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CENTRAL INTELLIGENCE AGENCY  
WASHINGTON 25, D. C.

3-0098

9 1963

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MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT (SECRET): "Forewarning  
and Notifying Troops About Radioactive  
Contamination", by Colonel D. Shein

1. Enclosed is a verbatim translation of an article from the SECRET Collection of Articles of the Journal "Military Thought" published by the Ministry of Defense, USSR, and distributed down to the level of division commander.

2. For convenience of reference by USIB agencies, the codeword IRONBARK has been assigned to this series of CSDB reports containing documentary Soviet material. The word IRONBARK is classified CONFIDENTIAL and is to be used only among persons authorized to read and handle this material.

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*Richard Helms*

Richard Helms  
Deputy Director (Plans)

Enclosure

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DATE: DEC 2004

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**Original: The Director of Central Intelligence**

**cc: The Director of Intelligence and Research,  
Department of State**

**The Director, Defense Intelligence Agency**

**The Director for Intelligence,  
The Joint Staff**

**The Assistant Chief of Staff for Intelligence,  
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- 4 - SR/Rp

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COUNTRY : USSR

SUBJECT : MILITARY THOUGHT (SECRET): "Forewarning and Notifying Troops About Radioactive Contamination", by Colonel D. Shein

DATE OF INFO : Mid - 1962

APPRAISAL OF CONTENT : Documentary

SOURCE : Reliable source (B).

Following is a verbatim translation of an article entitled "Forewarning and Notifying Troops About Radioactive Contamination", by Colonel D. Shein. It appeared in Issue 3 (64) of 1962 of a special version of the Soviet journal Military Thought which is classified SECRET by the Soviets and is published irregularly. Issue 3 (64) of 1962 was probably sent to press in May or June of 1962.

Headquarters Comment: Military Thought is published by the USSR Ministry of Defense in three versions, classified RESTRICTED, SECRET, and TOP SECRET. The RESTRICTED version has been issued monthly since 1937, while the other two versions are issued irregularly. The TOP SECRET version was initiated in early 1960. By the end of 1961, 61 issues of the SECRET version had been published, 6 of them during 1961.

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Forewarning and Notifying Troops  
About Radioactive Contamination

by

Colonel D. Shein

In a modern operation (battle) with the mass use of nuclear weapons, troops are faced with the constant danger of radioactive contamination, to which they may be subjected both as a result of the fallout of radioactive substances from the cloud of a nuclear burst as well as when troops cross zones of radioactive contamination.

Under these conditions troops must be ready in all situations to take several measures which will eliminate or lessen the harmful effects of radioactive substances. Such measures include, in particular, the use of personal means for protection against radioactive substances, the sheltering of personnel in various kinds of structures, as well as the protection of military equipment installations, property, etc., against these substances. In some cases, with a view to reducing the danger of personnel being affected, the ways of conducting combat operations even have to be changed.

The timely and complete implementation of the above-mentioned measures of protection depends greatly on an efficiently organized procedure for forewarning and notifying troops about radioactive contamination. However, in our view, these problems, unfortunately, have not been presented hitherto in a correct light either in military-scientific literature or in official handbooks, while in several regulations, especially in those concerning notification, in our view, they are set forth incorrectly.

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We shall attempt to throw a revealing light on what is really involved in forewarning and notifying troops about radioactive contamination and to assess their role in modern warfare.

In the first place, the need to forewarn troops about radioactive contamination arises because they require a considerable time for implementing certain preparatory protective measures, for instance, for the construction of various kinds of shelters. At the same time, such measures as the putting on of personal means of protection against radioactive dust and getting personnel into structures and shelters do not require much time, and it is advisable to resort to them only when faced with the direct threat of radioactive contamination after getting the notification signal.

As is known, it takes several hours for the track of a radioactive cloud to form. In this process, the direction and speed with which the front of radioactive contamination moves depend directly on the direction and velocity of the average wind. When the velocity of the average wind is of the order of 50 kph, such a front, with a level of radiation dangerous for troops resulting from ground bursts of medium yield nuclear warheads, can move to a total depth of several hundred kilometers. Thus, with the burst of a warhead with a yield of 100 kt, and when the wind velocity is as stated above, radioactive contamination at a level of radiation of 0.5 r/hour can spread for 250 km.

On receiving timely warning as to when the front of radioactive contamination will reach the troop positions, and taking into account the nature of the formation of the track of the radioactive cloud, the troops will have at their disposal considerable time to take the necessary measures. For instance, having learned of the possibility of contamination 2 to 3 hours in advance of the approach of the radioactive cloud, the troops will be able to change their combat activities in the most advisable way, to replenish

-3-

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their supplies for protection against radioactive substances, as well as their supplies for decontamination, and to accelerate the work of building shelters. In some cases, when the wind maintains a constant height, the troops can even change their locations.

It is essential to forewarn troops about radioactive contamination at the very first appearance of reliable facts showing that the enemy is making immediate preparations to use nuclear weapons on a given axis. Having information on the enemy's intention, analyzing the probability of his delivering nuclear strikes in the immediate future against a certain group of objectives, and having evaluated the meteorological situation, one can make an approximate assessment of the possible character of radioactive contamination.

It is also advisable to forewarn troops about the presence or possible formation of zones of radioactive contamination on their movement routes. Knowing in advance where such a zone is located, the time when it will form, and the way in which the levels of radiation will spread in it, the troops can use other routes and alter the speed with which they move, change their battle (march) formations, etc., with a view to reducing the effects of radioactive radiation (oblucheniye) on personnel.

Thus, under modern conditions, forewarning about radioactive contamination is a very important measure which promotes the preservation of the combat effectiveness of troops.

The initial data for such a forewarning, as is evident from the foregoing reasoning, may be: the results of a forecast of the way in which the radioactive clouds from nuclear bursts are moving and the formation of zones of radioactive contamination, data

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supplied by air and ground radiation reconnaissance and also information regarding the enemy's preparations to use nuclear weapons.

It seems preferable to us that the drawing up of forecasts of radioactive contamination in accordance with the parameters of nuclear bursts and information obtained from vertical sampling of the atmosphere should be the responsibility of the headquarters of formations. Such headquarters receive the fullest information regarding the presence and nature of the zones of radioactive contamination which have already formed, as well as information regarding the enemy's preparations for a nuclear attack. Therefore, the organization and implementation of forewarning to troops about radioactive contamination should become the responsibility in the first place of the headquarters of formations.

Forewarnings about radioactive contamination can be given repeatedly as the danger increases and can be conveyed to the commanding officers and staffs of subordinate troops as orders (instructions), coupled in several cases with a list of the measures which, in the given circumstances, will facilitate the elimination or reduction of the harmful effects of the radioactive substances to the greatest extent.

When there is an immediate threat of radioactive contamination arising as a result of the fallout of radioactive substances from the cloud of a nuclear burst onto a given objective, or when a subunit is approaching a zone of radioactive contamination, it is essential to notify all the objective's (subunit's) personnel in such a way that it will be possible to make use of personal and collective means of protection against radioactive substances.

It is proposed that there should be technical means to detect radioactive contamination and to measure the levels of radiation in every subunit of

-5-

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company size. With the aid of these means it is possible not only to establish the presence of radioactive substances on the terrain, but also to determine the gamma radiation from the radioactive cloud a few minutes before the fallout of radioactive substances onto the terrain. When the weather is such that there is no precipitation, the amount of time can comprise 5 to 10 minutes, which is enough for the timely notification of personnel by means of a signal about the threat of radioactive contamination which has arisen.

From the experience of troop exercises, not more than 1.5 minutes are needed for the notification signal to pass from a regimental headquarters to a soldier. All the personnel of a company will have time to put on personal means of protection in about one minute and, when a company has shelters at its disposal, to occupy them in 1 to 1.5 minutes. Thus, the total amount of time taken for the signal to be passed and for personnel to take protective measures against radioactive substances does not exceed the time period between the moment of determination of gamma radiation by dosimetric instruments and the fallout of radioactive substances from the radioactive cloud onto the terrain. Consequently, all the necessary conditions exist for the timely notification of personnel about radioactive contamination and the taking of protective measures by them.

It is true that in the case we have examined the danger of the personnel being affected by gamma radiation from the radioactive cloud has not been taken into account. Timely notification, with a view to measures being taken to protect against the effects of gamma radiation from a radioactive cloud, can be achieved by setting up radiation observation posts (post radiatsionnogo nablyudeniya) to the windward side of the installation at a distance determined by the average velocity of the ground wind and for

-6-

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the period of time required for the notification signal to pass and for the personnel to take cover. For instance, if the average velocity of the wind is 10 m/sec., then the indicated posts must be at a distance of about 2 km from the installation.

From the above calculation it follows that the notification signal about the radioactive contamination should be conveyed simultaneously throughout an area with a radius of not less than 3 km. In this event, a considerable part of the personnel of subunits and objectives located in this area will be able to get into shelters already before the gamma radiation from the radioactive cloud begins to take effect.

If it is determined immediately that the fall-out of radioactive substances from the cloud of a nuclear burst will be over a large area, the notification signal can be given for all the personnel of units simultaneously, but it is given for the whole large unit only when the front of radioactive contamination moves over all the large unit's battle formations in a comparatively short period of time.

From the above procedure for giving the notification signal it follows that all problems of organizing the notification of personnel about radioactive contamination must be resolved mainly in subunits and in units (at the most in large units). In our view, the role of the headquarters of an army and a front in notifying troops about radioactive contamination will be that of issuing to large units what they lack in the way of notification means, of checking the system of notification in units and large units, and of organizing notification only at control points of formations. To us, it seems wrong when army and front headquarters attempt at exercises to take over responsibility for all problems of organizing notification down to establishing the procedure for locating radiation observation posts and giving the notification signal.

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-7-

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In particular, the problem of establishing a separate notification signal about radioactive contamination must be examined. As is known, there is at present a single notification signal denoting radioactive, chemical, and bacteriological contamination. In our view, this is wrong, especially in view of the necessity of conducting combat operations in extensive zones of radioactive contamination.

From an analysis of the combat characteristics of radioactive and toxic substances, it is easy to see the distinct difference in the protective measures which are taken on receipt of the notification signal, as well as in the subsequent actions of the personnel. Thus, on getting the notification signal about radioactive contamination, it is essential at the very least to put on the means for protecting the breathing organs. But on receiving the notification signal about chemical contamination, in addition to gasmasks, it is also necessary to put on protective clothing (nakidka) (this is due to the high skin-resorption toxicity of modern toxic substances). Moreover, if the tactical situation allows it, then on receiving the first-mentioned signal the personnel immediately occupy shelters, which will give them protection against gamma radiation, while in the second case there is no point in going into shelters unless they are equipped in the antichemical sense.

It should also be emphasized that the physiological actions of personnel also differ on their receiving notification signals about radioactive and chemical contamination. It is known that the inhalation toxicity of modern toxic substances is so high that in the extent to which the atmosphere will be contaminated if chemical weapons are used in combat, it is enough to take one half-breath to receive a fatal dose. This makes it essential for personnel, on receiving the notification signal about chemical contamination, to stop breathing immediately until

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-8-

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they have put on a gasmask. In the case of radioactive contamination, it is not altogether necessary to stop breathing, because as a rule the notification signal based on the readings of radiation observation instruments will be given several minutes before radioactive substances settle on the terrain.

The conduct of personnel is also essentially different after they have taken immediate protective measures on getting the notification signal. In the case of contamination with toxic substances, if, in addition, protective stockings and gloves have been put on, then one can leave the shelters and carry out combat tasks without this leading to serious consequences. What is more, in several cases it is altogether undesirable for personnel to remain in shelters which have not been equipped in the anti-chemical sense, because of the possibility that vapor and mist from toxic substances may be lying stagnant there. In the case of radioactive contamination, one must not leave the shelters until the degree of contamination of the terrain (level of radiation) has been established, with the exception of cases where this is called for by the tactical situation.

The introduction of a separate notification signal about radioactive contamination may encounter opposition. Some comrades consider that it is enough to establish one compulsory minimum of protection against radioactive and chemical contamination which is to be implemented on getting the notification signal, and that the action of personnel after they have put on protective means will be determined by instructions from the commanding officer depending on the established nature of the contamination. But then, if there is one notification signal, it will be necessary to fix the compulsory minimum of protection on the basis of the danger of chemical contamination, i.e., to require, in particular, that gasmasks and protective clothing should be put on. But in the case of radioactive contamination,

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the use of protective clothing will only serve to prolong the period of the most dangerous external radiation, while, on the other hand, in the case of chemical contamination the single signal will, contrary to all common sense, compel the personnel to run to shelters, thus exposing themselves to the unnecessary danger of being affected by toxic substances while they are running as well as when they are in the shelter (if it is not equipped in the antichemical sense).

Thus, already, from an assessment of the protective measures taken by personnel against toxic and radioactive substances it is evident that it would be advisable to introduce a separate notification signal about radioactive contamination. If consideration is given to the different scales of radioactive and chemical contamination in modern operations and, consequently, the different frequency with which troops will be affected by radioactive and toxic substances, then the necessity of introducing a separate notification signal about radioactive contamination becomes quite obvious. Here it is pertinent to add that the nature of modern combat operations and the considerable scales on which there will be radioactive contamination urgently demand that in addition to gasmasks troops of all arms of troops should be provided with lightweight means to protect the breathing organs against radioactive dust (respirators). In this event, it will be absolutely essential to have a separate notification signal about radioactive contamination.

The training of personnel in interpreting notification signals becomes a matter of great importance. Unfortunately, in our army quite a wrong procedure has come into being whereby each operational formation, and sometimes a large unit too, takes independent action to fix the code words for the notification signal about radioactive, chemical, and

-10-

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bacteriological contamination, which in the majority of cases are even changed for each exercise. Such a practice considerably lowers the readiness of troops for correct and speedy interpretation of a notification signal and, consequently, will lead to unjustifiable losses under actual war conditions.

In our opinion, any notification signal should have permanently valid, fixed code words for all types of armed forces. What is more, we are convinced that the permanent code words for the notification signal should be the same for notifying the Armed Forces and the whole population of the country as well. Wherever a person may be: in the army, at a plant, or in a field, in a town or in a village -- notification signals must be conveyed to him by the same code words, fixed once and for all.

For each notification signal there can be, it seems, several code words, depending on the various means of sending the signals (radio, telegraph, telephone, sound and light effects, etc.). However, their number should be minimal, and all of them should be officially approved by government organs and have the force of law for the whole population of our country. Education of the people in the code words for the notification signals should start on the school bench.

In connection with the recommendation that constant code words should be established for notification signals, doubts may arise on the grounds that the enemy might exploit this for sending false signals with a view to exhausting our troops. Such doubts will disappear if one turns to the point about the initial data (readings of the dosimetric instruments) on the basis of which the notification signal must be sent, and to the technical means (as a rule, sound and light) used to give the signals directly to the troops.

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Thus, the fixing of permanent code words for notification signals about radioactive and chemical contamination will increase considerably the readiness of the Armed Forces and of the country's population for defense against radioactive and toxic substances.

-12-

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