[redacted]

TOP SECRET

[redacted]

3698

CENTRAL INTELLIGENCE AGENCY
WASHINGTON, D.C. 20505

14 September 1978

[redacted]

MEMORANDUM FOR: The Director of Central Intelligence

FROM : John N. McMahon
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): The Problem of Organizing Statistical Research

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 stresses the need to approach statistical research with a well thought out plan and in a coordinated manner. The author advances the idea of establishing special statistical departments within the main staffs of the armed forces branches. These departments would act on the requests coming in from scientific research institutions, directorates and military academies and be responsible for the whole data gathering process. This approach would make it possible to concentrate and collate the data in one place, resulting in more reliable data and a more efficient utilization of manpower. This article appeared in Issue No. 1 (71) for 1964. [redacted]

[redacted]

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 [redacted]

[redacted]

John N. McMahon

[redacted]

[redacted]

[redacted]

[redacted]

TOP SECRET

[redacted]

[redacted]

[redacted]

Distribution:

The Director of Central Intelligence

The Director of Intelligence and Research
Department of State

The Joint Chiefs of Staff

The Director, Defense Intelligence Agency

The Assistant to the Chief of Staff for Intelligence
Department of the Army

Director, National Security Agency

Deputy Director of Central Intelligence

Director of the National Foreign Assessment Center

Director of Strategic Research

[redacted]

[redacted]

Intelligence Information Special Report

COUNTRY USSR

[redacted]

DATE OF INFO. Early 1964

DATE 14 September 1978

SUBJECT

MILITARY THOUGHT (USSR): The Problem of Organizing Statistical Research

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 1 (71) for 1964 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is Engineer Lieutenant Colonel I. Domashnev. This article stresses the need to approach statistical research with a well thought out plan and in a coordinated manner. The author advances the idea of establishing special statistical departments within the main staffs of the armed forces branches. These departments would act on the requests coming in from scientific research institutions, directorates and military academies and be responsible for the whole data gathering process. This approach would make it possible to concentrate and collate the data in one place, resulting in more reliable data and a more efficient utilization of manpower. End of Summary

[redacted] Comment:

The author also contributed to an article entitled "Providing Security of Radio Communications when Moving Forward the Troops of a Reserve Front over Long Distances" in Issue No. 2 (84) for 1968 [redacted] 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]

The Problem of Organizing Statistical Research

by

Engineer Lieutenant Colonel I. DOMASHNEV

The conditions of conducting nuclear warfare impose exceptionally high demands on all levels of troop control. The most important of these are: rapid conversion of the information flowing into the automated control systems, using algorithms which ensure the adoption of optimimum decisions, and precise formulation and timely transmission of the decisions to the executors.

These demands can be met if the control and communications systems are supplied with improved technical means for converting and transmitting information and if the organizational structure of staffs, command posts, and communications centers conforms to modern principles of troop control.

The development of technical means of information transmission and conversion, the planning of troop control systems, and the determination of reasonable tactical-technical specifications for the individual elements of these systems must be based on modern scientific methods of analyzing complex systems.

Developing the optimal organizational structure for troop control organs, choosing the most expedient decision in a given situation, planning military actions, etc. are ceasing to be the domain of "pure" art. It is being replaced by engineer methods of designing complex systems, research of operations of the various branches of the armed forces, and mathematical methods of planning military actions with the use of electronic computer equipment.

At the present time we are witnessing the transition of military science from the descriptive qualitative stage to the stage of establishing strict quantitative patterns and relationships. Mathematical methods are becoming the main decisive methods of solving military problems.

However, the most sophisticated mathematical system will not bring any practical benefit if reliable and sufficiently complete experimental

initial data are not at the disposal of scientists or engineers. The lack or incompleteness of such data is often the major, extremely difficult obstacle to overcome in the use of mathematical methods for designing and developing troop control systems and their component elements.

The patterns characteristic of the actions of the different military levels of command are to a considerable extent probable in nature. Therefore, experimental initial data are statistical data, which obsolesce rapidly because of the burgeoning development of military technology, the improvement of troop control methods, and the change in the methods of conducting combat actions. In order to have sound data, statistical observations must be conducted continuously and systematically.

In peacetime, experimental initial data can be obtained only in the process of command-staff and troop exercises. Substantial forces and means are expended on the organization of each exercise, and there are sometimes thousands of participants in their preparation and execution. In our opinion, we must not consider it the purpose of exercises solely to train troops and staffs. This is not economically advantageous. Each exercise represents a complex experiment, the conduct of which must provide answers to questions posed by military science.

And above all, the statistical research carried out during exercises must provide the experimental initial data needed for the further improvement of troop control systems by creating the best structure for these systems and for introducing means of automating control and communications.

Organizing statistical research at exercises according to a previously worked out plan requires painstaking advance preparation. It is of no practical use to collect statistical data "in general," without a precise and clear understanding of the purpose for which they are required. It is no less important to determine also the volume of statistical data which can and should be obtained at the exercises. The impossibility of covering by observation all aspects of such a complex phenomenon as an exercise is fully understandable. This would require too many researchers and statisticians.

Consequently, in organizing statistical research, it must first of all be established which aspects of the phenomenon under study, or the objective, must be covered by observation in order to obtain sufficiently complete data for each scientific task. It is also necessary to establish precisely which values characterizing the phenomenon under study must be

taken into consideration and recorded. Finally, the sequence of data collection and of data recording in previously worked out forms for calculation should be carefully thought through.

The importance of and need for well thought out statistical research during exercises no longer evokes doubts or arguments from anyone. Unfortunately, however, up to the present time due attention has not been afforded to the organization of this research. At command-staff exercises of the Kiev and Leningrad military districts in 1962, a number of substantial deficiencies were discovered in the conduct of statistical research, chief among which was the absence of a unified plan and unified supervision of the research.

Each interested organization or institution conducted observations according to its own plan. As a result it happened that the very same data were being considered simultaneously by the representatives of several organizations. Thus, engaged in analyzing the flow of information at the communications center of the command post of the Northwest Front were representatives of the General Staff, the Military Academy i/n M. V. Frunze, the Military Communications Academy, the Central Scientific Research Institute of Communications of the Ministry of Defense, Central Scientific Research Institute No. 27, the Eighth Directorate of the General Staff, and others. In the dispatch office of the communications center of the front command post, data were being copied out of the registers by two or three representatives from different research groups at the same time, which evoked justified reproaches from the exercise participants.

A similar picture was also observed in the other sections of the command post, while at the same time a number of important sectors proved to be outside the researchers' field of view since not one organization individually had enough forces to carry out all of the necessary statistical research. Moreover, experimental data obtained in accordance with the particular interests and plans of the various institutions and organizations were not concentrated in one place and were not collated.

Excessive interference of the researchers in the operation of the installations under study, leading to the disruption of their normal operation, reduces the integrity of the statistical data obtained and must be reduced to a minimum. Having a large number of researchers at one installation occupied with virtually the same problems creates heavy mutual interference and lowers the effectiveness of the participants' actions.

We are thoroughly convinced that only a correct organization of statistical research will enable us to avoid unnecessary duplication, to collect more complete statistical material on the functioning of command posts and communications centers, to significantly decrease interference in the participants' actions, and to save on forces and means.

As is known, the calculations for and the designing of control systems are based on a knowledge of the informational characteristics of their individual elements, i.e., the volume and importance of the incoming information, the amount of information to be distributed, and the speed of information conversion by the given control element. These characteristics can be obtained most easily and fully by establishing the transmission time and the volume of the messages coming in over the communications channels. The task of statistical groups is facilitated by the fact that the personnel of teleprinter stations, radio stations, and telephone switchboards keep track of these data in special registers. There is thus no need to bring in special statisticians for this.

However, we cannot fail to note that these registers are kept in an extremely unsatisfactory manner: not all columns are filled in, rules for filling them in have not been worked out, information receipt and transmission times are not stated exactly and are often estimated, entries are made carelessly, and many errors are made. The officials responsible for monitoring the keeping of these registers do not always pay attention to eliminating these shortcomings.

Record keeping is particularly poor during exercises. The shortage of time, the great volume of information transmitted and received, and the complex working conditions lead to an even greater deterioration in the quality of records, and the data registered become less reliable. But it is precisely these data which serve as the basis for deductions and conclusions which are extremely important not only for organizing troop control but sometimes also for structuring the armed forces in general.

Statistics today represents a fairly abstract mathematical discipline. At the same time, the methods developed by it make it possible to obtain maximum information with minimum expenditures of labor. Mastery of all the subtleties of the methods and modes of statistics today is feasible primarily by the specialist in this field, while people engaged in scientific research are often not acquainted with them. As a result, time is spent unproductively, and statistical processing in many instances boils down to no more than determining the simplest numerical characteristics. A large proportion of the useful information contained in initial data remains unexploited.

The entire statistical research process -- from the solution of problems regarding the organization of labor and daily routine of statisticians to the mathematical processing of data obtained -- must take place in conformity with a unified plan and under unified supervision. In connection with this there arises, in our view, an imperative need to establish special statistical departments within the main staffs of the branches of the armed forces. The functional responsibilities of these departments may include fulfilment of the following tasks:

-- organizing statistical observations of the process of information transmission, information conversion methods, and the forms of recording and storing information in the various elements and levels of the troop control system;

-- planning the volume of statistical research according to the requests coming in from scientific research institutions, directorates, and military academies;

-- developing record keeping forms that make it possible to decrease the volume of work, prevent duplication, obtain sufficiently complete data, and monitor the work of statisticians and timekeepers;

-- accumulating, systematizing, and storing statistical data;

-- mathematically processing accumulated experimental data in order to establish probability rules governing troop control processes under the complex conditions of a modern battle or operation and also to determine the probability parameters determining the reliability and effectiveness of using technical control means;

-- conducting statistical observations of the functioning of technical means of information transmission, conversion, and storage;

-- providing the necessary statistical data for institutions and organizations working on calculation and design problems for technical means and troop control systems.

The departments must include specialists in the fields of mathematical statistics to process initial data. However, the representatives of military specialties in these departments must have enough mathematical training so that they can find a common language with the mathematicians.

The conduct of statistical research during command-staff or troop exercises requires the participation of a great many people, whose main responsibilities are to observe the process of information transmission, to record the down time of control equipment and the time taken to restore it, and also to time the work at each stage of information conversion within the control system. There is no need to have a special staff of statisticians and timekeepers within the statistical department. It is best that for the period of the exercises representatives from the interested institutions and organizations be called in for these purposes, as is in fact being done at the present time, although the statistical department must plan the work of the statistical group and supervise it. However, in order to familiarize the institution representatives with their tasks for collecting statistical data during exercises, special briefing sessions must be held with them in advance.

The statistics department must include a special computer laboratory equipped with small calculators, tabulators, and electronic computers. In this laboratory mathematician-statisticians will process data to determine the probability functions and numerical parameters characterizing the whole troop control system under study as well as its individual elements. In addition, the department must include a group for systematization, accumulation, and storage of statistical data and also for providing scientific research institutes and other institutions with initial data and with the results obtained in the computer laboratory.

The additional means which must be expended for organizing statistical research will be more than repaid from the cutting back of the troop control system which will result from improving its T/O&E, increasing the effectiveness of electronic computer use in automated troop control systems, and also improving the quality of control and increasing the effectiveness of troop combat actions.

The absence of a centralized organization for collecting and processing statistical data in the work of troop control organs nullifies all of the efforts of military scholars to apply cybernetic methods for accomplishing troop control tasks. This serious hindrance in the development of military science must be removed.