldiers.

To protect the force, commanders must divert significant combat power to counter or defeat enemy weapons and delivery systems. Elimination of the enemy's capability to employ weapons of mass destruction requires substantial combat power and can never be totally successful. Massing of forces creates lucrative targets. This increases the need for dispersion and negates the advantages of concentration.

At the operational and strategic levels, the use of NBC weapons escalates the conflict and creates a more difficult environment for conflict termination and postconflict activities. Commanders must consider how to respond to an enemy's use of weapons of mass destruction. Even if such weapons are not actually used, the threat of use, by itself, will produce militarily significant results. The force must adopt an NBC defense posture requiring logistical

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support. Resources must be devoted to achieving and maintaining NBC defense readiness.

## **NBC and the Operational Tenets**

FM 100-5 states that success on the battlefield depends on the ability of forces to follow operational tenets. Consider the primary effects from weapons of mass destruction on each tenet of Army operations.

**Initiative.** The introduction of NBC weapons on the battlefield by an opponent gives him the initiative. It places us on the defensive and changes the terms of the battle in his favor. With even the mere threat of their use, NBC weapons can become a dominating factor on the battlefield. During the Gulf War, preparations for operations under NBC conditions preoccupied many units. Destruction of Iraq's capability to wage chemical and biological warfare ranked as one of the highest priorities of the air phase of the war. Operations under NBC conditions degrade a leader's ability to set or change the terms of battle. By understanding the threat, the enemy's capabilities and intentions, it is possible to anticipate his use of NBC weapons and reduce many of their effects.

**Agility.** NBC weapons exert great combat power at the moment of their employment. Equally important, their residual effects also degrade our ability to act long after employment. Nuclear weapons create large areas of contamination and destruction, requiring units to avoid these areas or carefully regulate their

time in them. Chemical and biological weapons can render portions of the battlefield extremely hazardous. If we choose to operate in these areas, individuals must assume a protective posture. Operations under NBC conditions degrade the mental and physical quality of our forces. This reduces the ability to rapidly concentrate friendly strengths against enemy weaknesses. Successful application of NBC reconnaissance units and doctrine can enhance a unit's agility on the battlefield.

**Depth.** Through innovative selection of delivery means and by capitalizing on agent characteristics, weapons of mass destruction can be employed throughout the depth of the battlefield. Biological agents can cover large areas of the battlefield following a single employment well outside the battle area. Weapons of mass destruction extend across the organization of the battlefield and place our forces at risk throughout the area of operations. Operations under NBC conditions often require additional forces to achieve the same combat power as on a conventional battlefield. A commander's ability to control the necessary space through the depth of the battlefield and maneuver effectively is also reduced. Through the employment of detectors and alarms, NBC reconnaissance, decontamination and other passive measures, we can lessen the impact of NBC weapons anywhere on the battlefield.

**Synchronization.** US forces achieve synchronization by arranging activities in time and space to provide mass at the decisive point. An opponent employs weapons of mass destruction to break synchronization by disrupting the tempo and momentum of our forces. Forces arrive at the decisive point in a piecemeal fashion, and mass is never achieved. Battle command is crucial to synchronization. C<sup>2</sup> sites are typical NBC targets. Operations under NBC conditions degrades battle command. Through the CANE tests, the effect on battle command was clearly seen. The quality of leadership decreased, reports were less timely, coordination was often ineffective, clarity and conciseness of orders decreased and responses slowed.





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**Versatility.** The residual effect of NBC contamination strips away a unit's versatility. Contaminated units are unable to shift rapidly from one mission to another. However, this tenet ensures a degree of success under NBC conditions. The ability to rapidly transition from operations in a conventional environment to operations in an NBC environment is based upon an organization's versatility. Training, leadership and planning are critical elements that allow for transition to operations under NBC conditions. A robust chemical specialist representation in the force's composition is also essential to be versatile enough to transition to an NBC fight.

## Effects on Combat Power

Combat power is a combination of maneuver, firepower, protection and leadership. On the battlefield where weapons of mass destruction have been or may be employed, protection is even more important. Keys to force survival are training and equipping forces to operate on a contaminated battlefield. All units must take force protection measures to ensure survival. Until recently, our ability to deter a potential adversary from using chemical weapons relied on our capability to retaliate in kind. Today, we no longer have that capability; our NBC defense capability must be sufficient to reduce the

incentive to use weapons of mass destruction. One of the lessons of the Iran–Iraq War shows that the effectiveness of chemical weapons increases when employed against a force that is not readily capable of defending itself. Indeed, history tells us that chemical weapons are far more likely to be used against an unprepared force.

## Power Projection

Based on the continuing spread of weapons of mass destruction, no region or level of involvement is exempt from potential use of such weapons. Delivery systems range from intercontinental and ballistic missiles through standard battlefield weapons such as artillery and bombs, to terrorist or special operations forces “hand delivery,” such as a rented truck or boat. This is

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particularly significant when the use of NBC weapons during the initial period of early-entry operations could have devastating effects. It is reasonable to assume that our potential enemies learned lessons from our recent operations in the Gulf War. Protecting the force against weapons of mass destruction must begin long before any deployment. Training, logistic readiness and intelligence are critical components. Units must train to protect themselves and to operate under NBC conditions. Just getting the troops in MOPP gear is not enough. The protective equipment, NBC reconnaissance systems, detectors and alarms, decontamination capability and other

critical items must be available and ready to use. Tactics, techniques and decision matrices must be understood and practiced. Understanding the enemy's threat, capabilities and intentions is a continuous task. We cannot afford any surprises.

During force–projection operations, commanders must look at the impact of weapons of mass destruction by stage of the operation. In the case of nuclear weapons, actual projection of forces into the theater of operations may be difficult. During a recent wargame, the opposing force used a tactical ballistic missile saturation attack against the early entry force. The early entry force destroyed all but two of the missiles, but those two missiles, armed with nuclear warheads, caused 1,000 immediate casualties among the early force. A lesson from this wargame is that “we will have to think about new ways of getting into a theater of operations.”<sup>9</sup>

Intelligence concerning the enemy's capability to employ NBC weapons is critical. Types of weapons, delivery means, production and storage facilities and employment doctrine are examples of the intelligence required long before deployment begins. The ability of the enemy to use weapons of mass destruction will affect the force tailoring process. To provide force protection, the initial force package must include air defense units to afford a theater ballistic missile defense and chemical units to provide NBC reconnaissance, chemical/biological detection, large area smoke and decontamination.

NBC defense training at all levels is essential for providing a force capable of projection to regional conflicts. While units may not expect to deploy to a theater where there is an NBC threat, it can occur. We can assume that an NBC-capable enemy will not allow us to mass our combat power and conduct a lengthy preparation period that includes extensive NBC defense training. The newest tenet of Army operations—versatility—requires that units have the ability to operate in many environments. Once weapons of mass destruction are employed, they create their own unique physical environment. NBC defense training and the introduction of NBC conditions during exer-



cises is crucial for establishing a versatile force capable of power-projection operations.

## Force Protection

FM 100-5 states that when an enemy possesses weapons of mass destruction, the vulnerability of initial entry forces is acute.<sup>10</sup> To counter this vulnerability, force protection is critical and must remain part of the overall concept through war termination. Force protection considerations include dispersing forces and installations, maintaining tactical and operational mobility and planning for rapid reorganization of forces. Critical tasks of force protection are:<sup>11</sup>

**Maintain alertness.** Commanders at all levels must be continuously alert to the use of these weapons. They must balance risk against mission requirements and adjust their MOPP level without losing momentum.

**Develop leaders.** Leaders are the most critical component in force protection. Confident, competent leaders make the difference in such a complex environment. Once NBC conditions are imposed on the battlefield, the challenge to leadership increases dramatically.<sup>12</sup> Leaders must train to conduct operations under NBC conditions.

**Instill discipline.** Units must continue their missions despite the employment of NBC weapons by an adversary. Personnel must be adequately trained, properly equipped and psychologically prepared for the effects of nuclear and chemical weapons.

**Avoid detection.** Units must use active and passive measures to negate the threat's target acquisition means. The combination of active and passive force protection measures will negate any possible advantageous use of these weapons by an adversary.

**Retain mobility.** Tactical, operational and strategic mobility will enhance chances for survival. Commanders at all levels must consider displacing or dispersing whenever the threat of nuclear or chemical use is imminent.

**Disperse forces and installations to minimize potential damage.** Commanders will disperse forces based on an adversary's ability to employ weapons of mass destruction. The ex-

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tent of dispersion depends on the mission, enemy, terrain, troops, and time available). Dispersion includes plans for massing forces quickly once there is a reduction in risk of employment of weapons of mass destruction. The commander determines the size and type of maneuver forces and the timing for their concentration. Troop concentrations should be brief in duration and flexible to accommodate sudden changes, and they must use deception of the highest quality. Operations should be swift and violent to take advantage of concentration.

**Use terrain for cover and shielding.** Careful use of natural terrain shields personnel and equipment from the effects of nuclear and chemical weapons.

**Ensure logistic preparedness.** Combat service support personnel and installations will disperse while continuing to sustain the force. Units must have sufficient supplies, protective clothing, decontamination equipment and medical supplies to continue operations without immediate need for resupply.

**Plan for reorganization.** Commanders must anticipate the need to reorganize units following the employment of weapons of mass destruction. Prompt damage assessment of personnel and equipment and the rapid implementation of reorganization measures will allow the unit to maintain momentum and continue the mission.

**Reduce risk.** Commanders plan and conduct operations with the knowledge that weapons of mass destruction may be used by an adversary at



any time. To reduce that risk, it is essential that our units maintain alertness, avoid detection and retain mobility.

**Conduct offensive operations.** Nullify the use of weapons of mass destruction by attacking them at their source, before they can be employed against friendly forces and populations.

## The Future

The proliferation of weapons of mass destruction has altered the nature of regional conflict. While international efforts continue to reduce the spread of weapons of mass destruction, in all reality, potential enemies will continue to seek and obtain these weapons. The introduction of forces into regional conflicts has become increasingly risky due to the proliferation of these weapons. Therefore, commanders must consider the impact of these weapons on all stages of their operations, from mobilization through postconflict operations. US forces may encounter NBC weapons in operations other than war. Peacemaking, humanitarian, shows of force and other operations all have potential for encountering NBC weapons.

The potential of the use of weapons of mass destruction requires planners to consider creating force dispositions that do not provide lucra-

tive targets. In addition, offensive operations must combine with defensive umbrellas to limit the threat as close to its source as possible. Finally, planners must integrate the use of NBC reconnaissance and decontamination assets into the overall plan.<sup>13</sup> The emphasis must be on training to reduce the effects of the use of weapons of mass destruction. It is necessary to meet the challenges that weapons of mass destruction have on our warfighting capabilities. We must stand ready to fight and win under any condition, to include those produced by weapons of mass destruction.

As stated in Chapter 1 of FM 100-5, "The Army faces a unique set of challenges as it adapts to a world that has changed more broadly and fundamentally than at any other time since the end of World War II."<sup>14</sup> This is certainly the case for weapons of mass destruction. The NBC threat has changed; US National Policy has changed; strategic, operational and tactical warfare considerations have changed. The challenge now is to ensure that as the implementation of FM 100-5 moves forward, consideration of the impact of weapons of mass destruction is fully integrated into the development of our future warfighting capabilities. **MR**

## NOTES

1. Anthony H. Cordesman and Abraham R. Wagner, *The Lessons of Modern War—Volume II: The Iran–Iraq War* (Boulder, CO: Westview Press, 1990); and Gordon M. Burck and Charles C. Flowerree, *International Handbook on Chemical Weapons Proliferation* (Westport, CT: Greenwood Press, 1991).
2. Cordesman and Wagner, 509.
3. Burck and Flowerree, 117.
4. *National Military Strategy* (Washington, DC: The Pentagon, 1992).
5. US Congress, *Countering the Chemical and Biological Weapons Threat in the Post-Soviet World*, 23 February 1993.
6. MAJ Robert C. Neumann, "Dealing with a Contaminated Area—An Analysis of an wTC Battle," *CML — Army Chemical Review* (July 1992): 7.
7. US Army Chemical School, *Summary Evaluation Report for Combined Arms in a Nuclear/Chemical Environment Force Development Test and*

*Experimentation—Phase I*, March 1986.

8. US Army Chemical School, *Summary Evaluation Report for Combined Arms in a Nuclear/Chemical Environment Force Development Test and Experimentation—Close Combat Light*, May 1993, 2-4.

9. Sam Gardiner, "Playing with Nuclear Weapons," unknown publication, 19.

10. US Army Field Manual (FM) 100-5, *Operations* (Washington, DC: Headquarters, Department of the Army, 14 June 1993), 3-10.

11. LTC Michael Rampy, "Weapons of Mass Destruction Module for FM 100-5, *Operations and US Army, FM 100-5, Operations*," 20 August 1982, 4-4.

12. US Army Chemical School, *Summary Evaluation Report for Combined Arms in a Nuclear/Chemical Environment Force Development Test and Experimentation—Close Combat Light*, May 1993.

13. Rampy.

14. FM 100-5, 1-5.

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