

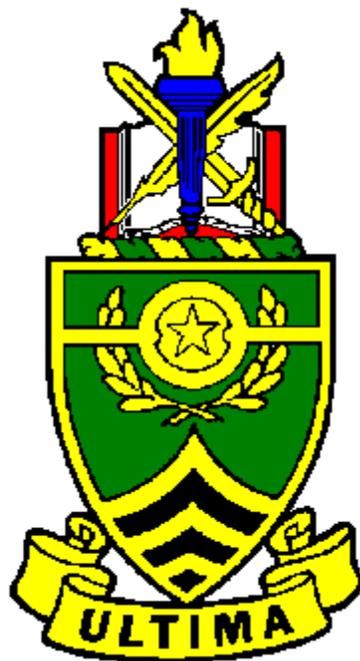
U.S. ARMY SERGEANTS MAJOR ACADEMY (ANCOC)

W424

OCT 03

PLATOON OPERATIONS IN AN NBC ENVIRONMENT

**TRAINING SUPPORT PACKAGE**



## TRAINING SUPPORT PACKAGE (TSP)

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<b>TSP Number / Title</b>	W424 (RES) / PLATOON OPERATIONS IN AN NBC ENVIRONMENT
<b>Effective Date</b>	1 Oct 03
<b>Supersedes TSP(s) / Lesson(s)</b>	W401, Platoon Operations in an NBC Environment, OCT 00 (W401 Changed to W424)
<b>TSP Users</b>	600-ANCOC, Advanced Noncommissioned Officers Course
<b>Proponent</b>	The proponent for this document is the Sergeants Major Academy.
<b>Improvement Comments</b>	Users are invited to send comments and suggested improvements on DA Form 2028, <i>Recommended Changes to Publications and Blank Forms</i> . Completed forms, or equivalent response, will be mailed or attached to electronic e-mail and transmitted to:  COMDT USASMA ATTN ATSS-D BLDG 11291 BIGGS FIELD FORT BLISS, TX 79918-8002  Telephone (Comm): (915) 568-8875 Telephone (DSN): 978-8875 e-mail: atss-dcd@bliss.army.mil
<b>Security Clearance / Access</b>	Unclassified
<b>Foreign Disclosure Restrictions</b>	FD5. This product/publication has been reviewed by the product developers in coordination with the USASMA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

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## PREFACE

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**Purpose**

This Training Support Package provides the instructor with a standardized lesson plan for presenting instruction for:

**Task Number**

**Task Title**

**Individual**

031-510-4001

Conduct operations in an NBC environment

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This TSP  
Contains

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**Platoon Operations in an NBC Environment  
W424 RES / Version 1  
1 Oct 2003**

**SECTION I. ADMINISTRATIVE DATA**

<b>All Courses Including This Lesson</b>	<u>Course Number</u> 600-ANCOC	<u>Version</u> 1	<u>Course Title</u> Advanced Noncommissioned Officers Course
	<hr/>		
<b>Task(s) Taught(*) or Supported</b>	<u>Task Number</u> <u>Individual</u>	<u>Task Title</u>	
	031-510-4001 (*)	CONDUCT OPERATIONS IN AN NBC ENVIRONMENT	
<b>Reinforced Task(s)</b>	<u>Task Number</u>	<u>Task Title</u>	
	031-503-1015	Protect yourself from NBC injury/contamination the appropriate mission-oriented protective posture (MOPP) gear	
	031-503-1018	React to a nuclear hazard or attack	
	031-503-1019	React to a chemical or biological hazard/attack	
	031-503-1021	Mark NBC contaminated area	
	031-503-1022	Decontaminate equipment using M13 decontaminating apparatus, portable	
	031-503-2001	Identify chemical agents using M256 series chemical agent detector kits	
	031-503-4002	Supervise unit preparation for NBC attack	
	031-506-2061	Conduct a mask fit test	
	<b>Academic Hours</b>	The academic hours required to teach this lesson are as follows:	
		<u>Resident Hours/Methods</u>	
Test		2 hrs	/ Conference / Discussion
Test Review		0 hrs	
Total Hours:		2 hrs	
<b>Test Lesson Number</b>		<u>Hours</u>	<u>Lesson No.</u>
	Testing (to include test review)	_____	N/A _____
<b>Prerequisite Lesson(s)</b>	<u>Lesson Number</u>	<u>Lesson Title</u>	
	None		

**Clearance Access** Security Level: Unclassified  
Requirements: There are no clearance or access requirements for the lesson.

**Foreign Disclosure Restrictions** FD5. This product/publication has been reviewed by the product developers in coordination with the USASMA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

**References**

<u>Number</u>	<u>Title</u>	<u>Date</u>	<u>Additional Information</u>
FM 3-20.98	Reconnaissance Platoon	14 Dec 2002	SS FM 17-98

**Student Study Assignments**

Before class--

- Read FM 3-20.98, Appendix C (Student Handout 2) with embedded Chemical School handouts.

During class--

- Participate in classroom discussion.
- Participate in brainstorm session.

After class--

- Turn in recoverable references after the examination for this lesson.

**Instructor Requirements** 1:16, ANCOC grad, and ITC and SGITC qualified.

<u>Name</u>	<u>Stu Ratio</u>	<u>Qty</u>	<u>Man Hours</u>
None			

<u>ID Name</u>	<u>Stu Ratio</u>	<u>Instr Ratio</u>	<u>Spt</u>	<u>Qty</u>	<u>Exp</u>
4110010190392 PROJECTOR, CANNON	1:16	1:1	No	1	No
673000T101700 PROJECTOR, OVERHEAD, 3M	1:16	1:1	No	1	No
702101T134520 DELL CPU, MONITOR, MOUSE, KEYBOARD	1:16	1:1	No	1	No
702501T132972 MONITOR, 17", LITE ON TECHNOLOGY	1:16	1:1	No	1	No
703500T102257 DESKTOP/EPSON PRINTER	1:16	1:1	No	1	No
704500T119010 POWER BACKUP, APC, BK400	1:16	1:1	No	1	No
*7520-00-138-798 Marker, Tube Type, Multi-Colors	1:16	1:1	No	1	No
*7520-00-579-701 EASELS/STANDS	1:16	1:1	No	1	No

	1:5	1:1	No	1	No
*7520-00-T82-325 LASER, POINTER (PEN SIZE)					
*7520-01-424-486 EASEL, (STAND ALONE) WITH PAPER	1:5	1:1	No	1	No
*7530-00-619-888 Pad, Easel	1:5	1:1	No	1	No
AV CENTER WITH AUDIO CAPABILITIES OF T-NET AND VTC	1:16	1:1	No	1	No
FSC-6 WINDOWS OS, MICROSOFT INTERNET EXPLORER, MSOFFICE, FTP SITE SOFTWARE	1:16	1:1	No	1	No
SNV1240262544393 36 - INCH COLOR MONITOR W/REMOTE CONTROL AND LUXOR STAND	1:16	1:1	No	1	No
SOFTWARE-2 WINDOWS XP, LATEST GOVERNMENT APPROVED VERSION	1:16	1:1	No	1	No

\* Before Id indicates a TADSS

**Materials  
Required**

**Instructor Materials:**

- TSP
- VGTs (11)
- Handout

**Student Materials:**

- Pen or pencil and writing paper.
- All reference material listed in the Advance Sheet

**Classroom,  
Training Area,  
and Range  
Requirements**

CLASSROOM INSTRUCTION 900 SF, 16 PN or Classroom Conducive to Small Group Instruction of 16 Students.

**Ammunition  
Requirements**

<u>Id</u>	<u>Name</u>	<u>Exp</u>	<u>Stu Ratio</u>	<u>Instr Ratio</u>	<u>Spt Qty</u>
None					

**Instructional  
Guidance**

**NOTE:** Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.

This is a student led lesson (SDL).

Before class—

- Read and study all TSP material and be ready to conduct the class.
- This TSP has questions throughout to check on learning or generate discussion among the group members. You may add any questions you deem necessary to bring a point across to the group.
- You must know the information in this TSP well enough to teach from it.
- This TSP presents references to allow you to inform your students where they would look in the reference to follow your instruction.
- Instructor: Issue all materials NLT three days prior to class. SDL: Read all TSP material.

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During class—

- SDL: Facilitate group process IAW this TSP.

After class—

- Report any lesson discrepancies to the Senior Instructor. Conduct an after action review for the lesson.
- 

**Proponent  
Lesson Plan  
Approvals**

<u>Name</u>	<u>Rank</u>	<u>Position</u>	<u>Date</u>
Salcido, Benjamin	GS-09	Training Specialist	
Eichman, Guy	MSG	Course Chief, BNCOC/ANCOC	
Lawson, Brian H.	SGM	Chief, NCOES	
Mays, Albert J.	SGM	Chief, CDD	

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**SECTION II. INTRODUCTION**

Method of Instruction: <u>Conference / Discussion</u>
Technique of Delivery: <u>Small Group Instruction (SGI)</u>
Instructor to Student Ratio is: <u>1:16</u>
Time of Instruction: <u>5 mins</u>
Media: <u>VGT-1</u>

**Motivator**

A capability to defend against NBC attack and to survive and sustain combat operations in an NBC environment requires intelligence forewarning and highly trained, properly equipped forces throughout the theater of operations. US forces must be prepared to conduct operations in an NBC environment with minimal degradation. At the theater operational level, NBC defense involves protection for forces and the means to remove or cope with operationally significant hazards, conceal intentions in the area of responsibility (AOR), and provide adequate health service support to preserve the fighting capability of the forces.

Physical and mental demands of military operations can have profound effects on the performance of individual service members and units. This is particularly true when the stress of combat is intensified by heat, continuous operations, and NBC protective clothing worn as part of a unit's MOPP.

The fundamentals of NBC defense are crucial to survival on today's battlefield. According to Army doctrine, you can expect the enemy to use NBC weapons/agents across vast areas of the battlefield. The number of casualties suffered will depend on how well you train your soldiers. It is the platoon sergeant's responsibility to train those critical NBC tasks necessary for his troops to know and perform in an NBC environment. This lesson will provide the basic knowledge you need to help you protect and defend your soldiers before, during and after an NBC attack.

**SHOW VGT-1, TERMINAL LEARNING OBJECTIVE**



**TERMINAL LEARNING OBJECTIVE**



Implement procedures for a platoon to operate in a nuclear, biological, and chemical (NBC) environment.



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**NOTE:** Have one of the students read the TLO.

**REMOVE VGT-1**

**Terminal Learning Objective**

**NOTE:** Inform the students of the following Terminal Learning Objective requirements.

At the completion of this lesson, you [the student] will:

<b>Action:</b>	Implement procedures for a platoon to operate in a nuclear, biological, and chemical (NBC) environment.
<b>Conditions:</b>	As a platoon sergeant in a classroom environment, given FM 3-20.98 (SH-2) with embedded Chemical School handouts.
<b>Standards:</b>	<p>Implemented the procedures necessary for a platoon to operate in an NBC environment by:</p> <ul style="list-style-type: none"> <li>Describing NBC contamination avoidance procedures.</li> <li>Identifying NBC protection procedures.</li> <li>Identifying NBC decontamination procedures.</li> </ul> <p>IAW FM 3-20.98 (SH-2) with embedded Chemical School handouts.</p>

**Safety Requirements**

None

**Risk Assessment Level**

Low

**Environmental Considerations**

**NOTE:** It is the responsibility of all soldiers and DA civilians to protect the environment from damage.

None

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**Evaluation**

You will take a written examination. The examination will contain questions from this lesson. You must correctly answer 70 percent or more questions on the examination to receive a GO.

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**Instructional  
Lead-In**

Even though the U.S. Armed Forces have no recent real life experiences of NBC warfare on the battlefield, we as leaders are still responsible for training our soldiers those NBC skills necessary to fight and win future battles. On the battlefield it is too late to train; we must teach these skills in peacetime. We are using FM 3-20.98, Reconnaissance Platoon, and the chemical school's handouts as the reference for this lesson. When you return to your unit, you will use this information and adapt it to your METL and the standing operating procedures (SOPs) employed in your unit.

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**SECTION III. PRESENTATION**

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**NOTE:** Inform the students of the Enabling Learning Objective requirements.

**A. ENABLING LEARNING OBJECTIVE**

<b>ACTION:</b>	Describe NBC contamination avoidance procedures.
<b>CONDITIONS:</b>	As a platoon sergeant in a classroom environment, given FM 3-20.98 (SH-2) with embedded Chemical School handouts.
<b>STANDARDS:</b>	Described NBC contamination avoidance procedures by discussing: <ul style="list-style-type: none"><li>• Defense before a nuclear attack,</li><li>• Biological defense,</li><li>• Defense before a chemical attack,</li></ul> IAW FM 3-20.98 (SH-2).

1. Learning Step / Activity 1. Describe NBC contamination avoidance procedures.

Method of Instruction: Conference / Discussion

Technique of Delivery: Small Group Instruction (SGI)

Instructor to Student Ratio: 1:16

Time of Instruction: 30 mins

Media: VGT-2 and VGT-3

Enemy forces could employ NBC weapons anywhere, anytime, on any battlefield. NBC defense applies as much to rear operations as it does on the forward line. Preparation of your platoon personnel is essential for their survival. To survive and remain effective on the integrated battlefield the platoon must be proficient in contamination avoidance.

Avoidance is the most important fundamental of NBC defense because the best way to survive is to avoid being the object of an NBC attack. Avoiding contaminated areas minimizes the risk of additional casualties and the degradation of combat power caused by operating in MOPP Level 3 or 4 for extended periods of time. In addition, the unit is not required to spend the time and resources needed for decontamination. Contamination avoidance measures include using passive avoidance measures, locating contaminated areas, identifying NBC agents, warning other members of the

platoon as well as other units, and reporting NBC threats to higher headquarters. If the tactical situation does not allow avoidance, the unit must be prepared to operate in a contaminated environment.

QUESTION: What is the most important fundamental of NBC defense? Why?

**NOTE:** Allow the students to answer the question and then show them the answer:

ANSWER: Avoiding contamination. You must prepare to protect your personnel and equipment from the effects of exposure.

Ref: SH-2, p SH-2-3, para C-24.

**NOTE:** At this time, call on some students to discuss the following:

1. Maintaining discipline.
2. Seeking protection.
3. Dispersion.

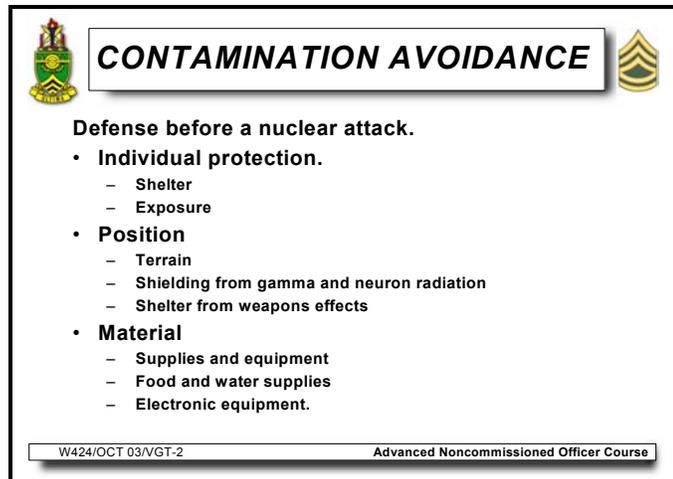
Ref: SH-2, p SH-2-3 and SH-2-4

The best defense against a nuclear attack is to dig in. Your soldiers should keep their weapons, equipment, clothing, and other items in their vehicles.

We will now discuss ways to avoid contamination.

## SHOW VGT-2, CONTAMINATION AVOIDANCE

**NOTE:** Direct the students to SH-2-5 thru SH-2-8. Uncover the bullets on the slide one at a time calling on a different student to explain/discuss each of them. Allow for student interaction and discussion.



The slide features a title box at the top with the text "CONTAMINATION AVOIDANCE" in bold, flanked by a crest on the left and a sergeant's rank insignia on the right. Below the title, the text "Defense before a nuclear attack." is followed by a bulleted list. The list includes three main categories: "Individual protection" (with sub-points for Shelter and Exposure), "Position" (with sub-points for Terrain, Shielding from gamma and neutron radiation, and Shelter from weapons effects), and "Material" (with sub-points for Supplies and equipment, Food and water supplies, and Electronic equipment). At the bottom of the slide, there is a footer with the text "W424/OCT 03/VGT-2" on the left and "Advanced Noncommissioned Officer Course" on the right.

**CONTAMINATION AVOIDANCE**

Defense before a nuclear attack.

- Individual protection.
  - Shelter
  - Exposure
- Position
  - Terrain
  - Shielding from gamma and neutron radiation
  - Shelter from weapons effects
- Material
  - Supplies and equipment
  - Food and water supplies
  - Electronic equipment.

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Ref: SH-2, p SH-2-5 thru 2-8

**NOTE:** As a minimum, the discussion should focus on the items on the slide. Ask the students to discuss how they accomplish these actions in their units and their experiences in carrying them out.

## A. Individual Protection

1. Ensure you shelter your personnel in well-constructed fighting positions with overhead cover, bunkers, or armored vehicles.
2. Ensure personnel cover all exposed skin.
  - a. Roll down sleeves and button collars.
  - b. Wear a handkerchief or similar cloth over the nose and mouth to prevent inhalation of contaminated dust.

## B. Position

1. Ensure you use terrain effectively to minimize effects of attack.
  - a. Hills and mountains—Reverse slopes of hills and mountains give some nuclear protection. Heat and light from the fireball of a nuclear blast and the initial radiation tend to be absorbed by hills and mountains. The slope deflects the heat and light not absorbed by hills and mountains.
  - b. Depressions and gullies—The use of gullies, ravines, ditches, natural depressions, fallen trees, and caves can reduce nuclear casualties; however, predicting the actual point of an attack is almost impossible.
  - c. Below ground areas—The best protection remains an area below ground with some sort of overhead cover.
2. The primary concern regarding position protection should be shielding from gamma and neutron radiation.
  - a. Gamma radiation protection requires thick layers of dense or heavy shielding material such as lead, iron, or stone.
  - b. Through absorption, light, hydrogen-based material gives good neutron radiation protection. Examples are water, paraffin, and oil.
  - c. Generally, the thicker the layers of each type of shielding material, the better the overall radiation protection.
3. Ensure the type of available shelter provides the best protection from weapon's effects.
  - a. Foxholes—Earth is a good shielding material and therefore digging in provides the best nuclear defense. A well-constructed fighting position gives excellent protection against initial nuclear effects and can reduce residual radiation. Foxholes/fighting positions should be hardened against the blast wave as time permits. Lining the fighting positions not only reduces the size of the opening, it can significantly increase survivability.
    - A smaller fighting position opening provides better protection as it reduces the amount of gamma radiation entering.
    - A deep fighting position gives more radiation protection than a shallow one by placing a greater thickness of shielding material between the occupant(s) and the nuclear detonation.
    - Thermal radiation can reach soldiers in fighting positions by line-of-sight exposure or by reflection off the sides. Use dark, rough materials (e.g., wool or canvas) to cover potential reflecting surfaces and as protective cover for soldiers and equipment.

b. Field-expedient overhead cover—Overhead covering of earth or other material reduces exposure to thermal and initial nuclear radiation and fallout. In addition, it helps prevent collapse and provides missile protection.

- Pre-World War II design and construction with thick, full-span floor and ceiling beams; heavy roofing tiles; dense, reinforced walls; and in most cases, full basement.
- Full basements constructed of concrete or stone with an exit directly to the outside as well as through upper floors in case of an emergency.
- Masonry structure with a thickness of 36 centimeters or greater than 1 foot, diagonal supports and block works.
- Buildings with the least amount of glass or protected by roll-up or folding shutters (which provide additional blast and thermal protection.)
- Buildings shielded by other structures that have less blast overpressure and structural damage than exposed structures (e.g., in an urban area, exterior rows of buildings shield interior buildings.)

Pre-World War II design and construction with thick, full-span floor and ceiling beams; heavy roofing tiles; dense, reinforced walls; and in most cases, full basement.

- Full basements constructed of concrete or stone with an exit directly to the outside as well as through upper floors in case of an emergency.
- Masonry structure with a thickness of 36 centimeters or greater than 1 foot, diagonal supports and block works.
- Buildings with the least amount of glass or protected by roll-up or folding shutters (which provide additional blast and thermal protection.)
- Buildings shielded by other structures that have less blast overpressure and structural damage than exposed structures (e.g., in an urban area, exterior rows of buildings shield interior buildings.)

**NOTE:** Mention tents and armored vehicles.

#### C. Material

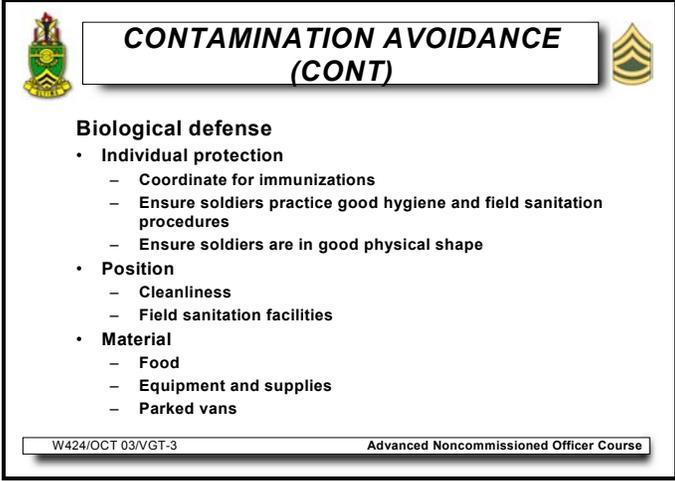
1. Disperse and dig-in supplies, equipment, and vehicles.
2. Disperse and dig-in explosives, ammunition, and flammables (fuel and oil). Cover them, if possible.
3. Secure small objects to minimize the danger of casualties and damage from flying debris.
4. Ensure existing cover provides protection and natural shielding for vehicles, supplies, and equipment from a nuclear explosion.
5. Park vans so the air conditioner intakes are opposite the prevailing wind direction. Turn off air conditioners and cover the intakes with nonporous materials such as plastic sheets or ponchos.
6. Seal all food and water supplies tightly in containers and secure them under available cover.
7. Turn off all electronic equipment and radios if not required for use. Disconnect or remove power cables, antennas, and unused electronic equipment from power mounts.

8. Place communications and electronic equipment inside bunkers or armored vehicles to increase protection against electromagnetic pulse (EMP).

**REMOVE VGT-2**

**NOTE:** On the next slide, call on some students to discuss each of the bullets. Allow for student interaction. Ask the students for their own thoughts other than on the student handout. They might have some ideas that the school has overlooked.

**SHOW VGT-3, CONTAMINATION AVOIDANCE (CONT)**



The slide features a title box at the top with the text "CONTAMINATION AVOIDANCE (CONT)" flanked by two insignia. Below the title, the text "Biological defense" is followed by a bulleted list of three categories: "Individual protection", "Position", and "Material". Each category has sub-bullets. At the bottom of the slide, there is a footer with the text "W424/OCT 03/VGT-3" and "Advanced Noncommissioned Officer Course".

**CONTAMINATION AVOIDANCE (CONT)**

**Biological defense**

- **Individual protection**
  - Coordinate for immunizations
  - Ensure soldiers practice good hygiene and field sanitation procedures
  - Ensure soldiers are in good physical shape
- **Position**
  - Cleanliness
  - Field sanitation facilities
- **Material**
  - Food
  - Equipment and supplies
  - Parked vans

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Ref: SH-2, p SH-2-9 thru SH-2-10, para a, b, and c

The best defense against a chemical attack is the proper wear and care of your protective masks and protective clothing (We will discuss MOPP in the next ELO). The M8A1 is the primary means of detecting an upwind chemical attack.

**NOTE:** Ask one of the students to give a short description of the M8A1: what the system provides and how they are emplaced (SH-2-10 AND SH-2-11).

**REMOVE VGT-3**

**CHECK ON LEARNING:** Conduct a check on learning and summarize the ELO.

QUESTION: What is the best defense against a nuclear attack?

ANSWER: The best defense is to dig in.

Ref: SH-2, p SH-2-5, second paragraph

QUESTION: What type of material does gamma radiation protection require?

ANSWER: Lead, iron, and/or stone.

Ref: SH-2, p SH-2-6, para B2a

QUESTION: What precautions should you take with food and water?

ANSWER: Tightly seal all food and water in containers and secure under available cover.

Ref: SH-2, p SH-2-10, para C1

We will now continue this lesson by discussing NBC protection.

**B. ENABLING LEARNING OBJECTIVE**

<b>ACTION:</b>	Identify NBC protection procedures.
<b>CONDITIONS:</b>	As a platoon sergeant in a classroom environment, given FM 3-20.98 (SH-2) with embedded Chemical School handouts.
<b>STANDARDS:</b>	Identified the NBC protection procedures by describing: <ul style="list-style-type: none"><li>• MOPP levels, alarms, and signals,</li><li>• Defense during and after a nuclear attack,</li><li>• Defense during and after a chemical attack,</li><li>• Symptoms and treatment of NBC casualties,</li><li>• Contamination marking,</li><li>• Unmasking procedures,</li></ul> IAW FM 3-20.98 (SH-2).

1. Learning Step / Activity 1. Identify MOPP levels

Method of Instruction: Conference / Discussion

Technique of Instruction: Small Group Instruction (SGI)

Instructor to Student Ratio: 1:16

Time of Instruction: 15 mins

Media: VGT-4 and VGT-5

If a nuclear, biological, or chemical hazard cannot be avoided, you must prepare to protect your personnel and equipment from the effects of exposure. You must determine the type and degree of protection required based on the unit's mission and the hazard.

**NOTE:** The line between contamination avoidance and protection is not distinct; many actions contribute to both.

You and your soldiers, on the integrated battlefield, may encounter a combination of NBC and conventional attacks. Your key ingredient to effective protection in an NBC environment is your platoon's proficiency in automatically and correctly implementing an effective NBC SOP. Individual and unit protection against chemical attack or contamination hinges on effective use of the mission-oriented

protective posture (MOPP) and on individual proficiency in basic NBC skills. You must ensure that all platoon members are familiar with the standard MOPP levels shown in Table B-1 of your student handout.

**NOTE:** Direct the students to the table on SH-2, page SH-2-13. Allow the students a couple of minutes to skim the information on the table.

**QUESTION:** What should you and your soldiers do when an NBC attack is recognized?

**ANSWER:** Every soldier must receive the warning and assume the appropriate MOPP level.

Ref: SH-2, p SH-2-13, paragraph immediately after Table B-1.

**NOTE:** Call on two or three students to discuss and describe some of the signals or alarms available to them.

Ref: SH-2, p SH-2-13, next to last paragraph.

**NOTE:** Direct the students to SH-2, p SH-2-13 thru SH-2-15.

**SHOW VGT-4, MOPP LEVELS**



# **MOPP LEVELS**





**MOPP-0**



**MOPP-1**



**MOPP-2**

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**NOTE:** This slide is larger than normal for clarity. Show the slide, one picture at a time and ask the soldiers to concentrate on the image. Each picture on this and the next slide shows the different MOPP levels. MOPP Ready level is not shown. Have one of the students describe MOPP Ready level. Call on different students to explain each of the levels. Allow for student interaction.

**REMOVE VGT-4**

**SHOW VGT-5, MOPP LEVELS (CONT)**



## ***MOPP LEVELS (CONT)***





**MOPP-3**



**MOPP-4**

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**NOTE:** Same note as above reference slide size.

**QUESTION:** When is the Mask Only command given?

**ANSWER:** Only in the following situations:

- When the employment of riot control agents (RCA) takes place and no chemical/biological threat exists.
- In a downwind vapor hazard of a nonpersistent chemical agent.

Ref: SH-2, p SH-2-15, para 7

**NOTE:** Mask Only is not an appropriate command when blister or persistent agents are present.

A consideration that you as platoon sergeants need to take into consideration is the performance degradation effect different MOPP levels may have on individual soldiers.

**NOTE:** At this time, break the class into three groups. Give them five minutes to brainstorm the following question. This should bring up some interesting discussions.

QUESTION: What are some degradation effects that MOPP level above Level 0 can have on an individual soldier?

Each group should select a briefer and a recorder. At the end of the five minute limit, bring the class together and have each group brief their findings.

There is no clear cut answer to this exercise.

The following information is from the Office of the Secretary of Defense study:

### **B. Performance Degradation Caused by MOPP Wear**

Depending on the outside temperature and the physical level of work, MOPP postures above Level 0 can result in the following individual performance limitations:

- Speech and communications problems
- Impaired hearing
- Reduced vision (acuity, field of view, depth perception)
- Difficulty recognizing individuals in MOPP
- Heat injuries
- Dehydration
- Inadequate nutrition
- Combat stress
- Mood swings and claustrophobia
- Impaired thinking and judgment.

You can find more information on the following website.

[http://www.gulflink.osd.mil/mopp/mopp\\_s03.html](http://www.gulflink.osd.mil/mopp/mopp_s03.html)

This information may prove useful when and if you find yourself and your soldiers in an NBC environment and need to make a decision on the MOPP level that you and your soldiers should be in depending on your mission.

**NOTE:** Conduct a check on learning and summarize the learning activity.

### **CHECK ON LEARNING**

QUESTION: What does individual and unit protection during a chemical attack depend on?

ANSWER: It depends on two things:

- a. Effective use of the MOPP gear.
- b. Individual proficiency in basic NBC skills.

Ref: SH-2, p SH-2-12, last paragraph

QUESTION: When is the "Mask Only" command not appropriate?

ANSWER: When blister or persistent agents are present.

Ref: SH-2, p SH-2-15, CAUTION paragraph, bottom of page

Break: Time: 00:50 to 01:00

2. Learning Step / Activity 2. Identify defense during and after NBC attacks

Method of Delivery: Conference / Discussion

Technique of Delivery: Small Group Instruction

Instructor to Student Ratio: 1:16

Time of Instruction: 30 mins

Media: VGT-6 thru VGT-9

QUESTION: Should your soldiers run for cover during a nuclear attack?

ANSWER: ***Never run for cover!***

- Start counting flash-to-bang.
- While still down, secure your Kevlar helmet and cover exposed skin.
- Secure your weapon under your body.
- When winds from the blast arrive, try to orient your body slowly to face the blast. Make your self more aerodynamic and less susceptible to flying objects.
- Keep your eyes closed until you no longer feel forced to do so. Squint before totally opening your eyes.

Ref: SH-2, p 2-17, para C-190

**NOTE:** Ask the following question to give the students an idea on what actions they should ensure their soldiers take during mounted defensive actions. Remind the soldiers that this is a recon solution. They should follow their unit's SOP.

QUESTION: What defensive actions should you take during a nuclear attack when you are in your vehicles?

ANSWER: As time permits, mounted soldiers take the following actions:

- Do not peer through driver or optical devices.
- Feel and reach to find open hatch doors, if necessary, close them.
- Close weapons breach and traverse gun tubes away from the direction of the blast or high winds.

- Attempt to turn vehicle and orient the front to face the blast.
- Keep your eyes closed until you no longer feel forced to do so. Squint before totally opening your eyes.

Ref: SH-2, p SH-2-17

As soon as the attack comes to an end, take the following actions:

- Wait for both shock waves to pass and debris to stop falling.
- Record the flash-to-bang time.
- Cover your mouth with a handkerchief, and wear goggles to protect your eyes from fallout contamination. If you do not have these items, put on the protective mask.

Take these precautions quickly before fallout arrives.

- Seek shelter from fallout.
- If fallout arrives while you are exposed, routinely shake the handkerchief or the mask filter element to remove dust particles and to prevent accumulation of contamination.
- Treat casualties. Refer to the discussion later in this appendix for information on treatment of casualties from nuclear detonations.
- Reconnect the FBCB2, radios, and antennas, and attempt to reestablish communications.
- Prepare and submit an NBC-1 nuclear report. Make sure it has “flash” precedence if it is the first reported attack in theater.
- Begin monitoring for radiation. Report the arrival of fallout using an NBC-4 report when the radiation level reaches 1 cGy/hr.
- Never relocate your vehicle or unit based on a fallout prediction (NBC-3 report).
- Reorganize, consolidate, and continue your mission.
- Conduct PMCS on tactical dosimeters.
- Consider previous exposure (total dose) and report new exposure in accordance with the OPOD or unit SOP.
- Regardless of the applicable exposure criteria, never move until the crossing risk is known and NBC personnel have developed evacuation procedures.
- Improve shelter and shielding.

Ref: Sh-2, p SH-18, para C-191

The first person to detect the arrival of fallout is usually the radiological monitor operating a radiacmeter.

QUESTION: You are supervising the soldier monitoring the fallout with a radiacmeter. When should you warn your personnel that fallout is in the area?

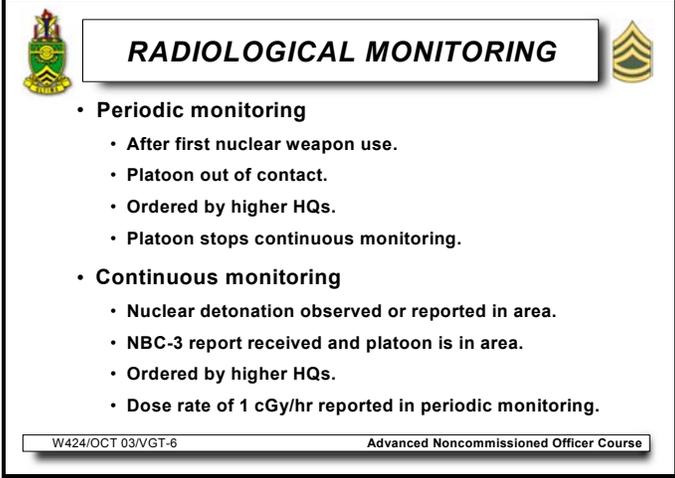
ANSWER: As soon as the reading on the radiacmeter notes a dose rate of 1 centigray per hour (1cGy/hr).

Ref: SH-2, p SH-2-18, bottom of page

There are two types of radiological monitoring, periodic and continuous, that ensure that your soldiers are safe or will get a warning of fallout in the area. We will now look at the two types.

## SHOW VGT-6, RADIOLOGICAL MONITORING

**NOTE:** Show the VGT, one frame at a time. Ask a student to explain the bullets and how they use the information. Allow for student interaction.



The slide features a title box at the top with the text "RADIOLOGICAL MONITORING" in bold, flanked by a military crest on the left and a sergeant's rank insignia on the right. Below the title, there are two main bullet points: "Periodic monitoring" and "Continuous monitoring". Each has a sub-list of conditions. At the bottom, there is a footer with the text "W424/OCT 03/VGT-6" on the left and "Advanced Noncommissioned Officer Course" on the right.

**RADIOLOGICAL MONITORING**

- **Periodic monitoring**
  - After first nuclear weapon use.
  - Platoon out of contact.
  - Ordered by higher HQs.
  - Platoon stops continuous monitoring.
- **Continuous monitoring**
  - Nuclear detonation observed or reported in area.
  - NBC-3 report received and platoon is in area.
  - Ordered by higher HQs.
  - Dose rate of 1 cGy/hr reported in periodic monitoring.

W424/OCT 03/VGT-6 Advanced Noncommissioned Officer Course

Ref: SH-2, p SH-2-12 and SH-2-19

**QUESTION:** When operating in or crossing radiological contaminated areas, what precautions should you and your platoon follow?

**NOTE:** Ask the students to talk about their own experiences in these areas or how they practice these actions in their units.

These are some typical answers. Not concrete. The SOP determines the actions.

- Vehicles are tightly shut.
- Cover cargo with tarps or tenting.
- Keep speed down to prevent dust.
- Maintain adequate following distances.

## REMOVE VGT-6

Now let's talk about defense during and after a chemical attack. Chemical warfare is widely regarded as brutal and barbaric. Nonetheless, the worldwide availability of advanced military and commercial technologies permits adversaries to develop and employ chemical weapons. This leaves open the potential for use of chemical weapons in a wide range of actions: terrorism during peacetime, limited use during urban operation, even large-scale employment during conflict or war.

The enemy may use nonpersistent chemical agents over areas that it believes friendly forces will use for crossing or occupation.

**QUESTION:** Why would potential enemies use persistent chemical agents?

ANSWER: To produce casualties, deny terrain use, force opposing soldiers into protective posture for extended periods of time, degrade combat effectiveness, and deny entry points.

Ref: SH-2, p SH-2-20, para C-205

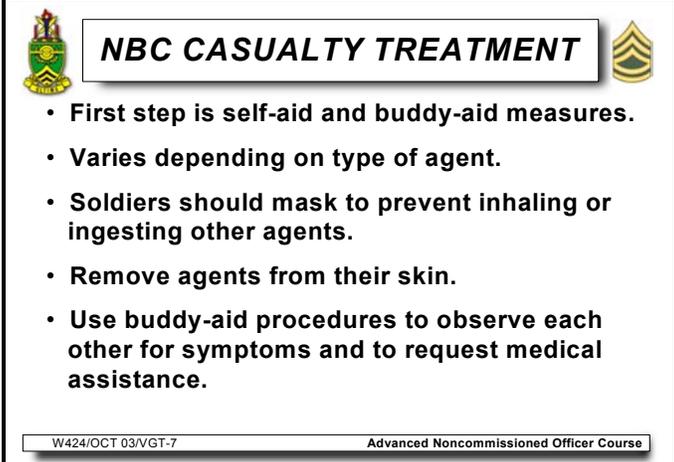
Biological agents are often referred to as the “poor man’s weapon” because they are easy and cheap to produce and dispense. In addition, biological attacks are hard to disseminate, detect, and identify. Small, even tiny, doses of biological agents can infect thousands of personnel. Counteracting these agents may require extensive use of quarantine.

Biological warfare is defined as the employment of living organisms, toxic biological products, and biological plant growth regulators to injure, incapacitate, or kill. Biological agents are generally created to target the respiratory system, skin, or digestive tract. The capability to directly enter the bloodstream and body tissue maximizes their effectiveness.

Potential adversaries, such as Saddam Hussein, may have access to a wide variety of biological agents and chemical agents on the modern battlefield. They can dispense these alone or with other carriers or agents. Casualties resulting from exposure to biological or chemical agents require medical treatment as quickly as possible. There are two actions that you as a leader should ensure:

**NOTE:** As you show the VGTs, ask the students whether they follow these precautions in their units and if they are in their SOP.

**SHOW VGT-7, NBC CASUALTY TREATMENT**



**NBC CASUALTY TREATMENT**

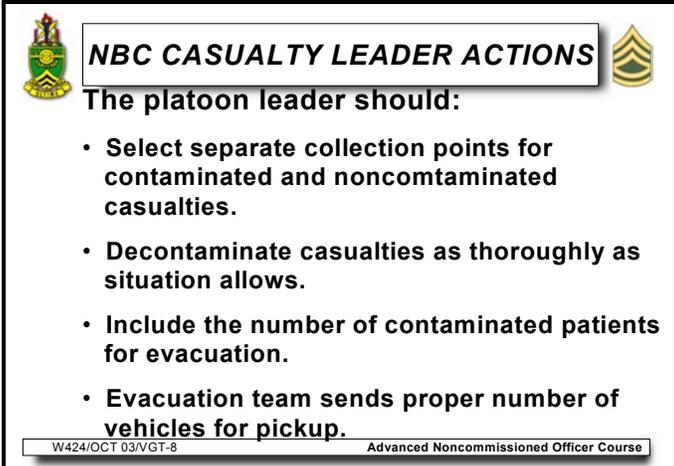
- First step is self-aid and buddy-aid measures.
- Varies depending on type of agent.
- Soldiers should mask to prevent inhaling or ingesting other agents.
- Remove agents from their skin.
- Use buddy-aid procedures to observe each other for symptoms and to request medical assistance.

W424/OCT 03/VGT-7 Advanced Noncommissioned Officer Course

Ref: SH-2, p SH-2-25

**REMOVE VGT-7**

**SHOW VGT-8, NBC CASUALTY LEADER ACTIONS**



**NBC CASUALTY LEADER ACTIONS**

The platoon leader should:

- Select separate collection points for contaminated and noncontaminated casualties.
- Decontaminate casualties as thoroughly as situation allows.
- Include the number of contaminated patients for evacuation.
- Evacuation team sends proper number of vehicles for pickup.

W424/OCT 03/VGT-8 Advanced Noncommissioned Officer Course

Ref: SH-2, p SH-2-25

**REMOVE VGT-8**

Chemical agents fall into four major categories: nerve, blister, blood, and choking. Their primary routes of attack on the body are through the respiratory system and the skin. These agents are especially dangerous because they can kill or incapacitate quickly.

**NOTE:** Direct the students to Table B-2, p SH-2-26. It lists the detection and protection measures, symptoms, and treatment and decontamination for chemical agents. Even though they should have a thorough knowledge of the information on the table, be ready to answer any questions.

NBC marking procedures are the same regardless of who conducts them. The purpose is to find contamination boundaries and/or routes around or through a contaminated area. Reconnaissance teams may have an ICAM, M256 detector kit, M8 and M9 paper, M272 water test kit, automatic chemical agent alarm, M34 soil sampling kit, and M274 marking set (shown in Figure C-32). They use this equipment to determine the following:

- Are chemical agents present?
- If an agent is present, what type is it?
- Where and when was the agent first detected?
- Where are the boundaries of the contamination?
- Are there clean routes through area? If so, where are they?

You must mark contamination so unsuspecting personnel will not be exposed to it. When platoon detection, monitoring, or reconnaissance teams detect or suspect NBC hazards, they mark all likely entry points into the area and report the contamination to higher headquarters.

QUESTION: What is an exception to this policy?

ANSWER: The only exception to this policy occurs when marking the area would help the enemy. If the commander makes this exception, you must still report the hazard to protect friendly units.

Ref: SH-2, p SH-2-27

### **SHOW VGT-9, NBC MARKING PROCEDURES**



## ***NBC MARKING PROCEDURES***



- **Markers should face away from the highest contamination reading.**
- **Placed at roads, trails, and points of entry.**
- **Distance between signs vary.**
- **If standing in front of a marker, the markers to the left and right must be visible.**

**\*\* Units discovering a marked contaminated area do not have to conduct elaborate, time-consuming surveys.**

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Ref: SH-2, p SH-2-27

Now we will discuss unmasking procedures. Soldiers should unmask as soon as possible except when they expect a biological or chemical attack. If the M256A1 detector kit is available to you, use it to supplement unmasking procedures.

However, the kit does not detect all agents. Therefore, you must still follow the proper procedures.

**NOTE:** Have two of the students describe the two procedures found on page SH-2-28 and SH-2-29. The first should describe how to unmask if all tests with the kit were performed and the results were negative. The second should describe the procedure if an M256A1 kit is not available. Allow for student interaction and experience factor to help in their explanations.

Have another student explain the "All Clear" signal. How it is given, who initiates it, and what action to take if the signal comes via the airwaves (Ref: SH-2, p SH-2-29).

**NOTE:** Conduct a check on learning and summarize the ELO

#### **CHECK ON LEARNING:**

QUESTION: What are the two types of radiological monitoring?

ANSWER: Periodic and continuous.

Ref: SH-2, p SH-2-19

QUESTION: What are the four major categories of chemical agents?

ANSWER: Nerve, blister, blood, and choking.

Ref: SH-2, p SH-2-26, Table B-2

QUESTION: If you have to have your soldiers mark a contaminated area, where would you tell them to place the markers?

ANSWER: Placed at roads, trails, and points of entry.

Ref: SH-2, p SH-2-27, 3rd paragraph

#### **C. ENABLING LEARNING OBJECTIVE**

**ACTION:** Identify NBC decontamination procedures.

**CONDITIONS:** As a platoon sergeant in a classroom environment, given FM 3-20.98 (SH-2) with embedded Chemical School handouts.

**STANDARDS:** Identified the actions and procedures for NBC decontamination by describing:

- Immediate,
- Operational, and
- Thorough decontamination, IAW FM 3-20.98 (SH-2).

1. Learning Step / Activity 1. Identify NBC decontamination procedures.

Method of Instruction: Conference / Discussion

Technique of Delivery: Small Group Instruction

Instructor to Student Ratio: 1:16

Time of Instruction: 15 mins

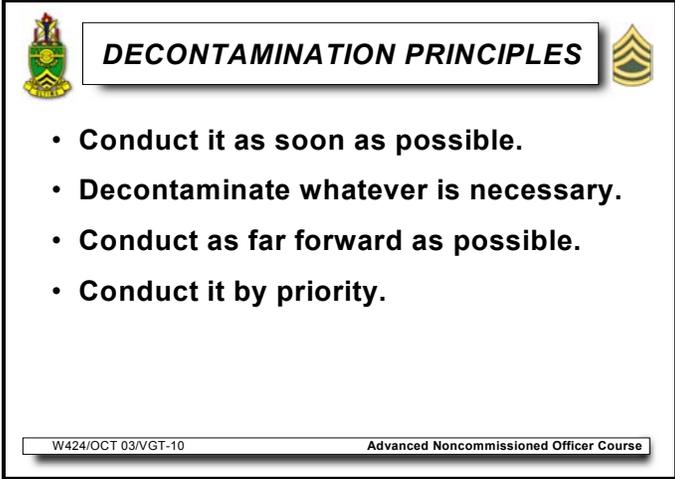
Media: VGT-10 and VGT-11

Since continued operation in the presence of nuclear or chemical contamination will cause casualties and severe combat degradation, decontamination is essential.

To get the maximum benefit of the time and resources available, your platoon should conduct decontamination using the following guidelines:

**NOTE:** As the soldiers read the bullets, ask the students to talk about their experiences on how they accomplish the actions depicted by each bullet.

**SHOW VGT-10, DECONTAMINATION PRINCIPLES**



The slide features a title box at the top with the text "DECONTAMINATION PRINCIPLES" in bold, flanked by a crest on the left and a sergeant's rank insignia on the right. Below the title is a list of four bullet points: "Conduct it as soon as possible.", "Decontaminate whatever is necessary.", "Conduct as far forward as possible.", and "Conduct it by priority." At the bottom of the slide, there is a footer with the text "W424/OCT 03/VGT-10" on the left and "Advanced Noncommissioned Officer Course" on the right.

Ref: SH-2, p SH-2-16 and SH-2-29

These principles are consistent with doctrine and places the decontamination burden at the battalion or troop/company level.

**QUESTION:** Before decontamination occurs, you, as platoon sergeant, must consider a variety of conditions that might affect the operation. What are those conditions?

**ANSWER:** You should consider the following:

- The toxicity/lethality of the NBC agents involved.
- Actual and anticipated performance degradation.
- Equipment and personnel limitations.
- Actual and potential transfer and spread of contamination.

Ref: SH-2, p SH-2-29

**NOTE:** Inform the students that FM 3-5 contains more detailed information on NBC decontamination.

Immediate decontamination is a basic soldier survival skill carried out by soldiers as soon as possible after they discover they are contaminated. Its basic purposes are to minimize casualties, save lives, and limit the further spread of contamination. Any contact between chemical or biological agents and bare skin should be treated as an emergency. Some agents can kill if they remain on the skin for longer than a minute. The best technique for removing or neutralizing these agents is to use the M291 skin decontamination kit. You, as leaders, must ensure that you train your soldiers to execute this technique automatically, without waiting for orders.

**NOTE:** Call on two students, one to explain *skin and personal equipment decontamination* procedures and one to describe *operator spraydown*.

They should describe the following:

a. **Skin Decontamination.** This is a basic soldier survival skill conducted as an immediate action drill. Some chemical agents can kill if they remain on the skin for longer than a minute, making removal or neutralization of the agent a must for survival. This can be done with the new M291 skin decontamination kit, shown in Figure C-44. Leaders must ensure that they train their soldiers to execute skin decontamination automatically and without orders. Leaders should observe soldiers who conduct skin decontamination for symptoms.

b. **Personal Equipment Wipedown.** Reconnaissance platoon soldiers must devote care and consideration to personal gear, supplies, and equipment that were exposed to NBC hazards. These items are often stored on the outside of vehicles, where they are threatened by whatever environment exists. Once a soldier recognizes or suspects the presence of contamination, he conducts immediate decontamination to neutralize harmful agents. Prompt action may prevent unnecessary destruction or disposal of critical supplies and equipment that are not rendered safe for continued use.

The M295 individual equipment decontamination kit (IEDK), illustrated in Figure C-45, removes or neutralizes contamination on the soldier's hood, mask, gloves, and personal weapon. Issue ne M295 IEDK to each soldier in the platoon; Store it in the right cargo BDU/BDO pocket or according to unit SOP. Units maintain at least one IEDK per soldier for resupply.

c. **Operator's Spraydown/Wipedown.** The platoon conducts operator's spraydown/wipedown to remove or neutralize chemical agents on frequently touched or occupied equipment surfaces and to prevent contamination spread. The process is most effective when accomplished within 15 minutes of contamination. It is done using the M13 decontamination apparatus, portable (DAP) and DS2 decontamination solution, the ABC-M11 DAP and DS2, or the M100 sorbent decontamination system (SDS).

**NOTE:** Ask the students to explain how to decontaminate biological and radiological agents.

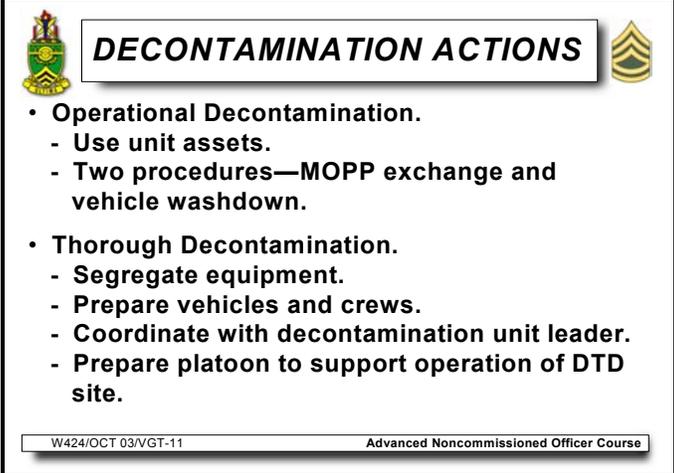
**NOTE:** For the next question, allow the students time to answer the question then show the VGT. Ask the students to explain how they accomplish these actions in their units.

QUESTION: What are the actions necessary to perform operational and thorough decontamination?

ANSWER: See VGT-11.

Ref: SH-2, p SH-2-34

### SHOW VGT-11, DECONTAMINATION ACTIONS



**DECONTAMINATION ACTIONS**

- **Operational Decontamination.**
  - Use unit assets.
  - Two procedures—MOPP exchange and vehicle washdown.
- **Thorough Decontamination.**
  - Segregate equipment.
  - Prepare vehicles and crews.
  - Coordinate with decontamination unit leader.
  - Prepare platoon to support operation of DTD site.

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Ref: SH-2, p SH-2-33 and SH-2-34

**CHECK ON LEARNING:** Conduct a check on learning and summarize the ELO.

QUESTION: How soon after contamination should operator spraydown/wipedown begin?

ANSWER: 15 minutes after contamination.

Ref: SH-2, p SH-2-31

QUESTION: What are the two operational decontamination techniques?

ANSWER: MOPP gear exchange and vehicle washdown.

Ref: SH-2, p SH-2-33

**SECTION IV. SUMMARY**

Method of Instruction: <u>Conference / Discussion</u>
Technique of Delivery: <u>Small Group Instruction (SGI)</u>
Instructor to Student Ratio is: <u>1:16</u>
Time of Instruction: <u>5 mins</u>
Media: <u>None.</u>

**Check on Learning**

Determine if the students have learned the material presented by soliciting student questions and explanations. Ask the students questions and correct misunderstandings.

**Scenario:** Your unit is conducting normal operations. The S-2 received intelligence reports indicating that the enemy is preparing to launch a nuclear attack possibly in the vicinity of your location. Your commander tasked you to supervise the preparation of the unit for a nuclear attack (Two questions).

QUESTION: What actions must personnel take to protect themselves from nuclear radiation?

ANSWER: Roll down sleeves and button collars and place a handkerchief or similar cloth over the nose and mouth to prevent inhalation of contaminated dust.

Ref: SH-2, p SH-2-5A(2)

QUESTION: How will the use of hills and mountains minimize the effects of an attack?

ANSWER: Heat and light from the fireball of a nuclear blast and the initial radiation tend to be absorbed by hills and mountains and what is not absorbed is deflected above the soldiers due to the slope.

Ref: SH-2, p SH-2-5B(1)a

**Scenario:** Your unit is conducting operations in an area where enemy forces used biological weapons in the past and all indications show that they will not hesitate to use them again to gain advantage on the battlefield. IPB reports indicate that the enemy is preparing to use biological weapons against your unit. You will provide supervision in preparing your unit for a possible biological attack (Next two questions).

QUESTION: What will protect soldiers from many diseases uncommon in the United States but prevalent in other parts of the world?

ANSWER: Immunizations.

Ref: SH-2, p SH-2-9A(1)b

QUESTION: What needs to be done with a latrine facility prior to a unit moving out of an area?

ANSWER: Ensure they are properly filled and marked.

Ref: SH-2, p SH-2-10B(1)b, 3rd bullet

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Question: Under what conditions may your commander use the "Mask Only" command?

ANSWER: When RCAs (riot control agents) are employed and no chemical/biological threat exists and in a downwind vapor hazard of a nonpersistent chemical agent.

Ref: SH-2, p SH-2-15B(7)b

Question: What are the three types of decontamination?

ANSWER: Immediate, operational, and thorough.

Ref: SH-2, p SH-2-29

---

**Review /  
Summarize  
Lesson**

Soldiers on the modern battlefield can expect to fight in nuclear, biological, or chemical environments for long periods of time. They must be able to fight and win under these conditions. As a leader, it is your responsibility to train your soldiers in all critical NBC technical and tactical skills. The survival of your soldiers on the battlefield is a direct reflection of how well you trained them in peacetime. Remember, well-trained soldiers, properly equipped and disciplined, can fight and win on the NBC contaminated battlefield.

During the last two hours we discussed the following:

- NBC contamination avoidance procedures.
- NBC protection procedures.
- NBC decontamination procedures.

This lesson should give you a good indication on what actions you should take when you return to your unit and read over and correct your NBC SOP.

---

## STUDENT EVALUATION

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### Testing Requirements

**NOTE:** Describe how the student must demonstrate accomplishment of the TLO. Refer student to the Student Evaluation Plan.

You will take a written examination. The examination will contain questions from this lesson. You must correctly answer 70 percent of the questions on the examination to receive a GO. Failure to achieve a GO on the examination will result in a retest. Failure of the retest could result in your dismissal from the course.

---

### Feedback Requirements

**NOTE:** Feedback is essential to effective learning. Schedule and provide feedback on the evaluation and any information to help answer students' questions about the test. Provide remedial training as needed.

Inform the students where their examination will take place, as posted on the training schedule, and when they will receive feedback on the test. Include any retest.

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Terminal Learning Objective

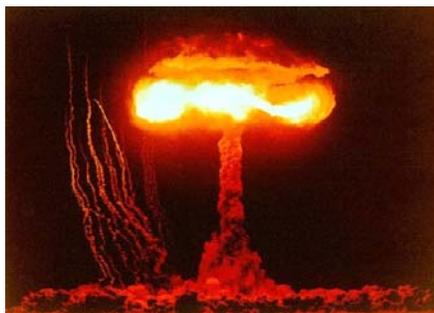
VGT-1, TERMINAL LEARNING OBJECTIVE



## TERMINAL LEARNING OBJECTIVE



**Implement procedures for a platoon to operate in a nuclear, biological, and chemical (NBC) environment.**



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## ***CONTAMINATION AVOIDANCE***



### **Defense before a nuclear attack.**

- **Individual protection.**
  - Shelter
  - Exposure
- **Position**
  - Terrain
  - Shielding from gamma and neutron radiation
  - Shelter from weapons effects
- **Material**
  - Supplies and equipment
  - Food and water supplies
  - Electronic equipment.



## **CONTAMINATION AVOIDANCE (CONT)**



### **Biological defense**

- **Individual protection**
  - Coordinate for immunizations
  - Ensure soldiers practice good hygiene and field sanitation procedures
  - Ensure soldiers are in good physical shape
- **Position**
  - Cleanliness
  - Field sanitation facilities
- **Material**
  - Food
  - Equipment and supplies
  - Parked vans

Enabling Learning Objective B

Learning Step 1

VGT-4, MOPP LEVELS



# ***MOPP LEVELS***





**MOPP-0**



**MOPP-1**



**MOPP-2**

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## ***MOPP LEVELS (CONT)***



**MOPP-3**



**MOPP-4**



## ***RADIOLOGICAL MONITORING***



- **Periodic monitoring**
  - After first nuclear weapon use.
  - Platoon out of contact.
  - Ordered by higher HQs.
  - Platoon stops continuous monitoring.
- **Continuous monitoring**
  - Nuclear detonation observed or reported in area.
  - NBC-3 report received and platoon is in area.
  - Ordered by higher HQs.
  - Dose rate of 1 cGy/hr reported in periodic monitoring.



## ***NBC CASUALTY TREATMENT***



- **First step is self-aid and buddy-aid measures.**
- **Varies depending on type of agent.**
- **Soldiers should mask to prevent inhaling or ingesting other agents.**
- **Remove agents from their skin.**
- **Use buddy-aid procedures to observe each other for symptoms and to request medical assistance.**



## ***NBC CASUALTY LEADER ACTIONS***



**The platoon leader should:**

- **Select separate collection points for contaminated and noncontaminated casualties.**
- **Decontaminate casualties as thoroughly as situation allows.**
- **Include the number of contaminated patients for evacuation.**
- **Evacuation team sends proper number of vehicles for pickup.**



## ***NBC MARKING PROCEDURES***



- **Markers should face away from the highest contamination reading.**
  - **Placed at roads, trails, and points of entry.**
  - **Distance between signs vary.**
  - **If standing in front of a marker, the markers to the left and right must be visible.**
- \*\* Units discovering a marked contaminated area do not have to conduct elaborate, time-consuming surveys.**



## ***DECONTAMINATION PRINCIPLES***



- **Conduct it as soon as possible.**
- **Decontaminate whatever is necessary.**
- **Conduct as far forward as possible.**
- **Conduct it by priority.**



## ***DECONTAMINATION ACTIONS***



- **Operational Decontamination.**
  - **Use unit assets.**
  - **Two procedures—MOPP exchange and vehicle washdown.**
- **Thorough Decontamination.**
  - **Segregate equipment.**
  - **Prepare vehicles and crews.**
  - **Coordinate with decontamination unit leader.**
  - **Prepare platoon to support operation of DTD site.**

**Appendix B Test(s) and Test Solution(s) (N/A)**

## Appendix C Practical Exercises and Solutions (N/A)

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**HANDOUTS FOR LESSON 1: W424 RES version 1**

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**This Appendix Contains**      This appendix contains the items listed in this table

<b>Title/Synopsis</b>	<b>Pages</b>
SH-1, Advance Sheet	SH-1 and SH-1-2
SH-2, 33 pages that contain extracted material from FM 3-20.98 and three handouts from the Chemical School.	SH-2-1 to SH-2-34

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## **Student Handout 1**

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This student handout contains Advance Sheet.

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# Student Handout 1

## Advance Sheet

<b>Lesson Hours</b>	This lesson consists of two hours of small group instruction.	
<b>Overview</b>	You as a leader will have to prepare your soldiers for the threats of NBC attacks on the modern battlefield. This lesson will show you how to be successful in supervising the preparation of the platoon, emplacement of chemical agent alarm, and the implementation of MOPP for Nuclear, Biological, and Chemical (NBC) attacks.	
<b>Learning Objective</b>	Terminal Learning Objective (TLO)	
	<b>Action:</b>	Implement procedures for a platoon to operate in a Nuclear, Biological, and Chemical (NBC) environment.
	<b>Conditions:</b>	As a platoon sergeant in a classroom environment, given FM 3-20.98 (SH-2), with embedded Chemical School handouts.
	<b>Standard:</b>	Implemented the procedures necessary for a platoon to operate in an NBC environment by: <ul style="list-style-type: none"> <li>• Describing NBC contamination avoidance procedures.</li> <li>• Identifying NBC protection procedures.</li> <li>• Identifying NBC decontamination procedures.</li> </ul> IAW FM 3-20.98 (SH-2) with embedded Chemical School handouts.

**ELOs**

**ELO A** Describe NBC contamination avoidance procedures.  
**ELO B** Identify NBC protection procedures.  
**ELO C** Identify NBC decontamination procedures.

**Study Assignments**

The student assignment for this lesson is:  
 Read Student Handouts 1 and 2.

**Additional Subject Area Resources**

None

**Bring to Class**

- Pen or pencil and writing paper.
- All reference material received for this lesson.

## **Student Handout 2**

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This handout contains information extracted from FM 3-90.98, Appendix C. Embedded in the handout are three handouts from the chemical school (Passive voice may occur within the handouts).

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## Appendix C

# Nuclear, Biological, and Chemical Operations

Military planners recognize that enemies of the United States have learned many lessons in the years since the Gulf War deployment. Rogue nations or insurgent elements, for example, may attempt to use the media to create psychological leverage to sway public opinion and create public discontent. At the same time, they may support such information oriented efforts with nontraditional forms of combat, such as NBC operations. The ultimate goal may be to break up an alliance or neutralize the commitment of an international coalition to a particular region. Such factors, coupled with US involvement in worldwide operational or support contingencies, increase the probability that U.S. forces will encounter asymmetrical threats, including NBC situations. To accomplish missions on contaminated battlefields, reconnaissance platoons must take precautions to avoid or minimize the effects of NBC hazards. Properly executed, the defensive measures in this appendix will help the platoon to survive, fight, and win.

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## SECTION II – CONTAMINATION AVOIDANCE

### INTRODUCTION

C-24. Avoiding contamination, the most important principle of NBC defense, requires the ability to recognize the presence or absence of NBC hazards in the air and on water, land, personnel, equipment, and facilities. If an NBC hazard cannot be avoided, the reconnaissance platoon must be prepared to protect personnel and equipment from the effects of exposure.

C-25. Contamination avoidance is absolutely critical to the success of the reconnaissance platoon. The platoon should constantly analyze its vulnerability to NBC attack and take appropriate actions. This discussion focuses on four measures the platoon can take for contamination avoidance:

- Employ active defensive measures.
- Employ passive defensive measures.
- Locate, identify, track, and predict contamination.
- Warn and report.

### MAINTAIN DISCIPLINE

C-31. Discipline is a must if the platoon is to survive and overcome the shock of an NBC attack. Soldiers must be physically and mentally capable of functioning in an NBC environment for extended periods. MOPP acclimation training is essential to developing stamina, teamwork, confidence, trust, and reliability for soldiers and the platoon leadership. Risk assessment and rest cycle management must become fundamental disciplines during mission planning.

### SEEK PROTECTION

C-32. When the platoon is mobile, natural cover may provide some shelter from chemical agents; however, the platoon must be aware of lowlying areas such as ditches, valleys, depressions, and ravines. Like fog, chemical agents are frequently released early in the morning and late in the afternoon, when they are likely to linger for longer periods. When the platoon is in the defense or is halted, leaders should remember that heavily wooded areas provide limited protection from liquid agents. At the same time, however, some semipersistent agents, uninhibited by climatic conditions, may prove more lasting, with toxic vapors lingering for unpredictable periods. MOPP gear, overhead cover, and mounted operations afford the best, most reliable protection.

**DISPERSE**

C-33. Effective dispersion should reduce the platoon's vulnerability without compromising the tactical mission. Leaders must understand the advantages of dispersing combat forces, as well as equipment and critical classes of supply, when the threat of NBC attack is high. In such a situation, using dispersion to create multiple targets increases platoon survivability and sustainability and presents a more formidable challenge for the threat. Conversely, the disadvantages of dispersing the platoon must be weighed against the risk of NBC attack. Extended distances may have a detrimental impact on the conduct of C4ISR, on treatment and handling of conventional and NBC casualties, and on logistics operations, including necessary decontamination operations. Reconnaissance platoon leaders must know how to use METT-TC to develop an effective dispersion plan.

**COVER SUPPLIES  
AND EQUIPMENT**

C-35. If an NBC attack is imminent, the platoon should cover its supplies and equipment to avoid contamination. This is especially critical when the platoon is in the defense. Tarpaulins and plastic sheeting can be used, as well as field expedient items such as canvas and cardboard. Leaders should remember that expedient NBC protective covers provide protection but must be monitored closely because contamination will seep through covers over time. After exposure to heavy contamination, covers should be replaced as soon as possible, ideally within one hour after contamination.

**CONDUCT  
PREMOVEMENT  
COMBAT  
ACTIONS**

C-36. Actions taken by the platoon before departing for a mission include premovement/precombat inspections, evaluation of the potential for an NBC attack, and identification of mitigation techniques (such as cover, close, seal) that may be required. Leaders must determine what items cannot be decontaminated and then take steps to guard or protect them (as well as platoon personnel) from accidental exposure. Measures that the platoon (or attached elements) should take before crossing or operating in an NBC environment include the following:

- Update the COP and/or FBCB2 to reflect the tactical situation and identify NBC hazards.
- Select the most favorable route(s) using principles of contamination avoidance.
- Notify higher headquarters of the platoon plan. Include checkpoints and halt positions.
- Rehearse passage of lines and coordination procedures, to include communications frequencies, call signs, and passwords.
- Conduct inventory and PMCS activities for NBC sensors and detection equipment.
- Apply NBC detection tape (M9 paper) so that it can be observed by vehicle occupants and/or dismounted soldiers.

**CONDUCT  
PREMOVEMENT  
COMBAT ACTIONS,  
cont**

- Remove gear, supplies, and equipment affixed to the vehicle exterior. Secure them inside or leave them at the base camp. Chemical protective covers may be used to retard hazards or to improve the chance that items can be effectively decontaminated.
- Install and test NBC detectors and sensors.
- Rehearse the designated crossing technique or method.
- Rehearse casualty treatment and evacuation plans.
- Rehearse techniques and procedures of the NBC warning and reporting system (NBCWRS).
- Conduct risk assessment and MOPP analysis.
- Upgrade to the appropriate MOPP level to prevent troop exposure. (**NOTE:** Overpressurized vehicles may require a lower level of protection.)
- Secure hatches and doors before entering or crossing the contaminated area.

The best defense against a nuclear attack is to dig in. Unit defensive positions, which vary from individual foxholes to improved positions, should be prepared whenever the tactical situation permits.

Scouts should keep their individual weapons, equipment, clothing, and other issue items in their vehicles. Equipment must be secured because the blast wave will convert unsecured items into lethal missiles. Supplies, explosives, and flammable materials should be dispersed and protected.

**Reverse slopes of hills and mountains give some nuclear protection. The initial radiation and the heat and light from the fireball of a nuclear blast tend to be absorbed by hills and mountains. Use of gullies, ravines, ditches, natural depressions, fallen trees, and caves can reduce nuclear casualties.**

## **STUDENT HANDOUT**

### **Chemical School Handout 1)**

#### **PREPARE A UNIT FOR A NUCLEAR ATTACK**

- A. Individual Protection
  1. Ensure personnel are sheltered in well-constructed fighting positions with overhead cover, bunkers, or armored vehicles.
  2. Ensure personnel cover all exposed skin.
    - a. Roll down sleeves and button collars.
    - b. A handkerchief or similar cloth may be worn over the nose and mouth to prevent inhalation of contaminated dust.
- B. Position
  1. Ensure terrain is used effectively to minimize effects of attack.
    - a. Hills and mountains—Reverse slopes of hills and mountains give some nuclear protection. Heat and light from the fireball of a nuclear blast and the initial radiation tend to be absorbed by hills and mountains and what is not absorbed is deflected above the soldiers due to the slope.
    - b. Depressions and gullies—The use of gullies, ravines, ditches, natural depressions, fallen

trees, and caves can reduce nuclear casualties; however, predicting the actual point of an attack is almost impossible.

- c. Below ground areas—The best protection remains an area below ground with some sort of overhead cover.
2. The primary concern regarding position protection should be shielding from gamma and neutron radiation.
    - a. Gamma radiation protection requires thick layers of dense or heavy shielding material such as lead, iron, or stone.
    - b. Through absorption, light, hydrogen-based material gives good neutron radiation protection. Examples are water, paraffin, and oil.
    - c. Generally, the thicker the layers of each type of shielding material, the better the overall radiation protection.
- C. Ensure the type of available shelter provide the best protection from weapon's effects.
    - a. Foxholes—Earth is a good shielding material and therefore digging in provides the best nuclear defense. A well-constructed fighting position gives excellent protection against initial nuclear effects and can reduce residual radiation. Foxholes/fighting positions should be hardened against the blast wave as time permits. Lining the fighting positions not only reduces the size of the opening, it can significantly increase survivability.
      - A smaller fighting position opening provides better protection as it reduces the amount of gamma radiation entering.
      - A deep fighting position gives more radiation protection than a shallow one by placing a greater thickness of shielding material between the occupant(s) and the nuclear detonation.
      - Thermal radiation can reach soldiers in fighting positions by line-of-sight exposure or by reflection off the sides. Use dark, rough materials (e.g., wool or canvas) to cover potential reflecting surfaces and as protective cover for soldiers and equipment.

**CAUTION:** Thermal exposure may still burn or char wool or canvas so direct contact with them should be avoided.

- b. Field-expedient overhead cover—Overhead covering of earth or other material reduces exposure to thermal and initial nuclear radiation and fallout. In addition, it helps prevent collapse and provides missile protection.

**CAUTION:** Do not use ponchos or other rubber or plastic materials alone as fighting position covers as they may melt and cause burns.

**WARNING:** Poorly constructed overhead cover is dangerous. The cover must be strong enough to withstand the blast wave

- Some examples of good field-expedient overhead cover include:
  - U-shaped metal pickets
  - Timbers
  - Certain fabrics and overlaying them with sandbags or earth
  - Ammunition boxes filled with earth
- Remember the following when constructing effective overhead cover:
  - Choose dense covering materials
  - Cover in depth
  - Provide strong supports
  - Cover as much of the opening as possible

Vehicles provide expedient overhead cover as well; and heavy armored vehicles are better than wheeled vehicles. Simply driving a vehicle over the top of a fighting position is a fast way to create protection. As with any overhead cover, initial radiation can still enter through the earth sides or openings in the sides of the vehicle (e.g., between the treads, road wheels, and tires.) If time permits, cover these openings with sandbags. Keep in mind that the vehicle is not a good neutron shield.

**NOTE:** Seeking shelter inside an armored vehicle is better protection than using it as overhead cover.

**CAUTION:** The blast wave may violently displace the vehicle and collapse a fighting position.

- c. Buildings—A rule for choosing buildings is the stronger the structure, the better the protection against a blast. The best choices include heavily-framed buildings with steel and reinforced concrete. Ammunition storage bunkers also provide exceptional protection and are usually large enough for most vehicles and equipment. The worst choices for protection include shed-type industrial buildings with light frames and long beam span. When searching for protection, the following building characteristics should be looked for:
- Pre-World War II design and construction with thick, full-span floor and ceiling beams; heavy roofing tiles; dense, reinforced walls; and in most cases, full basement.
  - Full basements constructed of concrete or stone with an exit directly to the outside as well as through upper floors in case of an emergency.
  - Masonry structure with a thickness of 36 centimeters or greater than 1 foot, diagonal supports and block works.
  - Buildings with the least amount of glass or protected by roll-up or folding shutters (which provide additional blast and thermal protection.)
  - Buildings shielded by other structures that have less blast overpressure and structural damage than exposed structures (e.g., in an urban area, exterior rows of buildings shield interior buildings.)

**NOTE:** While there is additional protection associated with shielded buildings, there are also increased debris and rubble problems. In addition, fire hazards increase toward the center of a town. Commanders should consider using shelters located two or three rows of buildings from the edge of town so as to avoid hindering post-attack maneuvers..

**NOTE:** Tents—Tents provide some protection, but they are not a preferred shelter against the effects of nuclear weapons. They initially provide good thermal protection, but the secondary fire hazard is serious. In most instances the blast wave will not blow the smoldering tent far enough away to prevent damage and injury from subsequent fires.

- Because the tent offers no resistance to blast winds, all equipment and glassware must be secured. These items can be propelled by the blast and cause serious injuries. The tent poles must also be protected from breakage. Piling sandbags around the center of the pole not only provides additional support, it also helps to ensure enough clearance to the ground to allow soldiers to evacuate a smoldering tent.
- d. Armored vehicles—Armored vehicles provide good nuclear protection. In most cases, tanks provide the best vehicular protection; however, even lightly armored vehicles such as infantry fighting vehicles and armored personnel carriers give protection. If time permits, any of the following actions should be performed to improve the protection these vehicles provide:
- Get as low as possible inside an armored vehicle. Keep all hatches and openings (e.g., main gun breech) shut.
  - Prevent injury while inside an armored vehicle by wearing protective helmets and securing all loose equipment.
  - Armored vehicles should be in hull defilable position or sandbagged. Hull defilable is digging in armored vehicles or placing them in trenches or cuts in roadways.
  - A single layer of sandbags placed on top of a tank turret or armored vehicle provides valuable overhead gamma radiation shielding.
  - Wetting the sandbags enhances neutron radiation shielding and protects the sandbags from thermal damage.
  - Place vehicle in a rear-on orientation.

**NOTE:** While there is additional protection associated with shielded buildings, there are also increased debris and rubble problems. In addition, fire hazards increase toward the center of a town. Commanders should consider using shelters located two or three rows of buildings from the edge of town so as to avoid hindering post-attack maneuvers.

C. Material

1. Ensure supplies, equipment, and vehicles are dispersed and dug-in as much as possible.
2. Ensure explosives, ammunition, and flammables (fuel and oil) have been dispersed and dug-in. Cover them, if possible.
3. Ensure small objects are secured to minimize the danger of casualties and damage from debris.
4. Ensure existing cover provides protection and natural shielding for vehicles, supplies, and equipment from a nuclear explosion.
5. Ensure vans are parked so the air conditioner intakes are opposite the prevailing wind direction. Ensure air conditioners are turned off and the intakes are covered with nonporous materials such as plastic sheets or ponchos.
6. Ensure all food and water supplies are sealed tightly in containers and secured under cover.
7. Ensure all electronic equipment and radios are turned off if not required for use. Disconnect or remove power cables, antennas, and unused electronic equipment from power mounts.
8. Place communications and electronic equipment inside bunkers or armored vehicles to increase protection against electromagnetic pulse (EMP).

**NOTE:** EMP is the high-energy, short duration pulse generated by nuclear detonation. It can induce a current in any electrical conductor and temporarily disrupt or overload and damage components of improperly protected or unprotected electronic equipment.

**End of Chemical School Handout 1**

## **BIOLOGICAL DEFENSE**

The key protective measure against a biological attack is maintaining a high order of health, personal hygiene, and sanitation discipline. Biological attacks are hard to detect. If an attack occurs, chances of survival are better if crewmembers are healthy and physically fit and maintain good personal hygiene. Keeping the body clean helps to prevent ingestion of biological agents. Keep small cuts or scratches covered and germ-free by using soap, water, and first-aid measures. Since insects carry biological agents, prevent insect bites by keeping clothes buttoned and covering the skin.

Do not eat food or drink water that may be contaminated. After an attack, you must assume that all surfaces have been exposed to germs. Eat or drink only food that has remained sealed; consume it only after you have washed and cleaned the outside of the container. All water must be boiled at least 15 minutes.

### **STUDENT HANDOUT 2 (Chemical School Handout)**

#### **PROCEDURES TO PREPARE A UNIT FOR A BIOLOGICAL ATTACK**

##### **A. Individual Protection**

1. Coordinate with medical personnel for needed immunizations.
  - a. Immunizations reduce the chances of soldiers becoming biological casualties.
  - b. Many diseases uncommon in the United States are prevalent in other parts of the world and soldiers can be protected through immunization.
2. Ensure soldiers practice good hygiene and field sanitation procedures.
  - a. One of the best ways of warding off disease is to keep the body as clean as possible. This means washing all parts of the body, particularly the feet and exposed skin.
  - b. Hands need to be cleaned before meals or anytime bare hands are used to help ingest food and liquid or when smoking.
  - c. Soldiers should brush their teeth, and they must shave. Shaving is required to achieve a proper seal of the mask.
  - d. Small nicks, cuts, and scratches are unavoidable in a field situation. Germs, either naturally occurring or intentionally employed, enter these breaks in the skin and will cause infections if left untreated. Soldiers should clean any breaks in the skin with soap and water followed by first-aid treatment.
3. Ensure soldiers are in good physical condition that means a well-rested, well fed, and healthy state.
  - a. A good physical fitness program will get soldiers in good shape and also increase their emotional health.
  - b. If soldiers keep healthy, their bodies will be better able to fight off germs.
  - c. A high level of physical fitness also reduces the likelihood of heat stress when MOPP gear is worn for extended periods.

**NOTE:** Refer students to Handout #3 for information on implementing MOPP.

4. Ensure soldiers button clothing and cover exposed skin, or wear appropriate MOPP level.
5. Ensure soldiers check protective masks and individual equipment for serviceability and coordinate with supply personnel for needed parts and equipment

B. Position

1. Ensure the area is kept clean in order to stop the spread of disease.
  - a. Bury all empty ration packets and residue.
  - b. Locate, construct, and use field sanitation facilities properly.
    - Latrine facilities should include soap and water for washing hands.
    - Latrines need to be cleaned daily.
    - Avoid leaving such facilities open, and make sure they are properly filled and marked before moving to prevent accidental digging the areas.
    - Prevent the spread of disease by controlling insects and rodents.
    - Ensure terrain is used effectively to minimize effects of attack.
    - Ensure the type of available shelter selected (covered foxholes, field expedient overhead cover, buildings, tents, and armored vehicles) provide the best protection from weapon's effects.

C. Material

1. Ensure all food and water supplies are sealed tightly in containers and secured under available cover.
2. Ensure equipment and supplies not in use are covered to avoid surface contamination from aerial spray attack.
3. Ensure vans are parked so the air conditioner intakes are opposite the prevailing wind direction. Ensure air conditioners are turned off and the intakes are covered with nonporous materials such as plastic sheets or ponchos.

**End of Chemical School Handout 2**

**DEFENSE BEFORE A CHEMICAL ATTACK**

**Protective procedures**

Make sure all personnel have their protective masks available, and make sure each mask fits and functions properly. All personnel should wear the proper protective clothing in accordance with the MOPP level designated by the commander. Protect all equipment and supplies from liquid chemical contamination by keeping them organized and covered.

**Emplacing the M8A1 automatic chemical agent alarm**

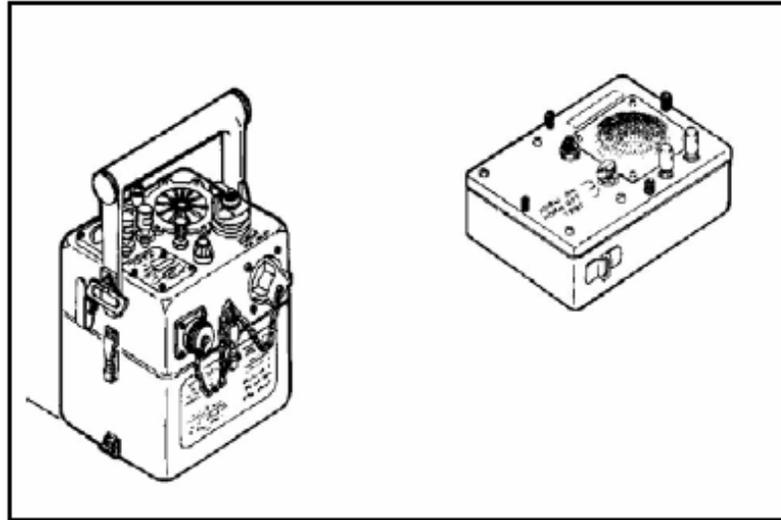
The M8A1 is the primary means of detecting an upwind chemical attack. The system provides two essential elements of survival: detection of a toxic agent cloud and early warning to troops in the monitored position. The platoon leader decides where to place the chemical alarm. The detector units should be placed no more than 150 meters from the platoon's perimeter or position. Space the available detector units approximately 300 meters apart, and make sure each detector unit is connected to the alarm unit by telephone cable (WD-1). Position the alarm units near radiotelephone assets; this makes it easy to alert the unit of an attack. Blowing sand or dust, rain, sleet, snow, temperatures below 40 degrees Fahrenheit, and tropical conditions can affect operation of the alarm.

**M8A1 AUTOMATIC  
CHEMICAL AGENT  
ALARM  
USE**

C-72. Positioned upwind from defensive positions, the remote detector (M43A1) is connected, using WD-1 communications wire, to the alarm unit (M42). It can provide early warning of potential nerve agents (vapor only).

## DESCRIPTION

C-73. As illustrated in Figure C-6, the M43A1 detector (larger unit; NSN 6665-01-081-8140) and M42 alarm unit (smaller unit; NSN 6665-0859-2215) are the major components of the M8A1. When the M43A1 detects a nerve agent, it sends an electronic signal along the communications wire to the M42 alarm, setting off a remote audible/visual signal (or visual signal only when noise discipline is a concern). The M10A1 power supply (NSN 6135-00-859-2225) provides DC power to the detector from an AC source (115 or 220V). The detector uses one BA-3517/U battery; the alarm uses four BA-3030 or BB-3203/UF (Dcell) batteries.



**Figure C-6. M8A1 Automatic Chemical Agent Alarm**

## LIMITATIONS

C-74. Accidental or incidental destruction of this detector must be reported immediately to the NBC officer or NCO. It contains Americium 241, a radiation hazard. False alarms may result from screening and signaling smoke, engine exhaust, rocket/missile propellant smoke, and electromagnetic pulse (EMP). The M8A1 is being replaced by the M22 ACADA (covered later in this discussion).

## UNIT ISSUE

C-75. Standard issue is one per platoon, subject to the applicable modified table of organization and equipment (MTOE).

## DECONTAMINATION

C-76. The M8A1 can be decontaminated using the M295/M291 decontamination kit(s) or using a nonstandard decontamination solution consisting of one part household bleach and three parts hot water.

## **SECTION V – NBC PROTECTION (REDUCING NBC VULNERABILITY)**

C-168. Shielding the force entails the action necessary to reduce the NBC threat and prevent NBC casualties, including medical pretreatment, contamination avoidance, and physical protection. Shielding begins in the predeployment phase, when units pretreat soldiers to minimize the chemical, biological, and residual radiation threat. Contamination avoidance allows the reconnaissance platoon to move around hazards or to relocate before the occurrence or arrival of a hazard. Physical protection, which covers both units and individuals, provides a contamination-free environment in which the platoon and its soldiers can operate successfully. Enhanced sensing and shaping capabilities will allow commanders and platoon leaders to use scientific concepts and methods to achieve an effective NBC-focused defense.

### **STUDENT HANDOUT3 (Chemical School Handout)**

#### **Implement Mission-Oriented Protective Posture (MOPP)**

If an NBC hazard cannot be avoided, the scout platoon must be prepared to protect personnel and equipment from the effects of exposure. The type and degree of protection required will be based on the unit's mission and the hazard. Note that the line between contamination avoidance and protection is not distinct; many actions contribute equally to both.

#### **MOPP LEVELS, ALARMS, AND SIGNALS**

Soldiers on the integrated battlefield will face a combination of nuclear, biological, chemical, and conventional attacks. The key to effective protection in an NBC environment is the scout platoon's proficiency in automatically and correctly implementing an effective NBC defense SOP. Individual and unit protection against chemical attack or contamination hinges on effective use of the MOPP and on individual proficiency in basic NBC skills. All platoon members must be familiar with the standard MOPP levels shown in [Table B-1](#).

**Table B-1. MOPP levels and equipment requirements.**

MOPP level	MOPP READY	MOPP 0 (ZERO)	MOPP 1	MOPP 2	MOPP 3	MOPP 4	Command (mask only)
<b>Equipment</b>							
<b>Mask</b>	Carried	Carried	Carried	Carried	Worn <sup>1</sup>	Worn	Worn
<b>Overgarment</b>	Ready <sup>3</sup>	Available <sup>4</sup>	Worn <sup>1</sup>	Worn <sup>1</sup>	Worn <sup>1</sup>	Worn	
<b>Vinyl overboots</b>	Ready <sup>3</sup>	Available <sup>4</sup>	Available <sup>4</sup>	Worn	Worn	Worn	
<b>Gloves</b>	Ready <sup>3</sup>	Available <sup>4</sup>	Available <sup>4</sup>	Available <sup>4</sup>	Available <sup>4</sup>	Worn	
<b>Helmet protective cover</b>	Ready <sup>3</sup>	Available <sup>4</sup>	Available <sup>4</sup>	Worn	Worn	Worn	
<b>Chemical protective undergarment <sup>2</sup></b>	Ready <sup>3</sup>	Available <sup>4</sup>	Worn <sup>2</sup>	Worn <sup>2</sup>	Worn <sup>2</sup>	Worn <sup>2</sup>	

1 In hot weather, coat or hood can be left open for ventilation.

2 The chemical protective undergarment is worn under the BDU (this primarily applies to armor vehicle crewmen and special operations forces).

3 These items must be available to the soldier within two hours, with a second set available within six hours.

4 These items must be positioned within arm's reach of the soldier.

When an NBC attack is recognized, every soldier must receive the warning and assume the appropriate MOPP level (see [Table B-1](#)). Those in immediate danger need warnings they can see or hear. The alarm or signal must be simple and unmistakable for quick and correct reaction. Units not immediately affected need the information to prepare for the hazard or to change plans.

If an NBC hazard has been located, the contaminated area should be marked. The NBC warning and reporting system (NBCWRS) and contamination markers contribute to the warning procedures for follow-on forces. In the immediate area of contamination, several methods (or a combination of methods) will allow quick reaction by all platoon members. These methods include vocal alarms (shout of "GAS"), the M8A1 alarm, nonvocal alarms (horn blast or banging of metal-to-metal objects), and visual alarms (most commonly, hand-and-arm signals). The tactical situation may not allow for audible alarms; therefore, the platoon SOP should clearly detail the visual signals for contamination.

**NOTE:** The purpose of MOPP gear and/or equipment is to protect a soldier against nuclear, biological, and chemical (NBC) contamination. It consists of the overgarment, mask, hood, overboots, protective gloves, individual decontamination (decon) kits, detection equipment, and antidotes.

A. Ensure All Soldiers have Assumed the Directed MOPP Level

1. All leaders need to be familiar with standard MOPP levels. Knowing these levels will aid the commander or small unit leader in making rapid and educated decisions regarding the level of MOPP to be worn by his/her soldiers. Standardized MOPP levels allow commanders to increase or decrease levels of protection through the use of readily understood prowords.
2. Once soldiers have been directed to assume a particular MOPP level, it is essential that the leader be able to tell quickly whether each soldier has donned the correct garments and/or equipment. Based on the threat, the commander's or leader's directive may include the percentage of soldiers that will assume a different MOPP level than the rest of the unit. Because different soldiers may be operating under different levels of protection you must be aware of the correctness of each. The safety of individual soldiers as well as the successful completion of the mission may depend on this.
3. Outlined below are the clothing and equipment required for each MOPP level. The following standardized protective postures assume that soldiers are also carrying their individual decontamination kit (M258A1 or M291), M8/M9 detector paper, NAAK, and their protective mask, unless the threat assessment indicates a zero percent probability of NBC use.

**NOTE:** Each MOPP level is cumulative. Those items that were donned at a lower MOPP level continue to be worn in the subsequent MOPP levels.

B. Clothing and Equipment for MOPP Levels

1. MOPP Ready

- a. Soldiers carry their protective masks and their load carrying equipment (LCE).
- b. The soldier's MOPP gear is labeled and stored no further back than the brigade support area (BSA) and is ready to be brought forward to the soldier when needed. The MOPP gear must be available to the soldier within two hours and a second set must be available in six hours.
- c. Units in MOPP Ready are highly vulnerable to persistent agent attacks and will automatically upgrade to MOPP Zero when they determine, or are notified, that chemical weapons have been used or that the threat for use of chemical weapons has risen.

**NOTE:** MOPP Ready is generally used in deployments by light forces to areas where the chemical threat is negligible, and is expected to remain negligible.

**NOTE:** Other than MOPP Ready, MOPP gear should be within arm's reach of each soldier (readily available). Readily available is not a MOPP level but a condition.

2. MOPP Zero

- a. Soldiers carry their protective mask with their LCE.
- b. The standard battledress overgarment (BDO) and other individual protective equipment (IPE) making up the soldier's MOPP gear are readily available.
- c. Units in MOPP Zero are highly vulnerable to persistent agent attacks and will automatically upgrade to MOPP1 when they determine, or are notified, that persistent chemical weapons have been used or that the threat for use of chemical weapons has risen.

**NOTE:** At MOPP1 through MOPP4 soldiers can wear or not wear chemical protective overgarment (CPOG) depending on the weather.

3. MOPP1

- d. Soldiers immediately don the BDO. In hot weather, the overgarment jacket can be unbuttoned, and the BDO can be worn directly over underwear.
- e. M9 or M8 chemical detection paper is attached to the overgarment.

4. MOPP2

- a. Soldiers put on their chemical protective footwear covers (CPFCs), green vinyl overboots (GVOS), or a field expedient item such as vapor-barrier boots.
- b. The protective helmet cover is worn.
- c. The overgarment jacket may be left unbuttoned, but trousers remain closed.

5. MOPP3

- a. Soldiers wear the protective mask and hood which protects them from vapor hazards.
- b. Particularly in hot weather, soldiers can open the overgarment jacket and roll the protective mask hood for ventilation, but trousers remain closed.

6. MOPP4

- a. Put on the NBC rubber gloves with cotton liners.
- b. Soldiers will completely encapsulate themselves by closing their overgarment, and rolling down and adjusting the mask hood.
- c. MOPP4 provides the highest degree of chemical protection, but also has the most negative impact on an individual's performance.

7. Mask-Only

- a. The mask is worn.
- b. The Mask Only command is given under these situations:
  - When RCAs (riot control agents) are being employed and no chemical/biological threat exists.
  - In a downwind vapor hazard of a nonpersistent chemical agent.

**CAUTION:** Mask Only is not an appropriate command when blister or persistent nerve agents are present.

**END OF CHEMICAL SCHOOL HANDOUT 3**

## NUCLEAR HAZARDS AND PROTECTIVE MEASURES

### US POLICY STATEMENT

**The United States reserves the right to use nuclear weapons.**

C-175. Soldiers cannot taste, feel, or see radioactivity; radiation can be lethal to unprotected, untrained, and unwarned troops. As a result, the reconnaissance platoon must be prepared to take contingency actions to reduce the effects of accidental or deliberate dissemination of radioactive material on the battlefield. Nuclear risks can result from several types of events: nuclear weapon detonations, discharge of radioactive munitions, environmental exposure of research isotopes or materials, and nuclear plant by-product spills or radiation releases. Each of these presents formidable and difficult challenges.

#### **TYPES OF NUCLEAR BURSTS**

C-176. The altitude at which a nuclear device is detonated determines blast, heat, and nuclear radiation effects. The four fundamental types of nuclear detonations are air, surface, subsurface, and high-altitude.

#### **ACTIONS BEFORE A NUCLEAR ATTACK**

C-188. The best defense against a nuclear attack is distance, combined with protection from natural terrain and/or reinforced structures (preferably below ground). If the tactical situation or other circumstances do not allow the reconnaissance platoon to move an adequate distance away from a detonation, the best defense against the effects of a nuclear attack is to get below ground with overhead cover and improved shielding. Use of natural terrain can also reduce nuclear casualties; effective terrain features include the reverse slopes of hills and mountains; low areas such as gullies, ravines, ditches, and natural depressions; fallen trees; and caves. Sandbags and blocking and bracing material can improve shelter and vehicle shielding. Wet sandbags enhance neutron radiation shielding.

**ACTIONS DURING  
A NUCLEAR  
ATTACK  
(WITHOUT  
ADVANCE  
STRIKEWARN)**

C-190. The following actions apply when the unit fails to receive a STRIKEWARN report of an impending nuclear attack:

**If in the open, take the following actions:**

- Keep your eyes tightly closed and hit the ground face down. **NEVER RUN FOR COVER OR ATTEMPT TO FACE AWAY FROM THE BLAST.**
- Start counting flash-to-bang time.
- While still laying down, secure your Kevlar helmet and cover exposed skin.
- Secure your weapon under your body.
- When winds from the blast arrive, try to orient your body slowly to face the blast, making yourself more aerodynamic and less susceptible to flying objects.
- Keep your eyes closed until you no longer feel forced to do so. Squint before totally opening your eyes.

**If in an armored vehicle, take the following actions:**

- Do not peer through driver or optical devices. Keep your eyes tightly closed, and start counting flash-to-bang time.
- Feel and reach to find open hatch doors, and if necessary, close them.
- Close the weapons breach, and traverse gun tube(s) away from the direction of the blast or high winds.
- Attempt to turn the vehicle and orient the front to face the blast. Then quickly turn off electronic equipment and the vehicle engine.
- Keep your eyes closed until you no longer feel forced to do so. Squint before totally opening your eyes.

## **ACTIONS AFTER A NUCLEAR ATTACK**

C-191. The following actions apply once the nuclear attack has concluded:

- Wait for both shock waves to pass and debris to stop falling.
- Record the flash-to-bang time.
- Cover your mouth with a handkerchief, and wear goggles to protect your eyes from fallout contamination. If you do not have these items, put on the protective mask. Take these precautions quickly before fallout arrives.
- Seek shelter from fallout.
- If fallout arrives while you are exposed, routinely shake the handkerchief or the mask filter element to remove dust particles and to prevent accumulation of contamination.
- Treat casualties. Refer to the discussion later in this appendix for information on treatment of casualties from nuclear detonations.
- Reconnect the FBCB2, radios, and antennas, and attempt to reestablish communications.
- Prepare and submit an NBC-1 nuclear report. Make sure it has "flash" precedence if it is the first reported attack in theater.
- Begin monitoring for radiation. Report the arrival of fallout using an NBC-4 report when the radiation level reaches 1 cGy/hr.
- Never relocate your vehicle or unit based on a fallout prediction (NBC-3 report).
- Reorganize, consolidate, and continue your mission.
- Conduct PMCS on tactical dosimeters.
- Consider previous exposure (total dose) and report new exposure in accordance with the OPOD or unit SOP.
- Regardless of the applicable exposure criteria, never move until the crossing risk is known and NBC personnel have developed evacuation procedures.
- Improve shelter and shielding.

### **Fallout warning**

The first person to detect the arrival of fallout is usually the radiological monitor operating a radiacmeter. As soon as he notes a dose rate of 1 centigray per hour (cGy/hr) or higher, he warns unit personnel. All personnel hearing the warning relay it to others. If the mission allows, soldiers should move into a shelter with overhead cover and stay there until given an "ALL CLEAR" signal or until otherwise directed to move. If the mission does not allow the unit to take cover, decontamination becomes more important and perhaps more difficult.

## Supervision of radiological monitoring

Radiological monitoring is performed routinely to determine the presence and intensity of a radiation hazard. It is conducted using the IM-174 or AN/VDR-2 radiacmeter. Scout leaders must ensure that their scouts are properly trained on this equipment. There are two types of monitoring, periodic and continuous.

Periodic monitoring assures the platoon that the area is not contaminated or, if applicable, provides a warning when contamination is detected after the platoon arrives. Readings are taken once every hour. Periodic monitoring is initiated under these conditions:

- After first use of nuclear weapons in theater.
- When the platoon is out of contact with higher headquarters.
- When ordered by higher headquarters.
- When the platoon stops continuous monitoring.

Continuous monitoring is the surveillance for radiation in the platoon's area or position. Continuous monitoring will be initiated when any of the following situations occur:

- When a nuclear detonation is observed or reported in the area of operations.
- When an NBC-3 report is received and the platoon is in the predicted area of contamination.
- When ordered by higher headquarters.
- When a dose rate of 1 cGy/hr is recorded in periodic monitoring.

## CHEMICAL HAZARDS AND PROTECTIVE MEASURES

### US POLICY STATEMENT

**The United States will never use chemical weapons.**

C-201. Chemical warfare is widely regarded as brutal and barbaric. Nonetheless, the worldwide availability of advanced military and commercial technologies permits adversaries to develop and employ chemical weapons. This leaves open the potential for use of chemical weapons in a wide range of actions: terrorism during peacetime, limited use during urban operation, even large-scale employment during conflict or war.

### CLASSIFICATION OF CHEMICAL AGENTS

C-202. Chemical agents are classified according to their effect on the body. There are six major types: nerve, blood, blister, choking, irritants, and vomiting. The terms persistent (P) and nonpersistent (NP) describe chemical agent duration.

C-203. The threat employs nonpersistent agents over areas that it believes friendly forces will use for crossing or occupation. These agents provide the threat with flexibility to use the terrain because it knows the duration of the chemical effects. On the other hand, nonpersistent agents may force friendly soldiers into protective posture for long periods, thus degrading combat effectiveness.

C-204. Persistent agents are employed to produce casualties, deny terrain use, force opposing soldiers into protective posture for extended periods, degrade combat effectiveness, force decontamination operations, disrupt LOGPACs, and deny entry points.

## **ACTIONS BEFORE A CHEMICAL ATTACK**

C-205. Friendly forces can use the following actions to limit vulnerability to the effects of chemical weapons:

- At a minimum, commanders and leaders should consider using MOPP level 2 if soldiers must conduct operations in anything other than overpressurized vehicles or shelters. Soldiers should apply M9 detector paper to their chemical protective overgarments. They attach one strip on the bicep of the nonfiring arm, one on the forearm of the firing arm, one on the calf of the nonfiring side, and one on the ankle of the firing side.
- Prepare to initiate entry and exit procedures for personnel in vehicles and shelters.
- Alert adjacent friendly forces, especially analog (nondigital) units.
- If a vehicle or shelter is unavailable, the next best solution is some type of overhead cover.
- Heavy canvas, plastic bags, or chemical resistant covers are required for combat gear, ammunition, supplies or equipment stored on the outside of vehicles.
- Ensure that vehicle decontamination materials are serviceable and adequate.
- Secure water and other valuable commodities inside the vehicle or structure.
- Conduct PMCS NBC sensors and alarms and test them for accuracy.
- Position M9 detector paper so that protruding tabs are visible to personnel inside vehicles or shelters through windows, firing port glass windows, and driver and TC stations.
- Inspect for adequate supplies of antidotes, such as the Mark 1 NAAK and the convulsant antidote for nerve agents (CANA).
- Rehearse self-aid, buddy-aid, and medical evacuation procedures.

**ACTIONS DURING  
A CHEMICAL  
ATTACK**

C-206. Whether they are mounted or dismounted, reconnaissance platoon soldiers must be prepared to react promptly to protect themselves and warn others of the dangers.

**Dismounted  
Actions**

C-207. The following steps apply for dismounted leaders, soldiers, and elements:

- Stop breathing; close eyes and mouth; and don, clear, and seal the protective mask.
- Give visual and vocal alarms.
- Upgrade to MOPP level 4.
- Perform immediate decontamination as required using the M291 decontamination kit.
- Seek shelter.
- Prepare and submit NBC-1 reports and/or SPOTREPs as necessary using the most expedient means available.

**Mounted Actions**

- Stop breathing; close eyes and mouth; and don, clear, and seal the protective mask.
- Close vehicle hatches, and activate the overpressurization system (if applicable).

**CAUTION**

In an overpressurized vehicle, DO NOT unmask until sensors and alarms are reset; use the ICAM to confirm “all clear” conditions and to verify the reliability of vehicle sensors and alarms. If the vehicle interior is exposed to a chemical hazard, assume MOPP 4 regardless of the availability of overpressurization.

- Wake sleeping personnel.
- Observe crewmembers for symptoms of chemical poisoning.

## **ACTIONS AFTER A CHEMICAL ATTACK**

C-209. The following actions and procedures apply after the commander or leader determines that the chemical attack has concluded:

- Conduct self-aid and buddy-aid and administer antidotes as required. A discussion later in this appendix covers treatment information for casualties of a chemical attack.
- If the tactical situation permits, provide responsible and disciplined digital warning (NBC-1 or SPOTREP) via SINCGARS and/or FBCB2 to friendly forces in the attack area and to elements potentially downwind of the hazard. (**NOTE:** Avoid sending poorly worded or overdramatic warnings that might prompt elements that are not in the attack area or downwind to assume an inappropriate MOPP level. The result could be degradation of their combat effectiveness.)
- Activate or reset detectors and sensors.
- Gather information on the attack, including means of delivery, number of munitions, and direction of attack; note the DTG for the start and end of the attack. Prepare and submit an NBC-1 follow-up report.
- If the tactical situation permits, perform operator spraydown with available decontamination supplies and equipment.
- When the tactical situation permits, coordinate for thorough decontamination.
- Conduct MOPP gear exchange as necessary to avoid hazards that may result from exceeding the “wear-out” or maximum usage time for overgarments. See Figure C-43.

## **BIOLOGICAL HAZARDS AND PROTECTIVE MEASURES**

### **US POLICY STATEMENT**

**The United States will not use biological weapons under any circumstances.**

C-192. Biological attacks against US forces are more likely on the modern battlefield than in the past. In 1998, Defense Secretary William Cohen cited “the danger of biological and chemical weapons as the chief threat to US security today.”

## **BIOLOGICAL WARFARE CONSIDERATIONS**

C-193. Biological agents are often referred to as the “poor man’s weapon” because they are easy and cheap to produce and dispense. In addition, biological attacks are hard to disseminate, detect, and identify. Small, even tiny, doses of biological agents can infect thousands of personnel. Counteracting these agents may require extensive use of quarantine.

C-194. Biological warfare is defined as the employment of living organisms, toxic biological products, and biological plant growth regulators to injure, incapacitate, or kill. Biological agents are generally created to target the respiratory system, skin, or digestive tract. The capability to directly enter the bloodstream and body tissue maximizes their effectiveness.

### **Types of Agents**

C-195. Biological agents are divided into the following categories:

- **Pathogens.** These are disease-causing substances. There are over 150 known infectious diseases; they are either contagious or noncommunicable.
- **Toxins.** These are poisonous chemicals derived from biological sources. Toxins can be natural or synthetic.

**NOTE:** Both types of biological agents are derived from a range of sources, including animals, plants (including fungi), and microorganisms (bacteria, viruses, rickettsiae, protozoa).

### **Dissemination and Delivery of Biological Hazards**

C-196. Numerous crude, low-tech methods (dry powders, droplets) exist to disseminate biological agents. For example, water and food supplies can be contaminated by human means. In general, however, there are two primary methods for disseminating biological agents:

- **Aerosol attacks.** There are numerous devices and media capable of disseminating agents in quasigaseous form, including aircraft spray tanks, boat- or truck-mounted aerosol generators, and explosive bomblets in air- or ground-burst munitions.
- **Vectors.** These are carriers that spread disease. Examples include infected insects or rodents that bite humans or parasites that invade the human body through exposed scratches or cuts in the skin.

### **Criteria (Signs, Symptoms, and Effects) of a Biological Attack**

C-197. Observable criteria for a biological warfare incident include the following:

- Large numbers of sick or dead animals.
- Sudden appearance of a large number of strange insects or ticks.

- Epidemic number of casualties occurring within a short time of each other (mostly within 24 hours, although the time frame may range up to three days).
- Generalized outbreaks of diseases, or increased outbreaks of a particular disease not normally encountered in a particular region or country.
- High number of respiratory ailments reported.

**ACTIONS BEFORE A BIOLOGICAL ATTACK**

C-198. The effects of biological agents are extremely unpredictable. Vulnerability reduction methods include the following:

- Identify regional biological hazards and threat biological threats.
- Complete immunizations.
- Maintain a high order of health, personal hygiene, and sanitation discipline.
- Limit exposure to hazards. Develop methods to reduce dirt and dust collection in vehicles and closed quarters. Wear a handkerchief, scarf, surgical mask and goggles, or protective mask (when necessary).
- Never occupy buildings with animal or rodent droppings and urine. Structures must be washed down with chlorine bleach or detergent to kill germs. NEVER sweep with a straw or push broom before decontamination is completed.
- Rehearse medical treatment plans and NBCWRS procedures.
- Button clothing and cover skin to avoid unnecessary exposure to insects.
- Eat only food from sealed containers or with protective wrappers.
- Drink only purified potable water that has been boiled for at least 15 minutes.
- Conduct PMCS on NBC defense sensors, detectors, and kits.
- Periodically monitor for suspected hazards.

**ACTIONS DURING A SUSPECTED BIOLOGICAL ATTACK**

C-199. The following actions apply when commanders or leaders suspect a biological attack is under way:

- Stay alert to suspicious activity.
- When signs, symptoms, and effects are recognized, STOP BREATHING and quickly don protective gear. This includes handkerchief, scarf, surgical mask and goggles, or protective mask (when necessary).
- Sound visual, vocal, or mechanical alarms to warn others.
- Inspect detectors and sensors.

- Ready treatment and decontamination equipment, and be prepared to request for external assistance.
- Dismounted personnel go to MOPP 4.

### **ACTIONS AFTER A SUSPECTED BIOLOGICAL ATTACK**

C-200. Once the suspected attack has concluded, the unit takes the following steps:

- Submit an NBC-1 report using the FBCB2. Indicate symptoms or signs you observe.
- Begin continuous monitoring using existing NBC defense sensors, detection materials, and kits. If you do not have these items, request assistance from higher headquarters.
- Report and seek treatment for illness, scratches, or cuts promptly. Refer to the discussion later in this appendix covering treatment of casualties resulting from biological agents.

### **SYMPTOMS AND TREATMENT OF NBC CASUALTIES**

Potential adversaries may have access to a wide variety of biological agents and chemical agents on the modern battlefield. These agents can be dispensed alone or with other carriers or agents. Casualties resulting from exposure to biological or chemical agents require medical treatment as quickly as possible.

The first step in the treatment process is usually appropriate self-aid and buddy-aid measures. These vary depending on the agent. Soldiers should first mask to prevent them from either inhaling or ingesting additional agents; then they should remove agents from exposed skin, either by washing with soap and water or by using the M291 kit. Soldiers use buddy-aid procedures to observe each other for early symptoms of toxic exposure and to request medical assistance.

The platoon leader should select separate casualty collection points for both contaminated and noncontaminated casualties to prevent cross-contamination. All contaminated casualties should be decontaminated as thoroughly as the situation allows before being evacuated. The platoon must include in its casualty evacuation request the number of contaminated patients; this will allow the evacuation team to send the proper number of vehicles for pickup.

Chemical agents fall into four major categories: nerve, blister, blood, and choking. Their primary routes of attack on the body are through the respiratory system and the skin. These agents are especially dangerous because they can kill or incapacitate quickly. The first, and most important, step in dealing with them effectively is to recognize symptoms so proper treatment can be administered. [Table B-2](#) lists protection and detection measures, symptoms, and treatment and decontamination procedures for chemical agents.

**Table B-2. Chemical agent protection procedures.**

<b>AGENT TYPE</b>	<b>NERVE</b>	<b>BLISTER</b>	<b>BLOOD</b>	<b>CHOKING</b>
<b>Protection</b>	Protective mask and suit	Protective mask and suit	Protective mask	Protective mask
<b>Detection</b>	M8A1, M256A1, CAM, M8/M9 paper	M256A1, M8/M9 paper, CAM	M256A1	Odor only (resembles new-mown hay or green corn)
<b>Symptoms</b>	Difficult breathing, drooling, nausea, vomiting, convulsions, blurred vision	Burning eyes, stinging skin, irritated nose (no symptoms with mustard or nitrogen mustard)	Convulsions and coma	Coughing, choking, nausea, headache, tightness in chest
<b>Effects</b>	Incapacitates	Blisters skin and damages respiratory tract	Incapacitates	Floods and damages lungs
<b>First aid</b>	Mark 1 NAAK, CANA	Same as for second- and third-degree burns	NONE	Avoid movement and keep warm
<b>Decontamination</b>	Use M291 kit and flush eyes with water	Use M291 kit and flush eyes with water	NONE	NONE

**LOCATING AND MARKING NBC HAZARDS**

C-166. NBC marking procedures are the same regardless of who conducts them. The purpose is to find contamination boundaries and/or routes around or through a contaminated area. Reconnaissance teams may have an ICAM, M256 detector kit, M8 and M9 paper, M272 water test kit, automatic chemical agent alarm, M34 soil sampling kit, and M274 marking set (shown in Figure C-32). They use this equipment to determine the following:

- Are chemical agents present?
- If an agent is present, what type is it?
- Where and when was the agent first detected?
- Where are the boundaries of the contamination?
- Are there clean routes through area? If so, where are they?

Contamination must be marked so unsuspecting personnel will not be exposed to it. When platoon detection, monitoring, or reconnaissance teams detect or suspect NBC hazards, they mark all likely entry points into the area and report the contamination to higher headquarters.

The only exception to this policy occurs when marking the area would help the enemy. If this exception is made by the commander, the hazard must still be reported to protect friendly units.

### Marking procedures

Markers should always face away from the contamination. For example, if markers are placed on the edge of a contaminated area to mark a radiological hot spot, they face away from the point of the highest contamination reading. Markers are placed at roads, trails, and other likely points of entry. When time and mission permit, additional markers should be emplaced. The distance between signs varies. In open terrain, they can be placed farther apart than in hilly or wooded areas. Soldiers should be able to stand in front of a marker and see the markers to the left and right of it.

Units discovering a marked contaminated area do not have to conduct elaborate, time-consuming surveys. The new unit checks the extent of contamination and alters its plans, if necessary. If the size of the hazard has either expanded or decreased, they relocate the signs. If the hazard is gone, they remove the signs. Changes are reported to higher headquarters.

### Types of markers

US forces use standard NATO markers to make it easier for allies to recognize the hazards (see [Figure B-1](#)). These markers are in the standard NBC marking set. Colors and inscriptions on a marker indicate the type of hazard. Other contamination information is written on the front of the sign.

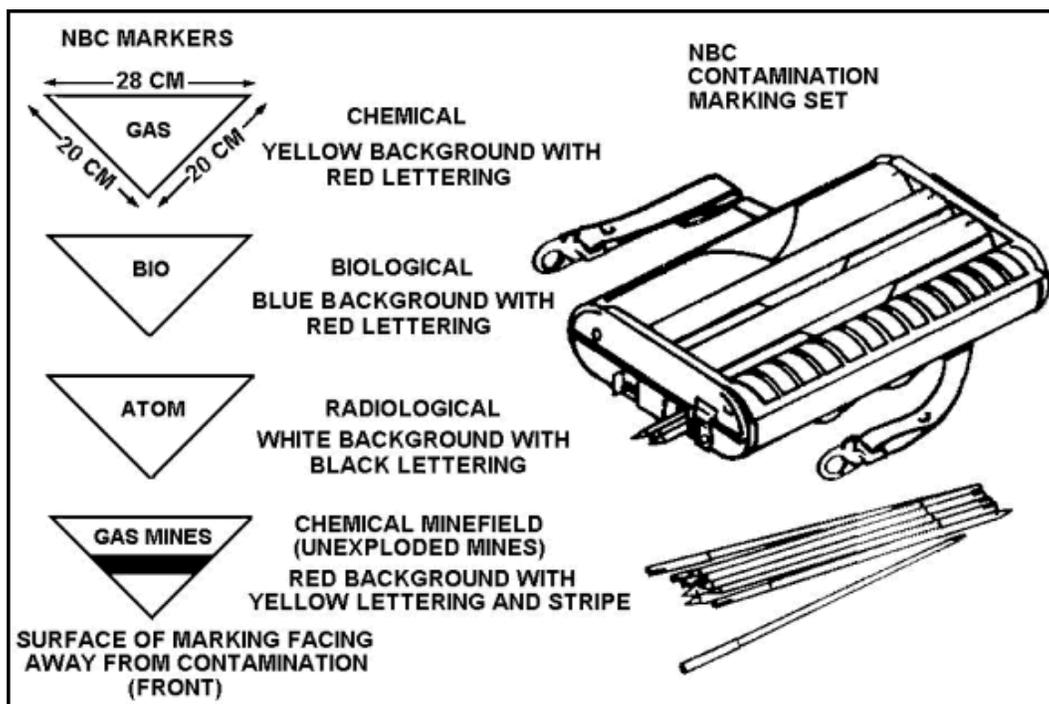


Figure B-1. NBC marking devices.

## **UNMASKING PROCEDURES**

C-243. Leaders should conduct unmasking procedures only after all applicable NBC chemical agent detection procedures indicate that no hazard is present. Once the environment in which soldiers will operate (area, vehicle, or building/shelter) is determined to be free of contamination, unmasking should be conducted as soon as possible to reduce the MOPP level.

**NOTE:** Unmasking procedures for biological agents must be coordinated through the troop/company headquarters.

C-244. Unmasking procedures are conducted either with the aid of NBC detection equipment (such as an M256A1-series chemical detector kit, a CAM, or an NBCRS vehicle) or without such equipment. The following discussion describes the steps for both types of unmasking.

## **UNMASKING PROCEDURES USING DETECTION EQUIPMENT**

C-245. This 15-minute procedure is conducted after all detection equipment and liquid contamination checks are negative. At the same time, however, leaders must remain on guard because current equipment cannot detect all chemical agents. The senior leader takes the following steps for this procedure:

- Select one or two soldiers and instruct them to disarm.
- Position the selected soldiers in a shady area; bright light will constrict pupils, potentially giving false nerve agent symptoms.
- Direct the soldiers to unmask for five minutes, then to reseal and clear their masks.
- Observe the soldiers for chemical agent symptoms for 10 minutes.
- If no symptoms appear, give the all-clear signal.
- Continue to watch all soldiers for any delayed symptoms; have immediate first-aid treatment available.

## **UNMASKING PROCEDURES WITHOUT DETECTION EQUIPMENT**

C-246. If detection equipment is not available, unmasking procedures will take about 25 minutes. Use M8 paper to check for liquid contamination. Only then should the platoon leader or other senior leader initiate unmasking procedures using the following steps:

- Select one or two soldiers and instruct them to disarm.
- Move the soldiers to a shady area; have immediate first-aid treatment available.

- Direct the soldiers to take a deep breath and break their mask seal for 15 seconds, keeping their eyes wide open. Then direct them to clear and reseal the masks.
- Observe soldiers for chemical agent symptoms for 10 minutes.
- If no symptoms occur, direct the soldiers to unmask for five minutes and then remask.
- Observe the soldiers for 10 minutes.
- If no symptoms appear, give all-clear signal.
- If symptoms appear, decide whether to move to a new area and retest. If movement is not possible, however, conduct a retest after one hour.
- Continue to observe all soldiers, especially those involved in the unmasking procedure, for delayed symptoms.

### **ALL-CLEAR SIGNAL**

The all-clear signal is given by word of mouth through the chain of command. It is initiated by higher headquarters after testing for contamination proves negative. If required, standard sound signals may be used, such as a continuous, sustained blast on a siren, vehicle horn, or similar device. When "ALL CLEAR" is announced on the radio, it must be authenticated before compliance. The commander designates the specific all-clear signal and includes it in his SOP.

### **DECONTAMINATION OPERATIONS**

C-214. Decontamination is the removal, destruction, or neutralization of contamination. Its purposes are to reduce the impact of an NBC attack, prevent erosion of platoon combat power, and reduce casualties.

### **Principles of Decontamination**

- C-216. There are four principles of decontamination:
- Conduct decontamination as soon as possible.
  - Decontaminate whatever is necessary.
  - Conduct decontamination as far forward as possible.
  - Conduct decontamination by priority.

### **Planning Factors**

C-217. Before decontamination occurs, the platoon leader must consider a variety of conditions that will affect the operation, including the following:

- The toxicity/lethality of the NBC agents involved.
- Actual and anticipated performance degradation.
- Equipment and personnel limitations.
- Actual and potential transfer and spread of contamination.

### **LEVELS OF DECONTAMINATION**

C-218. The three levels of decontamination are immediate, operational, and thorough. Battlefield elements, including the reconnaissance platoon, conduct immediate decontamination virtually automatically and instantaneously whenever they encounter NBC conditions. Operational level decontamination is accomplished with organic assets located at the squadron/battalion. Thorough and fixed site decontamination will require augmentation by a chemical decontamination platoon, host nation emergency response assets, or other service, coalition, or NATO unit. The platoon may have to provide augmentation support at operational and thorough decontamination sites.

## Immediate Decontamination

C-219. Units and soldiers conduct immediate decontamination as necessary using supplies and equipment they have on hand. This discussion focuses on the elements of immediate decontamination: skin decontamination, personal equipment wipedown, operator's vehicle spraydown (when applicable), and removal of biological and radiological agents (when applicable).

C-220. **Skin Decontamination.** This is a basic soldier survival skill that is conducted as an immediate action drill. Some chemical agents can kill if they remain on the skin for longer than a minute, making removal or neutralization of the agent a must for survival. This can be done with the new M291 skin decontamination kit, shown in Figure C-44. Leaders must ensure that their soldiers are trained to execute skin decontamination automatically and without orders. Soldiers who have conducted skin decontamination should be observed for symptoms.

C-221. Each soldier is issued two M291 kits. One is carried in the mask carrier, the other in the right cargo pocket of the BDU/BDO trousers or according to unit SOP. Each kit contains six individual decontamination packets. Units maintain at least one M291 kit per soldier for resupply.

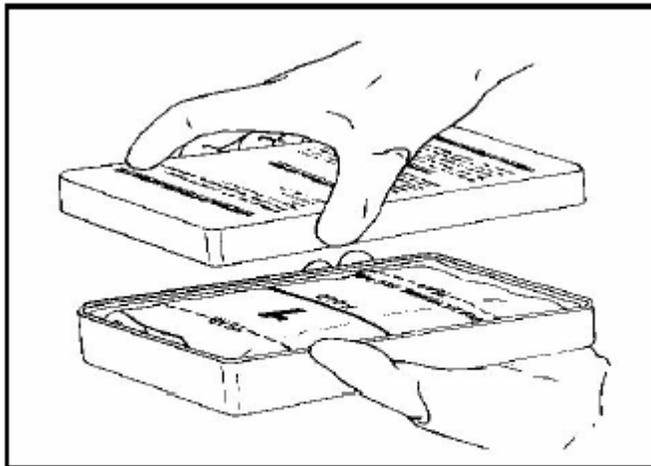


Figure C-44. M291 Skin Decontamination Kit

C-222. **Personal Equipment Wipedown.** Reconnaissance platoon soldiers must devote care and consideration to personal gear, supplies, and equipment that have been exposed to NBC hazards. These items are often stored on the outside of vehicles, where they are threatened b

by whatever environment exists. Once a soldier recognizes or suspects the presence of contamination, he conducts immediate decontamination to neutralize harmful agents. Prompt action may prevent unnecessary destruction or disposal of critical supplies and equipment that cannot later be rendered safe for continued use.

C-223. The M295 individual equipment decontamination kit (IEDK), illustrated in Figure C-45, removes or neutralizes contamination on the soldier's hood, mask, gloves, and personal weapon. One M295 IEDK is issued to each soldier in the platoon; it is stored in the right cargo BDU/BDO pocket or according to unit SOP. Units maintain at least one IEDK per soldier for resupply.



**Figure C-45. M295 Individual Equipment Decontamination Kit**

C-224. As noted, soldiers use the M295 kit to wipe down their masks, hood, gloves, and other essential gear. If the chemical agent is thickened or present in large globules on the BDO or CPOG, however, they must scrape it off with a stick or other object. They should not attempt to decontaminate the agent on the BDO/CPOG. Chemical agents are easily absorbed in the stocks and handgrips of weapons and may present a vapor hazard. For biological agents, plain soap and water will remove the contamination. Radiological contamination dust can be brushed, washed, or shaken off equipment.

C-225. **Operator's Spraydown/Wipedown.** The platoon conducts operator's spraydown/wipedown to remove or neutralize chemical agents on frequently touched or occupied equipment surfaces and to prevent contamination spread. The process is most effective when accomplished within 15 minutes of contamination. It is done using the M13 decontamination apparatus, portable (DAP) and DS2 decontamination solution, the ABC-M11 DAP and DS2, or the M100 sorbent decontamination system (SDS).

## **Operational Decontamination**

C-230. **Biological Agents.** A bleach solution is the preferred means for neutralizing and removing biological agents; if it is not available, hot, soapy water will suffice. The crew applies the solution or water with brushes, scrubs all surfaces well, and rinses. The 30-minute wait is not required for biological agents.

C-231. **Radiological Agents.** Radiological contamination can be removed by brushing or scraping. Water is effective for flushing the contamination, but runoff must be carefully controlled using a ditch or sump setup. The vehicle crew must remember that the runoff is still hazardous because contamination is not destroyed, only moved. If time permits, brushing or removing an inch of topsoil from fighting positions lowers the radiological contamination hazard.

C-232. If immediate decontamination is insufficient to quickly return platoon vehicles and personnel to action, the flow of battle may require the unit to conduct operational level decontamination. Also known as operational decontamination, this level of decontamination limits the spread of contamination and allows temporary relief from MOPP 4 restrictions and limitations; in doing so, it helps to sustain the platoon's combat capability and increase its maneuverability. MOPP gear exchange and vehicle washdown, covered later in this discussion, are the two most common techniques of operational decontamination.

C-233. The reconnaissance platoon conducts operational level decontamination, which is less resource-intensive than thorough decontamination, either unsupported, using only squadron/battalion assets, or with external support from the chemical platoon. Decontamination usually takes place in the platoon's area of operations. The squadron/battalion augments the operational level decontamination site with personnel to facilitate rapid turnaround of platoon combat power. The platoon will run MOPP gear exchange using the buddy system; it may have to provide soldiers to augment squadron/battalion operational decontamination stations and to provide security.

C-234. **Preparations.** As they get ready for operational decontamination, the troop/company and squadron/battalion battlestaffs should have a clear understanding of the type of contamination, number of vehicles and soldiers to be decontaminated, and the route "dirty" crews will travel to the operational decontamination linkup point. Squadron/battalion planners should ensure that all operational decontamination sites have sufficient quantities of decontamination solutions and water to complete the mission; they should also be prepared to augment the site with medical personnel should an emergency occur. Reconnaissance platoon leaders focus their planning on how to avoid the spread of gross contamination on the battlefield.

C-235. Before departure for the operational decontamination linkup point, platoon leaders must take extensive measures to prepare their vehicles and crews for the decontamination operation. If MOPP gear exchange is planned, the dirty platoon elements will arrange for adequate quantities of replacement gear to facilitate overgarment exchange. They will also make the necessary coordination for replacement of equipment and supplies.

C-236. Vehicles without overpressure systems will dismount at least one crewmember to conduct spraydown at least 20 minutes prior to arrival at the operational decontamination linkup point. This allows for sufficient contact time and increases the chances of neutralizing harmful agents. Focus of the spraydown should be directed to areas with which crews frequently come into contact (doors, hatches, crew compartments).

**NOTE:** To prevent crews from coming into contact with harmful and sometimes invisible agents or vapors, the platoon leader must ensure that equipment, gear, rations, or ammunition secured on the exterior of vehicles is decontaminated and checked with monitors (ICAM, M8 paper) before being moved inside the vehicles.

C-237. **MOPP Gear Exchange.** As noted in the discussion of shielding the force earlier in this appendix, this procedure entails soldiers exchanging contaminated MOPP gear for new, uncontaminated gear at squad level (see Figure C-49). MOPP gear exchange is conducted upwind from the vehicle washdown site. The squadron/battalion provides decontaminants and replacement overgarments. MOPP gear exchange removes nearly all liquid and solid contamination from soldiers and their individual equipment. Refer to FM 3-11.5 (FM 3-5) for detailed procedures.

C-238. **Vehicle Washdown.** This procedure, which limits contamination spread and transfer, should be conducted between one to six hours after contamination and as soon as possible after the operator's spraydown portion of immediate decontamination. Vehicle washdown uses hot, soapy water to speed the weathering process. The squadron NBC decontamination specialist operates power driven decontamination equipment (PDDE) to conduct washdown. His primary tool is the M17 lightweight decontamination system.

**NOTE:** When the platoon has completed operational decontamination and soldiers face little, if any, vapor hazard, they may use hazard-free areas to temporarily unmask to eat, drink, and rest. Operational decontamination, however, does not guarantee that conditions are safe enough to allow unmasking on or near equipment. Before unmasking and lowering the MOPP level for temporary relief, the platoon must conduct unmasking procedures using the CAM or M256-series chemical detector kit. In addition, leaders must conduct continuous contamination checks and monitoring to ensure that soldiers unmask in clean areas. Units must develop effective SOPs and training for

unmasking. Refer to the discussion of unmasking procedures later in this section.

## **Thorough Decontamination**

C-239. This is the most effective and resource-intensive level of decontamination, requiring external support by platoon- or company-size NBC elements. It takes place after combat operations, during reconstitution, and after a passage of lines to restore combat power by removing nearly all contamination from unit and individual equipment; this allows soldiers to operate equipment safely for extended periods at reduced MOPP levels.

C-240. Thorough decontamination techniques are detailed troop decontamination (DTD) and detailed equipment decontamination (DED). During DTD, soldiers remove contaminated MOPP gear, to include protective masks. The decontamination unit can provide technical assistance. DED procedures remove or neutralize contamination on interior and exterior equipment surfaces. The decontamination unit performs DED with some assistance from contaminated unit.

C-241. Before their units take part in thorough decontamination, reconnaissance platoon leaders must accomplish several activities, including the following:

- Segregate equipment according to priority or degree of decontamination required.
- Prepare vehicles and crews for decontamination.
- Coordinate with the decontamination unit leader (platoon or company).
- Prepare the platoon or individual soldiers as necessary to support operation of the DTD site.