NBC Reconnaissance

HEADQUARTERS, DEPARTMENT OF THE ARMY
COMMANDANT, US MARINE CORPS

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This publication is the doctrinal guide for NBC reconnaissance. It provides guidance on the planning and execution of NBC reconnaissance missions and chemical/biological (CB) sampling operations. This manual applies to any unit that has the primary or implied mission of performing NBC reconnaissance.

NBC recon is the active contamination avoidance measure that provides commanders with information on NBC hazards in the area of operations as a component of battlefield management. With knowledge of where NBC contamination hazards are and, just as important, where they are not, commanders can make better decisions. Commanders may modify their plans or protective postures with the information from NBC recon.

NBC recon provides early warning, determines the concentration and type of agent, and locates the boundaries of contamination. The information derived from the intelligence preparation of the battlefield (IPB) and the conduct of effective NBC recon operations are key factors for battlefield management. The avoidance of NBC contamination facilitates freedom of movement and maneuver for our forces. Contamination avoidance procedures are discussed in greater detail in FM 3-3 and FM 3-3-1.

NBC recon performs five critical tasks on the battlefield—detect, identify, mark, report, and sample. Early detection of NBC hazards is required for timely warning of units and personnel in affected areas. Detection of contamination is the cornerstone of contamination avoidance. Rapid identification is needed to adequately protect soldiers against NBC hazards. Identification dictates preventive measures and treatment of casualties. Contaminated areas are marked to allow friendly forces to avoid them. Data concerning contamination is useless unless it reaches decision makers. Timely, accurate reporting is essential for decision making and hazard warning. Samples are taken to aid in the identification of unknown agents. Sampling and subsequent laboratory analysis are the primary means of identifying biological agents.

This manual also provides the principles and techniques used by NBC recon units. It defines the capabilities and limitations of these organizations. Commanders and staff officers at all echelons will find guidance on the employment of NBC recon units. These units are located in chemical companies assigned to armored and light cavalry regiments and heavy divisions. NBC recon companies are assigned to corps and theater armies. The doctrine contained in this manual applies for commanders, staffs (chemical officers/S2s/G2s/S3s/G3s), trainers, and unit leaders responsible for NBC recon units and NBC recon operations.

The employment of M93 NBC reconnaissance system (NBCRS) (Fox)-equipped units is integrated throughout the manual. The M93 NBCRS is designed to improve the capability and increase efficiency for conducting NBC recon operations. The M93 NBCRS provides a faster response time, quicker detection, and identification rates, and quicker marking capability, while using basically the same NBC recon tactics, techniques, and procedures.

Although this manual does not implement any particular international agreement, material presented herein complies with related international agreements. A list of related international agreements and other references can be found in the references section.

Unless otherwise stated, whenever the masculine gender is used, both men and women are included.

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**Introduction**

On the modern battlefield, victory will come to those leaders who employ their assets effectively and who thoroughly understand the capabilities and vulnerabilities of the enemy. This manual provides leaders the information to employ NBC recon units and to conduct NBC recon.

The use of weapons of mass destruction can radically alter the flow of battle, restrict terrain, limit mobility, degrade military efficiency, and even shift the balance of power, placing a superior force at risk. NBC reconnaissance is a crucial element of combat operations that enables us to limit risk and avoid NBC contamination hazards. The degree of success in conducting NBC reconnaissance operations depends on three critical components: integrated planning, effective employment, and operational proficiency. This manual addresses these three areas.

**Nature of the Problem**

The challenges posed for military operations conducted under NBC conditions will be many and varied. There may be times when our forces will have to operate in complete individual or collective protection equipment. A significant problem will surface once the initial shock of first use of weapons of mass destruction has worn off. Areas targeted with these weapons may remain hazardous for days, even weeks, after the attack. We will know some of these hazardous areas with certainty and clarity. There will be other hazardous areas we may not know exist. If we must operate over this terrain, then we will need to know with certainty which areas and routes are passable and habitable, as well as those that are not.

**Leadership**

Unit leaders must also seek every opportunity to influence the conditions under which the enemy is engaged. Success depends on effectively orchestrating the battlefield operating systems to execute operations. The integration of all assets that influence the battle is essential to defeating an enemy and preserving combat potential. The enemy’s use of weapons of mass destruction may be the key factor for influencing the outcome of any battle. Leaders must not only be knowledgeable of the effects from weapons of mass destruction, but also the enemy's capabilities and intentions for these weapons. The NBC recon capability organic to the chemical companies in the heavy divisions, armored cavalry regiments, and the chemical company (recon) at corps and above is an invaluable asset available to the commander. NBC recon provides valuable and timely information that will aid the commander in contamination avoidance and mission accomplishment.

As with any other combat support asset, NBC recon units must be effectively employed to achieve optimum results. Commanders must know capabilities and limitations of the units. Staff planners, including the NBC battle staff must fully integrate NBC recon into the tactical planning process. Warfighting exercises must incorporate these capabilities to enhance employment proficiency. Field training exercises will reinforce tactical employment skills—support the maneuver plan, battle command, battlefield management, and so forth. Mission assignment to the NBC recon unit or element should be on “What?” not “How?” of NBC recon. Basic provisions for employment are—

- Integrate into planning process and develop detailed plans.
- Rehearse, rehearse, rehearse.
- Never place in reserve.
- Always have follow-on missions.
- Never fragment capability.

**NBC Technology**

The technology to produce and deliver chemical/biological (CB) weapons is proliferating at an alarming pace. Nations in some of the world’s most unstable regions perceive CB weapons as an effective deterrent against other more technically advanced nations. Some leaders view the mere possession of these weapons as an international military status symbol. Further, the technology used in CB weapons is readily available for the determined buyer.

Arguments that certain types of US forces will not encounter a CB or even a radiological threat are no longer valid. These weapons are possessed by potential hostile...
nations where the United States maintains a strategic interest. These same nations either have or are acquiring ballistic missiles thus extending their targeting capability. Even at the lowest end of the operational continuum (peace time competition), our Army has a need to assess, contain, and limit NBC hazards. Some corporations find the cheap labor pool and relaxed safety and environmental restrictions in developing nations to be attractive options for industrial and chemical production facilities. These facilities, either through accident or sabotage, may release chemical hazards that equal those found in open chemical warfare. Accidents or sabotage in nations that possess a nuclear industry can create radiological hazards like those of the 1986 Chernobyl reactor fire.
Chapter 1

Environment

NBC Conditions and the Battlefield

Operations involving weapons of mass destruction must be dealt with as any other battlefield condition, such as cold, night, desert, and so forth. Unit leaders must consider NBC in assessing their mission essential task list (METL). Employment of NBC recon assets to negate or offset enemy employment of NBC weapons is a critical component of warfighting preparation and operations.

The purpose of NBC reconnaissance is to detect and identify NBC contamination. With equipment currently in the field, we can only detect and identify chemical and radiological contamination.

It is much easier to detect radiological contamination than it is to detect chemical contamination. Radiological contamination is normally found over large areas. The behavior of radiological contamination is more easily predicted. Chemical contamination, however, is typically limited to small areas of terrain. Chemical agents are influenced by a number of environmental conditions that make it difficult to predict their behavior. Biological contamination is the most difficult to detect and predict.

The primary environmental factors that affect the ability to detect chemical agents for NBC recon purposes are the surface and soil type, contamination footprint, concentration, and meteorological conditions.

Contamination hazards depend on ground conditions encountered on the battlefield. The surface and soil type will affect how readily the chemical agent is absorbed into the soil. The type of surface also affects the persistency of chemical agents. Even though the actual battlefield is a combination of conditions, looking at four general conditions separately will give an indication of what to expect.

Sand—Any surface that has a large amount of sand (such as a beach). This generally, has good drainage. When chemical agents are applied to this surface, they tend to be drawn into the subsurface, lowering the quantity of contamination available for liquid detection.

Soil—Any surface that contains quantities of clay and loam. Depending on the relative amount of each soil component, chemical agents react differently. Generally, some percentage of the agent is absorbed into the subsurface (until saturation).

Grass—Any surface covered with a layer of grass, from a few centimeters to half a meter in height. A portion of the chemical agent remains on the grass, while the rest is absorbed into the underlying soil. The chemical agent on the grass is available for liquid detection.

Mud—Any surface saturated with water resulting in muddy conditions. The amount of persistent agent that can be absorbed by wet soil is inversely related to the water content of the soil (such as the more water, the less chemical agent absorbed). Under this condition, chemical agents will remain on the surface longer. This increases the probability of detection.

The more absorbent the soil, the less liquid remains on the surface. This decreases the probability of detection by detector paper (M8 and M9). For the M93 NBC recon system (NBCRS) (Fox), the smoother and harder the surface is, the higher the probability of detection. When NBCRS is detecting on rough surfaces, the sampling wheel tends to bounce, decreasing the probability of detection. On soft or porous surfaces, the ability of NBCRS to detect contamination can be improved by stopping to lower the probe near the surface. The heated probe will cause absorbed chemical agent to vaporize. The vaporized agent can then be analyzed by the NBCRS.

Planners and executers of NBC recon operations must understand that chemical attacks will not cover extensive areas with liquid contamination. Depending on the type of munition and delivery system, contaminated areas may be relatively small in comparison to the operational area. The contamination footprint is the actual dimensions of the liquid hazard area formed by the detonation of chemical weapons.

Chemical munitions are typically fuzed to burst over the target, to get the best spread of agent on the target. When a munition detonates at ground level, it deposits most of the agent in the shell crater, minimizing the contaminated area. When munitions burst above the target, wind speed and direction directly influence the spread of the agent. As a
munition bursts, the heavier droplets fall faster, and the smaller ones drift downwind. The most heavily contaminated area is near the attack area. The chemical agent radiates in a bell shape in the direction of the wind. This creates the contamination footprint. Figures 1-1 to 1-4 show typical contamination footprints for persistent chemical agents delivered by artillery, multiple rockets, missiles, and aircraft bombs. A unit conducting NBC recon has a higher probability of detecting contamination when traveling crosswind to the footprint.

The higher the concentration of the agent, the higher the probability of detection. The M93 NBCRS can detect extremely low concentration levels about .001 miligrams per cubic meter (mg/m$^3$). CAM and M256 detectors are not as sensitive. The concentration of agent on the ground depends on the type of agent, time since delivery, and the delivery method.

Meteorological conditions influence the persistency of liquid contamination. Such contamination is detected in two ways: as a vapor as it evaporates, or by physical contact. As wind speed and temperature increase, evaporation of liquid contamination increases. This means there is more vapor present to detect, thus increasing the probability of detection. The evaporation rate of chemical agent can be predicted using tables in FM 3-6.

**The Threat**

Potential enemy forces have the capability of employing weapons of mass destruction against US forces. Nuclear weapons are used to maintain the momentum of advance during the offense and to seize the initiative from the attacker in the defense. Enemy nuclear weapons will be targeted against troop concentrations; nuclear delivery means; airfields; air defense systems; command, control, and communications centers; logistical facilities; port, and to create obstacles.

Biological agents produce either immediate or delayed casualties. These weapons can be used against military or civilian targets. Biological attacks can range from attacks against a specific target or can cover vast areas of terrain. Detection and identification of biological agents are extremely difficult. FM 3-3 provides additional information on biological attacks.

Chemical weapons are used to restrict our mobility to maneuver and concentrate forces, to contaminate combat support and combat service support systems, to cause immediate...
and delayed casualties, and to force an increase in protective measures. Persistent chemical agents are typically used against deeper targets or those areas not expected to be immediately occupied. Persistent agents will be used against reinforcements, deep targets, and units along the flanks of attacking enemy forces to produce casualties, create a decontamination burden, and restrict mobility. Enemy forces in the defense can be expected to employ persistent agents against attacking forces.

Chemical agents also are used to produce casualties (immediate or delayed). The threat’s primary delivery systems will either be artillery or rocket. When the delivery means is via artillery, the persistent chemical agents are a mixture of droplets, micro-particles, and vapors. Chemical agent droplets are readily detectable, while micro-particle contamination is not as detectable, using standard NBC detection equipment. Dissemination via rocket will result in gross contamination, leaving small puddles of chemical agent in addition to droplets and micro-particles. Detection is easier when rockets are used; however, the areas of contamination are significantly larger.

Figure 1-3. Contamination footprint for a liquid agent missile attack (contours are mg/m$^2$). Approximate area covered is 600 by 4,000 meters.

Figure 7-4. Contamination footprint for a liquid agent aircraft-delivered bomb (contours are mg/m$^2$). Area covered is about 130 by 1,000 meters.
Chapter 2

Unit Organizations

There are several organizations that have the primary mission of performing NBC reconnaissance. This chapter provides an overview of the organization and capabilities of NBC recon units.

Heavy Division NBC Recon Platoon

The heavy division NBC recon platoon consists of an officer and 19 enlisted soldiers. It is organized with a platoon headquarters and three recon squads (Figure 2-1). The platoon is equipped with six M93 NBCRS (Foxes) or M113A2 APCs.

The platoon headquarters provides command and control for the platoon. It consists of the platoon leader and the platoon sergeant (PSG). During operations, the platoon leader and PSG ride in two of the squad’s vehicles. Each squad is composed of a squad leader, an assistant squad leader, and the crews, which man two M93 NBCRSs or M113 APCs. Each vehicle and crew comprise a team.

Armored Cavalry Regiment NBC Recon Platoon

Each chemical company assigned to an armored cavalry regiment has an organic NBC recon platoon. These platoons are organized identically to the heavy division NBC recon platoon. Each platoon may be equipped with either M93 NBCRSs (Foxes) or M113 APCs.

Light Armored Cavalry Regiment NBC Recon Plt

The light armored cavalry regiment’s chemical company has two NBC recon platoons. Each platoon is organized with a platoon headquarters and two recon squads. The platoons are equipped with four M93 NBCRSs.

NBC Recon Company

There are two types of NBC recon companies. One is equipped with armored carrier versions of the HMMWV; the other is equipped with twenty-four M93 NBCRS vehicles. The authorized personnel strengths of the two types of companies vary slightly.
NBC recon companies operate in corps, division, and TAACOM areas. Normally, the company is deployed as a separate company in the corps under control of the chemical brigade. However, the company may be attached to a corps chemical battalion.

Each NBC recon company has a headquarters and three NBC recon platoons. Each platoon has four NBC recon squads equipped with HMMWV or M93 NBCRS.

The mission of the company is to provide NBC recon support for elements of a corps or theater army. Each corps is allocated one of these companies. Figure 2-3 shows the structure of the company.

**NBC Recon Teams (LA/LB)**

The NBC recon team (LA) provides NBC recon support to a unit or to augment the NBC recon efforts of a specific unit. LA teams are allocated to separate brigades. An LA team also may perform NBC recon at the site of a nuclear, biological, or chemical strike, and provide NBC data to the NBC center (NBCC) or supported unit commander. It collects, examines, and identifies NBC contamination and has limited capability to evaluate NBC data. Each LA team has two HMMWVS and is 100 percent air mobile. This NBC recon team depends on the supported unit for all logistical and administrative support.

The NBC recon team (LB) provides NBC recon support to a special forces unit. LB teams are allocated on the basis of one per special forces group. These units are assigned or attached to units organized into composite chemical combat support (CS) units. These CS units provide NBC recon support under diverse circumstances. The LB team performs NBC recon in a very similar manner as the LA team.

The LB team also can provide NBC technical knowledge about the enemy’s NBC personnel, materiel, techniques, and tactics. It can analyze and assist in the disposition of captured NBC intelligence and materiel. The LB team performs strategic NBC recon operations of theater requirements, using unconventional warfare techniques. It collects NBC intelligence and provides technical knowledge pertaining to the enemy’s weapon capabilities, techniques, and disposition. The LB team is parachute qualified. It depends on captured vehicles or the supported unit for transportation and for a great deal of its communication requirements. For further information concerning this team see FM 3-18.

**NBC Recon Unit Organization for Combat**

The NBC recon platoon leader organizes his or her platoon to accomplish the mission based on mission, enemy, troops, terrain, and time (METT-T). The platoon normally operates in one of four organizations: team, squad, section, or platoon.

**Team**

Each vehicle in the platoon can operate independently on the battlefield to accomplish very specific tasks. These tasks include point surveys, sampling, and limited surveys to find bypass routes. This organization should only be employed for short periods during rear area operations.
Squad

Squad is the basic organization for the NBC recon platoon (see Figure 2-4). The platoon leader and platoon sergeant split the platoon headquarters section, and each operates with a squad. This organization provides the most flexibility in assigning missions to the platoon. The squad is incapable of supporting themselves. When they are operating independently, logistical support must be carefully coordinated.

Section

Section organization is used when the platoon leadership is needed to supervise the execution of a mission. It is formed by splitting the third squad and adding one vehicle each to the first and second squads to form Alfa and Bravo sections. These sections are under the command and control of the platoon leader and PSG, respectively (see Figure 2-5). Platoons in the chemical recon company rarely form this organization because of the four-squad configuration. However, it is possible to form a two-section organization by merging two squads together. This is the least preferred organization because it does not provide for maximum use of the specialized platoon.

Platoon

The platoon organization is the most difficult to control (see Figure 2-6). The platoon is employed in this fashion when it is necessary to conduct a large zone reconnaissance. This organization provides little flexibility to the supported commander.

Table 2-1. Organization summary.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Number of Vehicles</th>
</tr>
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<tbody>
<tr>
<td>Team</td>
<td>1</td>
</tr>
<tr>
<td>Squad</td>
<td>2</td>
</tr>
<tr>
<td>Section</td>
<td>3</td>
</tr>
<tr>
<td>LACR Platoon</td>
<td>4</td>
</tr>
<tr>
<td>Platoon</td>
<td>6</td>
</tr>
<tr>
<td>Corps Platoon</td>
<td>8</td>
</tr>
<tr>
<td>LA Team</td>
<td>2</td>
</tr>
<tr>
<td>LB Team</td>
<td>0</td>
</tr>
</tbody>
</table>

Unit Capabilities

In determining how, when, where, and what size element to employ, commanders, staffs, and NBC recon leaders at all levels must consider METT-T. The leaders must also consider the advantages and disadvantages of employing a specific size element and how it relates to mission accomplishment. The following paragraphs highlight the advantages and disadvantages of M93-NBCRS- and M113/HMMWV-equipped units.

Advantages and Disadvantages of M93-NBCRS-Equipped Units

Advantages:
- Conduct NBC recon and survey on the move.
- Vehicle capable of keeping up with maneuver forces.
- Built-in vehicle orientation system for navigation.
- Greater mobility allows greater area coverage.
- Conduct NBC recon mission without exiting the vehicle.
- Detect and identify all known chemical warfare agents.
- Overpressure system allows crews to operate in contaminated environment without masking.
- Provide location data to better delineate contamination.
- Vehicle swims readily with little preparation.
- Vehicle air conditioner allows the vehicle’s identification and detection equipment to operate under extreme conditions.
- Vehicle marking system allows contamination to be marked without exposing the crew.
- Ability to store data on unknown suspected chemical agents.

**Disadvantages:**
- Vehicle is not readily recognizable as friendly.
- Specialized maintenance support requirements.
- Requires 15 to 20 minutes to initially prepare on-board chemical detection equipment (MM1) for operation.
- Vehicle is restricted by rough terrain; maintains greatest mobility over level terrain.

### Advantages and Disadvantages of M113/HMMWV-Equipped Units

**Advantages:**
- Capable of obtaining large samples of suspected Chemical/Biological contamination.
- Has larger caliber (.50 CAL) weapon system.
- Vehicles are more recognizable as friendly.
- Maintenance/repair parts are easily obtainable.
- Can keep up with maneuver forces over rough terrain.

**Disadvantages:**
- Crew must conduct operations in MOPP 4 while in contamination.
- Vehicle must stop to conduct survey and detection.
- Vehicle has difficulty keeping up with maneuver force over flat terrain.
- Readings obtained using M256A1, detector paper, and CAM are not as reliable as MM1 readings.
Chapter 3

Principles

Reconnaissance is a mission undertaken to obtain information by visual observation, or other detection methods, about the activities and resources of an enemy, or about the meteorologic, hydrographic, or geographic characteristics of a particular area. NBC recon is a specific type of reconnaissance. The purpose of NBC recon is the detection and identification of NBC hazards. This includes finding gaps and detours around NBC contaminated areas.

Purpose

The goal of NBC reconnaissance is to produce combat information to allow friendly forces to avoid contaminated areas. NBC reconnaissance also can produce technical intelligence concerning the enemy’s offensive NBC capability. NBC recon is part of the overall intelligence collection effort. It is performed in advance of other combat operations, as well as during them, to provide information used by the commander to confirm or modify his concept. NBC recon also is conducted throughout the framework of the battlefield from the forward combat area to deep in the theater’s rear area. NBC recon missions are conducted wherever the enemy has the capability of employing NBC weapons.

Fundamentals

NBC recon operations are planned and performed with six fundamentals in mind:

- Retain freedom of maneuver.
- Orient on the threat.
- Report all information rapidly and accurately.
- Develop the situation rapidly.
- Avoid contact with enemy forces.
- Maximize the capability of NBC recon units.

Retain Freedom of Maneuver

By avoiding contaminated areas, the commander maintains freedom of maneuver. Knowing the location of contaminated areas allows all units to practice the first principle of NBC defense--contamination avoidance. This limits the effects of degradation on soldiers operating in high MOPP levels.

Orient on the Threat

NBC recon operations are limited to those areas where the enemy can employ NBC weapons. The use of persistent chemical agents is the major threat that the majority of NBC operations will be directed against. The intelligence preparation of the battlefield (IPB) will identify where, when, how, and why the enemy will employ his NBC weapons. It is impossible to conduct NBC recon continuously at all points on the battlefield. The IPB assists in focusing the NBC recon effort at the most critical places and times on the battlefield.

Report All Information Rapidly and Accurately

NBC recon is performed to obtain information. Higher commanders need this information to confirm or make decisions. Combat information loses value quickly. Negative reports tell as much as positive reports. Accurate reporting of locations is essential to avoiding NBC hazards.

Develop the Situation Rapidly

Once contamination is encountered, the unit performing the mission must rapidly identify the type and intensity.
Possible bypass routes or gaps must be quickly identified.

**Avoid Contact with Enemy Forces**

Detecting and identifying NBC agents is extremely difficult on the battlefield. Many of the detection procedures are time consuming. Contact with enemy forces has a degrading effect on NBC recon operations. It is seldom possible to accurately detect and identify NBC agents while in close combat. The loss of a single M93 NBCRS to enemy direct fire severely degrades the ability of the entire force to conduct future NBC recon operations.

**Maximize the Capability of NBC Recon Units**

When selecting an NBC recon unit to perform a task, the commander must consider the various capabilities and limitations of the unit. The mobility, survivability, and detection capabilities of each type of unit is considered when assigning tasks and missions.

**Actions on NBC Contact**

When the unit performing NBC recon encounters NBC contamination, the unit uses a series of actions to develop the situation:
- Stop and report.
- Determine agent type and intensity.
- Choose a course of action for the recon unit.
- Recommend a course of action to the supported unit.
- Commander’s decisions.

**Stop and Report**

Upon encountering contamination, the recon unit halts and reports the presence of contamination. A simple contact or spot report can be used or an NBC 4 report. If enemy contact is likely or expected, the unit must not remain in an area of limited cover and concealment. Also, the unit must minimize its exposure to the contamination.

**Determine Agent Type and Intensity**

The unit develops the situation by determining the exact type and intensity of the contamination if possible. Depending on the unit’s detection and identification capability, the time required can be rather short, or take up to 20 minutes. If the unit has limited detection and identification capability, one element should remain at the contaminated area to determine the agent type. Other elements should move to covered and concealed positions to provide overwatch.

**Choose a Course of Action**

Once the leader has gathered enough information to make a decision, he selects a course of action. The course of action should adhere to the intent of the commander, be within the capability of the unit, and allow the unit to resume its mission as soon as possible. Courses of action include—
- Survey. An NBC survey determines the exact boundaries of the contaminated area. This provides the maximum information concerning the contaminated area.
- Bypass. Routes around the contaminated area are located and marked. This allows follow-on forces to avoid the contaminated area.
- Cross. Bypassing the contaminated area may not be possible. The shortest, safest route across the contaminated area is located. This allows follow-on forces to minimize their exposure while crossing the contaminated area.

**Recommend a Course of Action**

Once the recon leader has selected a course of action, he reports it to his commander. The commander approves or disapproves the course of action based upon its impact on the overall mission. The SOP or OPORD may provide automatic approval of certain actions to avoid unnecessary delay.

Once the recon unit has reported the presence of NBC contamination, the commander acts on this information. The impact of the reported contamination must be analyzed against current and future operations. The commander may decide to alter the scheme of maneuver to avoid the contamination area or to increase the protective posture.

**Recon Techniques**

Units performing NBC recon use NBC recon techniques to accomplish their missions. These techniques fall into the two categories of search and survey. Search techniques are used initially to find the contamination. Once contamination is detected, survey techniques determine the size of the contamination. These techniques can be used while mounted or dismounted or in combination to meet the needs of the situation. Various NBC recon techniques are discussed in detail in Chapter 8 and apply to any unit needing to perform an NBC recon mission.

It maybe necessary to dismount to conduct a detailed survey of an area or to obtain readings in areas not accessible to vehicles. The majority of dismounted operations will be performed by units not equipped with the M93 NBCRS.

Aerial radiological survey techniques are discussed in FM 3-3-1. Aerial operations normally are conducted to locate radiologically contaminated areas because of the large area typically contaminated after nuclear events.
**NBC Route Recon**

An NBC route reconnaissance is a directed effort to obtain information of a specific route. (A route is the prescribed course to be traveled from a specific point of origin to a specific destination). A route may encompass a single road or could be an axis of advance. Units performing a route recon typically conduct an NBC route recon as part of the overall operation.

A unit, particularly an NBC recon unit, could be given the specific mission of conducting an NBC route reconnaissance. This mission is appropriate when the commander feels there is a high likelihood of contamination along the route. An NBC route recon proceeds faster than an NBC zone recon. The size of the route and the time available dictate the size of the recon element. Once contamination is detected, the recon element has the following options:

- Conduct an NBC survey to define the boundaries of the contamination,
- Locate and mark clear bypass routes.
- Terminate the mission and move to the coordinated decon point.
- Continue the mission.

### Critical Tasks

Certain tasks must be accomplished during a route recon. The IPB will indicate possible locations for contamination along with previous NBC reports. The critical tasks are—

- Reconnoiter the route, and determine the location of any contamination.
- Locate and mark bypass routes if contamination is encountered.
- Report and mark all NBC hazards along the route.

**NBC Zone Recon**

An NBC zone reconnaissance is a directed effort to obtain detailed information on NBC hazards within a specified zone. An NBC zone recon is appropriate when previous knowledge of the area is limited and there are indications or reports of NBC hazards. Typically, a zone NBC recon is performed to determine the suitability for large unit (brigade or higher) assembly areas or logistic bases (such as BSAs, DSAs, and CSAs). Previous reports or intelligence indicate a high probability of past NBC attacks within the zone. A zone recon is a deliberate, time-consuming process that requires a large expenditure of resources. Once contamination is detected, the recon element has the following options:

- Conduct an NBC survey to define the boundaries of the contamination.
- Terminate the mission and move to the coordinated decon point.
- Continue the mission.