

Force Multiplier

— in an NBC environment

By MAJ Conrad C. Szymczak

Civil affairs is not an everyday word in the active Army. There's only one battalion-sized unit on active duty. The bulk of civil affairs assets are in the Reserves. Their ranks are filled with both specialists and generalists from various professions and civilian governmental agencies. They exist to provide the tactical commander—

- an interface with (or replacement of) foreign governments;
- psychological operations;
- assistance in meeting his legal and moral obligations;
- refugee control;
- intelligence from civilian sources; and the use of facilities, equipment, supplies, and labor from the civilian sector.

Civil affairs can be an asset to the tactical commander in an NBC environment by providing assistance in decontamination operations. Facilities such as hardstands, parking lots, car washes, and warehouses can be converted to small- or large-scale vehicle and personnel decontamination stations.

Decontamination materials such as cleaning tools, soaps, bleaches, and other chemicals can be procured and delivered to site. Water sources can be identified and tapped into or arrangements could be made for water to be delivered to site by civilian trucks. It is feasible that water could be obtained from wells drilled by civilian contractors at the

decontamination site.

Civilian fire-fighting equipment might be available to augment US equipment. Fire-fighting equipment was used extensively at Chernobyl for decontamination operations.

Civilian labor may be available in rear areas to assist in converting facilities or building new decontamination facilities. They may also be available to assist US forces in carrying out decontamination operations.

Using civilian material, equipment, and labor has a twofold benefit. First, it would augment US chemical and engineer personnel in the rear areas and free them up for duty in forward areas. Secondly, it would train civilian civil defense personnel and provide a vehicle for good will and cooperation between

military and civilians.

The use of existing facilities has its problems. Drainage from these facilities may contaminate ground water and other water resources. If contaminated wash water and decontaminating solutions are allowed to drain into existing sewer systems, serious if not irreversible damage to urban water treatment facilities may occur. If sanitary systems become inoperable, sanitary conditions will become far worse than if sanitary systems never existed. Outbreaks of disease and epidemics are inevitable.

The tactical commander has an obligation not to further contaminate the environment if at all avoidable.

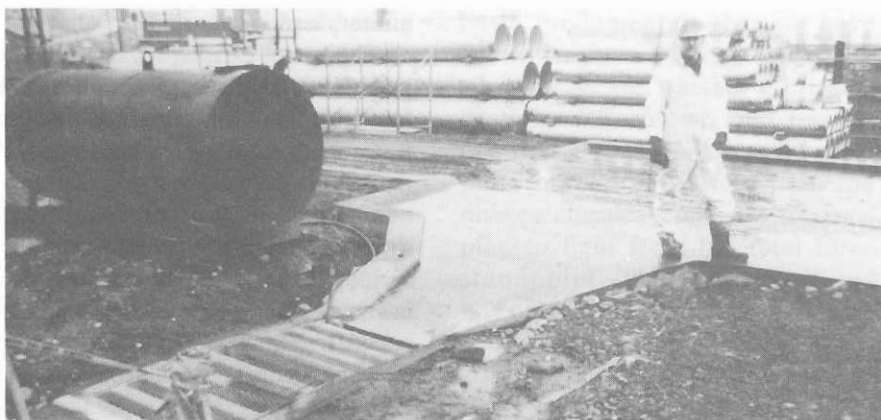
One method of relieving the drain on US military assets and minimizing the damage to the environment in the theater of operations is through pre-engineered, self-contained decontamination sites. These sites typically would consist of a reinforced concrete slab with drainage to a holding tank, a separator/decontamination tank, clean water storage tank, and through access-egress.

These facilities can be built with either military or civilian materials, equipment, and personnel. They can be operational in two to three days.

I've been involved with two such hazardous material (HAZMAT) facilities as an ancillary part of a



1705 decon site showing decontamination in progress.



I705 decon site close up showing wash slab, collector, and contaminated water holding tank.

construction project. The first was used in Tacoma, Washington, at the I-705 interchange project to decontaminate trucks enroute from a contaminated area to a HAZMAT containment facility in Arlington, Oregon.

This facility consisted of a reinforced concrete slab sloped to a drainage trough that emptied into a holding tank. This contaminated water was then gravity-drained from the holding tank into a separator/decontamination tank where oily contaminants were separated out and the remaining effluent was treated and released to the environment. Clean water was supplied from the city water main. The power washer was gas powered, steam generating, man portable, simple, and reliable.

The second site was built in the City of Seattle's Cedar Falls watershed area. All construction vehicles had to pass rigid cleanliness standards and absolutely no fuels, oils, or contaminants could be spilled.

This facility consisted of a reinforced concrete slab and a trailer-mounted steam cleaner. Water was supplied from a drilled well. A water storage tank was used because of the quantities of water required at the site exceeded the well pump capacity.

Oil and fuel were absorbed from

the wash water by means of oil absorbent pads that were then stored in drums and hauled off site for disposal at a landfill. Both facilities were completely self-contained and together decontaminated hundreds of vehicles during the time they were in operation.

As discussed earlier, wash water and decontaminating solutions must not be allowed to contaminate the environment. Options for treating the contaminated liquids include separation, filtration, chemical treatment, thermal treatment, dilution, and ultraviolet light treatment.

Separation involves the mechanical separation through such means as oil flotation on water or centripetal force and chemical flocculation through the addition of a catalyst.

Filtration extracts hazardous materials by using various papers, polymers, or other mediums to filter out oils, solids, and organics. Carbon bed filtration is an excellent medium for stripping organics from the contaminated liquid. This is the principle behind the charcoal lining in our current BDO chemical protective suits.

Chemical treatment seeks to modify the chemicals present through oxidation or other chemical reactions to a non-hazardous state.

Thermal treatment changes the chemical state of the effluent or

residue through incineration or some other thermal/combustive means.

Dilution involves the addition of water, soil, or some other inert substance to the point where the concentration no longer poses a hazard.

Ultraviolet light treatment involves the formation of ozone from dissolved oxygen in the water. The ozone spins off an oxygen molecule that neutralizes organics. This process is used in Europe to purify drinking water. It's also in limited use stateside for waste water treatment.

This technology can be modified to build a portable on-site decontamination facility. There are currently no effluent decontaminating systems available to the military. The Chemical School needs to take the lead in developing such a system.

Selection and implementation of an on-site effluent decontamination system is beyond the scope of this paper. Selection of a system would have to consider in detail the composition of the contaminants and decontaminating solutions that go into the holding tanks, the possibility of decontaminating this solution on site or trucking it to another site for treatment, and careful monitoring of the effluent that is released into the environment.

At the time this article was written, MAJ Conrad Szymczak was assigned as a reserve officer with the 364th civil affairs brigade in Portland, Oregon. MAJ Szymczak has completed the engineer officer basic course; the communication security course; nuclear, biological, and chemical warfare course; engineer officer advanced course; personnel effective course; civil affairs officer advanced course (Special Warfare School); and the command and general staff college. He has a degree from the University of Illinois in structural engineering and materials.