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SUBJECT	: USSR GENERAL STAF and Artillery in	F ACADEMY LESSON: a <u>Front</u> Offensive	Rocket Troops Operation		
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Page 2 of 20 Pages

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Summary:

The following report is a translation from Russian of the text of a lecture at the Voroshilov General Staff Academy on the subject of rocket troops and artillery. It is a very organized, textbook presentation in four sections: mission, strength, use, and planning. The principal innovation appears to be the considerable space devoted to the Soviet counterpart of precision location strike systems, which are in one place termed comparable to low-yield nuclear weapons. Several specific battlefield systems are mentioned briefly with their most salient characteristics; most of these facts are already known from other sources, but there appear to be a few new details on some systems.

End of Summary

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Page 4 of 20 Pages

ROCKET TROOPS AND ARTILLERY IN A FRONT OFFENSIVE OPERATION

[First line illegible.] ... principles of the combat actions of rocket troops and artillery in a front offensive operation. The following topics will be addressed, with primary emphasis on the first two:

1. The role and missions of the rocket troops and artillery in a <u>front</u> offensive operation.

2. The combat composition and force grouping of rocket troops and artillery in a <u>front</u> offensive operation.

3. Delivery of nuclear and conventional fire against the enemy in a <u>front</u> offensive operation.

4. Planning and organizing delivery of nuclear and conventional fire against the enemy.

[First part of line illegible.] ... are a key component of a front offensive operation. Rocket troops and artillery destroy and neutralize the enemy's nuclear attack means, personnel, weapons, tanks, artillery, and air defense means, demolish fortification structures, carry out remote minelaying, and perform other tasks. The effectiveness of the combat actions of front rocket troops and artillery largely depends on the accuracy and timeliness of reconnaissance data on enemy targets to be hit. In order to be successful in carrying out reconnaissance tasks to support the effective employment of rocket troops and artillery, all types of military reconnaissance -- strategic, operational, and tactical -- focus their efforts in peacetime on setting up and carrying out constant surveillance of important targets to be hit by nuclear and conventional means such as missile units, depots and bases with nuclear munitions and chemical weapons, reconnaissance-strike complexes, base airfields for weapon-platform aircraft, control posts, and key groupings of [ground] forces. The creation and improvement of reconnaissance-strike systems (multipurpose reconnaissance-strike complexes and reconnaissance-fire complexes) represent a new stage in the development of the rocket troops and artillery. They [line illegible].

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Page 5 of 20 Pages

The Role and Missions of Rocket Troops and Artillery in a Front Offensive Operation

Rocket Troops

The role of the rocket troops in an operation is determined above all by the importance of the missions being performed and by their combat capabilities: the ability to effectively hit the enemy with nuclear and conventional means, inflict massive losses on the enemy, and to hit virtually any enemy target throughout the entire depth of the operation.

Front rocket troops are the main means of employment of operational-tactical and tactical nuclear weapons in combat and in operations. They possess a tremendous striking power, a long range, and the capability for broad maneuver and massing of strikes on the main axis.

Front rocket troops are equipped with missiles with a launch range of 15 to 900 km. They have nuclear munitions of various yields, from 5 to 300 kilotons.

The enormous striking power, long range, and high accuracy of delivery of the missiles make it possible to strike the enemy to the entire depth of his operational disposition. By maneuvering trajectories, <u>front</u> rocket troops are able to radically change the situation on the battlefield within a limited period of time, regardless of the nature of the terrain and other situational conditions, including weather conditions, which restrict the employment of other branches and branch arms.

In a <u>front</u> offensive operation, the objective of the combat actions of the rocket troops is to thwart an enemy nuclear attack and to inflict substantial damage on the enemy's main grouping, thereby creating favorable conditions for accomplishing the total defeat of enemy troops and achieving the objective of the operation within a short period of time.

In order to accomplish the objective of the operation the rocket troops perform the following main tasks:

1. Destruction of the [enemy's] nuclear attack means. This task is accomplished by destroying Pershing and Lance subunits, artillery, weaponplatform aircraft at airfields, field depots, and bases. Currently available missiles are able to hit targets such as a Pershing battery (platoon), Lance battery, artillery battalion, and weapon-platform aircraft at an airfield with single strikes.

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Central Intelligence Agency Act of 1949 (50			
U.S.C., section 403g)		Page	6

Page 6 of 20 Pages

2. Hitting the main enemy troop groupings and operational reserves for the purpose of effecting a decisive change in the correlation of forces to our advantage within a short period of time. The main targets to be hit will be tank, motorized rifle, and artillery battalions.

3. Disruption of enemy troop command and control. This task is accomplished by taking enemy control systems and posts and electronic warfare means out of action. The targets to be hit are command posts of army groups, corps, and divisions, control posts for nuclear attack means, air control centers, and other similar targets.

4. Destruction of targets in the enemy's air defense system. This task is performed for the purpose of assisting our aviation in carrying out its combat missions. The rocket troops are called upon to hit these targets when aviation is unable to perform this task itself. The targets to be hit are individual Nike Hercules, Hawk, and Patriot [batteries] and other targets which are capable of effectively combatting our aviation.

5. Disruption of the operation of the operational and combat rear services. This task is performed in order to cut off the enemy's troop supply and make it difficult for him to maneuver, and is accomplished by delivering single and grouped nuclear strikes against detraining stations, logistic and technical support airfields, large crossing sites, communications centers, major militaryindustrial centers, and other important targets.

On a coastal axis, the rocket troops, operating in coordination with naval means, are able to attack groupings of enemy naval forces, as well as enemy amphibious landing forces, naval bases, and ports.

In an offensive operation in which only conventional weapons are employed, the main mission of the rocket troops is to maintain high combat readiness to deliver the initial nuclear strike. Missiles with conventional warheads can be utilized successfully for delivery of conventional fire against the enemy's nuclear attack means, command posts, electronic equipment, communications centers, etc.

The basic principles of the combat actions of the rocket troops and artillery in an operation are the massing of the rocket troops and of the strikes delivered by them on vital axes to perform the main missions; surprise and timeliness in delivering strikes; delivery of strikes against reliably reconnoitered targets; broad maneuvering of strikes, missiles, and large units and units of rocket troops; close and continuous coordination of <u>front</u> rocket troops and artillery with the Strategic Rocket Forces, with other weapons, as well as with strikes by the Ground Forces, that is, motorized rifle and tank troops; and continuous and flexible centralized command and control.

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Page 7 of 20 Pages

Artillery

During the Great Patriotic War artillery was the main means for delivery of conventional fire. The advent of nuclear missiles could not fail to have an effect on the development of artillery. In connection with this many military specialists were skeptical in evaluating the prospects for further development of artillery. They maintained that in the nuclear age artillery had become obsolete and had no future.

However, these predictions were not justified. Experience demonstrated that missiles cannot perform all the tasks that artillery does. Thus missiles and artillery have their own specific spheres of employment in which they can be employed to the greatest effect; therefore, they do not exclude one another, but complement one another.

Artillery has a number of important advantages as compared to short-range missiles: high accuracy, simplicity of design and combat employment, constant readiness for utilization, reliability of operation under any climate conditions, and relative cheapness of manufacture.

The role of artillery in modern <u>front</u> offensive operations is defined above all by the scope and importance of the missions it performs and will vary depending on the nature of combat actions and, most importantly, on the scale of employment of nuclear weapons.

In an offensive operation in which nuclear weapons are employed, artillery, using nuclear munitions as well as conventional munitions, hits key targets in the enemy's first-echelon divisions, supports the breakthrough of enemy defenses and rapid defeat of the enemy in a meeting engagement, hits his counterattack groupings, and performs other important tactical and operational missions.

In an operation in which conventional weapons alone are employed, rocket troops and artillery are assigned 80-85 percent of the tasks for delivery of conventional fire against the enemy in the tactical depth and in the immediate operational depth. Under these conditions artillery becomes the main weapon of the ground forces.

Modern artillery possesses tremendous firepower, long range, accuracy, survivability, and a high rate of fire. It is capable of broad maneuvering and sudden massing and concentration of nuclear strikes and fire in short periods of time throughout the entire tactical depth and against key targets in the immediate operational depth.

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Page 8 of 20 Pages

New self-propelled long-range artillery and multiple-round systems are entering service. The high combat qualities of artillery in combination with nuclear and conventional munitions are making artillery a general-purpose means for delivery of fire against the enemy.

New artillery systems include the 203.2-mm PION gun (with a maximum range of 37.5 km and up to 50 km with a rocket-assisted projectile); the 240-mm TYUL'PAN mortar (with a range of 9.7 km and up to 19.7 km with a rocket-assisted shell); and the URAGAN rocket launcher (with a range of up to 40 km).

Progress in the theory of automatic control, aerodynamics, rocket engines, and particularly in electronic technology has been the basis for practical realization of the ONE ROUND-ONE HIT ["vystrel-porazheniye"] requirement in prospective weapons, that is, the achievement of a combination of power and range of the warhead and accuracy of its delivery to the target which ensures hitting specifically the designated target with the first round with a probability of at least 0.5. Tactical and operational-tactical nonnuclear guided weapons which meet this requirement are given the designation "precisionguided." Why are they currently the subject of discussion? What are their advantages?

1. When precision-guided weapons are used in mass, their combat effectiveness is comparable to the effectiveness of low-yield tactical nuclear weapons.

2. The selectivity of effect and the absence of radioactive contamination of the terrain make it possible to fire at any distance from the forward edge without the risk of accidentally hitting friendly troops.

3. The need for ranging, characteristic of unguided weapons, is eliminated. This increases suddenness in delivering strikes.

4. Using precision-guided weapons substantially reduces the forces and means needed to carry out the combat mission, which can in turn substantially reduce losses in personnel, weapons, and [word illegible] and [simplify] material and technical supply. For example, to hit a battery of 155-mm selfpropelled howitzers, it currently takes 900 standard rounds (152-mm HE fragmentation shells), 10 minutes, and two artillery [word illegible]. This same task can be performed by fire from one battery [of precision-guided weapons] in a little more than two minutes using 15-20 shells guided by seekers.

Existing precision-guided weapons are constantly being improved, and new, improved systems are being developed. In recent years new requirements have emerged in addition to such traditional directions for improvement of weapons as increasing range, accuracy, protection against enemy ECM means, and all-weather capability. In particular this refers to meeting the "fire and forget"

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U.S.C., section 403g)

Page 9 of 20 Pages

requirement as well as the capability for [word illegible] [employment], that is, inflicting great damage on the enemy with one shell. The "fire and forget" requirement is met by putting in automatic target [detection] devices, including on the guided missile itself, and seekers.

With our first guided missiles, the operator had to align three points: the sight, the target, and follow the flight of the missile. Now the operator follows two points (the target and the reticle), and the utilization of seekers has already freed the operator in principle of the need to follow the missile during its flight to the target. Of course, this substantially increases the operator's capabilities for observing the battlefield. As far as the capability for hitting a group target with one round is concerned, a fundamentally new element of these weapons are cluster-charge weapons which are equipped with 50-100 self-guided cluster submunitions or projectiles.

There are currently a number of different types of precision-guided weapons, including antitank missile systems, tube and guided rocket artillery, and precision-guided weapons of the Air Forces, many of which are used for hitting armored equipment. An example of a precision-guided weapon is the FALANGA antitank guided missile complex, which is radio-controlled and can be mounted on armored personnel carriers and helicopters. The range is 4-5 km, armor penetration is 400-500 mm, and the probability of kill is 0.6-0.8.

The main directions for development of antitank missile complexes are increased range, accuracy, and interference protection, as well as the capability for utilization under poor visibility conditions. Another direction for improving precision-guided weapons is the utilization of new capabilities for hitting the most vulnerable parts of tanks from above.

The 100-mm laser-guided antitank artillery shell has a long direct-fire range (1880 [m]) and a high muzzle velocity ([1575] m/sec), which results in a high effectiveness of fire. The probability of kill with one shell is 0.95, which is very high.

The rocket of the URAGAN system is corrected twice in the initial [word illegible] segment and has a cluster warhead.

[Unknown amount of text missing.] ... multiple-launch rocket system, the so-called RSZO, as well as [two words illegible], only a little larger and more powerful.

Operational-tactical and tactical missiles. A missile with a cluster warhead has been developed for the AK [expansion unknown] missile system, and the same kind of missile has also been developed for the R-70 tactical missile system. TOCHKA R missiles have a passive seeker and are used in reconnaissancestrike complexes, which will be discussed later.

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Page 10 of 20 Pages

[Two words illegible] is represented by air-to-surface guided missiles as well as by guided bombs, the testing of which is currently in full swing. Work on aircraft torpedos is also scheduled for the future.

By virtue of artillery's combat capabilities and the role assigned it in an offensive operation, it can perform the following main tasks of hitting the enemy with nuclear and conventional means:

1. Destruction of [the enemy's] tactical nuclear attack means and neutralization of his artillery grouping, which ensures that fire superiority over the enemy is gained and maintained.

2. Hitting enemy motorized infantry and tanks in the course of repelling their invasion and when <u>front</u> troops move forward, are deployed, and go over to the offensive.

3. Hitting enemy personnel and weapons in the covering force area in the course of breaking through the forward defense line and other defense lines, carrying out river assault crossing operations, and repelling counterattacks and counterthrusts, and interdicting maneuver by enemy reserves.

4. Hitting the enemy with conventional means during forward movement, deployment, and commitment to battle of second echelons, operational maneuver groups, and army and front reserves.

5. Destruction of defensive installations in the course of breaking through fortified areas and assaulting towns, and combat with enemy ships and assault landing forces during an offensive on a coastal axis.

In addition, artillery is assigned to perform the tasks of target marking, terrain illumination, and smoke screening of enemy targets.

The main principles for effective employment of artillery were worked out during the Great Patriotic War. They include:

1. massing of artillery on key axes of a front offensive;

2. close coordination of artillery with motorized rifle and tank troops and aviation;

3. continuity of support for advancing troops throughout the entire operation.

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Page 11 of 20 Pages

The Combat Composition and Grouping of Rocket Troops and Artillery

The Combat Composition of Rocket Troops and Artillery

The combat composition of <u>front</u> rocket troops and artillery is not constant. It depends above all on the objectives of an offensive operation, the composition of enemy forces and means, and the nature of the enemy's defense. For the most part the composition of forces and means will depend on the scale of utilization of nuclear weapons planned for the <u>front</u> area of responsibility [polosa fronta]. The composition of <u>front</u> rocket troops and artillery could be one R-300 (or now, R-400) <u>front</u> missile brigade, one R-900 brigade, up to two RVGK [Reserves of the Supreme High Command] artillery divisions, one or two heavy artillery brigades, and one or two RVGK antitank artillery brigades.

Each combined-arms army in a <u>front</u> has an R-300 (R-400) army missile brigade; in the latest [word illegible] there can also be a brigade of tactical missiles, that is, divisional missile battalions. Now, in any event, in the training program the General Staff Academy is introducing brigades or transferring [word illegible] to the armies from the divisions [several words illegible]. This is connected to the advent of nuclear artillery in the division; the purpose is to increase combat readiness and to improve command and control and technical support by making them more centralized. The Frunze Academy does not use this [feature] yet. According to authorized manning levels, practically [two words illegible] only in the General Staff Academy. [One or two sentences apparently missing.]

In a tank army the composition of the rocket troops and artillery is the same; only the army tank destroyer artillery regiment is lacking.

When a <u>front</u> consists of three or four armies, including one tank army, and three to five combined-arms reserve divisions (in other words, 22-25 divisions, including 8-10 tank divisions), the <u>front</u> can include 148-172 operationaltactical and tactical missile launchers and 48-96 atomic artillery pieces. This is an artificial way to put it, since almost all artillery can employ nuclear munitions. There is even a 152-mm nuclear shell and a 122-mm [nuclear] shell. Therefore, in doing calculations the quantity and capabilities should be based on all the nuclear munitions allotted for conducting an operation or battle. There can be 4400-5300 field artillery guns and mortars and up to 2000 antitank artillery pieces, antitank guided missile launchers and SPG-9s.

Under this option, the <u>front</u> can allocate 160-200 operational-tactical and tactical missile launchers and atomic artillery pieces (mortars) for an initial nuclear strike. On selected strike sectors 16-20 km wide overall, the <u>front</u> can establish densities of 180-200 [?] weapons per kilometer of front. For us this means 180-200 average standard weapons, with 152-mm caliber taken as the

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Page 12 of 20 Pages

average. Everything else, everything [word illegible] is converted [word illegible]: the 120-mm mortar shell, 130-mm shell, and BM-21 shell have a coefficient of 0.9; the 240-mm mortar shell and 203.2-mm have a coefficient of 1.1; an operational-tactical missile with a conventional warhead (one launch) -- 2-3. The purpose of this is to be able to perform calculations for delivery of conventional fire against the enemy.

In the operational disposition of a \underline{front} these means are in a particular grouping.

The Grouping of Rocket Troops and Artillery

One of the main conditions for successfully carrying out missions in a <u>front</u> operation is continuous and close coordination of the rocket troops and artillery with combined-arms large units. Continuity of coordination is achieved by establishing the grouping of rocket troops and artillery in accordance with the concept of the operation.

The grouping of rocket troops and artillery should be taken to mean the part of the operational disposition of front troops which consists of missile and artillery large units, units, and subunits distributed among combined-arms formations (large units) and artillery groups, under unified command and control for carrying out combat missions in an operation. The core of the rocket troop and artillery grouping is made up of missile large units and units, artillery battalions which use nuclear munitions, artillery groups, and antitank reserves.

The general grouping of rocket troops and artillery. The general grouping of front rocket troops includes front and army groupings of missile large units and units and divisional missile units which are an element of the operational disposition (battle formation) of a front, army, and division respectively. Its function is hitting the enemy with nuclear means as well as attacking enemy troops and individual targets using missiles with conventional warheads.

During an initial nuclear strike by the <u>front</u>, employment of large units and units of rocket troops is usually centralized; subsequently they are employed in accordance with the decision of the corresponding formation commanders (large unit commanders).

The siting areas of <u>front</u> rocket troops, depending on situation and terrain conditions, are usually designated at a distance from the forward edge of the battle area which corresponds to the minimum launch range of the missiles.

Army and <u>front</u> missile brigades, as well as missile battalions of motorized rifle and tank divisions, are not included in groups and are directly subordinate to the corresponding officer in charge.

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U.S.C., section 403g)

Page 13 of 20 Pages

The general grouping of <u>front</u> artillery includes army and divisional artillery groupings, nuclear-capable artillery, and the artillery of combinedarms units and subunits. It is made up of organic artillery and RVGK artillery. Its function is hitting the enemy with conventional means and attacking the enemy with nuclear munitions. To do this the following are formed: in an army, army artillery groups; in large units and units, divisional and regimental artillery groups respectively. They are an element of the operational disposition (battle formation).

The function of an army artillery group (AAG) is to hit enemy tactical nuclear means, artillery, air defense means, command posts, reserves, and other important enemy installations and targets on the axis of the main thrust, and also to reinforce first-echelon artillery fire.

An army artillery group usually includes 5-9 long-range artillery battalions. Army artillery groups are usually divided into subgroups among the divisions which are advancing on the axis of the main thrust. These are called AAG subgroups. An army rocket artillery group can be formed consisting of one or two army rocket artillery regiments.

To destroy permanent emplacements and other fortifications during a breakthrough of fortified areas, an army artillery destruction group [armeyskaya artilleriyskaya gruppa razrusheniya] (AAGR) is formed from heavy artillery.

Heavy artillery attached to an army is generally resubordinated to firstechelon large units operating on the axis of the main thrust. In some cases it can remain under the [army] commander. The main positions for heavy artillery battalions are chosen at a distance of 3-6 km from the enemy's forward defense positions.

The function of a divisional artillery group (DAG) is to combat the enemy's tactical nuclear attack means and artillery and deliver conventional fire against enemy reserves, electronic means, and other targets. A divisional artillery group usually includes 3-5 battalions which consist primarily of heavy howitzer, gun, and rocket artillery. Some of the battalions included in the divisional artillery group can be assigned to support the division's first-echelon regiments.

The function of a regimental artillery group (PAG) is to perform tasks in direct support of a motorized rifle (tank) regiment for delivering conventional fire against enemy personnel and weapons and providing continuous support to advancing troops. In the course of battle battalions which are part of a regimental artillery group can directly support motorized rifle (tank) battalions or be attached to these battalions.

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U.S.C., section 403g)

Page 14 of 20 Pages

The function of antitank reserves of a front or army in an offensive operation is to increase the antitank capability of first-echelon troops, engage in combat with enemy tank groupings which have broken through, and provide cover on vulnerable axes and the exposed flanks of attack groupings.

Antitank reserves perform their tasks in coordination with first- or secondechelon troops, artillery, aviation, and mobile obstacle detachments; they can also operate independently. Usually one or two antitank reserves are formed in a <u>front</u> or army. Antitank reserves are also formed in a division or regiment.

Reconnaissance-strike systems are a new element of the operational disposition of <u>front</u> and army troops and of the battle formation of a division. These are so-called multi-purpose RUKs [reconnaissance-strike complexes] and ROKs [reconnaissance-fire complexes]. Certain reconnaissance-strike system versions are currently being studied and utilized in the tactical training of large units, operational training of formations, and in the training program of higher educational institutions. These are training reconnaissance-strike and reconnaissance-fire complexes, and certain reservations must be made in comparing them with advanced complexes such as PLSS, Assault Breaker, and SOTAS.

In accordance with the recommendations of the Ground Forces five such complexes are being proposed for development. In our terminology, reconnaissance-strike systems consist of reconnaissance-strike complexes, which are multifunctional complexes that include various weapons and whose function is to hit different types of targets, and reconnaissance-fire complexes, whose function is to hit individual weapons, to hit targets of one type. In any event, this is how it is written in the recommendations. It is probably simpler to represent it this way: reconnaissance-strike complexes generally belong to fronts and armies, whereas reconnaissance-fire complexes generally belong to large units and units.

I. The <u>front reconnaissance-strike complex (front RUK)</u>, like the PLSS, has the function of hitting targets which emit radio waves. In other words, its targets are radars, such as guidance and control radars for Nike Hercules and Hawk, and others.

Composition. In principle all reconnaissance-strike posts will have three components: reconnaissance means, control means, and weapons. These elements are not mechanically combined, but rather, as it is written in the sources, "integrated" in an automatic mode. According to some data, this is a revolution both in terms of military science and in terms of technology.

Reconnaissance means. The AN-72R aircraft with electronic reconnaissance, guidance, and relay equipment. This aircraft is specially designed for the reconnaissance-strike complex. It actually exists; in any event, foreign sources have photographs of it. The zone of reconnaissance coverage is 500 km.

TS #888443 Copy # 2

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-TOP SECRET

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U.S.C., section 403g)	

Page 15 of 20 Pages

Control means. The automated control system of the reconnaissance-strike complex is linked with the MANEVR automated troop control system and the ETALON air control system.

Weapons. Bomber and fighter-bomber squadrons with the corresponding armaments, as well as missile battalions which are part of a <u>front</u> missile brigade. Their attack capabilities are determined by the capabilities of the missile armaments.

Principle of operation. The AN-72R reconnaissance aircraft patrols or conducts reconnaissance at a distance of 100-150 km from the forward edge of the battle area. The data obtained by the aircraft can be relayed and transmitted to a ground control center and from there to the weapons, i.e., to fighterbomber aircraft or to a missile battalion. We have missiles which are specially designed for this complex, and the kill range is 110 km plus the operational radius of the aircraft. In general the aircraft can [deliver a missile] to a distance of 500-600 km, that is, to the depth of reconnaissance. However, the R-900 missile can quite handily cover a range of 600 km.

II. The army reconnaissance-strike complex. This complex is also organic; there is a reconnaissance-strike complex commander.

Reconnaissance means. The complex also includes AN-72 aircraft with reconnaissance equipment. The zone of reconnaissance coverage is 100 km wide and 200 km deep.

Weapons. Missile battalions of operational-tactical missiles and tactical missiles and battalions of multiple-launch rocket systems. The equipment makes it possible to transmit data from the AN-72 to the army intelligence chief's post and to other weapons. [Word illegible], of course, is a closed system.

Capabilities. As has already been mentioned, cluster warheads have been developed for the AK and TOCHKA missiles. That is, missiles with self-guided cluster submunitions have been developed which have the capability of taking out a tank company with a single missile or a single salvo of a multiple-launch rocket system.

III. The IGLA reconnaissance-fire complex. This complex can be formed in a division or can also be transferred to an army, in which case it is essentially an army complex. Its mission is reconnaissance and engagement of targets which emit radio waves. This is also essentially combat with enemy air defense means.

Reconnaissance means. The IGLA-5 automated reconnaissance and target designation complex. Capabilities: the zone of reconnaissance is 70 km deep and 30 km wide.

TS #888443 Copy #

TOP SECRET

-TOP SECRET

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Page 16 of 20 Pages

Weapons. The TOCHKA R missile, which has a passive radar seeker. One to two missiles per target. The kill probability is 0.7-0.8.

IV. The [?POSEV] reconnaissance-fire complex. Its mission is to combat enemy artillery and mortars.

Reconnaissance means. The ARK-1 artillery radar complex. It determines the rectangular coordinates of weapons which are firing at a distance of 20 km [word illegible] 30 degrees according to the [illegible] which exists until the shell falls....

[Several lines illegible.]

... data can be sent to artillery battalions for firing, more or less in real time.

Weapons. One or two artillery battalions from a divisional artillery group or army artillery group. Control is organic and is the [responsibility] of the battalion commander who is appointed commander of the complex. In other words, the [word illegible] of control are essentially organic, which is a shortcoming.

V. The [word illegible] reconnaissance-fire complex. Its function is [word illegible] and destruction of small targets: entrenched tanks, armored personnel carriers, and company and battalion command posts.

Reconnaissance means and weapons. Reconnaissance means include a laser rangefinder with a range of up to 12 km. It is installed in the command-staff vehicle of the commander of a 240-mm self-propelled mortar battery. The mortar shell is guided by a laser beam with double correction. Target kill time is 100 seconds. Its effectiveness is 0.6-0.7.

These are the types of complexes which are now being used in the training program and tried out by the troops. Reconnaissance-strike systems of the Ground Forces are currently organic subunits and units of aviation and rocket troops and artillery. They are included in the general command and control system and are an element of the battle formation of a division or of the operational disposition of an army or front.

Delivery of Nuclear and Conventional Fire Against the Enemy

In a front operation delivery of nuclear and conventional fire against the enemy is organized and carried out, which should result in major losses to the enemy and the creation of conditions for achieving the objective of the operation. Thus delivery of nuclear and conventional fire against the enemy is

TS #888443 Copy # X

TOP SECRET

TOP SECRET

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Central Intelligence Agency Act of 1949 (50
U.S.C., section 403g)

Page 17 of 20 Pages

the main content of the combat actions of the rocket troops and artillery in a <u>front</u> offensive operation. A key task of the commanders and staffs of all combined-arms formations and large units is the planning and organization of delivery of nuclear and conventional fire against the enemy.

Delivery of nuclear fire against the enemy consists in the delivery of the initial and follow-up nuclear strikes by rocket troops, nuclear-capable artillery, and aviation, as well as the utilization of nuclear landmines. It is carried out throughout the entire depth of the operational disposition of enemy troops.

The initial nuclear strike is delivered on the order of the Supreme High Command by: missile large units and units of the <u>front</u> and of combined-arms (tank) armies; missile battalions of motorized rifle (tank) divisions; <u>front</u> aviation; and nuclear-capable artillery.

The initial nuclear strike is delivered in coordination with the Strategic Rocket Forces, the Air Armies of the Supreme High Command, and on coastal axes, with the naval forces. The objective of the initial nuclear strike is to inflict major damage on the opposing enemy and to create the conditions for motorized rifle and tank troops to complete the defeat of the enemy with a subsequent offensive.

In the initial nuclear strike up to 50 percent of the nuclear munitions allotted to the <u>front</u> for the operation (which can number 1000 or more) can be expended on delivery of nuclear fire against the enemy. 1200 nuclear munitions [word illegible] in exercises. The initial nuclear strike by a <u>front</u> is usually delivered within short periods of time and can include one or two launches of operational-tactical and tactical missiles, one or two rounds fired by nuclear artillery, and one aircraft sortie. The strike usually begins with the launch of operational-tactical and tactical missiles and rounds fired by nuclear artillery.

Following strikes by rocket troops and artillery, with a minimum lapse of time and sometimes even simultaneously, nuclear strikes are delivered by <u>front</u> aviation delivery aircraft. Their approach to the designated targets and installations is carried out with safety and the results of missile and artillery attacks on enemy air defense installations taken into account.

The time structure of an initial nuclear strike scenario can be represented as follows. The time from "P" to "P + 3 minutes": the command goes out to all participants in the initial nuclear strike. From "P + 3 minutes" to "P + 15 minutes": the first launch of missiles is carried out by the rocket troops and the first round is fired by nuclear artillery against targets whose coordinates are known. From "P + 18 minutes" to "P + 1 hour": aircraft deliver a nuclear strike and perform final reconnaissance of the target. From "P + 1 hour and 3

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TOP SECRET

TOP SECRET

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Page 18 of 20 Pages

minutes" to "P + 1 hour and 10-30 minutes": the second launch of missiles is carried out and the second round of nuclear artillery is fired against the targets of final reconnaissance. Accordingly, the duration of a nuclear strike can be from one hour and ten minutes to one hour and thirty minutes.

A follow-up nuclear strike is delivered at the decision of the <u>front</u> commander in accordance with the readiness of the nuclear means and as targets to be hit are detected.

For the purpose of effective delivery of the initial nuclear strike by the <u>front</u>, reconnaissance detects and updates the location of missile units, base airfields for weapon-platform aircraft, nuclear munitions and chemical weapons depots, major groupings of ground forces, tactical aviation, air defense means, control posts, and other installations. Various reconnaissance forces and means are used in close coordination to accomplish this.

- Before the initial nuclear strike and follow-up nuclear strikes are delivered against the enemy, the position of enemy troops and installations is refined and updated, that is, final reconnaissance is carried out.

Nuclear landmines are used to cover vulnerable axes and exposed flanks of front and army attack groupings as well as to foil enemy counterthrusts.

Delivery of conventional fire against the enemy in an offensive operation consists in the integrated effect of fire against the enemy with the means of various Armed Forces branches, branch arms, and special troops using missiles and munitions armed with conventional and incendiary agents. It includes the delivery of strikes against the enemy by rocket troops using missiles with conventional warheads, all types of artillery fire by the weapons of tank and motorized rifle troops, the delivery of strikes by aircraft using bombs, airlaunched missiles, and other types of aircraft weapons, and on coastal axes, it also includes the delivery of missile strikes and fire by naval missile and artillery forces.

During a breakthrough of enemy defensive lines with troops moving up from the depth, river assault crossing operations, and commitment to battle of second echelons and sometimes operational maneuver groups as well, delivery of conventional fire is organized and carried out in four periods:

1. covering fire for troops which are moving up,

2. preparation fire for the assault,

3. fire support for the assault,

4. close support fire for troops advancing in the depth.

TS #888443 Copy # 8

-TOP SECRET-

5

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-TOP SECRET

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U.S.C., section 403g)

Page 19 of 20 Pages

This breakdown of delivery of conventional fire into periods helps to integrate strikes by missiles with conventional warheads, artillery fire, and airstrikes with one another and with the combat actions of combined-arms large units and units; improves the conditions for coordination of weapons and attacking troops; and facilitates continuous and effective engagement of the enemy throughout the entire depth of the assigned missions.

During a breakthrough of prepared defenses or a river assault crossing operation carried out from a position of close contact with the enemy, delivery of conventional fire is usually planned and carried out in three periods:

1. preparation fire for the assault,

2. fire support for the assault,

3. close support fire for troops advancing in the depth.

When an advance is being pushed through or a meeting engagement is being conducted, delivery of conventional fire is planned, organized, and carried out in two periods:

1. preparation fire for the assault,

2. close support fire for troops advancing in the depth.

Depending on the situation, there can also be other variants for organizing delivery of conventional fire against the enemy.

In all of the periods of delivery of conventional fire particular importance must be accorded to the reliable neutralization of the enemy's air defense system, which will be carried out continuously for the purpose of supporting the actions of friendly aircraft.

Planning and Organizing Delivery of Nuclear and Conventional Fire against the enemy

The preparation of a <u>front</u> offensive operation is a complex set of measures in which all <u>front</u> troops participate. With respect to the combat actions of the rocket troops and artillery, the most important measure is the planning and organization of delivery of nuclear and conventional fire against the enemy.

In planning and organizing delivery of nuclear fire in a <u>front</u> offensive operation the following are determined: the tasks which are to be performed using nuclear weapons; the composition of rocket troops and artillery, aviation, and engineer

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- TOP SECRET

TOP SECRET

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Central Intelligence Agency Act of 1949 (50
U.S.C., section 403g)

Page 20 of 20 Pages

units enlisted to perform these tasks; the allocation of nuclear munitions for the initial nuclear strike, follow-up nuclear strikes, and the reserve and their distribution among formations and large units; the configuration and sequence for delivery of the initial nuclear strike by the <u>front</u> with indication of the targets to be hit; the sequence for employment of tactical nuclear means; and the sequence for increasing the readiness of nuclear munitions and the means for their employment.

In planning and organizing delivery of conventional fire in a <u>front</u> offensive operation the following are determined: the general sequence for delivery of conventional fire against the enemy when the main operational missions are performed by the troops (breakthrough of enemy defensive lines, major river assault crossing operations, commitment to battle of second echelons and operational maneuver groups, and other missions); the periods of delivery of conventional fire against the enemy during a breakthrough of enemy defenses in the <u>front</u> area of responsibility; the classes and densities of conventional weapons in the breakthrough sectors; the distribution of weapons; the consumption of munitions in an operation by armies and <u>front</u> means; the specific day-by-day tasks of weapons under <u>front</u> subordination when <u>front</u> troops are carrying out operational missions; and the procedures for coordination of rocket troops, artillery, and aviation in carrying out the missions of delivery of conventional fire against the enemy.

Thus the rocket troops and artillery are the main means for delivery of nuclear and conventional fire against the enemy in a <u>front</u> offensive operation. The preparation of rocket troops and artillery in a <u>front</u> offensive operation and the organization and conduct of combat actions include a large number of measures whose successful implementation largely depends on the effectiveness of the actions of all the types and means of operational reconnaissance. Therefore a profound knowledge of the principles of the combat actions of rocket troops and artillery in a <u>front</u> offensive operation helps to achieve greater success in organizing and implementing comprehensive support, including reconnaissance support, for the operation.

> TS #888443 Copy # 8

TOP SECRET