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CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

22 July 1977

MEMORANDUM FOR: The Director of Central Intelligence

FROM : William W. Wells
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): Collecting and Collating Data on the Nuclear and Radiation Situation

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article relates the experience of the Belorussian Military District pertaining to the collection and processing of data on nuclear bursts and the resultant radiation situation. During district exercises a special radio net was set up for reporting situation data which front and army staffs plotted on maps, analyzed, and reported to the troop commanders for action. It was found that the staff work involved could be made more efficient by parallel work at all levels, collective transmission of data, and the use of a minor form of mechanization in plotting and forecasting the situation. This article appeared in Issue No. 5 (66) for 1962

2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies. For ease of reference, reports from this publication have been assigned

William W. Wells

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[redacted]

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SUBJECT

MILITARY THOUGHT (USSR): Collecting and Collating Data on the Nuclear and Radiation Situation

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 5 (66) for 1962 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is General-Mayor A. Chumakin. This article relates the experience of the Belorussian Military District pertaining to the collection and processing of data on nuclear bursts and the resultant radiation situation. During district exercises a special radio net was set up for reporting situation data which front and army staffs plotted on maps, analyzed, and reported to the troop commanders for action. It was found that the staff work involved could be made more efficient by parallel work at all levels, collective transmission of data, and the use of a minor form of mechanization in plotting and forecasting the situation.

End of Summary

[redacted] Comment:

The author died in 1970. He was a former Chief of Staff of the Ural Military District. The SECRET version of Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970. [redacted]

[redacted]

[redacted]

Collecting and Collating Data on the Nuclear and Radiation Situation
(Based on the Experience of Exercises)

by

General-Mayor A. CHUMAKIN

It is known that a radical improvement in troop control is possible by automating a good number of the control processes. However, even before means of automation have been introduced into the staffs, generals and officers can improve staff work considerably and raise its efficiency by making use of the existing means. Such an improvement is also necessary as a preparation for receiving the new control equipment and rapidly mastering it. In the present article we should like, on the basis of exercise experience, to demonstrate the possibility of improving the work of staffs, taking as an example the solution to the matter of collecting and collating data on the nuclear and radiation situation.

To a commander it is very important to receive data on the results of the delivery by belligerents of nuclear strikes in a short time, since such strikes may instantly change the situation on the field of battle and require immediate measures for maintaining the combat readiness of large units and units. A delay in the execution of these measures can have very serious consequences.

It is not out of the question that at the very beginning of an offensive massed nuclear strikes, which will cause heavy losses, may be delivered against the large units of the first echelon. To bring the first-echelon troops back into a combat-effective status will require rapid replacement of part of the first-echelon large units with troops of the second echelon or reserve. If a great deal of time is spent on the collection of situation data and the assignment of tasks, then the first-echelon troops will enter into battle in an uncoordinated manner and will not be able to achieve the results which might be expected of them.

It is well known that the radioactive cloud formed by ground bursts of nuclear warheads moves at the speed of the wind. There

is a very limited time in which troops, rear services units, subunits, and facilities in the path of the radioactive cloud's movement can take protective measures. If the wind speed is 50 kilometers per hour, for the troops in an area with a high level of radiation this time will amount to 10 to 30 minutes, depending on their distance from the ground zero of the burst. Within this time the staffs must collect the data on the nuclear bursts, make a decision, notify the troops, and take measures to reduce the effectiveness of the radiation.

The present practice of collecting data on the nuclear and radiation situation by wire and radio means does not provide the necessary speed for receiving the data and rapid execution of measures on the part of commanders and staffs, as a result of which the troops suffer heavy losses. The staffs must find and introduce new procedures and methods of working in order to achieve a timely reaction to such a rapidly changing situation.

At exercises in the Belorussian Military District matters of collecting and collating data on the nuclear and radiation situation were resolved as follows.

First of all, we identified a need for the staffs of all levels to revise the entire system of collecting information on the situation, with the object of shortening the time for obtaining the data.

The following were plotted on the maps of the nuclear and radiation situation: all the nuclear bursts, their locations, time, yields, and the presumed (calculated) aftereffects of the bursts -- losses of personnel and equipment and damage to installations against which the strikes had occurred; the forces, means, and time required to restore the damaged installations, particularly those affecting the actions of the troops in the execution of their assigned task; the areas subject to radioactive contamination and the radiation levels, with a graph of the drop in radiation for each ground nuclear burst; the direction and velocity of the wind by altitudes.

This whole situation was carried in the staff of the front on a special map and on the working maps of all the directorates, and also in the staffs of the divisions and armies on working maps. In addition to these maps, the staff of the front kept a

summary map for all the nuclear bursts and all the areas subject to radioactive contamination.

The maps of the nuclear and radiation situation gave only an operational orientation on the situation, but with them a commander was able to make a decision without spending a great deal of time to refine the situation, on which information kept accumulating in the staffs as all types of reconnaissance data came in and were recorded on the summary maps.

To collect data on the nuclear and radiation situation, a special nuclear situation radio net was set up and special signal tables were devised for the staffs of all levels.

The special feature of the nuclear and radiation situation radio net was the fact that radio means of the front, armies, large units, and rear services bases were switched into this net, i.e., up to 15 to 20 reporting stations operated in the one radio net, and each station was switched into the net with a transmitter and separate receiver. The receivers of all the subscribers were always kept on receive, whereas the transmitters were switched on only for transmitting data on nuclear bursts, and each transmitter was permitted to switch on only if no other station in the net was operating at the time.

Operation in the net was permitted only by short signals, which were made up on the basis of special signal tables and coded maps. The special signal tables included up to 20 to 30 values and were intended primarily for transmitting the time, place, yield, and type of burst.

Using short signals (from six to ten groups) in the net permitted achieving stable operation of the radio means under conditions of radioelectronic countermeasures.

Working with the signal tables did not present special difficulties or take much time, since the officers who worked with the tables for any length of time memorized them and turned to them only when they had to make certain data more precise.

The process of collecting the nuclear and radiation situation data went as follows.

Each large unit, army, front, and rear services base had the responsibility of reporting on the nuclear bursts in a certain zone or area.

When there was a nuclear burst in its area, a division (or other station) switched on its transmitter and transmitted the radio message, while simultaneously monitoring on its own receiver any possible interference on the net.

All of the stations received the signal and, depending on how much this burst might affect the actions of the troops of one or another large unit, plotted this burst on their maps and reacted accordingly.

At the front staff all of the nuclear bursts occurring in the front zone were marked on the map, and a forecast of the results of these nuclear bursts was made -- losses, destruction, and the propagation of the radioactive cloud were calculated. At the same time an assessment was made as to how these bursts affected the condition of the troops and rear installations, a decision was made and, when necessary, instructions were issued. Of the ground nuclear bursts that occurred outside the front zone in the areas of adjacent formations, only those that were within 60 kilometers on the windward side were plotted on the map, i.e., those bursts whose radioactive clouds were spreading into the zone of the front and could affect the troops of the front.

On the maps of the army and divisions of the first echelon, all nuclear bursts that took place in the army (division) zone were recorded, as were those ground nuclear bursts that occurred in the areas of adjacent troops at distances of 50 to 60 kilometers on the windward side.

On the maps of the second-echelon divisions, were plotted all nuclear bursts that occurred in the division's disposition area and in the zone into which it was to advance during the offensive, and those ground bursts that occurred on the windward side at distances of up to 50 kilometers.

In the reserve divisions, which did not have zones or routes of advance during an offensive, the nuclear bursts were marked on maps in the same manner as in the second-echelon divisions. The nuclear and radiation situation in the zone of their movement was

given by the higher staff (army staff) during the assignment of tasks for a movement or battle.

The commanders and staffs of all levels, after receiving notification of a nuclear burst, forecast the results of the burst and took measures to reduce the effectiveness of the strikes which had been delivered.

The directorates and departments within the field headquarters of the front (army) were informed over selective circuit communications; the signal was transmitted without being decoded.

What does such a procedure for collecting and processing the data on the nuclear and radiation situation provide?

The introduction of a single communications net for the nuclear and radiation situation allows a considerable reduction in the time to collect the data on this situation. By means of this net the staffs of all levels are notified simultaneously of nuclear bursts that have occurred within the zone of the front, both on their own side and on the enemy side. Notification of nuclear strikes takes from one to three minutes, and at the same time the long process of collecting situation data by having a lower staff report to a higher staff is eliminated.

The commanders and staffs of all levels simultaneously begin the analysis of the situation created as a result of the nuclear bursts. Within the limits of his authority, each commander takes measures to preserve the combat readiness of the large units and units, either by moving into alternate areas or by sheltering personnel and equipment in trenches and shelters. One or the other is done in short periods of time in accordance with pre-established signals.

Each commander reports measures taken to the higher level. These measures, naturally, must not exceed the confines of the senior commander's concept. Senior commanders can issue instructions to subordinate large units and units if the measures which must be taken go beyond the authority of the subordinate commanders.

In all cases this simultaneous, as it were parallel, setting to work of commanders and staffs of all levels makes it possible to save much time and react in a timely manner to the situation that has developed.

The transmission of data by radio using short signals makes it possible to have quite stable and reliable communications for collecting situation data. The use of other types of communications for this purpose increases the stability of the communications but does not satisfy the requirements which radio communications do in the given case, i.e., the capability for collective transmission and reception of data on the situation during all types of combat actions, particularly mobile actions.

In studying matters of collecting data on the nuclear and radiation situation certain difficulties were encountered at first in plotting the nuclear bursts on the maps and forecasting their aftereffects in a short time. It took a well-trained officer, using only the existing tables, from 10 to 20 minutes to plot one ground nuclear burst and forecast the zone of radioactive contamination. Naturally, such an expenditure of time, especially under conditions of the massed employment of nuclear weapons, cannot be considered acceptable. For this reason the staff of the Belorussian Military District, in order to reduce the time for this work, proceeded to find and employ means of so-called "minor mechanization", such as various types of special slide-rules, compasses, and other computing devices. These means have given tangible results. Similar searches must be continued further, particularly in the matter of improving the devices for computing the losses of personnel and equipment, damage to installations, etc.

The plotting of the ground nuclear bursts on a map for the purpose of arriving at an operational decision, in our view, is achieved most quickly and easily by hand by plotting an ellipse in accordance with the table specially devised for this purpose. In this case it is not necessary in doing a forecast to plot several zones of different radiation levels on the map; we can limit ourselves to two zones -- a zone of over 100 roentgens per hour, and a zone of five roentgens per hour.

To be sure, plotting the zones of radioactive contamination manually allows large inaccuracies to occur. However, these

inaccuracies also occur when slide rules are used, but the time for plotting the zones will be several times longer. Plotting the zones by hand allows us to achieve the main thing, namely, having the situation quickly (even though only approximately), according to which the commander can, in good time, orient his troops and take measures to lessen the effect of radiation. In the regiment and division these measures will be carried out along with making corrections on the basis of radiation reconnaissance data.