

APPENDIX H

NUCLEAR, BIOLOGICAL, AND CHEMICAL OPERATIONS

Many countries that may constitute a threat consider chemical warfare part of conventional warfare. They may use chemicals during both defensive and offensive operations. They are prepared to accept casualties and reduced efficiency in exchange for tactical gain. Nuclear weapons and biological agents, while not considered part of conventional warfare, may be used by an ever-increasing number of adversaries. All FST personnel must understand the capabilities of these weapons and agents and know how to negate their effects and survive to continue the FST mission.

Section I. INDIVIDUAL AND UNIT SURVIVAL OPERATIONS

This section will discuss techniques and procedures that are necessary for the survival of the individual and the team. These procedures are employed by all Army units, including medical units. Individuals and units must first attend to their defense requirements to survive and continue their mission. Forward surgical teams are fortunate; they do not have to engage, fight, and contain an enemy force while under an NBC attack. Usually, they can be more deliberate in attending to their survival and their patient's survival.

H-1. Fundamentals of Nuclear, Biological, and Chemical Defense

a. Chemical agents add a troublesome, complex dimension to the battlefield. These agents can produce numbers of casualties that overtax the medical evacuation, medical treatment, and personnel replacement systems; create heat and psychological casualties; and degrade the efficiency and effectiveness of a unit. During chemical contamination—

- Individuals and units become more difficult to identify.
- Command, control, and communications deteriorate.
- All simple human tasks, such as eating, sleeping, moving, and passing body wastes, become difficult, complicated and subject to contamination.

b. Training and rehearsal of SOPs are keys to reducing unit casualties and enhancing the FST's ability to relocate, if necessary, and continue its mission.

c. Nuclear, biological, and chemical defense no longer means just to protect yourself and stay alive. Nuclear, biological, and chemical casualties are the price of waging war. We must take educated and often calculated risks. Nuclear, biological, and chemical defense is a condition, not a task in the mission. Degradation of capabilities caused by individual and collective protection must be weighed against potential casualties from NBC attack. Going too far in either direction can reduce individual effectiveness and the overall efficiency of the FST. Mission-oriented protective posture (MOPP) was designed for maximum flexibility to maintain unit capability at the highest level possible, despite contaminated conditions. See Table H-1 for MOPP levels and equipment worn at each level.

Table H-1. Mission-Oriented Protective Posture Levels and Protective Equipment

MOPP EQUIPMENT	MOPP LEVELS						COMMAND
	MOPP READY	MOPP ZERO	MOPP 1	MOPP 2	MOPP 3	MOPP 4	MASK ONLY
MASK	CARRIED	CARRIED	CARRIED	CARRIED	WORN ^a	WORN	WORN
OVERGARMENT	READY ^c	AVAILABLE ^d	WORN ^a	WORN ^a	WORN ^a	WORN	
VINYL OVERBOOTS	READY ^c	AVAILABLE ^d	AVAILABLE ^d	WORN	WORN	WORN	
GLOVES	READY ^c	AVAILABLE ^d	AVAILABLE ^d	AVAILABLE ^d	AVAILABLE ^d	WORN	
HELMET PROTECTIVE COVER	READY ^c	AVAILABLE ^d	AVAILABLE ^d	WORN	WORN	WORN	
CHEMICAL PROTECTIVE UNDERGARMENT ^b	READY ^c	AVAILABLE ^d	WORN ^b	WORN ^b	WORN ^b	WORN ^b	

- a IN HOT WEATHER, COAT OR HOOD CAN BE LEFT OPEN FOR VENTILATION.
- b THE CPU IS WORN UNDER THE BDU (PRIMARILY APPLIES TO SOF, ARMORED VEHICLE CREWMEN).
- c MUST BE AVAILABLE TO THE SOLDIER WITHIN TWO HOURS. SECOND SET AVAILABLE IN 6 HOURS.
- d WITHIN ARM'S REACH OF SOLDIER.

d. Nuclear, biological, and chemical defense training must strike a balance between protection and mission accomplishment. Training includes techniques of decontamination and MOPP relief to rebuild the medical-oriented potential of the situation. In combat, the focus is on protecting the team and its patients, rather than on the source of contamination. Nuclear, biological, and chemical contamination is an aspect of METT-T and the medical commander's analysis of the situation.

This paragraph implements STANAG 2047.

H-2. Nuclear, Biological, and Chemical Protection and Contamination Avoidance

a. Protection can be improved by locating, identifying, and reporting NBC hazards; by warning about NBC hazards; and through passive measures. Passive measures decrease the probability of attack by reducing target signature and improving survivability. Normally, these measures include concealment,

cover, operations security, and dispersion. However, when the FST collocates with the CSH, the hospital must be laid out so that all patient care elements are interconnected and, therefore, the hospital is difficult to conceal. Concealment of a hospital unit is not a normal practice. However, when the FST locates with a medical company, the area or tactical commander (brigade or higher) will normally require the forward medical facilities to be camouflaged; thus, achieving a hide-position. Partial cover for the unit may be achieved by sandbagging around the facility and the revetment of vehicles, supplies, and equipment. Camouflage will cause the unit to lose its identity as an MTF, increasing the potential to be attacked.

b. Avoidance can be achieved by locating and marking contaminated areas along routes, around assembly areas, and the area(s) intended for occupation. Locating and identifying the type and density of contamination enables the unit to develop a plan to bypass, or cross an NBC hazardous area. See FM 3-3 and FM 3-3-1 for more detailed information on NBC contamination avoidance.

NOTE

Forward surgical teams do not set up and operate in contaminated areas.

c. In addition to chemical agent alarms, M9 paper can detect liquid contaminants. Strips of M9 paper taped to clothing, equipment, and vehicles can provide the warning that a contaminated area has been entered, or that a chemical attack is occurring. However, the paper can react to nonthreatening liquids; therefore, the Chemical Agent Monitor (CAM), the M256A1 Detector Kit, or the M8 paper must be used to verify chemical agent contamination. Field Manual 8-285 provides signs and symptoms, self-aid, buddy aid, and combat lifesaver care, and medical treatment for chemical agent injuries.

d. Look for evidence of a chemical agent in the physical reaction of the soldier. Physical symptoms of a chemical agent can be similar to toxins, heat stress, and combat stress reactions.

e. A chemical company with the newly developed Biological Integrated Detection System will be able to detect and identify a number of biological agents. Units, other than the chemical company and specialized medical units, are unlikely to immediately detect the use of biological agents. Any unusual disease pattern is most likely the first warning of a biological attack. It is critical that medical commanders and staff report possible biological warfare (BW) attacks immediately through command channels. When assumed before the attack, MOPP 4 provides excellent protection against BW agents. The best passive defense against BW agents is the use of PVNTMED measures.

f. A nuclear hazard presents additional considerations for protection. A strike warning (STRIKWARN) (nuclear) message will be sent from the tactical or area command headquarters for friendly nuclear strikes. Generally, this message will be brief.

(1) The message should contain—

- A proword indicating that the message is a nuclear STRIKWARN.

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- A brief message, prearranged by SOP, directing the unit to observe a specific nuclear defense level or evacuate the area.
- Expected time of burst.
- The location of burst.

(2) For maximum protection, the FST, along with its host unit (CSH or medical company), must—

- Evacuate from soft shelter systems to bunkers, or use sandbags or earth berms (refer to FM 8-10-7, Appendix B) for radiation shields.
- Cover vision portals in bunkers to shield against blinding light.
- Take down antennas and disconnect all cables, including handsets, from all radios except mission-essential sets for monitoring nets as required by command SOP.
- If moving or if time does not allow for digging in, assume positions at the bottom of hills. The best shielded position is over the brow of a hill and part way down the slope (see Figure H-1).

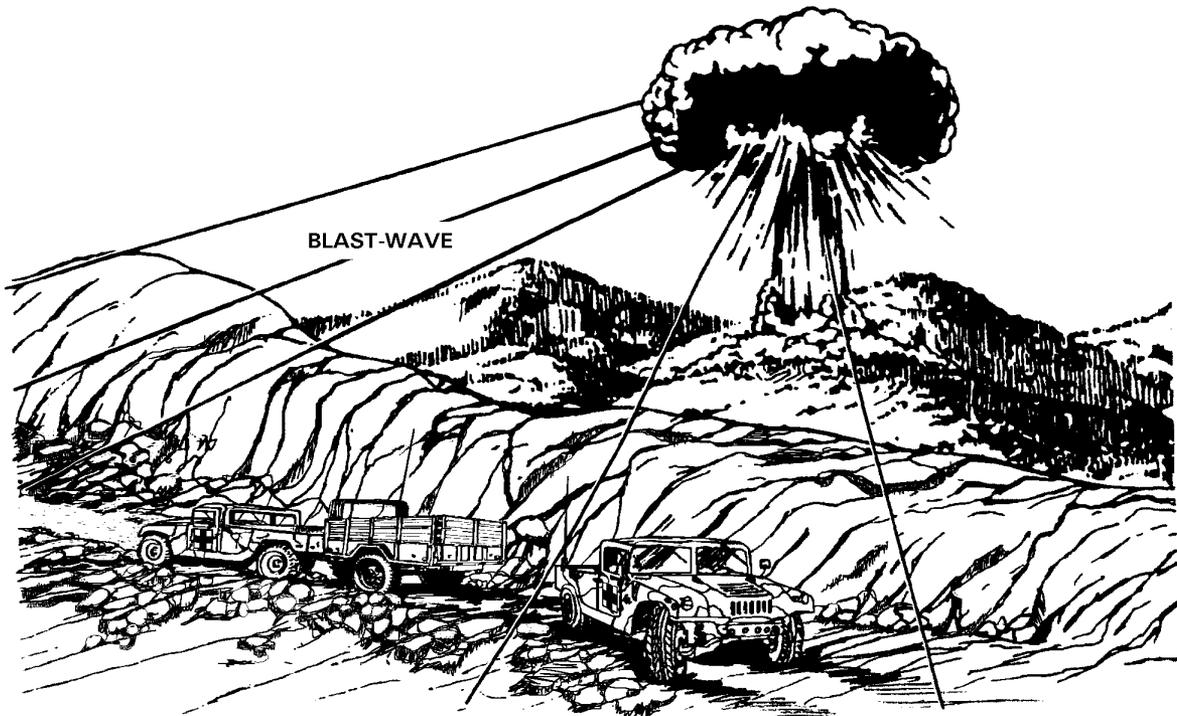


Figure H-1. Protected blast-wave position.

H-3. Chemical and Biological Agent Decontamination

a. After biological and chemical contamination, decontamination (see Table H-2) to some degree, must take place before the protection level is reduced below MOPP 4. The team can undertake the following hasty decontamination actions:

- Decontaminate skin with the M291 (or M258A1) kit.
- Wipe down equipment with the M295 Decon Kit Individual Equipment.
- Spray down vehicles, using the M13 Decon Apparatus, Portable or the M11 decontamination apparatus, to include vehicle exits, entrances, and any areas necessary for unit operations.

b. If a biological contaminant is suspected, follow the same decontamination procedures as with chemicals.

Table H-2. Decontamination Techniques

TYPE	BEST START TIME	PERFORMED BY	TECHNIQUE	EFFECTS
IMMEDIATE	WITHIN 1 MINUTE	INDIVIDUAL	SKIN DECON	STOPS AGENT FROM PENETRATING.
	WITHIN 15 MINUTES	INDIVIDUAL OR ELEMENT	PERSONAL WIPEDOWN	
			OPERATOR'S SPRAYDOWN	
OPERATIONAL	WITHIN 6 HOURS	UNIT	MOPP GEAR EXCHANGE	POSSIBLE TEMPORARY RELIEF FROM MOPP 4. LIMIT LIQUID AGENT SPREAD.
		FST	VEHICLE AND EXTERNAL EQUIPMENT WASHDOWN	
THOROUGH	WHEN MISSION ALLOWS RECONSTITUTION	UNIT	DETAILED TROOP DECON	PROBABLE LONG-TERM MOPP REDUCTION WITH MINIMUM RISKS.
		DECON PLATOON	DETAILED EQUIPMENT DECON	

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H-4. Decontamination—After Nuclear Fallout

Decontamination can begin when fallout stops or when the unit has cleared the contaminated area.

a. To perform individual decontamination—

- Brush or wash clothing and equipment thoroughly to remove dust particles. (This must be done away from the position to be occupied.)
- Shower and change clothes, if time and supplies are available.
- Wear a scarf or other piece of cloth to cover the mouth and nose, if there is a great deal of dust in the air.

b. To decontaminate equipment in an area—

- Turn over 2 inches of soil in the immediate area of the facility, equipment, and vehicles.
- Wash shelter system, outside stored equipment, and vehicles using any available source away from the occupied position.

H-5. Unit Nuclear, Biological, and Chemical Defense Teams

a. The FST will be required to organize an NBC defense team from its own resources. The FST NBC defense team is comprised of individuals designated by the FST commander. This team will normally be headed by an EMT NCO assisted by two additional selected team members.

b. Each FST element will be trained (as an additional duty) to handle the NBC defense aspects in their own areas. The CSH or the supported medical company's NBC operations NCO, assisted by selected FST personnel trained in defense procedures, will operate assigned NBC equipment and perform decontamination operations.

c. The NBC operations NCO will advise and assist in the NBC defense activities of the FST and in training NBC equipment operators and decontamination teams. He advises on operational exposure guidance and unit decontamination operations. He coordinates radiological monitoring, chemical detection, and unit decontamination operations. The NBC operations NCO—

- Trains other personnel in NBC defense.
- Receives, prepares, evaluates, and disseminates information on an NBC attack.
- Inspects individual and unit NBC equipment and advises on its maintenance.
- Ensures that the basic load of individual and unit NBC equipment and supplies are maintained.

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- Assists in the employment of unit's decontamination teams and the unit's detecting, monitoring, and surveying equipment.
- Maintains unit radiation status records from data obtained from the AN/PDR27, AN/PDR77, AN/VDR2, IM93/UD, IM9/PD, or other radiation detection equipment.

Section II. MEDICAL OPERATIONS IN A NUCLEAR, BIOLOGICAL, AND CHEMICAL ENVIRONMENT

H-6. Fundamentals of Combat Health Support in a Nuclear, Biological, and Chemical Environment

a. The mission of the FST (as previously stated) is to provide a forward surgical capability for nontransportable patients. It optimizes the recovery potential of critically wounded soldiers through early surgical intervention. On a volatile and chaotic battlefield, this unit may be thrust into a situation where it is the first forward surgical element available in a given area to provide frontline surgical support. However, the unit is not equipped with chemical agent patient treatment sets or a chemical agent patient decontamination set and will rely on the supported medical company to thoroughly process those patients triaged to it. The FST is not staffed or equipped to handle chemical agent contaminated casualties. When available, the FST will employ a chemical and biological agent harden collective protection shelter (CPS) system. Employment of the CPS will be as outlined in the user's TM provided with the system. With training and practice, the FST can continue its surgical support mission on the integrated battlefield but will require its patients to be decontaminated by the supported medical company.

b. On future battlefields, the enemy may employ NBC weapons and agents. Chemical, biological, and directed-energy (DE) protective measures and procedures to mitigate the effects of nuclear weapons must be included in both the FST training programs and the daily operations. This section provides guidance for unit operations in an NBC environment and for protection from the hazards of DE devices. The information presented in this text emphasizes contingency planning for the capability to provide CHS.

c. Nuclear, biological, and chemical actions create high casualty rates, materiel losses, maneuver problems, and contamination. Mission-oriented protective posture Levels 3 and 4 result in body heat buildup, reduced mobility, and degraded visual, touch, and hearing senses. Laser protective eyewear may degrade vision, especially at night. Individual and unit operational effectiveness and productivity are degraded.

d. Contamination is a major problem in providing CHS in an NBC environment. To increase survivability, as well as supportability, FST units must take necessary action to avoid NBC contamination. Maximum use must be made of—

- Alarm and detection equipment.
- Unit dispersion (when possible).

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- Overhead cover, shielding materials, and when available, CPS.
- Chemical agent resistant coating.

e. Generally, a biological aerosol attack will not significantly impact on materiel, terrain, or personnel in the short term. Detailed information on characteristics and soldier dimensions of the nuclear battlefield, NBC operations, extended operations in contaminated areas, NBC decontamination, NBC avoidance, and NBC and DE protection are contained in FMs 3-3, 3-3-1, 3-4, 3-5, 3-100, 8-9, 8-10-7, 8-33, 8-50, 8-250, and 8-285. For additional information regarding nuclear weapons effects, mitigation, and nuclear defense training, refer to FMs 25-50, and 25-51.

H-7. Deployment in Nuclear, Biological, and Chemical Operations

a. Normally, the FST will deploy to handle those 57 patient conditions outlined in Appendix A. However, in an NBC environment, plans must be made to consider worst-case scenarios. The FST commander makes a quick appraisal to determine the expected patient work load in an unconventional warfare situation. The standard triage- and EMT-decision matrices for managing NBC casualties in a contaminated environment will be considered for immediate implementation by the supported medical company (see FMs 8-9 and 8-10-7).

b. If unable to relocate upon receipt of a STRIKWARN or chemical warning (CHEMWARN) message, or an NBC report, the FST will automatically configure for NBC operations.

H-8. Collective Protection Shelter Systems

a. Without CPS systems, medical care for patients in an NBC environment will be greatly reduced. Therefore; a CPS systems (METT-T determined) must be available for forward deploying FSTs. The CPS system will provide a contamination-free area in which FST personnel and patients can remove their protective ensemble; thereby maintaining required treatment capabilities.

b. The CPS system will consist of chemical and biological protection shelters, NBC filter blower units, conditioned (heated or cooled) air systems, and air locks to accommodate staff, ambulatory, and litter patients. The CPS system, when deployed, will provide complete chemical and biological agent hardening capability for the FST.

c. The shelter system will be configured as required for the TTM, surgery, and recovery elements. It may be used in an NBC or a conventional operational mode. Information on the establishment and operations of the CPS will be provided in FM 8-10-7 when the system becomes available.