

Chapter 11: NBC and Smoke Operations

This page is a section of FM 7-100.1 Opposing Forces Operations.

The use of nuclear, biological, and chemical (NBC) weapons can have an enormous impact on all battlefield operations.[1] Not only does the sheer killing and destructive power of these weapons affect the battlefield, but the strategic, operational, psychological, environmental, economic, and political consequences of their use affect strategic campaign plans and operational design.

In response to foreign developments, the OPFOR maintains a capability to conduct chemical, nuclear, and possibly biological warfare. However, it would prefer to avoid the use of NBC weapons by either side—especially nuclear and biological weapons. Both nuclear and biological weapons characteristically have lethal effects over much larger areas than do chemical weapons. The effects of biological weapons can be difficult to localize and to employ in operations without affecting friendly forces; their effects on the enemy can be difficult to predict. Unlike nuclear or biological weapons, chemical agents can be used to affect limited areas of the battlefield. The consequences of chemical weapons use are more predictable and thus more readily integrated into operation plans.

Because chemical employment is more likely than nuclear or biological, this chapter begins by focusing on OPFOR chemical capabilities. Because the OPFOR may also have some nuclear and biological capabilities, these also deserve discussion, despite of the lower probability of their employment. The chapter concludes with discussions of NBC protection and employment of smoke.

Preparedness

Due to the proliferation of NBC weapons, the OPFOR must anticipate their use, particularly the employment of chemical weapons. OPFOR planners believe that the best solution is to locate and destroy enemy NBC weapons and their supporting infrastructure before the enemy can use them against OPFOR troops or the State. In case this fails and it is necessary to continue combat operations despite the presence of contaminants, the OPFOR has developed and fielded a wide range of NBC detection and warning devices, individual and collective protection equipment, and decontamination equipment.

Multiple Options

Force modernization has introduced a degree of flexibility previously unavailable to combined arms commanders. It creates multiple options for the employment of forces at strategic, operational, and tactical levels with or without the use of NBC weapons. Many of the same delivery means available for NBC weapons can also be used to deliver precision weapons that can often achieve desired effects without the stigma associated with NBC weapons.

The OPFOR might use NBC weapons either to deter aggression or as a response to an enemy attack on the State. It has surface-to-surface missiles (SSMs) capable of carrying nuclear, chemical, or biological warheads. Most OPFOR artillery is capable of delivering chemical munitions, and most systems 152-mm and larger are capable of firing nuclear rounds. Additionally, the OPFOR could use aircraft systems and cruise missiles to deliver an NBC attack. The State has also trained special-purpose forces (SPF) as alternate means of delivering NBC munitions packages. The threat of using any or all of these means to deliver NBC weapons is an intimidating factor that the State can use against potential regional and/or extraregional adversaries.

Targeting

The OPFOR considers the following targets to be suitable for the employment of NBC weapons:

- NBC delivery means and their supply structure.
- Precision weapons.
- Prepared defensive positions.
- Reserves and troop concentrations.
- Command and control (C2); reconnaissance, intelligence, surveillance, and target acquisition (RISTA); and communications centers.
- Key air defense sites.
- Logistics installations, especially port facilities.
- Airfields the OPFOR does not intend to use immediately.

Enemy NBC delivery means (aircraft, artillery, missiles, and rockets) normally receive the highest priority. The suitability of other targets depends on the OPFOR's missions, the current military and political situation, and the NBC weapons available for use.[2]

Staff Responsibility

On the functional staff of an operational-level headquarters (such as an OSC), the chief of WMD is responsible for planning the offensive use of WMD, including NBC weapons. (See the subsections on Release under Chemical Warfare, Nuclear Warfare, and Biological Warfare below.) The WMD staff element advises the command group and the primary and secondary staff on issues pertaining to NBC employment. The WMD element receives liaison teams from any subordinate or supporting units that contain WMD delivery means.

NBC defense comes under the chief of force protection. The force protection element of the functional staff may receive liaison teams from any subordinate or supporting chemical defense units.[3] However, those units can also send liaison teams to other parts of the staff, as necessary (including, for example, the chief of reconnaissance).

Chemical Warfare

The OPFOR is equipped, structured, and trained to conduct both offensive and defensive chemical warfare. It is continually striving to improve its chemical warfare capabilities. It believes that an army using chemical weapons must be prepared to fight in the environment it creates. Therefore, it views chemical defense as part of a viable offensive chemical warfare capability. It maintains a large inventory of individual and collective chemical protection and decontamination equipment. (See the NBC Protection portion of this chapter.)

Weapons and Agents

Chemical delivery means include aircraft, multiple rocket launchers (MRLs), artillery, mines, rockets, and missiles. Virtually all OPFOR indirect fire weapons can deliver chemical agents. Other possible delivery means could include SPF, affiliated insurgent or terrorist organizations, or civilian sympathizers.

One way of classifying chemical agents according to the effect they have on persons. Thus, there are two major types, each with subcategories. Lethal agents, categorized by how they attack and kill personnel, include nerve, blood, blister, and choking agents. Nonlethal agents include incapacitants and irritants. (See FM 7-100.2 for more details on these agent types.)

Chemical agents are also categorized according to their persistency. Generally, the OPFOR would use persistent agents on areas it does not plan to enter and nonpersistent agents where it does.

Persistent agents can retain their disabling or lethal characteristics from days to weeks, depending on environmental conditions. Aside from producing mass casualties initially, persistent agents can produce a steady rate of attrition and have a devastating effect on morale. They can seriously degrade the performance of personnel in protective clothing or impose delays

for decontamination.

Nonpersistent agents generally last a shorter period of time than persistent agents, depending on weather conditions. The use of a nonpersistent agent at a critical moment in battle can produce casualties or force enemy troops into a higher level of individual protective measures. With proper timing and distance, the OPFOR can employ nonpersistent agents and then have its maneuver units advance into or occupy an enemy position without having to decontaminate the area or don protective gear.

Other Toxic Chemicals

In addition to traditional chemical warfare agents, the OPFOR may find creative and adaptive ways to cause chemical hazards using chemicals commonly present in industry or in everyday households. In the right combination, or in and of themselves, the large-scale release of such chemicals can present a health risk, whether caused by military operations, intentional use, or accidental release.

Toxic Industrial Chemicals

Toxic industrial chemicals (TICs) are chemical substances with acute toxicity that are produced in large quantities for industrial purposes. Exposure to some industrial chemicals can have a lethal or debilitating effect on humans. The near-universal availability of large quantities of highly toxic stored materials, their proximity to urban areas, their low cost, and the low security associated with storage facilities, make them a potentially attractive option for use as weapons of opportunity or weapons of mass destruction. Employing a TIC against an opponent by means of a weapon delivery system, whether conventional or unconventional, is considered a chemical warfare attack, with the TIC used as a chemical agent. The target may be the enemy's military forces or his civilian population.

In addition to the threat from intentional use as weapons, catastrophic accidental releases of stored industrial chemicals may result from collateral damage associated with military operations, electrical power interruption, or improper facility maintenance or shutdown procedures. These events are common in armed conflict and post-conflict urban environments.

The most important factors to consider when assessing the potential for adverse human health impacts from a chemical release are acute toxicity, physical properties (volatility, reactivity, flammability), and the likelihood that large quantities will be accidentally released or available for exploitation. Foremost among these factors is acute toxicity.

The following are examples of high- and moderate-risk TICs, based on acute toxicity by inhalation, worldwide availability (number of producers and number of countries where the substance is available), and physical state (gas, liquid, or solid) at standard temperature and pressure:

- High-Risk. Ammonia, chlorine, fluorine, formaldehyde, hydrogen chloride, hydrogen cyanide, phosgene, sulfuric acid.
- Moderate-Risk. Carbon monoxide, methyl bromide, nitrogen dioxide, phosphine.

This list does not include all chemicals with high toxicity and availability. Specifically, chemicals with low volatility are not included. Low-vapor pressure chemicals include some of the most highly toxic chemicals widely available, including most pesticides.

Some of the high-risk TICs are frequently present in an operational environment. Chlorine (water treatment and cleaning materials), phosgene (insecticides and fertilizers), and hydrogen cyanide are traditional chemical warfare agents that are also considered TICs. Cyanide salts may be used to contaminate food or water supplies. Hydrogen chloride is used in the production of hydrochloric acid. Formaldehyde is a disinfectant and preservative. Fluorine is a base element that is used to produce fluorocarbons. Fluorocarbons are any of various chemically inert

compounds that contain both carbon and fluorine. Fluorocarbons are present in common products are refrigerants, lubricants, and nonstick coatings, and are used in the production of resins and plastics.

Household Chemicals

The OPFOR understands that some everyday household chemicals have incompatible properties that result in undesired chemical reaction when mixed with other chemicals. This includes substances that can react to cause an imminent threat to health and safety, such as explosion, fire, and/or the formation of toxic materials. For example, chlorine bleach, when mixed with ammonia, will generate the toxic gases chloramine and hydrazine that can cause serious injury or death. Another example of such incompatibilities is the reaction of alkali metals, such as sodium or potassium, with water. Sodium is commonly used in the commercial manufacture of cyanide, azide, and peroxide, and in photoelectric cells and sodium lamps. It has a very large latent heat capacity and is used in molten form as a coolant in nuclear breeder reactors. The mixture of sodium with water produces sodium hydroxide, which can cause severe burns upon skin contact.

Chemical Release

Among NBC weapons, the State is most likely to use chemical weapons against even an extraregional enemy, particularly if the enemy does not have the capability to respond in kind. Since the State does not believe that first use of chemical agents against units in the field would provoke a nuclear response, it is less rigid than other nations in the control of chemical release.

Initially, the use of chemical weapons is subject to the same level of decision as nuclear and biological weapons. At all levels of command, a chemical weapons plan is part of the fire support plan. Once the National Command Authority (NCA) has released initial authorization for the use of chemical weapons, commanders can employ them freely, as the situation demands. Then each commander at the operational-strategic command (OSC) and lower levels who has systems capable of chemical delivery can implement the chemical portions of his fire support plan, as necessary.

After a decision for nuclear use, the OPFOR can employ chemical weapons to complement nuclear weapons. However, the OPFOR perceives that chemical weapons have a unique role, and their use does not depend on initiation of nuclear warfare. It is possible that the OPFOR would use chemical weapons early in an operation or strategic campaign or from its outset.

Offensive Chemical Employment

The basic principle of chemical warfare is to achieve surprise. It is common to mix chemical rounds with high-explosive (HE) rounds in order to achieve chemical surprise. Chemical casualties inflicted and the necessity of chemical protective gear degrade enemy defensive actions. The OPFOR also may use chemical agents to restrict the use of terrain. For example, contamination of key points along the enemy's lines of communication can seriously disrupt his resupply and reinforcement, while simultaneously keeping those points intact for subsequent use by the attacking OPFOR.

Nonpersistent agents are suitable for use against targets on axes the OPFOR intends to exploit. While possibly used against deep targets, their most likely role is to prepare the way for an assault by maneuver units, especially when enemy positions are not known in detail. The OPFOR may also use nonpersistent agents against civilian population centers in order to create panic and a flood of refugees.

Persistent agents are suitable against targets the OPFOR cannot destroy by conventional or precision weapons. This can be because a target is too large or located with insufficient accuracy for attack by other than an area weapon. Persistent agents can neutralize such targets

without a pinpoint attack.

In the offense, likely chemical targets includeâ

- Troops occupying defensive positions, using nonpersistent agents delivered by MRLs to neutralize these troops just before launching a ground attack. Ideally, these nonpersistent agents would be dissipating just as the attacking OPFOR units enter the area where the chemical attack occurred.
- NBC delivery systems, troop concentration areas, headquarters, and artillery positions, using all types of chemical agents delivered by tube artillery, MRLs, missiles, and aircraft.
- Bypassed pockets of resistance (especially that pose a threat to the attacking forces), using persistent agents.
- Possible assembly areas for enemy counterattack forces, using persistent agents.

The OPFOR could use chemical attacks against such targets simultaneously throughout the enemy defenses. These chemical attacks combine with other forms of conventional attack to neutralize enemy nuclear capability, C2 systems, and aviation. Subsequent chemical attacks may target logistics facilities. The OPFOR would use persistent agents deep within the enemyâ s rear and along troop flanks to protect advancing units.

Defensive Chemical Employment

When the enemy is preparing to attack, the OPFOR can use chemical attacks to disrupt activity in his assembly areas, limit his ability to maneuver into axes favorable to the attack, or deny routes of advance for his reserves. Once the enemy attack begins, the use of chemical agents can impede an attacking force, destroying the momentum of the attack by causing casualties or causing attacking troops to adopt protective measures. Persistent chemical agents can deny the enemy certain terrain and canalize attacking forces into kill zones.

Nuclear Warfare

The OPFOR believes a war is most likely to begin with a phase of non-nuclear combat that may include the use of chemical weapons. The OPFOR emphasizes the destruction of as much as possible of enemy nuclear capability during this nonnuclear phase. To do so, it would use air and missile attacks; airborne, heliborne, and special-purpose forces; and rapid, deep penetrations by ground forces. The OPFOR hopes these attacks can deny the enemy a credible nuclear option.

Delivery Means

Nuclear delivery systems may include aircraft from both national- and theater-level aviation, and SSMs. Most artillery 152-mm or larger is capable of firing nuclear rounds, if such rounds are available. Other possible delivery means could include SPF. The OPFOR is unlikely to use affiliated forces for nuclear delivery.

Transition to Nuclear

Even when nuclear weapons are not used at the outset of a conflict, OPFOR commanders deploy troops based on the assumption that a nuclear-capable enemy might attack with nuclear weapons at any moment. The OPFOR continuously updates its own plans for nuclear employment, although it prefers to avoid nuclear warfare. As long as it achieves its objectives, and there are no indications that the enemy is going to use nuclear weapons, the OPFOR would likely not use them either. However, it could attempt to preempt enemy nuclear use by conducting an initial nuclear attack. Otherwise, any OPFOR decision to go nuclear would have to be made early in the conflict, so that sufficient nonnuclear power would remain to follow up and to exploit the gains of nuclear employment.

If any opponent were to use nuclear weapons against the State, the State would respond in kind,

as long as it is still capable. The same would be true of any nuclear-capable opponent, if the State were the first to use nuclear means. While the State recognizes the advantage of its own first use, it may risk first use only when the payoff appears to outweigh the potential costs. Therefore, it would probably avoid the use of nuclear weapons against an extraregional power unless survival of the regime or the nation is at stake.

The OPFOR is probably more likely to use its nuclear capability against a regional opponent. The likelihood increases if that opponent uses or threatens to use its own nuclear weapons against the State or does not have the means to retaliate in kind. This could account for a nuclear or nuclear- threatened environment existing at the time an outside force might choose to intervene in the region.

Types of Nuclear Attack

The OPFOR categorizes nuclear attacks as either massed or individual attacks. The category depends on the number of targets hit and the number of nuclear munitions used.

A massed nuclear attack employs multiple nuclear munitions simultaneously or over a short time interval. The goal is to destroy a single large enemy formation, or several formations, as well as other important enemy targets. A massed attack can involve a single service of the State's Armed Forces, as in a nuclear missile attack by the Strategic Forces, or the combined forces of different services.

An individual nuclear attack may hit a single target or group of targets. The attack consists of a single nuclear munition, such as a missile or bomb.

Nuclear Release

At all stages of a conflict, the OPFOR keeps nuclear forces ready to make an attack. The decision to initiate nuclear warfare occurs at the highest level of the State government. National-level planners develop the fire plan for the initial nuclear attack for approval by the NCA.

After the initial nuclear release, the NCA may delegate employment authority for subsequent nuclear attacks to an OSC commander. The commander of the OSC's integrated fires command (IFC) submits to the OSC commander, for approval and integration into OSC fire support plans, recommendations for the subsequent employment of nuclear and chemical weapons.

Offensive Nuclear Employment

Once the NCA releases nuclear weapons, two principles govern their use: mass and surprise. The OPFOR plans to conduct the initial nuclear attack suddenly and in coordination with nonnuclear fires. Initial nuclear attack objectives are to destroy the enemy's main combat formations, C2 systems, and nuclear and precision weapons, thereby isolating the battlefield.

Nuclear attacks may target and destroy the enemy's defenses and set the conditions for the exploitation force. Other fire support means support the assault and fixing forces. The OPFOR may plan a high-speed air and ground offensive operation to exploit the nuclear attack.

If the enemy continues to offer organized resistance, the OPFOR might employ subsequent nuclear attacks to reinitiate offensive operations. Nuclear attacks can eliminate the threat of a counterattack or clear resistance from the opposite bank in a water-obstacle crossing. If the enemy begins to withdraw, the OPFOR plans nuclear attacks on choke points where retreating enemy forces present lucrative targets.

Planning

Although the opening stages of an offensive operation are likely to be conventional, OPFOR planning focuses on the necessity of

- Countering enemy employment of nuclear weapons.
- Maintaining the initiative and momentum.
- Maintaining fire superiority over the enemy (preempting his nuclear attack, if necessary).

In deliberately planned operations, the OPFOR plans nuclear fires in detail. An exploitation force would probably receive the highest percentage of weapons; however, the OPFOR may also reserve weapons for other large, important targets. In more fluid situations, such as during exploitation, the commander may keep some nuclear weapon systems at high readiness to fire on targets of opportunity. Nuclear allocations vary with the strength of the enemy defense and the scheme of maneuver.

Since the enemy too is under nuclear threat, he also must disperse his formations, which can make him more vulnerable to penetration by an attacking force. However, the OPFOR realizes that enemy troops are also highly mobile and capable of rapidly concentrating to protect a threatened area. Therefore, it considers surprise and timing of operations to be extremely critical in order to complicate enemy targeting and deny him the time to use his mobility.

Execution

Upon securing a nuclear release, the OPFOR would direct nuclear attacks against the strongest points of the enemy's formations and throughout his operational depth. This would create gaps through which maneuver units, in nuclear-dispersed formations, would attack as an exploitation force. As closely as safety and circumstances permit, maneuver forces follow up on attacks near the battle line. Airborne troops may exploit deep attacks. An exploitation force would probably attack to take full advantage of the speed of advance it could expect to achieve. The aim of these maneuver units would be to seize or neutralize remaining enemy nuclear weapons, delivery systems, and C2 systems. By attacking from different directions, the maneuver units would try to split and isolate the enemy.

Commanders would ensure a rapid tempo of advance by assigning tank and mechanized infantry units to the exploitation force. Such units are quite effective in this role, because they have maneuverability, firepower, lower vulnerability to enemy nuclear attacks, and the capability to achieve penetrations of great depth.

Defensive Nuclear Employment

Primary uses of nuclear weapons in the defense are to

- Destroy enemy nuclear and precision weapons and delivery means.
- Destroy main attacking groups.
- Eliminate penetrations.
- Support counterattacks.
- Deny areas to the enemy.
- Conduct preemptive attack.

If nuclear weapons degrade an enemy offensive, the defender could gain the opportunity to switch quickly to an offensive role.

Biological Warfare

The State closely controls information about the status of its biological warfare capabilities. This creates uncertainty among its regional neighbors and potential extraregional opponents as to what types of biological agents the State might possess and how it might employ them.

Biological weapons can provide a great equalizer in the face of a numerically and/or technologically superior adversary that the OPFOR cannot defeat in a conventional confrontation.

However, their effects on the enemy can be difficult to predict, and the OPFOR must also be concerned about the possibility that the effects could spread to friendly forces.

Weapons and Agents

Biological weapons consist of pathogenic microbes, micro-organism toxins, and bioregulating compounds. Depending on the specific type, these weapons can incapacitate or kill people or animals and destroy plants, food supplies, or materiel. The type of target being attacked determines the choice of agent and dissemination system.

Biological weapons are extremely potent and provide wide-area coverage. Some biological agents are extremely persistent, retaining their capabilities to infect for days, weeks, or longer. Biological weapons can take some time (days, weeks, or months) depending on the agent) to achieve their full effect. To allow these agents sufficient time to take effect, the OPFOR may use clandestine means, such as SPF or civilian sympathizers, to deliver biological agents in advance of a planned attack or even before the war begins.

Delivery Means

It is possible to disseminate biological agents in a number of ways. Generally, the objective is to expose enemy forces to an agent in the form of a suspended cloud of very fine biological agent particles. Dissemination through aerosols, either as droplets from liquid suspensions or by small particles from dry powders, is by far the most efficient method.

There are two basic types of biological munitions: point-source bomblets delivered directly on targets and line-source tanks that release the agent upwind from the target. Within each category, there can be multiple shapes and configurations.

Military systems, as well as unconventional means, can deliver biological agents. Potential delivery means include rockets, artillery shells, aircraft sprayers, saboteurs, and infected rodents. Aside from SPF and civilian sympathizers, the OPFOR might use affiliated insurgent or terrorist organizations to deliver biological agents within the region, outside the immediate region (to divert enemy attention and resources), or even in the homeland of an extraregional opponent.

Targets

Probable targets for biological warfare pathogen attack are nuclear delivery units, airfields, logistics facilities, and C2 centers. The OPFOR may target biological weapons against objectives such as food supplies, water sources, troop concentrations, convoys, and urban and rural population centers rather than against frontline forces. The use of biological agents against rear area targets can disrupt and degrade enemy mobilization plans as well as the subsequent conduct of war. This type of targeting can also reduce the likelihood that friendly forces would become infected.

Biological Release

The decision to employ biological agents is a political decision made at the national level by the NCA. Besides the political ramifications, the State recognizes a degree of danger inherent in the use of biological agents, due to the difficulty of controlling an epidemic caused by them.

The prolonged incubation period makes it difficult to track down the initial location and circumstances of contamination. Thus, there is the possibility of plausible deniability. Even if an extraregional opponent might be able to trace a biological attack back to the State, it may not be able to respond in kind.

NBC Protection

The OPFOR's ability to protect itself against NBC weapons and to operate in contaminated environments is at least the equal of any force in the world, including extraregional forces. OPFOR planners readily admit that casualties would be considerable in any future war involving the use of NBC weapons. However, they believe that the timely use of active and passive measures can significantly reduce a combat unit's vulnerability. These measures include but are not limited to protective equipment, correct employment of reconnaissance assets, and expeditious decontamination procedures. The OPFOR conducts rigorous training for chemical defense.

The OPFOR believes the best way to protect against NBC weapons is to destroy delivery systems, which are always high-priority targets. Other operational-tactical responses to the threat include:

- Dispersion: Concentrations of forces must last for as short a time as possible.
- Speed of advance: If the advance generates enough momentum, this can make enemy targeting difficult and keep enemy systems on the move.
- Camouflage, concealment, cover, and deception (C3D): C3D measures complicate enemy targeting.
- Continuous contact: The enemy cannot attack with NBC weapons as long as there is intermingling of friendly and enemy forces.

Organization

Chemical defense units are responsible for nuclear and biological, as well as chemical, protection and reconnaissance measures. In the administrative force structure, such units are organic to all maneuver units brigade and above. Operational-level commands may provide some chemical defense augmentation to subordinate units, particularly those conducting the main effort. However, they must also retain some chemical defense assets at the operational level to deal with the threat to the support zone and provide chemical defense reserves.

Chemical troops are a vital component of combat support. They provide trained specialists for chemical defense units and for units of other arms. Basic tasks chemical troops can accomplish in support of combat troops include:

- Reconnoitering known or likely areas of NBC contamination.
- Warning troops of the presence of NBC contamination.
- Monitoring changes in the degree of contamination.
- Monitoring the NBC contamination of personnel, weapons, and equipment.
- Performing decontamination activities.
- Providing trained troops to handle chemical munitions.

They perform specialized NBC reconnaissance in addition to supporting regular ground reconnaissance efforts.

NBC protection functions are not limited to maneuver units. Artillery and air defense regiments and brigades have their own chemical defense units. Medical and SSM units have some decontamination equipment. Engineer troops also are important, performing functions such as decontaminating roads, building bypasses, and purifying water supplies. Of course, all arms have a responsibility for chemical reconnaissance and at least partial decontamination without specialist support. However, they can continue combat actions for only a limited time without complete decontamination by chemical troops.

Equipment

OPFOR troops have protective clothing. Most combat vehicles and many noncombat vehicles have excellent overpressure and filtration systems. Items of equipment for individual or collective protection are adequate to protect soldiers from contamination for hours, days, or longer, depending on the nature and concentration of the contaminant. Antidotes provide protection

from the effects of agents. Agent detector kits and automatic alarms are available in adequate quantities and are capable of detecting all standard agents.

Chemical troops have a wide variety of dependable equipment that, for the most part, is in good supply and allows them to accomplish a number of tasks in support of combat troops. They have specialized equipment for detecting and monitoring NBC contamination. They have some specialized NBC reconnaissance vehicles, and they may use helicopters for NBC reconnaissance. Decontamination equipment is also widely available.

NBC Detection and Warning Reports

The OPFOR transmits NBC warning information over communications channels in a parallel form using both the command net and the air defense and NBC warning communications net. Depending on what type of unit initially detected the contamination, detection reports leading to such warnings may go either through chemical defense and force protection channels or through the maneuver unit or ground reconnaissance reporting chain.

Detection Reports

Upon detection of contamination, an NBC observer or NBC reconnaissance patrol normally transmits an NBC detection report to the chief of force protection on the staff of the commander that sent out the observer or patrol. When NBC observers (whether from the chemical troops or another branch) are attached to regular ground reconnaissance forces, security forces, or maneuver units, the NBC observers that detect contamination would initially pass the detection report through reconnaissance or maneuver unit reporting channels. Of course, they would also report the detection to the commander of the unit to which they are attached. When the maneuver unit chief of staff or chief of reconnaissance receives an NBC detection report through his own channels, he immediately passes it to the chief of force protection at that level.

Warning Reports

The chief of force protection and his staff evaluate the NBC detection report and determine whether it warrants the issuing of a warning. If it does, they inform the maneuver commander (or his chief of staff). At this point, the NBC detection report changes into an NBC warning report. Then, the maneuver commander (or chief of staff) disseminates the NBC warning report via his command net to all subordinate unit commanders and via the next-higher commander's command net to the higher commander and other subordinates of that command. Simultaneously, the chief of force protection disseminates the same report to all of his own command's subordinates over the air defense and NBC warning communications net. He would also inform the chief of force protection at the next-higher headquarters. The desired goal is to disseminate the warning as rapidly as possible to all affected units.

The chief of force protection (and/or the chief of staff) may issue an advance NBC warning based on the predicted development of an NBC situation. NBC protective measures would change or be rescinded based on subsequent NBC detection reports or on warning reports from higher, lower, or adjacent units. Changes in the NBC protective measures are disseminated by the maneuver commander or chief of staff and the chief force protection using their respective communications nets.

Smoke

The OPFOR plans to employ smoke extensively on the battlefield whenever the situation permits. Use of smoke can make it difficult for the enemy to conduct observation, determine the true disposition of OPFOR troops, and conduct fires (including precision weapon fires) or air attacks. The possible presence of toxic smokes may cause the enemy to use chemical protection systems, thus lowering his effectiveness, even if the OPFOR is using only neutral

smoke.

Organization

In the administrative force structure, army groups, armies, and corps typically have smoke companies in their chemical defense battalions and/or smoke battalions. In either case, the smoke companies each consist of nine smoke-generating trucks. These assets are often allocated to OSCs, which can then suballocate them to tactical-level subordinates.

Agents

Smoke agents may be either neutral or toxic. Neutral smoke agents are liquid agents, pyrotechnic mixtures, or phosphorus agents with no toxic characteristics. Toxic smokes (commonly referred to as combination smoke) degrade electro-optical (EO) devices in the visual and near-infrared (near-IR) wavebands; they also can debilitate an unmasked soldier by inducing watering of eyes, vomiting, or itching.

The OPFOR may use a number of different smoke agents or other obscurants together. For instance, obscurants such as fog oil block portions of the electromagnetic spectrum more fully when seeded with chaff. The vast quantities of white phosphorus (WP) on the battlefield also suggest that random mixtures of this agent with other obscurants (both manmade and natural) could occur, by chance or by design. The OPFOR recognizes the need to counter target acquisition and guidance systems operating in the IR and microwave regions of the electromagnetic spectrum. It has fielded obscurants, including chaff, capable of attenuating such wavelengths.

Delivery Systems

The OPFOR has an ample variety of equipment for smoke dissemination. Its munitions and equipment includeâ

- Smoke grenades.
- Vehicle engine exhaust smoke systems (VEESS).
- Smoke barrels, drums, and pots.
- Mortar, artillery, and rocket smoke rounds.
- Spray tanks (ground and air).
- Smoke bombs.
- Large-area smoke generators (ground and air).

Although not designed for this purpose, some decontamination vehicles with chemical defense units can also generate smoke.

Smoke grenades include hand grenades, munitions for various grenade launchers, and smoke grenade-dispensing systems on armored vehicles. These grenades can provide quick smoke on the battlefield or fill gaps in smokescreens established by other means. Some armored fighting vehicles have forward-firing smoke grenade dispensers that can produce a bispectral screen up to 300 m ahead of vehicles.

All armored fighting vehicles can generate smoke through their exhaust systems. With these VEES-equipped vehicles, a platoon can produce a screen that covers a battalion frontage for 4 to 6 minutes.

Smoke-filled artillery projectiles, smoke bombs, spray tanks, and generator systems are also common. Artillery can fire WP rounds (which have a moderate degrading effect on thermal imagers and a major one on lasers). The OPFOR makes considerable use of smoke pots emplaced by chemical troops, infantrymen, or other troops. The OPFOR still uses smoke bombs or pots dropped by fixed- or rotary-wing aircraft.

Types of Smokescreens

The OPFOR recognizes three types of smokescreens: blinding, camouflage, and decoy. Classification of each type as frontal, oblique, or flank depends on the screen's placement. Smokescreens are either stationary or mobile depending on prevailing winds and the dispensing means used. Each basic type can serve a different purpose. However, simultaneous use of all types is possible.

Blinding

Blinding smokescreens can mask friendly forces from enemy gunners, observation posts, and target-acquisition systems. They can restrict the enemy's ability to engage the OPFOR effectively. Delivery of WP and plasticized white phosphorus (PWP) is possible using MRLs, artillery, mortars, fixed-wing aircraft, or helicopters. The OPFOR lays blinding smoke directly in front of enemy positions, particularly those of antitank weapons and observation posts. Blinding smoke can reduce a soldier's ability to acquire targets by a factor of 10, and its use can reduce casualties significantly.

Likely targets for blinding smokescreens are enemy defensive positions, rear assembly areas, counterattacking forces, and fire support positions. The screening properties of a blinding smokescreen can couple with dust, HE combustion effects, and the incendiary effects of phosphorus. This can create an environment in which fear and confusion add to the measured effectiveness of the smoke.

Camouflage

The OPFOR uses camouflage smokescreens to support all kinds of C3D measures. Such screens can cover maneuver, conceal the location of units, hide the nature and direction of attacks, or mislead the enemy regarding any of these. The camouflage smokescreen is useful on or ahead of friendly troops.

These screens are normally effective up to the point where forces deploy for combat. The number, size, and location of camouflage smokescreens vary depending on terrain, weather, and type of combat action. Camouflage also forces enemy attack helicopters to fly above or around a screen, thus exposing themselves to attack. Camouflage smoke can also cover assembly areas, approaches of exploitation forces, or withdrawals. Smokescreens can also cover a wide surface area around fixed installations or mobile units that do not move for extended periods.

Establishing camouflage smokescreens normally requires use of a combination of smoke grenades, smoke barrels, smoke pots, vehicles mounting smoke generating devices, and aircraft. Some decontamination vehicles also have the capability to generate smoke.

Two smoke-generator vehicles can lay a smokescreen of sufficient size to cover a battalion advancing to the attack. For larger smokescreens, the OPFOR divides the smokescreen line into segments and assigns two vehicles to each segment. Doctrinally, camouflage smokescreens should cover an area at least five times the width of the attacking unit's frontage.

The threat of enemy helicopter-mounted antitank systems concerns the OPFOR. Consequently, its doctrine calls for advancing forces to move as close behind the smokescreen as possible. The higher the smokescreen, the higher an enemy helicopter must go to observe troop movement behind the smokescreen, and the more vulnerable it is to ground-based air defense weapons. Depending on weather and terrain, some large-area smoke generators can produce screens up to several hundred meters high. There is considerable observation-free maneuver space behind a screen of this height. Conversely, smoke pots provide a screen 5 to 10 m high. This screen masks against ground observation but leaves the force vulnerable to helicopters hugging the deck and popping up to shoot.

The protection produced by camouflage smoke also interacts as a protective smoke. Just as smokescreens can degrade enemy night-vision sights, the protective smoke can shield friendly EO devices from potentially harmful laser radiation. This protective effect is greater with a darker smoke cloud because of the better absorption capability of that cloud. Protective smokescreens are also a good means of reducing the effects of thermal radiation from nuclear explosions. A protective smokescreen is useful in front of, around, or on top of friendly positions.

Decoy

A decoy screen can deceive an enemy about the location of friendly forces and the probable direction of attack. If the enemy fires into the decoy smoke, the OPFOR can pinpoint the enemy firing systems and adjust its fire plan for the true attack. The site and location of decoy screens depend on the type of combat action, time available, terrain, and weather conditions. One use of decoy smoke is to screen simultaneously several possible crossing sites at a water obstacle. This makes it difficult for the enemy to determine which site(s) the OPFOR is actually using.

Offensive Smoke Employment

The OPFOR emphasizes the use of smoke during the offense to help reduce friendly battle losses. However, it understands that smoke may hinder its own C2, battlefield observation, and target engagement capabilities. In addition, the enemy may take advantage of OPFOR smokescreens to shield his own maneuvers or to carry out a surprise attack or counterattack. Thus, a smokescreen is successful when the OPFOR attackers are able to maintain their assigned axis and retain sight of the objective. To prevent the smoke from interfering with friendly maneuver, OPFOR commanders must coordinate the planned location and duration of smokescreens with the scheme of maneuver.

Defensive Smoke Employment

In the defense, the OPFOR may use smokescreens for

- Camouflaging or covering the maneuver of friendly units.
- Concealing engineer activities from enemy observation.
- Screening replacements of units under conditions of good visibility.
- Camouflaging the approach of friendly units for a counterattack.
- Providing flank and maneuver security.
- Misleading the enemy on the disposition of reserves and planned counterattack axes.

Because a completely obscured environment tends to aid the attacker more than the defender, an OPFOR defense uses smoke to minimize the enemy's vision while allowing the defenders a fairly clear view of the enemy's location. Smoke from artillery and mortar shells is the most effective means of blinding an advancing enemy while keeping friendly forces out of the obscured area.

Signaling Smoke

Aside from smokescreens, the OPFOR also uses colored smoke for signal purposes. Smoke can mark enemy positions or, occasionally, friendly positions or movement routes for the information of supporting aircraft or artillery. By prearrangement, colored smoke may

- Identify friendly units.
- Identify targets.
- Control the commencing and lifting of fire.
- Coordinate fire and maneuver of combat units.

Strategic Context

During all strategic-level courses of action, the OPFOR will ensure that the employment of NBC weapons is coordinated with perception management efforts. The purpose of this coordinated effort is to convey a message of political and military dominance to the regional civilian populace as well as to convey an adverse view of an intervening extraregional opponent.

The OPFOR may use the threat of employing NBC weapons as an intimidating factor. Any regional opponent with an NBC capability of its own knows that the OPFOR is prepared to retaliate in kind. The fact that NBC weapons may also place noncombatants at risk is a further intimidating factor. From the State's perspective, this is a positive factor. Thus, it may use or threaten to use NBC weapons as a way of applying political, economic, or psychological pressure by allowing the enemy no sanctuary. This applies to both regional and extraregional foes.

The OPFOR realizes that an extraregional force will possess a technological edge in the ability of its RISTA means to target OPFOR fire support assets capable of delivering NBC munitions. Additionally, the OPFOR realizes that its regional opponent may receive RISTA support (such as satellite and fixed-wing signals intelligence and imagery) from an extraregional power. Therefore, OPFOR fire support planners develop contingency plans to preserve their NBC-capable fire support assets during all strategic-level courses of action. Common countermeasures are to disperse fire support assets and to use decoys and camouflage.

Regional Operations

During regional operations, the State may be able to employ NBC weapons with little fear of retaliation from its regional neighbors. Thus, it is possible that the OPFOR would use chemical weapons early in an operation or from its outset, against key targets in a neighbor's homeland. However, it is aware that use of any NBC weapons could have both positive and negative affects on its ability to achieve its strategic goals. On the one hand, it may be concerned that NBC use during a strategic campaign against a regional neighbor might lead to the intervention of an extraregional force. On the other hand, the OPFOR could use NBC against a regional neighbor as a warning to any potential extraregional enemy that it is willing to use such weapons. The State would prefer not to use chemical weapons within its own boundaries, except perhaps in an area populated by a particularly rebellious dissident minority opposed to the State government.

Transition Operations

During transition operations, the OPFOR may use NBC weapons to attack unique or key targets in aerial and sea ports of debarkation in order to disrupt the deployment tempo of the extraregional force. These targets include key C2 nodes, logistics operating bases, ground and airborne RISTA platforms, and contractors and contractor-operated facilities. The OPFOR will also seek to conduct these attacks in concert with the perception management portion of the information warfare (IW) plan, in order to leverage the world media to report adverse perceptions of the extraregional force.

Adaptive Operations

When the OPFOR shifts to adaptive operations, it will employ all means available, even WMD against selected targets, to allow the enemy no sanctuary. As in regional operations, the OPFOR would prefer not to use even chemical weapons within the boundaries of the State. However, it would contaminate its own soil if necessary in order to preserve the regime or the State's sovereignty.

During adaptive operations, the OPFOR seeks to use a nontraditional approach to NBC warfare. This approach revolves around the creation of WMD-like events in concert with the perception management portion of the IW plan. For example, the OPFOR may seek to use the media to amplify and embellish the results of a fire at a facility that produces chemicals used in everyday households. The media campaign would seek to attribute the cause of the fire to enemy action.

and would emphasize that injuries caused to the civilian population are similar in nature to those caused by the release of a chemical munition.

References

1. NBC weapons are a subset of weapons of mass destruction (WMD), although the latter exclude the delivery means where such means is a separable and divisible part of the weapon. WMD are weapons or devices intended for or capable of causing a high order of physical destruction or mass casualties (death or serious bodily injury to a significant number of people). The casualty-producing elements of WMD can continue inflicting casualties on the enemy and exert powerful psychological effects on the enemy's morale for some time after delivery. Existing types of WMD include chemical, biological, and nuclear weapons. However, technological advances are making it possible to develop WMD based on qualitatively new principles, such as infrasonic (acoustic), radiological (enhanced-radiation), or particle-beam weapons. In addition, conventional weapons, such as precision weapons or fuel-air explosives, can also take on the properties of WMD.
2. The same list of targets would apply for enemy use of NBC weapons against the OPFOR.
3. Although the OPFOR calls these units "chemical defense" or "chemical reconnaissance," their functions actually encompass nuclear, biological, and chemical (NBC) defense or reconnaissance.