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Meteorological Support of Missile Units and the Artillery by the Use of a Single Meteorological Bulletin

Meteorological support of missile units and the artillery includes:

-providing missile and artillery subunits with meteorological bulletins for calculating, during the preparation of firing data, the influence of meteorological factors on the flight of a missile (projectile);

-providing combined-arms and artillery staffs with data concerning the average wind for calculating its influence on the spread of the radioactive cloud during the delivery of nuclear strikes;

-notifying the subunits of dangerous weather phenomena, influencing the use of nuclear/missile weapons.

As is generally known, up to the present time the artillery meteorological means, which are available in an army in the meteorological battery of the separate reconnaissance battalion, have been employed for providing meteorological bulletins to subunits of tactical missiles, tube, ground, and antiaircraft artillery, and sound-ranging reconnaissance (meteorological-missile, meteorological-fire, meteorological-antiaircraft, meteorological-sound-ranging) (meteoreaktivnyy, meteoognevoy, meteozenitnyy, meteozvuk).

Experience from a series of exercises indicates that there are a number of shortcomings in such a use of meteorological means in an army. First of all, it does not provide for unified planning in the use of the army's meteorological means in an operation, and consequently for their most effective use for the purpose of continually

providing meteorological data for missile troop and artillery firing.

The use of special meteorological bulletins containing the ballistic values of meteorological factors does not permit an exchange of the results of atmospheric soundings between either the army stations or the meteorological stations of missile units of operational-tactical designation. As a result, the reliability of the meteorological support of missile units and artillery is decreasing, despite the considerable quantity of available meteorological stations.

A meteorological battery is compelled to spend much time (up to 1 to 1.5 hours) in compiling meteorological bulletins of various designations and transmitting them, which causes the results of atmospheric soundings to be obsolete.

The mentioned deficiencies in the meteorological support of missile units and artillery, as experience from the May exercise indicates, can be eliminated by using a single meteorological bulletin "meteoyedinyy" in the army.

The single meteorological bulletin used during the exercise contained not the ballistic values of meteorological factors but rather their average values in the layer from the earth's surface to certain altitudes. The content of the "meteoyedinyy" bulletin is: DDChChMNo.---VVVV---BBBT'T'---$V_tV_tV_tV_vV_vV_v$---02---TTNNSS---04---TTNNSS....., etc., at an altitude of 800, 1200, 1600, 2000, 2400, 3000 meters, 4, 5, 6, 8, 10, 12, 14, 18, 22, 26, and 30 kilometers,

where DD -- day (date) of the month;
ChChM -- hours and minutes (in tens) of the beginning of atmospheric sounding;
No. -- the prearranged number of the meteorological station;
VVVV -- the height of the location of the meteorological station above sea level in meters;
BBB -- the deviation of the atmospheric pressure at

ground level from the tabular pressure at the station level in milimeters of mercury standard (Rt. ST.);

T'T' -- the deviation of the actual surface temperature of the air from the tabular temperature in degrees;

$V_tV_tV_tV_vV_vV_v$ -- the achieved altitude of sounding (temperature and winds);

02, 04, 08, 12, etc. -- standard altitudes;

TT -- the average deviation of the temperature of the air from the tabular temperature in the layer from the earth's surface up to the standard altitude in degrees;

NN -- the grid azimuth of the direction of the average wind (from which it blows) in large azimuth scale units;

SS -- the velocity of the average wind in the layer of the atmosphere from the earth's surface up to the standard altitude in meters per second.

Calculation of the values of the meteorological factors included in the meteorological bulletin is made simultaneously with the atmospheric sounding. Therefore, it can be completed 7 to 10 minutes after the completion of the sounding.

Calculation of the ballistic values of the meteorological factors is made in the subunits directly. In tube artillery subunits, the computers determine the ballistic values of the meteorological factors immediately during the preparation of the initial firing data. For this purpose, they determine the prearranged height of the trajectory, from the nomogram chart (sbornik nomogramm); according to this trajectory they turn to the meteorological bulletin and calculate the ballistic values of the meteorological factors from it.

In tactical missile subunits, this work can be carried out both by the computers of the data preparation sections and by the meteorological post personnel, if they are not occupied with work in determining the ballistic wind on the active (aktivnyy) sector of the trajectory.

In view of the fact that the calculation of the ballistic values of the meteorological factors for tactical missiles

requires some time (5 to 7 minutes on one point), it is advisable to make all the computations in advance, even before the receipt of the fire mission, for several points and directions and to construct a chart of calculated corrections. For more rapid construction of the chart, the the meteorological post personnel and computers can be brought in. The meteorologists can, for example, compute the ballistic values of the meteorological factors for certain points, and the computers can prepare the initial data for them. Special tables can be used to speed up the calculation of the ballistic values of meteorological factors.

As the exercises indicate, even under the conditions of using a single meteorological bulletin in the army, missile units of operational-tactical designation must have their own organic meteorological stations and use the "meteorological-missile" bulletin, which is compiled for standard altitudes, for fire support. This is explained by the fact that nuclear/missile weapons are decisive in achieving success in an operation and therefore the constant readiness of missile units for delivering strikes, both during the preparation for an operation and during the course of it, must be ensured.

The siting areas of missile units are selected at a considerable distance from the areas of tactical missiles and tube artillery and therefore cannot always use the meteorological data from the army meteorological stations. Furthermore, during the movement of missile battalions in the course of an operation by bounds of 80 to 100 kilometers and more, their use of a common meteorological bulletin is practically precluded. In addition, the proposition that the deployment of missile units in the course of an operation will often occur precipitately in areas not provided for by the transfer plan, should also be considered. However, this does not preclude the possibility, in certain favorable instances, of carrying out an exchange of the meteorological information which has been received between the army meteorological station and the meteorological stations of the missile units operating in the zone of the army.

The staff of the missile troops and artillery of the army plans the meteorological support of the missile units and artillery with the use of the "meteoyedinyy" bulletin.

The following must be provided for by the meteorological support plan for the army meteorological means:

-the disposition areas of the meteorological stations, the period of time and the order of their transfer in the course of an operation;

-the means of communication for the transmittal of meteorological bulletins;

-the procedure for conveying the results of soundings to the missile and artiliery units and subunits;

-the procedure for controlling the receipt of meteorological bulletins by the subunits;

-the procedure for using the results of the soundings by the meteorological stations of the missile units of operational-tactical designation for the meteorological support of the battalions of tactical missiles and the artillery;

-the procedure for providing combined-arms and artillery staffs with data concerning the average wind and weather forecasts.

In using the single bulletin, one of the versions of the employment of an army meteorological station in an offensive operation of the army can be the following. Two of the three army meteorological stations can be located in the army zone at a distance of 10 to 15 kilometers from the main line of resistance of its troops. The mission of these stations is to provide "meteoyedinyy" bulletins to the subunits of tactical missiles and the basic artillery grouping. In this, the atmospheric sounding and the distribution of the "meteoyedinyy" bulletin can be carried out by the stations consecutively and also simultaneously in order to ensure mutual control over the computations being made and to increase their accuracy by this means.

One of the meteorological stations can be located on the flank for providing meteorological data to the most distant subunits. Atmospheric sounding and compiling the meteorological station's meteorological bulletin

carried out on a single chart worked out by the staff of the missile troops and artillery of the army in accordance with the specific conditions of the combat situation and the weather.

Under stable weather conditions, a comprehensive (temperature - wind) sounding can be carried out for 4 hours while the wind sounding can be carried out during the intervals between the comprehensive soundings, i.e., 2 hours after the regular comprehensive sounding.

During the planning of the meteorological station's work, it is necessary to take into consideration the fact that the uninterrupted work of a radar set must not exceed 6 to 8 hours, after which the operators must be given a rest period and the set must be turned off for 5 or 6 hours.

For ensuring continuity in the meteorological support of the missile units and artillery in the course of an operation (battle), proper organization of the transfer of meteorological stations has great significance. A transfer of the meteorological stations must be thoroughly planned, taking into account the available means and the tasks being performed by the troops. Two meteorological stations, working on one axis, can be shifted in turn in bounds of 25 to 30 kilometers. It is advisable to begin the transfer of the meteorological station next in line after the meteorological station being transferred is ready to work in the new area. The transfer plan for the army meteorological stations must not fail to take into consideration the transfer of the missile units of operational-tactical designation so that when necessary the results of the soundings by their meteorological stations can be used for support of the firing of tactical missiles and artillery.

The positions of the meteorological stations during transfers in the course of an operation should be planned so that the results of soundings can be used by the greatest number of subunits, i.e., if possible, in the center of the main grouping of the missile units and artillery.

Each position of a meteorological station is given a specific number which is placed in the bulletin format. The subunit receiving the bulletin will in this case know the area from which the atmospheric sounding was made and consequently will be able to determine the possiblity of

using the bulletin in the preparation of initial firing data.

All of the necessary data concerning the work of the meteorological stations: the positions, the numbers of the meteorological stations and the procedure for their transfer, the periods of time and the procedure for the transmittal of the bulletins, are conveyed to the missile and artillery units (subunits) by combat instructions.

In order to have continuous and reliable meteorological support of the missile units and artillery in the course of an operation, taking into account the transfer of meteorological stations, their number in an army must be increased. In particular, the advisability of having two meteorological batteries, with two meteorological stations in each, in an army, was revealed in the course of the exercises.

The results of the atmospheric sounding (the "meteo-yedinyy" bulletin) by the army meteorological stations must not only be received by the tactical missile and artillery subunits but also by the operational-tactical missile battalions.

This will permit control over the results of the soundings themselves. In some cases (a radar set put out of action, an unsuccessful sounding, etc.), the data in the "meteoyedinyy" bulletin may be the only data available to a missile battalion's meteorological stations for calculating the ballistic values of meteorological factors and compiling a bulletin for the standard altitudes.

The meteorological stations of missile battalions must in their turn always be prepared to compile a "meteo-yedinyy" bulletin on the basis of the results of their own soundings and to distribute it on instructions from the staff of the missile troops and artillery of the army in order to support the tactical missile and artillery subunits.

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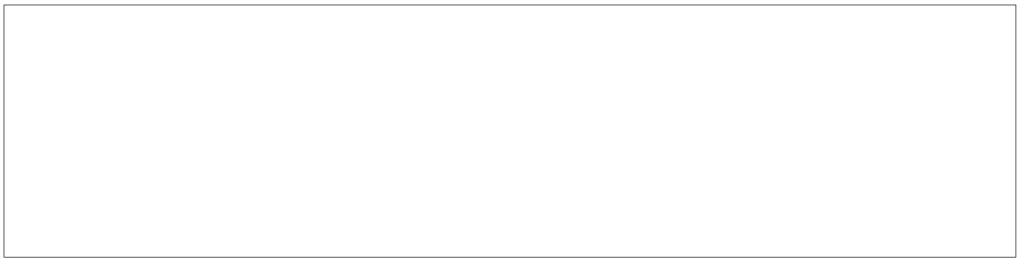
The brigade staff plans for the use of the missile brigade's meteorological stations, taking into account

the instructions of the staff of the missile troops and artillery of the army concerning meteorological support, the nature of the operation, and the missions of the missile brigade. This question is examined in detail in Information Collection of Missile Units and Artillery No. 51.

The most effective means of meteorological support for the firing of all types of missiles and artillery is the mobile artillery radio-technical meteorological station (podvizhnaya artilleriyskaya radiotekhnicheskaya meteorologicheskaya stantsiya --- PARMS). It permits accurate measurement of the wind and temperature to be made at an altitude 2.5 to 3 times greater than does a mobile artillery meteorological station (podvizhnaya artilleriyskaya meteorologicheskaya stantsiya --- PAMS).

Communications have exceptionally great significance in the meteorological support of missile units and artillery, especially when a single meteorological bulletin is used. Experience from exercises indicates the necessity of organizing a special meteorological communications network in the army and missile brigade. There must be powerful radio sets in the meteorological subunits (R-118 sets were used in some exercises) for the transmission of bulletins and R-311 receivers must be used in missile and artillery units (subunits) to receive them. A bulletin must be transmitted several times. For example, in one of the exercises, a bulletin was transmitted not less than three times by microphone, and during the subsequent 15 minutes not less than two times by key.

The staffs of the missile troops and artillery (staff of a missile brigade) control the receipt of the bulletins in the missile and artillery units (subunits). When a meteorological subunit for some reason is not able to transmit a bulletin, it must be transmitted by the means of the appropriate staff. It is advisable to assign one of the officers and the appropriate means of communications in the staffs of the missile troops and artillery (in the missile brigade staff) for this purpose. The calculation of the average wind (on the basis of the meteorological bulletins being received) for use during an estimate of a radiation situation can also be included in the tasks of this office.



In connection with the fact that in the course of an operation the use of a nuclear charge of any yield is possible, the necessity arises to conduct in the staffs a calculation of the values of the average wind for a number of standard altitudes, corresponding to the most typical yields of nuclear charges.

Moreover, considering the continual changes in data concerning the wind, it is advisable to calculate its values on a special chart with an interval of values for every 100 kilometers.

Data concerning the wind for one's own disposition is taken from the "meteoyedinyy" bulletin; and for the enemy's disposition, they can be obtained from the meteorological service of the air army.

In order to acquire practical experience in the use of the single meteorological bulletin and in working out recommendations for the troops, it is advisable to continue the study of this question during forthcoming troop exercises.