# CHAPTER 6

# NBC OPERATIONS

## TOXIC CHEMICAL AGENTS

Personnel who purify, store, distribute, and issue water supplies must know NBC operations. Operators and supervisors must be alert to avoid NBC contamination. They must know NBC requirements related to field water supply.

Water supply personnel in the TO may work for long periods in a toxic environment. The commander must adopt a MOPP based on the threat and mission requirements. The commander must consider:

- Mission operations in a NBC environment.
- Handling and operations of water supplies in purification, storage, and distribution at various MOPP levels. This includes requirements for group protection.
- Degradation of units and individuals performing service and maintenance at various MOPP levels.
- NBC training status of assigned individuals.
- Availability of NBC school-trained personnel.
- Requirement and responsibility for large-scale decontamination.
- The effect of various MOPP levels on morale, discipline, and fatigue.

The effect of toxic chemical agents on potable water supplies is well-known. Potable water contamination will be a direct result of:

- The degree to which potable water is exposed. (This will be limited considering the closed systems involved in handling, transfer, and storage.)
- The type of chemical agent involved. Nerve agents (GB and VX) pose a great threat to water supplies because of their high toxicity at low

concentrations. Blister agents (mustard and lewisite) are lesser threats due to low solubility.

- The extent to which air-breathing pumps would contaminate the water in a toxic chemical environment.
- The concentration and duration of the toxic agent.
- The extent to which air-breathing pumps or engines will accept chemical agents designed to disrupt pump mechanical operations. Clogged air filters or congealed pump fuel will require replacement action.

In the face of possible contaminated water supplies, the commander must consider:

- The method for identifying the contamination and the degree of hazard involved. You can identify chemical agent contamination of water supplies by using the M272 Water Testing Kit-Chemical Agents.
- The use of assets to remove contamination from potable water supplies instead of purifying raw water.
- The decontamination of equipment used for the purification, storage, and distribution of contaminated water.
- The safe and rapid disposal of contaminated purification equipment components (filters and reverse osmosis membranes).

There are no test results to show the effects of toxic agents on collapsible fabric tanks or drums, hose lines, or SMFTs. Data on toxic agent effects on rubber indicate that adverse results would be based on the degree of contamination. Data on the toxic effects of chemical agents on potable water storage and distribution equipment will appear in all operations manuals when such data become available. Current doctrine dictates a rapid decontamination of these systems to preclude excessive absorption and degeneration of the material. These water systems, when operational, are under significant pressure. The pressure and an increase in temperature may release toxic agents. Based on the amount of prior absorption, ruptures caused by degenerated material may lead to large losses of potable water supplies.

The commander must provide for rapid and complete decontamination of all water purification, storage, and distribution equipment. He should consider:

- Decontaminant available as opposed possible needs.
- Training level of unit personnel to perform NBC decontamination operations.
- Decontamination expertise available to the unit (trained personnel).
- Supplemental decontamination support available to the unit.
- Mission requirements and operations during the decontamination process.
- Soldier safety during decontamination and MOPP levels.
- Replacement of subassemblies that cannot be decontaminated.

## NUCLEAR WEAPONS

The blast, heat, and nuclear radiation effects of nuclear weapons are hazards to the water supply system and personnel. Details pertaining to defense against nuclear attack are in FM 3-100.

The chief hazard of nuclear weapons to water supplies and facilities is the blast effect. It is most destructive to supplies and facilities that are direct targets. Facilities above ground are exposed to air, surface, and subsurface bursts. Blast damage depends on dynamic pressure, terrain conditions, atmospheric conditions, nuclear burst yield, and height of burst. The greatest blast damage is delivered by a high-yield nuclear weapon detonated as an airburst.

Thermal effects of nuclear explosions extend over a wide area. Heat from a nuclear explosion may cause flammable surfaces to ignite on contact.

NIGA may be found in some equipment, but the greater hazard is from NIGA in the surrounding terrain. Nuclear contamination of water is a result of fallout. Like radioactive fallout that settles on the

ground, rain washes NIGA in the soil into lakes, rivers, and other raw water sources. Radioactive isotopes in raw water must be removed during the purification process to be sure potable water supplies do not contain radioactive contamination. The AN/PDR 27 Radiac Meter is used to measure radioactivity in water sources and supplies.

## BIOLOGICAL AGENTS

Biological agents inflict casualties and damage to personnel, animals, and food. They normally do not damage equipment or facilities. Biological agents consist of infectious live organisms and toxins.

Infectious live organisms include viruses, bacteria, rickettsia, protozoa, and fungi. They can cause disease or death. To reduce danger to these organisms, commanders must consider:

- Immunizing personnel before deployment.
- Enforcing personal hygiene and field sanitation practices.
- Controlling insects and rodents which carry infectious agents.

Toxins are poisonous chemicals produced by bacteria, algae, and fungi. They can cause illness or death. The protective mask protects against toxins, which are usually distributed by aerosol sprays.

Army ROWPUs remove or destroy infectious organisms and toxins in raw water sources.