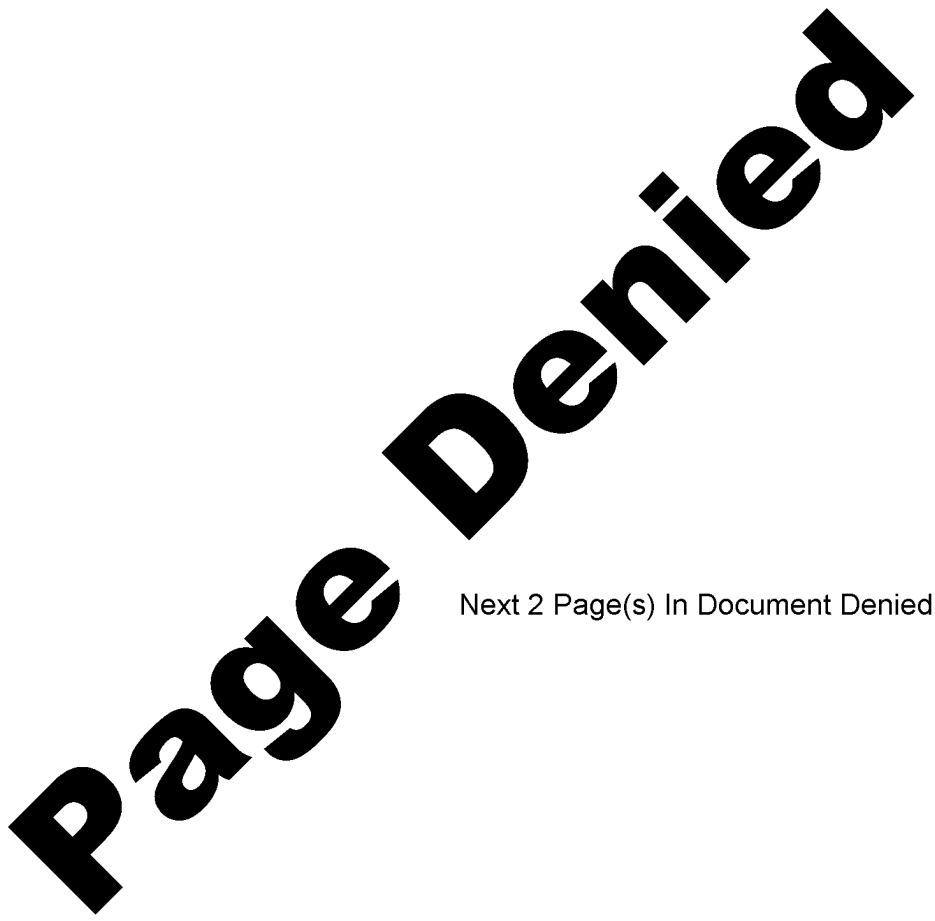

Next 2 Page(s) In Document Denied

The Protection of Troops Against Weapons of Mass Destruction

by

Major-General of Technical Troops, A. Isayuk

Nuclear and chemical weapons inflict casualties on personnel and damage on combat equipment and armament over areas covering tens and hundreds of square kilometers. A surface burst of a warhead having a yield of 30 thousand tons, given a wind with an average speed of 50 km an hour, can contaminate an area of 900 or more square kilometers with a radiation level of over 5 roentgens per hour, and 250 to 300 square kilometers with a radiation level of 100 roentgens per hour and more.

Considering such an enormous casualty effect of the weapons of mass destruction, it is now essential to train troops to disperse rapidly, to maneuver, to use skilfully the protective characteristics of the terrain, and to cross rapidly large areas contaminated by radioactive and toxic substances.

Maneuver and dispersion are the integral conditions in the combat activities of large units and units. It is impossible to preserve the combat effectiveness of troops without them. Maneuver and dispersion must be carried out no matter how distant the troops are from the enemy. Nevertheless, maneuver and dispersal must not have an adverse effect on the carrying out of the main task by the troops.

In selecting the areas for the disposition and concentration of troops, it is essential to take into consideration the features of the terrain that give protection from the destructive factors of atomic and chemical weapons. Ravines, hills, ditches, caves, quarries, underground excavations, vegetation cover (woods, bushes), and meteorological conditions all change the radius and areas of destruction by the shock wave, limit the spread of light radiation, reduce penetrating radiation, affect the spread and the volume of the radioactive fall-out, and also reduce the effectiveness of chemical weapons and bacteriological agents.

The effect of all the destructive factors of a nuclear burst on personnel is considerably reduced when they are dispersed in ravines, on reverse slopes of heights, and in ditches. The effective casualty radius of the shock wave is reduced by approximately two times under these conditions. Thick woods reduce the effective casualty radius from light radiation, on the average, by 5 to 6 times, and that of penetrating radiation by 15 to 20 percent. By an accurate consideration of all the positive features of broken terrain and meteorological conditions and by their skilful use, destruction in personnel and combat equipment is reduced, on the average, by about half.

Unfortunately, not enough attention is paid to the accurate consideration of the protective features of the terrain. The evaluation and reconnaissance of terrain from this viewpoint is seldom done, and the necessary measures to strengthen the existing natural cover and to improve its protective features are not undertaken.

In March 1960 in an army exercise in the Transcaucasus Military District (ZakVO), the forward command point of the 7th Army and later its command point were located on absolutely open terrain despite the existence in the exercise area of broken terrain and other favorable conditions. Neglecting the protective features of the terrain, the army command point was bunched so close together (on an area of less than one square kilometer) that for its destruction several high explosive bombs, not to mention nuclear warheads, would be sufficient.

Dispersal and maneuver, the advisable formation of combat and march formations, the skilful use of the protective features of the terrain, in our opinion, are the basic measures for protecting troops from the weapons of mass destruction.

In this connection, the question arises of what significance will the preparation of the terrain in an engineer respect have. Certainly, the significance of engineer preparation of terrain under modern conditions has increased even more. Even the simplest types of engineer construction reduce by several times the destructive factors of nuclear and chemical weapons. Trenches and communication trenches, for example, protect troop personnel from the shock wave of a nuclear warhead burst having a yield of 15 to 20 thousand tons at a distance of up to 1 km from the center of the burst, and from a warhead having a yield of 100 thousand tons at a distance of up to 1.8 km.

The radiation doses from a surface burst for personnel seated in trenches and communication trenches $1\frac{1}{2}$ m deep are reduced 3 to 5 times (and when lying down up to 30 times), and the radiation level is reduced 15 to 20 times. Trenches and slit trenches covered over even thinly give complete protection from light radiation and from droplet-liquid toxic substances (otravlyayushcheye veshchestvo--OV), and reduce the dose of penetrating radiation 50 times, while dugout shelters with a top cover of 100 cm reduce penetrating radiation 200 to 400 times.

The most reliable shelters are the various types with thick top cover. Depending on their types and function such shelters give complete protection from penetrating radiation, and at a distance of 400 m from the center of a nuclear burst give protection from the shock wave.

The creation of engineer structures, however, and also the preparation of the terrain with the modern state of means of mechanization will require a lengthy period of time and a great expenditure of forces and means. The command post (KP), communication centers, and medical points alone of a division will require more than 50 shelters, well equipped in an antiatomic and antichemical respect. The combat equipment, the vehicles, and the needs of the rear services of a division and regiments will require the digging of about 2,000 trenches, dugouts (uglubleniye) and pits for various purposes.

It is quite obvious that such a large number of structures can only be created when troops remain in place for a lengthy period. Under conditions of great mobility, high maneuverability, and fluidity of combat operations, this is impossible with the modern means of mechanization of engineer works and the insufficiency of light and portable structures for the construction of engineer structures. Often it will not even be necessary. Therefore, the protective features of the terrain must be utilized to the full.

Of no less importance in the protection of troops from the weapons of mass destruction is the elimination of the consequences of an atomic and chemical attack by the enemy. Unfortunately, experience of exercises shows that such basic measures as the restoration of combat effectiveness of the troops, rescue and medical-evacuation work, medical processing of personnel, decontamination of combat equipment and weapons, and dosimetric checks are not only not worked out in practice but frequently are not even solved organizationally.

In one of the tactical exercises, the commander of the 210th Motorized Rifle Regiment of the 118th Motorized Rifle Division located directly in the area of a "nuclear burst" with high levels of radiation, took more than two hours to make an evaluation of the situation created as a result of the "nuclear burst". The evaluation of the radiation situation was made slowly. Control and communications with subunits were lost and no practical steps to reestablish them were taken. Emergency rescue work was not organized, and the medical processing of personnel was carried out after lengthy delay. The regimental medical post (polkovoy meditsinskiy punkt) was not prepared for this work and the division medical battalion (mediko-sanitarnyy batalon divizii), having arrived after a long delay, was not able to render any actual assistance to the personnel who had become casualties.

The subunit commanders of this regiment who were in the zone of destruction did not even try to take any measures to eliminate the consequences of the "nuclear burst". The individual antichemical protection equipment was not fully utilized by the personnel.

The commander and the chief of staff of the division, knowing the situation in which the 210th Motorized Rifle Regiment found itself, did not exercise any decisive influence on the organization and rendering of assistance to the affected subunits of the regiment. The supply of materiel (clothing, medicines, foodstuffs, and means of communications) was not organized.

The commanders of large units, units, and subunits which find themselves in an area of nuclear burst (in the zone of fallout from a radioactive cloud, in an area contaminated by toxic substances) must quickly evaluate the situation and make a decision as regards protection of their troops. First of all, communications with the subordinate subunits must be established to find out what their situation is and what their needs are, report the situation to the senior commander (chief) and inform the neighboring units about this, appoint new commanders in place of those who have become casualties, and without waiting for assistance from above, start eliminating the consequences of the employment of the nuclear (chemical) weapon with their own forces and means.

In the first place, measures for the rescue of personnel are carried out, extracting them from the debris and rubble of engineer structures and the rendering of immediate medical aid on the spot.

First aid to the victims is rendered in the form of self-aid and mutual aid, and also by the medical personnel allocated for rescue work. Casualties are immediately evacuated to collecting and triage points.

For the evacuation of personnel, medical units and subunits should be used first of all. If this should prove to be insufficient, then other units and subunits may be utilized. The collecting and triage points should be located outside the area of radioactive contamination, near sources of water, and in places having good approaches for vehicles and people on foot. All personnel must be informed of the location of these points.

In the case of mass destruction of personnel, army and front independent medical battalions are sent to the area of the atomic burst. They are given a part of the more complicated work of rescue and treatment of personnel. Units or subunits of chemical protection are also sent to the area of the atomic burst to establish special processing points (punkt spetsialnoy obrabotki--PuSO).

Combat equipment and weapons are salvaged from ruins, restored, and evacuated by the combat effective personnel of the units and subunits after the radiation situation has been clarified and the radiation levels do not exceed the permissible irradiation doses. To assist the troops in the evacuation of equipment and weapons from the areas of atomic bursts, it is advisable to allot subunits from other units, and primarily from repair units.

Combat equipment, weapons, and other materiel which were in the zone of total destruction and are badly damaged are left on the spot and evacuated (if this is found necessary) on special directions by army and front forces and means.

Clearance and restoration of routes for maneuver, and bringing up of supplies and evacuation are carried out by the units and subunits of all arms of troops with their own forces and means. The most difficult tasks--the making of passages through the obstructions and the repair of roads, bridges, and other tasks--are carried out by engineer units and subunits reinforced with the necessary means of mechanization.

Extinguishing fires in the areas of atomic bursts should be undertaken only in exceptional cases where these areas are of tactical or operational importance, and then only when the high level of radiation in these areas has fallen. Small fires occurring at a considerable distance from the ground zero of the atomic bursts should be localized by the personnel of the subunits in the area or by specially detailed subunits from units located near the area of the fire.

In order not to expose troops, combat equipment, and armament to the danger of radioactive contamination and to maintain their combat effectiveness, the radiation situation in an area of radioactive contamination must be constantly known. To accelerate the clarification of the radiation situation and the taking of a decision, a simple method of calculation with tables (raschetno-graficheskiy sposob) can be recommended to commanders and staffs.

The route of movement of a motorized rifle regiment crosses the axis of the path of a radioactively contaminated cloud at a distance of 12 km from the center of a 40 thousand ton nuclear burst. The length of the route along the path l_n = 18.5 km. The speed of the average wind is 30 km an hour. The level of radiation on the axis of the path, 5 hours after the burst, equals P_{max} = 75 roentgens per hour. The speed of movement of the column while on the path of the cloud equals 25 kph. The movement is carried out on motor vehicles.

Under these conditions, we find that the dose of irradiation received by the personnel is:

$$Д = \frac{P_{max} \times l_n}{4VK} = \frac{75 \times 18.5}{4 \times 25 \times 2} = 7 \text{ roentgens per hour}$$

and if the move is carried out in armored personnel carriers:

$$Д = \frac{75 \times 18.5}{4 \times 25 \times 4} = 3.5 \text{ roentgens per hour.}$$

A motorized rifle battalion moving in motor vehicles at 12 kph must cross the path of a cloud from a surface atomic burst having a yield of 30 thousand tons at a distance of 16 km from the center of the burst. The speed of the average wind is 25 kph.

First of all, the level of radiation under the given conditions is calculated, and then the dose of irradiation.

$$P = \frac{50 \times qV}{R^2 \times t} = \frac{50 \times 30 \times 25}{16^2 \times 4} = 36 \text{ roentgens per hour}$$

$$Д = 1.5 \frac{P}{KV}\sqrt{\frac{q}{t}} = 1.5 \frac{36}{2 \times 12}\sqrt{\frac{30}{4}} = 6 \text{ r}$$

Good aids in carrying out most diverse calculations are The Short Reference Book of Combat Characteristics of Atomic Weapons and Antiatomic Protection, the textbook Atomic Weapons and Operations of Troops Under Conditions of its Employment, Tables for Evaluating Radioactive Contamination of Terrain during Employment of Atomic Bursts, and dosimetric rules DL-1 and DL-2.

In eliminating the consequences of the employment of weapons of mass destruction the most aggressive and organizing role must belong to the senior commanders and staffs. They must immediately send their representatives into or toward the areas of nuclear bursts for direct supervision of the work. Medical, chemical and engineer units and subunits must be sent to the areas of nuclear bursts, and, if necessary, subunits and units of other arms of troops. The composition of the units and subunits so detailed will be determined by the specific situation of each case and by the proposed scope of work.

At present, attempts are being made within the troops to create temporary supernumerary teams for the elimination of the consequences of a nuclear attack. In our opinion, improvised rescue groups and teams do not fulfil their purpose either organizationally or in fact. By their composition and technical equipment they are not able to carry out the whole range of special tasks--evacuation of personnel casualties, clearance of obstructions and of lines of supply, reestablishment of communications and control, fire fighting, medical processing of personnel, decontamination and degassing of combat equipment and materiel, etc.

Furthermore, these groups and teams may themselves be put out of action by nuclear bursts even before they are used. The very creation of such teams will to some extent weaken for a long time the unit or subunit providing the personnel and the equipment.

Owing to the combat situation prevailing, temporarily created teams may be at such a distance from their troops that it will be difficult and also sometimes impossible for them to reach the required area to carry out the tasks of eliminating the consequences of an atomic attack.

We consider that the most effective aid to the troops in eliminating the consequences of a nuclear attack can and must be rendered by those units and subunits which are in the vicinity of the area of the burst but outside the sphere of its effects.

The elimination of the consequences of the employment of weapons of mass destruction consists first of all in rendering immediate aid to the casualties from toxic substances; in the medical observation of affected personnel; in discovering which units and subunits have been exposed to the effects of bacterial agents; in carrying out dosimetric checks and in organizing and carrying out medical processing of personnel; the degassing and decontamination of combat equipment, armament, clothing, equipment, and terrain, and also of purifying water and neutralizing foodstuffs from toxic and radioactive substances and bacterial agents.