Chapter 5

Special Decon Operations

The potential for NBC weapons on the AirLand battlefield poses a great challenge for decon efforts. The major responsibilities of the fixed site commander is to restore his unit back to an acceptable level of readiness and effectiveness while conducting the mission.

Fixed Site Decon

Decon of fixed sites must be conducted to sustain readiness. Examples of fixed sites:

- Nuclear and chemical delivery system and storage sites.
- Command, control, communications, and intelligence (C3I) facilities.
- Temporary key structure for reserve and large troop concentration.
- Supply installations, depots.
- Pre-positioning of materiel configured to unit sets (POMCUS), airfields, water terminals, and rail terminals.
- Medical facilities.
- Ammunition supply points, and petroleum, oil, and lubricants (POL) points.
- Maintenance sites.

Operations of fixed site and support activities can be slowed down or limited (mobility) by the enemy use of chemical agents. In these circumstances, fixed sites may get contaminated. Thorough decontamination may be required because it:

- Limits the spread and transfer of contamination.
- Restores mission essential functions.
- Opens accessibility for entry and exit to key facilities.
- Increases survivability for the mission and troops.

Operational decon may not be practical as a long-term solution. Operational decon, however, may be used as a short-term solution to speed up the weathering process. Operational decon will also provide temporary relief and sustainability to the mission and the force. A major consideration for either operational or thorough decon will be the persistency of the chemical agents used during the Threat attack as well as the weather conditions (use the CAM/M256A1 to identify chemical agent). If chemical agents are identified as nonpersistent agents, decon will not be required. Weathering and protection from contamination will be required.

The decon principles are an important factor to be considered when decontaminating fixed sites (FM 3-4-1).

- Decontaminate as soon as possible. This is the most important principle because you must remove any contamination that forces personnel into a higher MOPP level. The first steps in restoring site mission effectiveness include personnel decontaminating themselves, their personal equipment, and critical, mission-essential equipment that they operate.
- Decontaminate only what is necessary. For fixed sites, decon requires more resources than other deliberate decon procedures. The length of time in MOPP4 will be considered as a major constraint. With this in mind, the commander must first ensure the decon of the mission-essential equipment. Additionally, equipment and/or areas contaminated will be marked appropriately. For example, you are loading and unloading supplies on a boxcar at a site with railheads. Since the fixed site does not have the manpower or the right amount of decon equipment to decontaminate the entire boxcar, the boxcar's door handle, outer side, and lip-edge are decontaminated. This prevents the spread of contamination into the boxcar, onto personnel, and supplies.
- Limit spread and transfer of contamination. Decon supports contamination control by limiting the spread of contamination. Through the application of this decon principle, we begin to limit the spread and transfer of contamination into work areas, rest and relief areas, equipment, and supplies. Next, the commander must consider moving the decon effort to contaminated personnel and equipment on the site. The other concern is spreading more contamination to other parts of the site, and possibly personnel and equipment entering and leaving the site. For example, if a contaminated entry or exit route of an ammunition supply point (ASP) cannot be avoided decontaminate the route most needed or trafficable.
- Decontaminate by priority. Items such as wheeled vehicles, forklifts, and railcars that are critical to the site's overall mission will be decontaminated first to make most effective use of available decon assets. Therefore, the commander should establish a set of priorities. These priorities may be broken down by functional areas, if various missions are performed at the site, such as maintenance (light and heavy), ammunition repair and supply, and general supply.

Decon resources are limited and must be employed wisely. The chemical staff at corps, support command, and all levels within the command must monitor and

develop a plan to manage those assets. Managing the decon assets on the battlefield is the solution. Decon equipment can be mobile for the decon of equipment, roads, buildings and any structure used for any type of operations. The decon equipment can be used for limited (operational) decon to prevent the spread or transfer of contamination to roads, key terrain, or buildings that are considered vital for continued operations. Decon assets are classified as mobile decon teams and permanent decon teams.

Mobile Teams

The corps' chemical staff may designate mobile teams that can support operational and thorough decon for fixed site operations. These mobile teams will usually be a platoon or a reinforced platoon. Larger teams will be needed to decontaminate large facilities and key locations. Mobile teams will find it difficult and unrealistic to decontaminate everything at some facilities. The following are fixed site decon concepts that the mobile teams should apply, as required by various situations:

Airfield

It will not be cost effective to decontaminate an entire airfield or airstrip. An excessive amount of manpower would be required for the conduct of such operations. Decontaminate from the entry through the exit and the area of operations required to sustain the ongoing operations for support of the mission (see Figure 5-1). This concept is more practical and efficient in employing limited decon assets. Figures 5-1 and 5-2 illustrate the application of STB on the entrance/exit of the air hangars. Note that the STB application includes 3 meters on each side of the runway between the entrance and the exit. One technique of application is shown at Figure 5-6, page 5-5. Transfer hazard will remain a problem until all parts of the airfield have weathered. Buildings or hangers entry/exit and doors must be decontaminated accordingly. Figure 5-2 illustrates a field expedient method which could be employed at any fixed site to cover the major entry/exit towards the site. Details of drum emplacement and use are shown in Figure 5-5, page 5-3.

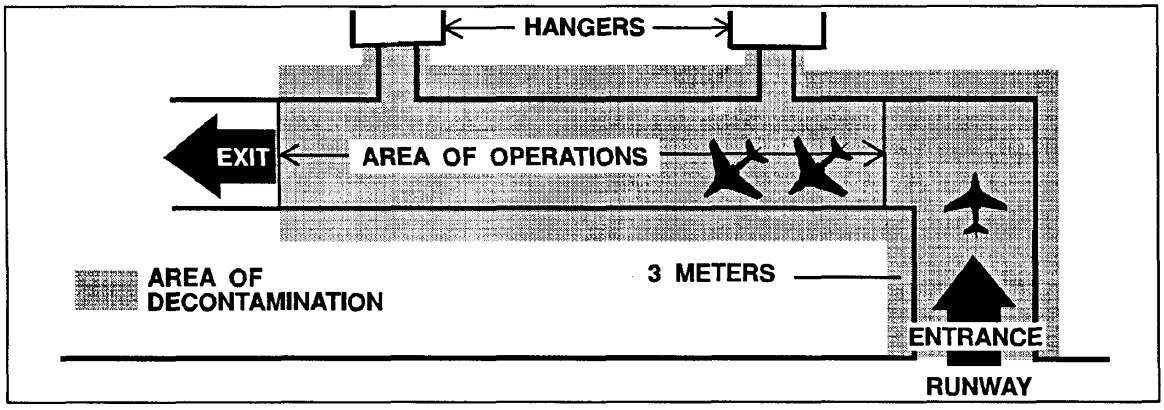


Figure 5-1. Airfield decontamination.

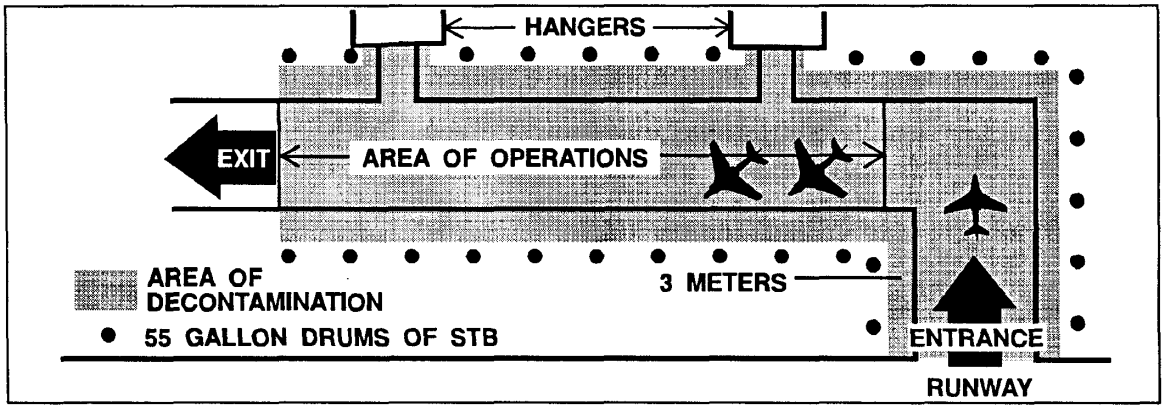


Figure 5-2. Field expedient airfield decontamination.

Helipad

To decon such sites, spray STB on entry/exit approach or on paths in an event that chemical contamination occurs (see Figure 5-3).

NOTE: Airborne STB particles can damage sensitive aircraft components. The decontaminated area should be washed with water before landing helicopters.

For further detail on fixed site decon and protection see FM 3-4-1.

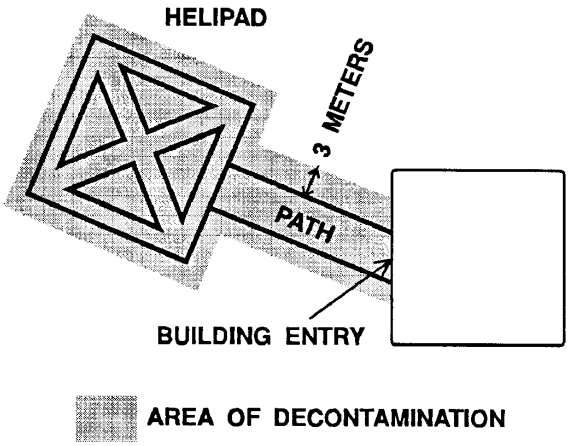


Figure 5-3. Helipad decontamination.

POMCUS/Motor Parks

In POMCUS sites, decontaminate exit/entry approaches to limit contamination. Exposed vehicles in motor parks will get contaminated, but most likely there will not be enough personnel to drive the vehicles to a decon station. Use an M12 PDDA for spraying STB or hot, soapy water. The M12 PDDA crew will drive around the parked vehicles and perform operational decon methods (see Figure 5-4). This will accelerate the weathering process of chemical agents.

NOTE: If DS2 is applied, rinse with water after 10 minutes (30 minutes if HD is used). For further information on methods and protection for fixed sites, see FM 3-4-1. This same concept applies to ports.

Permanent Decon Teams

Service-station type decon sites could be set up to service a given region. These sites must be evenly spaced across the support area so contaminated units do not have far to travel. The soldiers and mobile equipment at a contaminated fixed facility, like an airfield, can be moved to one of these service stations for decon. Some advantages of using regional decon sites for corps and higher support areas are –

- Less risk to troops and civilians. Runoff and vapor hazards at the decon site can be easily controlled. The sites can be put in areas away from troops and civilian populations. A possible hazard will be contamination build-up unless sumps are carefully constructed.

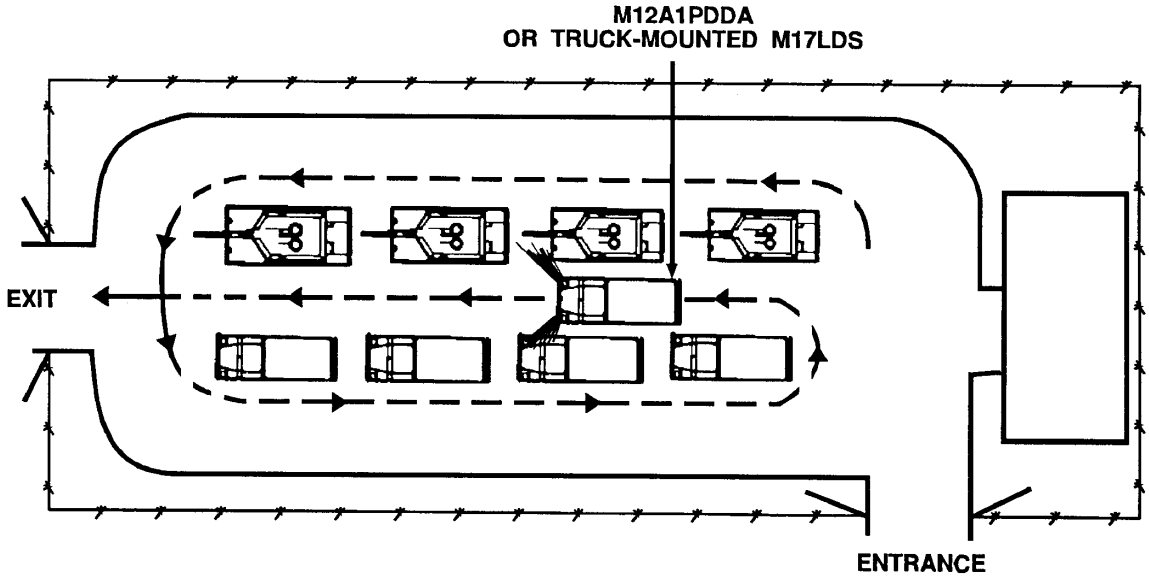


Figure 5-4. Motor park sites decontamination.

- Better decon sites. The fixed decon site generally has a more efficient site layout and operation. It does not have to be continuously set up, torn down, and moved.
- Fewer decon units required. A decon company can be dedicated to the decon station and service a large part of the corps support area. They can provide extended equipment and troop decon.

It is important to avoid contamination spread in fixed sites. When contaminated equipment moves to fixed stations, it may spread contamination along its route. There are two ways to reduce this problem: maintain enough decon service station points to keep travel distances short, or conduct a vehicle washdown before the move. For instance, when a mobile team arrives at a contaminated airfield, it can set up a vehicle washdown just outside the contaminated area.

The airfield personnel, after running their vehicles through the washdown, then move to the service station for thorough decon without spreading significant contamination along their way. See Figure 5-5 for a field-expedient setup for fixed sites. This field-expedient procedure can be used fixed an airfield or entry/exit of any fixed site with use of minimum resources. Planning, however, is required for emplacement of the washdown area. To emplace the 50-pound drum of STB on the ground, you must ensure that it is directed to the desired coverage area. The two levels of decon, operational and thorough, must be applied to manage and prioritize the assets available.

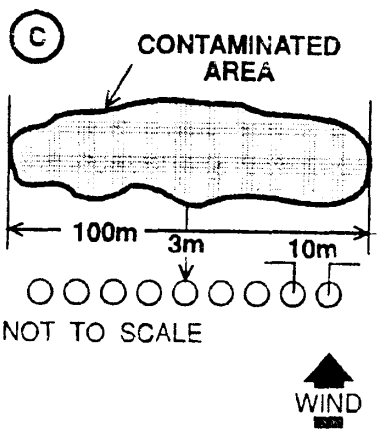
The first key point is to reduce the spread and transfer hazard by decontaminating selected surfaces of equipment, entry/exit of key locations, and buildings. The second key point is to eliminate contamination from equipment so maintenance can be performed at the site in a toxic-free environment. Table 5-1 provides a listing of decontaminants and decon kits that can be used for fixed site decon.

Terrain Decon

Use the lid of an STB drum as a plunger to push STB into the air. Use a 1-meter length of detonation cord and form a loop smaller than the drum lid. Place the loop on the ground. Loosen the lid of an STB drum. Hold the lid in place while you turn the drum upside down and set it over the loop. Remove the drum and the decontaminate will be piled on top of the lid (See A).

Use the decontaminate drum as a makeshift mortar. the top end of the drum must be pointed in the direction you wish to propel the decontaminate. Position the drum by digging a shallow hole to hold and point the drum. Place a 1-1/2-meter loop of detonation cord in the bottom of the hole (2 meters in soft soil). Loosen the holding bond on the drum, loosen the lid, and set the drum upside down in the shallow hole (See B).

For either method of emplacement, suggested spacing for charges is 10 meters apart for a 100-meter-front contaminated area. Place the charges along the upwind edge of the contaminated area (See C).



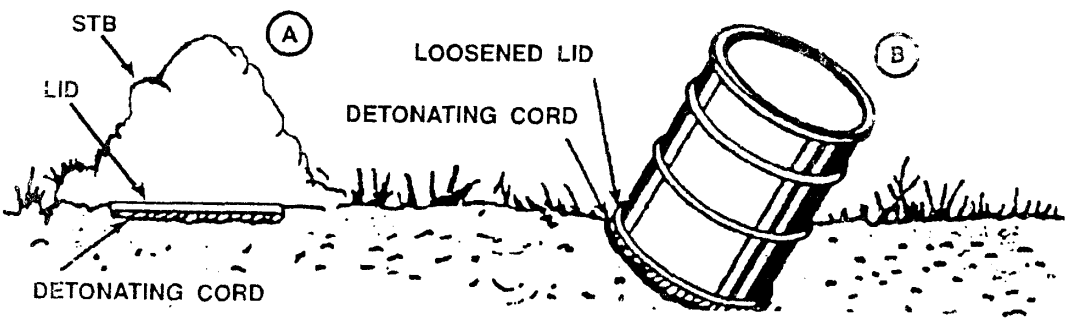


Figure 5-5. Field-expedient setup for fixed sites.

Table 5-1. Decontaminants for fixed site decon.

Decontaminants	Usage
STB	Mission-essential buildings, roofs, roads, terrain, entry/exits of major areas.
Weathering	Nonmission-essentail buildings, roofs, roads, terrain, vehicles.
Accelerated Weathering	Buildings exterior and interior vehicles.
Soap/detergent and water	Roads, buildings, windows, vehicles.
M280 DKIE	Entry/exit of building or fixed site, small tools and equipment, windows.
DS2	Vehicles, machinery.
M291 SDK/M258A1	Personal skin decon.

Terrain decon has little short-term benefit, but it may have some long-term benefits. Generally, you cannot decontaminate occupied terrain well enough to allow you to reduce your MOPP level right away. At best, all you can do is speed the weathering process. This may allow you to reduce your MOPP level a little sooner–for example, in two days instead of four or five days.

Terrain decon can be so expensive and so ineffective that you should seriously consider not doing it at all. But there may be times when it is absolutely necessary. The enemy may strike vital facilities like airfields and ports (see decon for fixed sites, page 5-1).

If you decide on terrain decon, limit the amount you do. Build a causeway or breach a path through the contamination for entry/exit into a major facility. Restrict your efforts to areas where you must work or move. No matter what you do, you will probably have to remain in MOPP; but you can reduce the danger of picking up liquid contamination and spreading it to other areas.

The most effective techniques for terrain decon are the natural methods. Only a brief mention of these techniques is given here. Refer to Chapter 6, this manual, where more discussion is given to a technique for spreading STB slurry; but remember, using standard decontaminants for terrain decon should be used as a last resort. It will quickly exhaust your resources. To determine persistencies of chemicals at various temperatures, refer to Chapter 3, FM 3-9.

Weathering

Weathering is the simplest and easiest form of decon.

Chemical and biological contamination

Warm, windy weather can significantly reduce terrain contamination. In some eases this occurs in a few hours or it may take a few days. Many variables affect the persistency of chemical and biological hazards, so it is impossible to accurately predict how long it takes such contamination to weather. Sunlight is especially effective against most biological agents.

Radiological Contamination

Although the term "weathering" is used to describe the decon process, weather has little effect on radiological hazards. Heavy rain and wind may remove some contamination, but only time will reduce the radiation emanating from the contamination. The hazard reductions that will occur over time can be roughly predicted. See the discussion on aging in Chapter 6.

Flushing

Flushing with large quantities of water removes contamination. A pressurized stream of hot, soapy water can remove significant amounts of agent. Scrubbing removes even more.

Chemical and Biological Contamination

Flushing is not very effective against some kinds of agents, especially thickened agents. However, flushing may speed up the weathering process.

Radiological Contamination

Flushing is very effective for removing loose radioactive contamination such as fallout. Rainout, however, can coat surfaces with a film that resists flushing. Such films must be scrubbed. Any contamination removed by flushing and scrubbing will remain radioactive, so control the runoff.

Burning

Burning works well against chemically or biologically contaminated vegetation, but it is of no value against radiological contamination.

Chemical and Biological Contamination

Fuel or explosives may be used to bum or blow away green vegetation. Burning also works on dirt surfaces.

Soak the area with kerosene or diesel fuel and ignite remotely. Do not use gasoline; it burns too quickly. Burning may create a vapor hazard downwind. Area commanders must warn downwind units of these vapor hazards.

Radiological Contamination

Avoid burning radiologically contaminated surfaces. Burning Will not destroy radiological contamination or its hazards. It may spread contamination if radioactive particles become suspended in smoke spread by wind.

Covering

Covering contamination does not destroy it, but it does keep the hazards away from you temporarily.

Chemical and Biological Contamination

Use roofing paper, plastic sheets, wood mats, or earth to cover contamination. This is a temporary measure because the agents may penetrate the covering. When the contamination penetrates the covering or when the covering is removed, the hazards will reappear. The coverings may also extend the life of the contamination hazard by reducing their exposure to air and sunlight.

Radiological Contamination

Radiological contamination must be covered by thick layers of dense material, like earth. Eight centimeters (3 inches) of earth will decrease radiation dose rates by half because of the shielding provided by the soil. Thirty centimeters (12 inches) is more effective. The job will be easier with earth-moving equipment, but the equipment and operators probably will have to undergo decon.

Clearing

Clear passageways by removing contamination layers covering terrain.

Chemical and Biological Contamination

Most chemical agents will not penetrate the soil more than 5 centimeters (2 inches) and biological agents penetrate even less. When contamination is scraped aside, a passageway will be created that is free of transfer hazards. Contamination on either side of the passageway will continue to present a vapor hazard.

Radiological Contamination

Fallout does not penetrate the top layer of soil unless it is followed by rain. It can be scraped aside. Move contaminated soil as far away as possible; the piles tend to concentrate radiation. Immediately below a nuclear blast area, the soil may be radioactive to a depth of 1-1/2 meters. In most cases, decon of this much earth is not practical.

Neutralizing

Dry Mix or Bleach

Dry mix or bleach may be used effectively against chemical or biological contamination, but not radiological contamination.

Chemical and Biological Contamination. Spread dry bleach or STB dry mix on solid surfaces. Rake it into soft surfaces like sand or earth. The decontaminants could be used as a field-expedient decontaminant (See Table 5-1).

Radiological Contamination. Dry mix and bleach have no effect on radiological contamination or its hazards.

Slurry

Terrain can be decontaminated with STB slurry. It requires trained chemical decon troops and the equipment is costly both in time and material.

Chemical and Biological Contamination. Apply STB slurry to terrain by spray hoses attached to an M12A1 decon apparatus. Operators wear TAP aprons over their MOPP gear and sit on the front fenders of the vehicle to spray the slurry. Adjust the vehicle speed according to terrain this normally will be 2 to 4 miles per hour. The suited nozzle operators spray a fan pattern 3 to 5 feet ahead of the vehicle. The pattern overlaps on the center, and extends past both sides of the vehicle (see Figure 5-6).

Radiological Contamination. STB slurry has no effect on radiological contamination or its hazards.

One load of slurry will decontaminate a concrete surface approximately 100 meters long by 10 meters wide. Other surfaces may require more decontaminants. It takes about an hour to load and mix one load of slurry. See TM 3-4230-209-12 for slurry loading, blending, agitating, and spraying procedures.

Slurry ingredients and amounts required to decontaminate chemical agents on various surfaces are shown in Table 5-2.

Slurry ingredients and amounts required to decontaminate biological agents on various surfaces are shown in Table 5-3.

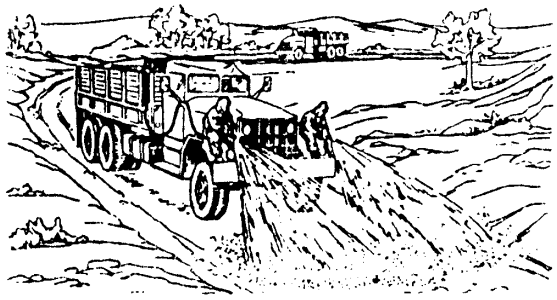


Figure 5-6. Terrain decon technique.

Table 5-2. Slurry mix to be used for chemical decontamination.

Slurry ingredientrs		
1,300 pounds STB (26 drums)		
25 gallons water		
12.5 pounds M2 antiset		
24 ounces antifoam compound		
Makes 317 gallons of slurry		
Type of surface	**Square meters of surface decontaminated per gallon**	**Square meters of surface decontaminated per load**
Concrete roadway (smooth)	3.7	1,130
Macadam or gravel roadway (loosely surfaced)	1.8	564
Short grass (3 to 5 inches)	1.3	338
Long grass or low brush	.84	259

Table 5-3. Slurry mix to be used for biological decon.

Slurry ingredients		
150 pounds STB (3 drums)		
225 gallons water		
1.5 pounds M2 antiset		
24 ounces antifoam compound		
Makes 256 gallons of slurry		
Type of surface	**Square meters of surface decon-taminated per gallon**	**Square meters of surface decon-taminated per load**
Concrete (smooth)	7	1,792
Closely packed (loose)	2	512

Vulnerable Equipment

Most military equipment has not been critically assessed for its ability to withstand decon without adverse effects. As more testing is done, specific decon instructions will be included in the technical manual for ail types of equipment. We know that some equipment is extremely vulnerable to damage when subjected to decon. Electronics and optical equipment are especially vulnerable. Some materials, such as canvas and rubber, tend to absorb chemical agents. As a result, decontaminating absorbent surfaces is extremely difficult, if not impossible. Most decontaminants are highly corrosive and cannot be used on certain materials. They may also corrode and render ammunition unserviceable.

Do not subject vulnerable equipment to unnecessary decon. Radiacmeters may measure low levels of radiation that are not dangerous. The commander's operational exposure guidance determines the maximum permissible radiation dose rate (usually .33 cGy [rad] per hour). If this dose rate is exceeded, you must decontaminate.

Once you know that decon is necessary, keep the four principles of decon in mind: decontaminate as soon as possible, decontaminate only what is necessary, decontaminate as far forward as possible, and, decontaminate by priority.

Consider the most practical method of decon for your situation and for the materials you have available. Remonitor periodically after each stage of decon to determine when you reach safe levels. Control runoff. Liquids, rags, and other materials used for decon probably will be contaminated. Handle DS2 carefully; do not splash it on MOPP gear. If you do, wipe it off immediately. Protect your vulnerable equipment from the dangers of decon two ways: First, carefully choose the right technique to use. Second, choose the best decontaminant for the job.

Electronics

Nonsealed electronic equipment circuitry can be damaged by moisture, dust, and corrosive deconontamination materials. Most field electronic equipment is watertight for environmental protection. This also provides good protection against NBC contamination. Contamination probably will not penetrate gasket-equipped protective covers and sealed components on electronic equipment but if exposed, the contaminants may be present on the outside of cases containing the

electronic equipment. Wipe down the outside portions of the equipment case with a designated decontaminant. After decontaminating the outside, the equipment should be wiped down with water or approved solvent to remove traces of decontaminant solutions. If equipment seals appear damaged or penetration of NBC contamination into the inside of the equipment is suspected, then the unit should be treated as if it was nonsealed. Under no circumstances should electronic equipment be immersed in a decontaminant solution or subjected to high-pressure application of decontarninant solutions.

For chemical contamination, wipe all metal electronic cases with DS2. If chemical agent is identified as HD, allow 30 minutes contact time. Wipe thoroughly with damp close, dry, and wipe with a designated oil. (For other than chemical agents, wait 10 minutes). If DS2 is not available or the case is of some material other than metal, wipe the equipment's exterior with a cloth and hot, soapy water or use a nonstandard decontaminant (see Appendix F). If contamination is not extensive, use the M291 or M258A1 decon kit.

Corrosive decontaminants, such as DS2, should never be used on nonsealed electronic equipment. This type of equipment is often found inside shelter assemblies and helicopters. Refer to the appropriate technical manuals or to Appendix G for acceptable decon procedures for nonsealed electronic equipment.

For radiological contamination, brush, wipe, or vacuum contamination from equipment. The contamination is not destroyed, just moved from one place to another. So, control the runoff and treat is as a hazardous substance.

Optics

Optical systems are extremely vulnerable to decon materials that might scratch or adversely affect the lenses. Wipe optical systems with a soft, nonabrasive material such as lens-cleaning tissue, cotton wadding, or soft cloth dipped in hot, soapy water. Wipe the optical system with decontaminants. Do not immerse it.

Hot, soapy water is the preferred decontaminant for chemical and biological contamination. When DS2 is applied to coated lenses, it causes some damage. Likewise, exposing lenses to STB slurry removes some of the magnesium from the coating. Small optical surfaces can be decontaminated with the DKIE, M291, or M258A1 towelettes.

Warning

Do not use DS2 or STB on ammunition. It removes critical markings from ammunition. STB may cause fire when it comes In contact with blister agent or DS2. it may also corrode and render ammunition unserviceable. Do not use nonstandard decontaminants that are corrosive. They also may remove critical markings from the ammunition.

Radiological contamination should be blown off with a stream of air or wiped off with hot, soapy water. Rinse by wiping with a sponge dipped in clean water.

Ammunition

Decontaminate contaminated ammunition with cool, soapy water. Apply with PDDE or with brushes, mops, rags, or brooms.

Cool, soapy water is the preferred decontaminant for all types of contamination.

Canvas Items

These items include load-carrying equipment and web gear. Decon is difficult. It may be necessary to burn or bury them if they are heavily contaminated with chemical agent. STB dry mix or slurry may be used. Slurry is more effective. In many cases, weathering may be the preferred decon technique because scrubbing canvas frequently imbeds the contamination further and worsens the situation. If the item must be decontaminated boiling for one hour in soapy water is the preferred decontaminant for chemical and biological contamination. Radioactive contamination can be removed by brushing, then washing. It may also be vacuumed.

The attempt to salvage contaminated canvas will require a great amount of logistic and manpower requirements. Decon of canvas items presents not only a severe strain on the unit's available decon resources, but will cost many manhours that could be used for mission-related functions. Other options for disposal of contaminated canvas should be considered in the overall tactical situation.

Dispose of large canvas items, such as GP tents (excluding shelter halves), vehicle cargo, cab and seat canvas used for protection of supplies and equipment, and worn tracked vehicle canvas. The use of available NBC protective covers to protect stocking items keeps the survivability of the unit, but this cover must be disposed after exposure to contamination. Removing the items and either burying or destroying them before the unit exits the contaminated area is a consideration in this case.

Food and Water

Most Army units cannot test the purity of food or water even if they can decontaminate it. Food and water decon usually takes special handling by trained technicians. If your water becomes contaminated, contact medical personnel. Quartermaster and medical units test water and approve it for safe use. Water treatment specialists test and treat the water in an NBC environment. Direct contaminated food questions to veterinary medicine personnel at the battalion (or higher) aid station and medical facilities. Army food service specialists can avoid food and water contamination by decontaminating certain sealed items.

Food and water decon is difficult, so make every effort to keep food and water in sealed containers and protective packaging. Leave food in wrappers. Keep wrapped food in boxes, tins, or other containers. Store these containers in closed refrigerators or vans. If you use these techniques and your unit becomes contaminated, you still may be able to salvage and decontaminate some food or water. See FM 3-3 for further discussion on avoiding contamination.

Do not discard large quantities of contaminated food or potable water. It may be usable. Contaminated food supplies should be handled only by personnel trained in decon methods. Contaminated food items should be placed into three groups for handling

Group I consists of canned and unopened items that have been exposed only to the vapors of the agents. Generally, the items in this group will be safe for issue to personnel after a brief period of outdoor airing to remove clinging vapors.

Group II consists of canned and unopened items that have been contaminated with a liquid chemical agent. Attempts to decon porous packaging materials, such as cardboard or wood, are likely to be unsuccessful and may result in spreading the contamination. The best procedure in handling such items is to strip off the outer contaminated coverings and examine the inner layer to determine if agent penetration has occurred. If it has, continue stripping off layers until an uncontaminated layer is reached. Items packaged for military operations are usually packed in boxes, so this procedure is feasible. When the inner uncontaminated package is reached, place it in Group I. If the agent has penetrated to the food, place it in Group III.

Group III consists of unpackaged or poorly packaged items that have been exposed to an agent in either vapor or liquid form. Foodstuffs in this group should be decontaminated only when absolutely necessary. Boiling food in water may be eliminated when the contamination has been only with the vapors of irritant agents. When such an exposure has been light, airing for a short time may be used for decon. Frying, roasting, or broiling will not remove traces of blister agents from meats. In general, salvaging foods heavily contaminated with droplets of blister agent, especially the arsenical blister agents, is not practical.

Operational rations are the primary rations issued and uncontaminated stocks should always be issued first. This allows for decon of contaminated stocks without interrupting supply support.

If in doubt, throw it out! Do not use or decontaminate items in Group III without help of veterinary or water treatment personnel.

Disposal and Decontamination of Chemical Rounds

In combat, chemical munitions may be encountered. Leaking munitions must be decontaminated, evacuated, and disposed of safely. Soldiers performing this task must be well trained and have a thorough knowledge of munitions after agents and their effects. Soldiers must use protective clothing and mask when there is a possibility of exposure to a toxic chemical agent. The MOPP level will be specified by the unit commander. Use detection equipment (chemical agent monitor, M256A1 detector kit, M8A1 chemical alarm and M8 or M9 paper) to monitor chemical munitions during handling, shipment and storage.

See AR 385-32 and TM 10-277 for additional guidance for safety.

Handling

Handle chemical projectiles with care. A good rule of thumb is to handle them as you would a fuzed HE round. Handling procedures for binary and unitary chemical projectiles do not differ. Even though the compounds are in separate containers in a binary round, each is hazardous in its own right and should be handled with care. Since chemical munitions are a different class of explosive, they should be segregated from other types of ammunition. Chemical munitions should be inspected periodically for damage and leaks, especially after the unit moves. Security and protective measures must match those given to conventional ammunition.

Contamination Control

Whenever a chemical projectile is damaged and starts to leak, the round presents the same hazards to personnel in the area as an enemy chemical attack. Leakers evaporate the agent; they don't dribble. Only rounds that have not completely detonated or have been severely damaged may exude liquid agent if large holes, narrow openings, or cracks have been created. It is the vapor hazard created when the chemical leakage occurs that poses the greatest threat to personnel. When a leaking chemical round is discovered take the following hasty contamination control actions.

Protect personnel

Personnel in the local area should mask. Masks alone are sufficient for those not actually in contact with the projectile and contaminated equipment because the agent will simply evaporate. Again, the vapor hazard is the real danger.

NOTE: One exception is agent HD. In high vapor concentrations, HD can irritate the skin and later cause blisters. The MOPP level should be to cover exposed skin for personnel in the area. Farther

away, the vapor hazard is much less. There is probably no need to put the entire unit in MOPP4.

Liquid agents must come into direct contact with personnel, equipment, or terrain to contaminate them. Only personnel who may physically come in contact with the liquid agent on the projectile or surrounding area need move to MOPP4.

Seal and package projectile

To keep the liquid from continuing to vaporize, attempt to suppress the leak and seal the projectile from the environment.

- If the leak on the projectile can be easily located, tilt the projectile so the point of leakage is up. This should stop or slow the leakage. Beyond this measure, a leaking round should not be moved before packaging.
- If a hole, puncture, or crack can be found, quickly try to plug or patch it. Use materials such as a rag, packing material, a wood chip, or putty. Bind the patch in place with adhesive tape, twine, or rope. See Figure 5-7.
- Keep the leakage point right-up (high). Place the projectile in a plastic bag. Wrap several layers around it. Seal the bag with adhesive tape, twine, or rope. (A tarp or camouflage net carrier will also work.) Figure 5-8 shows a typical method of sealing and packaging a leaking round.
- Find a suitable, sturdy, sealable container into which the projectile may be placed (Figure 5-9). Carefully place the round into the container. Use packing material to keep the container from tearing the plastic bag and causing increased leakage. Seal the container.
- Decontaminate the sealed container. Carefully move the sealed container (again keeping the leakage upright) to the designated area for disposal.

NOTE: Do not use decontaminating agents directly on the projectile. Do not try to decontaminate the projectile itself or try to submerge the round in decontaminants. This would quickly exhaust the battery supply and be a waste of decontaminants, which are precious in a war. Save them for decon of friendly equipment.

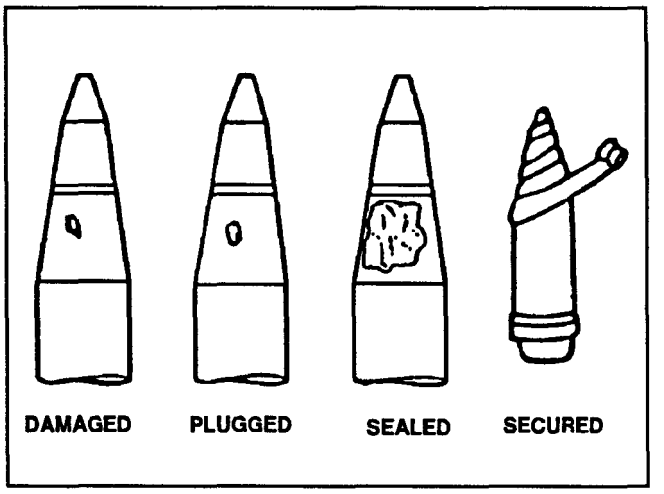


Figure 5-7. Sealing the leak.

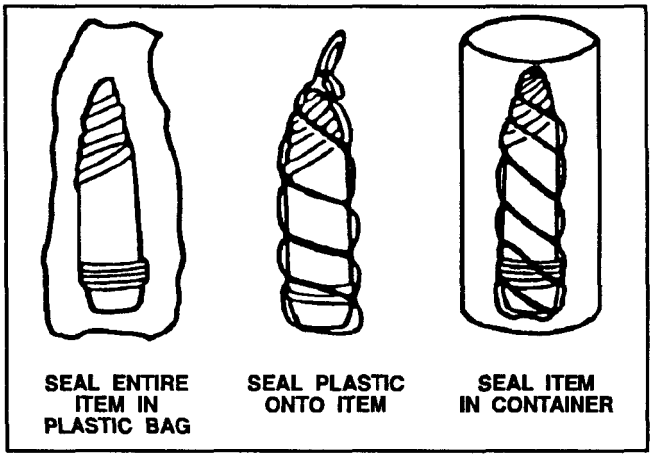


Figure 5-8. Sealing and packaging a leaking round.

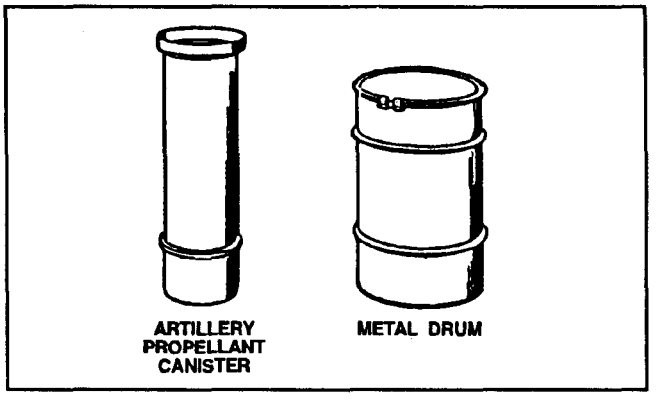


Figure 5-9. Examples of sealable containers.