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MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT: "Combat Against Enemy Missile Submarines", by Rear Admiral O. Zhukovskiy

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Richard Helms
Deputy Director (Plans)

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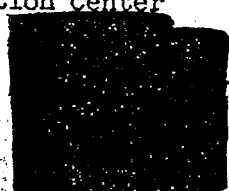
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O. Zhukovskiy

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Combat Against Enemy Missile Submarines

by Rear Admiral O. Zhukovskiy

The application of atomic energy to the submarine has decisively changed the character of its activity: the operating range of submarines has grown immeasurably, and their speed, especially their submerged speed, their endurance, and their diving depth, have been increased considerably. The arming of submarines with ballistic missiles (ballisticheskaya raketa) with nuclear warheads makes it possible to use submarines extensively in a nuclear attack, assigning them missions to destroy important operational-strategic objectives in enemy territory from great distances. Thus, atomic missile (atomnaya raketnaya) submarines have acquired independent strategic significance, unlike other arms of forces of the navy.

The military leadership of the United States considers that in the next ten years atomic missile submarines will become one of the decisive means of combat at sea and will replace aircraft carriers as the main striking force of the navy. Therefore, the United States is devoting great attention to the construction of atomic submarines equipped with "Polaris" missiles. To allot the maximum possible amount of money for the construction of atomic submarines, the United States has abandoned the further construction of aircraft carriers for the time being.

In the United States there are now three types of atomic missile submarines in service and under construction: the "GEORGE WASHINGTON", "ETHAN ALLEN", and "LAFAYETTE", which differ somewhat in their performance characteristics (taktiko-tekhnicheskiye dannyye). According to the reference book Jane's Fighting Ships, in 1960-1961 the United States should have five submarines of the "GEORGE WASHINGTON" type, five of the "ETHAN ALLEN" type, and four of the "LAFAYETTE" type. In addition, it is planned to build seven more submarines of the "ETHAN ALLEN" type in the next few years.

In October 1960, there were the following atomic submarines in the US Navy: the missile (raketnaya) submarines "GEORGE WASHINGTON" and "PATRICK HENRY", the torpedo (torpednaya) submarines "NAUTILUS", "SEAWOLF", "SARGO", "SKATE", "SWORDFISH", "SEADRAGON", "SKIPJACK", and "SCORPION", the guided missile (UF

submarine "HALIBUT", and the radar picket (RLD) submarine "TRITON". Of the submarines under construction, two should join the fleet at the end of 1960, and the remainder on the following dates:

--the missile submarines "T. ROOSEVELT", "ROBERT LEE", and "ABRAHAM LINCOLN" at the beginning of 1961, the "THOMAS EDISON" in May 1961, and the "J. MARSHALL" in June 1961;

--the torpedo submarines, five in 1961, seven in 1962, and four in 1963.

Data on the Construction of Atomic Submarines in the United States as of October 1960*

Type of Atomic Submarines	In Service	Under Construction	Planned for Construction	Total
Missile Submarines	2*	7	12	21
Torpedo Submarines	8	18	4	30
Guided Missile Submarines (PL URS)	1	-	-	1
Radar Picket Submarines (PL radiolokatsionnogo dozora)	1	-	-	1
Total	12	25	16	53

*There are now five atomic missile submarines in service in the US Navy.

Altogether, according to data from the foreign press, by 1970 the shipbuilding program of the United States envisages bringing the number of atomic missile submarines in the navy up to 45, and the number of antisubmarine submarines up to 100.

The main centers for construction of atomic submarines in the United States are:

1. General Dynamics Corporation in Groton, Connecticut.
2. Portsmouth Shipyard in Portsmouth, New Hampshire.
3. Mare Island Shipyard in Vallejo, California.

1. The bulletin "Naval Equipment", No. 4, 1961.

4. The New Shipbuilding Corporation in Pascagoula, Mississippi.
5. Newport News Shipbuilding in Newport News, Virginia.
6. The New York Shipbuilding Corporation in Camden, New York [sic].

The missile submarines are being built primarily in Groton and Camden. The antisubmarine submarines are being built primarily in Camden, Pascagoula, and Vallejo.

At present, the missile atomic submarines of the US Navy are armed with type A-1 Polaris ballistic missiles with a range of 2000 km and a nuclear warhead with a trotyl equivalent of .6 megatons. Later they are expected to take on board for their armament A-2 and A-3 type Polaris missiles with ranges of 2800 and 3200 km and a warhead with a trotyl equivalent of three megatons.

According to data from the foreign press, experimental launchings of Polaris missiles from a submarine have shown that it is possible to use this weapon at a speed of 2 to 3 knots, from a depth of 30 meters, and with a sea state of not more than six balls, conducting the firing with an interval of 15 minutes between firings. Later on, it is proposed to increase the rate of firing, decreasing the interval between firings to 2 to 3 minutes. The accuracy of firing Polaris missiles from a submarine against ground targets with specified coordinates is sufficiently high. According to preliminary calculations, their average probable deviation from target at maximum range is three miles (5.5 km).

The complex navigation equipment of the submarines allows them to sail submerged for a long time and determine their own position exactly without coming to the surface, and this ensures the launching of the missiles against specified coastal targets.

The systems for biological protection of personnel from radiation, and regeneration and conditioning of the air, which are installed on atomic submarines, and also the quality of the outfitting of the internal quarters, provide the comparatively good habitability of the submarines and

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the necessary conditions for the crew of a submarine continuously submerged for almost two months.

According to the views of the military leadership of the United States, the use of missile submarines in a surprise nuclear attack should be sufficiently effective. The Pentagon believes that to achieve this effectiveness, up to two thirds of all the missile atomic submarines must be constantly at sea.

At the present time, American atomic missile submarines continuously patrol in the Northeast Atlantic area in readiness to deliver nuclear/missile strikes against previously designated targets in the territory of our country, just as the bombers of the strategic aviation of the United States, with their load of atomic and hydrogen bombs, patrol in the air. Thus, the atomic missile submarine (PLAR) "GEORGE WASHINGTON" arrived in the patrolling area for the first time on 24 November 1960 and returned to New London (in the United States) on 21 January 1961. This submarine carried out patrolling for the second time from 3 March 1961 to 27 April 1961. The atomic missile submarine "PATRICK HENRY" was on patrol from 28 December 1960 to 8 March 1961. The relief of submarines is carried out on station, and this ensures the continuity of the patrolling and the possibility for immediate use of the missiles. As new missile submarines are put in service, the number of patrolling submarines will be increased.

As a result of the ever-increasing importance of atomic missile submarines in the plans of our probable enemy primarily in a surprise nuclear attack, combat against them must be considered one of the main missions of our navy. This combat must be a combination of offensive and defensive operations carried out in the entire depth of possible location of enemy submarines in a given sea (ocean) theater of military operations.

In our opinion, under modern conditions combat against submarines should envisage the following:

--destruction of the points of basing and construction of missile submarines, and also the destruction of the submarines at these points;

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--the searching out and destruction of missile submarines at the exits from bases, during sea passage, on the approaches to the launch positions, and in the area of launch positions (startovaya pozitsiya);

--frustrating and hampering the missile submarines in the use of their weapons;

--destruction of the forces and means of combat support of the missile submarines.

The experience of the past war testifies to the considerable effectiveness of strikes against the system of construction and basing of submarines. Thus, for example, despite several measures carried out by the German command to defend the points of construction and basing of submarines (construction at the shipyards of special concrete-covered shelters in which were carried out the construction and assembly of submarines, construction of shelters for the basing and repair of operating submarines, strengthening of the anti-aircraft defense of the points of construction and basing, etc.), submarine losses sustained by the former German fleet at bases were very substantial. Directly at bases, from the strikes of aviation, 63 submarines were lost, 150 submarines were lost in the process of construction -- at assembly yards, at outfitting yards, and in transport-- and 22 submarines were lost during trials and combat training. A total of 235 submarines were destroyed at bases, and in the process of construction and trials; this amounts to 25.2 percent of the total German submarine losses.

In addition, as a result of bomber strikes against German shipbuilding centers and other industrial enterprises cooperating with them, German submarine shipbuilding systematically failed to fulfil submarine construction plans. During the years of the war, this nonfulfilment reached 29.5 percent of the plan and amounted to 462 submarines. (See Causes of German Submarine Losses During Their Stay at Bases and in the Process of Construction and Combat Training, by A. L. Eifshits, published by the Naval Academy of Shipbuilding and Armaments i/n Krylov (VMAKV im. Krylova) in 1960.)

Thus, although the main German submarine losses were sustained during their conduct of combat operations at sea, even during the past war the tendency of a relative decrease

of submarine losses at sea and a relative increase of submarine losses at construction bases became evident. In a future nuclear/missile war this tendency probably will become more evident. With the appearance of atomic submarines possessing high maneuvering capabilities and great endurance, combat with them at sea has become much more difficult and complicated than in the past. The nature of probable operations of these submarines differs sharply from the nature of operations of submarines in past wars, when they were forced to approach vessels and ships to the range of a torpedo salvo because the basic mission of submarines was to destroy vessels and ships, i.e., the destruction of sea targets. In approaching the targets being attacked, submarines were forced to break through the line of protection, exposed themselves, underwent pursuit, and some of them were destroyed.

As has already been indicated above, atomic missile submarines have as their basic mission the destruction of important coastal targets. Therefore, one can anticipate that while bound for launch positions to fire ballistic missiles they will avoid meeting any vessels so that they will not be detected prematurely. If it is taken into consideration that the launch positions and the routes of movement to them can be situated in vast spaces of ocean in areas where the operations of our antisubmarine forces are hampered, then the advisability of delivering strikes against points of basing and construction of missile submarines, to destroy the latter before they put out to sea, becomes evident.

However, it is necessary to keep in mind that the goals of combat against missile submarines cannot be achieved completely by means of strikes against bases and construction points, because a large portion of the enemy submarines (according to American views, up to two thirds of the effective strength) always will be at sea. Therefore, despite all the complexity of its organization and the large economic expenditures, direct combat against enemy submarines at sea continues to remain one of the main methods of combat against missile submarines, along with their annihilation at bases and the destruction of shipbuilding centers.

The missions of destroying missile submarines at bases and destroying naval bases, shipbuilding, and missile-building

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plants, and also other important industrial enterprises cooperating with these plants, can be assigned to the missile troops. It is obvious that the operations of the missile troops in fulfilling these missions differ in no way in principle from operations to annihilate or destroy other important targets; therefore, they are not being examined in the present article.

With the present state of coastal missile weapons, the destruction of submarines at sea can be carried out only by the navy. Taking into consideration the complexity of combat against submarines at sea, let us examine in more detail the basic principles of the organization and conduct of combat operations to destroy submarines by naval forces.

In view of the fact that it is difficult or even impossible to distinguish missile submarines from submarines of other types at sea, combat against them will develop into combat against all submarines. It must be waged in vast areas of oceans and seas, including even Arctic areas. This combat demands a considerable quantity of forces and vigorous exertion of them. To destroy a missile submarine at sea or bar the use of its missile weapons against important coastal targets, it is necessary to detect the submarine even before the approach to launch positions and to concentrate antisubmarine forces for its pursuit and destruction in the area of detection. Of course, it is difficult to carry out a mission of this sort by haphazard operations of special naval antisubmarine forces without advance equipping of the sea (ocean) theater of military operations with various antisubmarine means.

We believe that combat against submarines at sea can be successful when the use of antisubmarine forces is supported by a previously prepared and continuously operating system of antisubmarine defense in the theater.

A continuously operating system of antisubmarine defense must be a set of measures for the special equipping of the theater and organizing the combat operations of naval forces directed toward combat against enemy submarines, and must include:

--stationary means and maneuvering forces used for anti-submarine observation and for warning about detected enemy submarines;

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--mine and net barriers, restricting the penetration of submarines into defended areas;

--antisubmarine forces used for seeking and destroying submarines on antisubmarine lines and in open areas of the sea, and also the means to control them.

Taking into consideration the threat of delivery of surprise concentrated strikes by missile submarines of the probable enemy which are continuously at sea, it is advisable to create and use a system of antisubmarine defense, of necessity, even in peacetime, like the system of anti-air defense of the country.

In our opinion, the makeup of the system of antisubmarine defense must conform to the following basic principles:

1. Antisubmarine defense in a theater should be created to a depth of not less than the firing range of ballistic missiles from enemy submarines against important operational-strategic objectives on the coast and in the depth of the territory of the country.

There is no doubt that the best system would be one operating within the limits of the entire theater right up to the exits from the points of basing of the enemy submarines. However, actual capabilities are inadequate to create such a complex system of antisubmarine defense (PLO) over the entire expanse of the seas and oceans. Therefore, we speak of a depth of not less than the range of fire of the ballistic missiles as the necessary minimum. On various axes of the theater, it is necessary to determine the depth of the antisubmarine defense on the basis of the military-geographic conditions, the location of objectives being defended, the degree of threat from enemy missile submarines, and the capabilities and performance characteristics (taktiko-tekhnicheskoye svoystvo) of the antisubmarine forces and means.

2. Antisubmarine defense in a theater should be echeloned; this is achieved by the organization on separate axes of a series of successive operations of antisubmarine forces on several lines (in several zones).

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This principle is necessitated by the impossibility of reliably accomplishing the mission of search and destruction of enemy submarines on one line and is directed toward the achievement of higher probabilities of destruction of enemy submarines.

3. The density of the antisubmarine forces and means comprising the system of antisubmarine defense should correspond to the degree of threat of enemy submarine operations from various axes, and also with the capabilities of antimissile defense on these axes because the security of targets being defended is ensured by the destruction not only of the submarine missile carriers, but also of the missiles themselves.

This principle conforms with the requirement of the optimum of the system of antisubmarine defense, i.e., the achievement of its maximum effectiveness, defined as the greatest probability of destruction of enemy submarines and the least damage inflicted on our coastal targets through the efficient disposition of antisubmarine stationary facilities and maneuvering forces in a theater.

4. Antisubmarine defense in a theater should possess high combat stability and constant readiness to repel a surprise attack of enemy submarines.

This is especially important for the initial period of a war, when the enemy will try to use simultaneously all of the strike forces of his fleet which have been deployed at sea beforehand to wage a nuclear attack.

The system of antisubmarine defense should be tied in with the reconnaissance and the patrol service and with the organization of observation in the theater as a whole, and also with the antiaircraft (antimissile) defense of the country.

Such are the basic principles for building a system of antisubmarine defense in a theater, and the observance of them, in our opinion, will ensure the success of operations of the naval forces for the destruction of enemy missile submarines at sea.

Who should exercise control over the system of anti-submarine defense in a theater?

There can be only one answer to that question -- the commander of a fleet, for only he has sufficient means available and is capable of resolving the entire group of problems connected with waging combat against submarines within the limits of a theater as a whole.

In accordance with possibilities for using various types of weapons by enemy submarines and the performance characteristics of antisubmarine forces and means, the search for and destruction of submarines at sea is organized into near and far zones of antisubmarine defense.

It is accepted practice to consider that the near zone of the antisubmarine defense will be established in the coastal part of a sea. The basic mission of antisubmarine forces operating in the near zone is to defend its lines of communication, vessels and ships at bases and points of dispersal, and coastal installations against action by enemy submarines.

The search for and destruction of submarines in the near zone is carried out by antisubmarine surface vessels, aircraft, and helicopters. Fixed antisubmarine means are also widely used for combating submarines in the near zone.

The far zone of the antisubmarine defense includes the water space from the outer limit of the near zone of the antisubmarine defense to the maximum possible distance away of the launching line for ballistic missiles from enemy submarines against the most important targets on the coast and in the depth of the territory of the country. The basic mission of the antisubmarine forces operating in the far zone of the antisubmarine defense is to bar strikes by enemy missile submarines against coastal installations.

The search for and destruction of missile submarines in the far zone of the antisubmarine defense is carried out by antisubmarine submarines, aircraft, helicopters, and surface vessels.

Antisubmarine submarines possess a number of positive characteristics: a considerable operating radius, great endurance, and the capability to operate under ice cover.

The antisubmarine submarines have means to detect enemy submarines and antisubmarine weapons to destroy them.

Such characteristics of atomic antisubmarine submarines as range of operation, endurance, and the capability of sailing under ice are practically unlimited and will depend mainly on the physical condition and morale of the crew and also on the presence of equipment for regeneration of the air. The range of operation and endurance of diesel-electric submarines are determined by fuel supplies, and their endurance and range of sailing under ice are determined by the capacity of their storage batteries.

The possibility of antisubmarine submarines' choosing sailing depth and low-noise speeds in a favorable hydrologic relationship contributes to more effective use of the hydroacoustic equipment for observation through the water medium and detection of submarines.

Surface antisubmarine vessels also have a number of favorable characteristics enabling them to wage combat against submarines both in near and far zones of the antisubmarine defense. Among such characteristics are the following:

- large sailing ranges and endurance;
- the capability of carrying out the search and pursuit of submarines under difficult hydrometeorological conditions;
- the availability of powerful antisubmarine weapons which, because of their weights and sizes, cannot be used by other arms of the forces;
- the opportunity to establish well-equipped command posts making it possible to control the heterogeneous antisubmarine forces directly at sea.

However, the combat use of antisubmarine surface vessels is hampered by a number of shortcomings. These shortcomings are: first of all, low combat capabilities to repel air attacks, and this makes it necessary to protect in a special way their stay at sea; less range of hydroacoustic detection in comparison with the hydroacoustic sets of submarines, and this reduces the effectiveness of

their search for submarines; and little concealment of the operations of antisubmarine surface vessels from enemy reconnaissance, and this facilitates the selection of axes of movement for submarines' breaking through.

Antisubmarine aviation, having available modern airplanes and helicopters of long and short range magnetometric and radio hydroacoustic means of observation through the water medium, and with special types of antisubmarine weapons is capable of waging effective combat against submarines at sea.

The favorable characteristics of antisubmarine aviation are:

--the capability of searching, in short periods of time, large spaces of the sea to the entire extent of possible use of missiles from submarines by the enemy;

--high readiness for operations and the capability of arriving in areas where submarines might be located in the shortest time;

--the potential for quickly concentrating the necessary number of airplanes and helicopters on the required axis of operations.

The shortcomings of antisubmarine aviation, hampering its combat use, include the following:

--dependence on meteorological conditions and the status of airfield basing;

--the relatively low endurance of airplanes (helicopters);

--limited potential for carrying out combat operations in Arctic areas.

Planning the operations of the forces of a fleet to destroy enemy submarines at sea is done by the staff of the fleet, taking into account the combat capabilities of the enemy submarines and its own forces, their operational and tactical characteristics, and also the possibilities of supporting combat operations, and the military-geographic conditions of the theater.

It is advisable to carry out combat operations to destroy enemy submarines at sea, particularly in the initial period of war, by enlisting the maximum possible quantity of anti-submarine forces and facilities of the fleet and also the ships and aviation of the maritime fleet, the fishing industry, and the Chief Directorate of the Northern Sea Route, which are capable of carrying out observation of enemy submarines. In the period preceding the initiation of combat operations, all of the forces mentioned should be deployed in the zone covered by the system of antisubmarine defense in the theater, beyond the limits of this zone on the approaches to the points of basing of the submarines of the probable enemy, and on the routes of their movement into areas of combat operations.

The great difficulty of operations of antisubmarine forces in a theater during a period of threat is that, not having the right to use their weapons, they are, in point of fact, deprived of the opportunity to prevent actively the deployment of missile submarines of the probable enemy to launch positions or, in general, to any areas of sea located beyond the limits of our territorial waters.

In our opinion, under these conditions the use of antisubmarine forces should be organized in the following manner: Before the signal of the beginning of military operations, antisubmarine forces operating beyond the limits of territorial waters establish observation of every detected submarine, information about which is transmitted from some groupings of forces, individual vessels (ships), and means of observation to others located on the path of the submarine's movement. Such escorting of detected submarines must be done without the use of weapons until the signal of the start of military operations or until the moment of use of weapons by enemy submarines against our antisubmarine forces. Upon receipt of the signal for the start of military operations, attacks against all detected submarines are carried out by those forces in whose area of operations they are located.

With the start of military operations it is advisable to carry out immediately the establishment of antisubmarine barriers in previously planned areas in which they could not

be established earlier because of peacetime conditions.

In our opinion, the sequence of operations of the antisubmarine forces to destroy submarines at sea is determined by the operational organization of the anti-submarine forces resulting from the decision of the commander of the fleet and depends on what area the initial detection of an enemy submarine is made in and what forces or means it is made by. By areas, the sequence of operations might be approximately the following:

Beyond the limits of the zones covered by an antisubmarine defense system, destruction of enemy submarines at sea must be carried out by our submarines deployed on approaches to the bases of enemy submarines, in remote areas of the sea, at exits from straits, and also on probable routes of movement of enemy submarines to launch positions.

Prior to the approach of enemy submarines to the anti-submarine lines and lines of observation, action against them can be carried out by our submarines deployed to fulfil other missions (operations against aircraft carrier strike forces and on the lines of communication) in areas through which pass the routes of movement of enemy submarines. In the operations of our antisubmarine forces in the Arctic, a systematic search for and destruction of enemy submarines must be carried out by atomic submarines under the ice and by antisubmarine aviation in open water areas in the ice (ledovoye razvodye) and in the open water areas beyond the landfast ice (zapripaynaya polynya).

With the approach of enemy submarines to the antisubmarine lines, antisubmarine submarines are moved to the sector of probable courses in accordance with information from reconnaissance and stationary means of observation. The antisubmarine submarines attack the enemy submarines in sequence and direct antisubmarine aviation and surface vessels against those submarines which have broken through into the depth of our defense. Aviation and antisubmarine surface vessels in tactical coordination carry out the search for and destruction of enemy submarines which have broken through within the limits of the areas assigned to them.

With the discovery of the axes of operations of the enemy submarines, a redeployment of forces ensuring a

1. The term antisubmarine line (protivolodochnyy rubezh) means an echeloned barrier of various fixed means and maneuvering antisubmarine forces, in relatively narrow axes of sea on probable routes of movement of enemy submarines.

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strengthening of efforts on the main axes should be carried out in the system of antisubmarine defense of the theater. In addition, in the areas of probable launch positions it is necessary to carry out systematically a search for enemy submarines which have broken through, with the goal of destroying them and hampering the use of their missiles.

The most crucial and difficult measure in combating submarines at sea is searching for them. There are various methods of operations of forces of a fleet in searching for enemy submarines. Specific selection of methods should be determined with consideration of the operational-combat capabilities of one's own forces and the enemy, the military-geographic features of the area of combat operations, its provision with antisubmarine barriers and stationary and drifting means of antisubmarine observation, and also the importance of the area in the over-all system of combating submarines in the theater.

In carrying out the search for and delivery of strikes against enemy submarines at sea, antisubmarine submarines can use the following methods;

--the position (pozitsionny) method (when carrying out independent operations on routes of passage of submarines through straits and narrows);

--the position-maneuvering (pozitsionno-manevrenny) method (when carrying out operations jointly with other forces and when operating on the basis of data on initial detection of enemy submarines from stationary means of observation);

--and the cruising (kreyserstvo) method (when carrying out independent operations in areas of possible positions, in a zone of pack ice, and on approaches to points where enemy missile submarines are based).

Antisubmarine submarines on position search the areas assigned to them, running at low-noise speeds at depths providing the greatest operating range for their hydroacoustic means of observation.

After detection of enemy submarines, antisubmarine

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submarines determine the elements of the enemy movement and maneuver to take favorable fire positions with speeds and depths ensuring advantage in the operating range of their hydroacoustic equipment. After the attack, depending on the results of the attack, the antisubmarine submarines either occupy positions for a repeated attack or continue searching. Later, at the first opportunity, these submarines report on the attack, its results, and the further movement of the enemy.

The basic method of operations of antisubmarine aviation for the destruction of enemy submarines is active search by groups of antisubmarine airplanes, either independently or on the basis of information of initial detection of submarines by other arms of forces or from stationary means of observation.

Operating independently in assigned areas or on lines, hunter-killer groups of antisubmarine aviation carry out the following:

--the laying of barriers of moored radio hydroacoustic buoys (radiogidroakusticheskiy yakornyy buy), set out in lines perpendicular to the probable axis of movement of enemy submarines;

--the laying in open areas of sea of drifting radio hydroacoustic buoys (radiogidroakusticheskiy dreyfuyushchiy buy) in the form of a zone of dense coverage (several parallel lines, in a circle or in a spiral), with the calculation of obtaining contact with a submarine at any point in the area of its assumed location;

--the laying of drifting radio hydroacoustic buoys in lines covering an area subject to search, with simultaneous search in the area with the aid of hydroacoustic sets lowered into the water by helicopters or of aerial magnetometric equipment (aeromagnetometrisheskaya apparatura).

In accomplishing the mission of search and destruction of submarines on the basis of data of initial detection by other forces, it is most advisable to lay intersecting barriers of several parallel lines of drifting radio hydroacoustic buoys in the sector of possible courses of submarines detected earlier.

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To reduce enemy counteraction against antisubmarine aviation, it is essential to choose, when possible, areas of its operation and flight routes to these areas which are outside the zone of operation of enemy fighter aviation. After detecting enemy submarines, aviation hunter-killer groups attack them, using antisubmarine aerial bombs with a special charge or antisubmarine aerial torpedos to destroy the submarines. Airplanes which have not discharged their weapon loads or antisubmarine surface vessels located in the waiting areas are directed against the undestroyed submarines.

The basic method of operations of antisubmarine surface vessels is carrying out the search for and destruction of submarines as components of vessel hunter-killer groups. Taking into account the high maneuvering capabilities of missile submarines and their advantages over surface vessels in range of detection by hydroacoustic means of observation, surface vessels should be used for searching for submarines jointly with airplanes of the antisubmarine aviation and helicopters which are components of hunter-killer groups and also independently on the basis of data of initial detection of submarines by other arms of forces or by the stationary means of antisubmarine observation. After detecting enemy submarines, the vessel hunter-killer groups carry out a number of successive attacks against the detected submarines, using rocket (reaktivnyy) depth charges, ordinary depth charges, and antisubmarine torpedoes.

The basic principle of the use of antisubmarine forces to destroy enemy submarines at sea is their joint operations, which make it possible to carry out combat missions more effectively. Joint operations can be carried out by groupings of antisubmarine forces with the following possible combinations of heterogeneous forces of the fleet:

- antisubmarine submarines and airplanes (helicopters);
- antisubmarine airplanes (helicopters) and surface vessels;
- antisubmarine submarines and surface vessels;
- antisubmarine submarines, airplanes (helicopters), and surface vessels.

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Coordination between antisubmarine submarines and antisubmarine aviation and also between antisubmarine submarines and surface vessels consists of agreement upon time and location of search for enemy submarines carried out by these forces independently within the limits of assigned lines (areas). Coordination is achieved through direction, by the combat fleet command post (BFKP) of the commander of the fleet, of antisubmarine aviation or surface vessels against enemy submarines detected and not destroyed by our antisubmarine submarines and through the designation of demarcation zones between areas of operations of various forces.

Coordination between antisubmarine aviation and surface vessels consists of agreement upon time and place of search efforts and attacks against enemy submarines carried out by vessels and airplanes (helicopters) independently or jointly. Coordination is achieved through direct mutual direction of vessels and airplanes and determination of the sequence of attack during joint operations or through direction of hunter-killer groups against enemy submarines by the combat fleet command post of the commander of the fleet during independent operations. Direction of vessels against detected submarines by airplanes can be carried out by radio information (radioinformatsiya) methods, radio homing (radioprivod), leading (lidirovaniye), and with the aid of visual signals. Direction of airplanes against detected submarines by vessels is carried out by issuing information on their own location and the bearing and range of the submarine.

Combat against enemy missile submarines does not amount only to operations for the direct destruction of the submarines themselves, the carriers of missile weapons. It is also necessary to strive for the creation of conditions which hamper the control of the submarines and their use of their weapons. This can be achieved by the following:

--destroying the coastal control points of the submarines, the transmitting and receiving radio centers with the goal of making it difficult for the enemy to control his submarines at sea;

--destroying or putting out of operation coastal systems of radio navigation and destroying satellite (sputnikovyy)

systems of navigation to make it difficult for enemy submarines to determine their position at sea and thus reduce the accuracy of their firing of ballistic missiles;

--radiocountermeasures (radioprotivodeystviye) against systems of control of missile weapons, radio navigation systems, and communications installations.

Preparing for an aggressive war against the USSR and the countries of the Socialist Camp, the military leadership of the United States began to devote great attention to the Arctic as a possible base of operations for a surprise nuclear attack. With this goal, the intensive study and mastery of the Arctic, primarily by atomic submarines, began. Thus, since October 1957, American atomic submarines have carried out a total of seven voyages, passing under the ice of the Central Arctic Basin by various routes. Considering the threat of the use of missile submarines from this axis, it is advisable to provide for the establishment of an anti-submarine defense in the Arctic areas.

Considerable influence on the organization of anti-submarine defense in the Arctic is exerted by its physical and geographic features. Bad meteorological conditions during the larger part of the year and ice cover hamper the use of antisubmarine forces, particularly aviation and surface vessels. Frequent magnetic and ionospheric disturbances complicate the organization of continuous 24-hour communications with antisubmarine forces. The presence of great depths, drifting icebergs, and the forward and rotating movement of icefields hinder the establishment of stationary systems of observation of submarines.

In addition to the measures enumerated earlier, the success of operations of the forces of the fleet for the destruction of enemy submarines in Arctic waters should be ensured by the following:

--use of antisubmarine submarines to search for and destroy enemy submarines under the ice;

--use of antisubmarine aviation to search for and destroy enemy submarines in open water areas in the ice and in the open water areas beyond landfast ice in areas of probable launch positions;

--establishment of antisubmarine barriers in straits and narrows on possible routes of penetration of submarines

into Arctic areas to launch positions;

--wide use for antisubmarine observation of ice hydroacoustic stations in a zone of pack ice, and cable-connected hydrophone lines (kabelno-gidrofonnaya liniya), coastal hydrophone stations (beregovaya shumopelengatornaya stantsiya), and stationary radio hydroacoustic buoys near the ice edge, together with the antisubmarine forces permanently located in these areas;

--continuous ice, hydrometeorological, and geophysical reconnaissance, making it possible to predict ice movement, hydrological characteristics, and the transmission of radio waves of various length, and in accordance with this to correct the system of antisubmarine observation, redistribute antisubmarine forces by areas, and ensure uninterrupted communications with them by the proper selection of frequencies;

--the establishment of far forward ice airfields and points of material-technical support, making it possible to carry out a broad maneuver by antisubmarine aviation in ice areas in accordance with the mobility of the ice and the presence of open water areas in the ice and open water areas beyond the landfast ice;

--the establishment on the Arctic islands of remote control posts (vynosnyy post upravleniya) for the anti-submarine forces and repeater centers of communications (repetichnyy uzel svyazi), ensuring the possibility of controlling forces directly in areas of combat operations.

As is generally known, since November 1960 one or two American missile submarines constantly patrol in the area of the Lofoten Islands near the coast of Norway. It should be expected that they can take up launch positions among the Norwegian fiords. Therefore, it is necessary to devote attention to the organization of combat against missile submarines with launch positions in fiord areas of the enemy seacoast. The location of these areas outside the limits of our antisubmarine observation, in a zone of powerful enemy antiaircraft and antisubmarine defense, and also the difficult navigational and hydrographic conditions for sailing, hamper the use of our antisubmarine forces directly among the fiords.

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To hinder or eliminate the operations of missile submarines in fiord areas, there can be carried out systematically the concentrated laying of antisubmarine mines, the destruction of the system of channels among the fiords, and the search for and destruction of enemy missile submarines at entrances to fiord areas and in open reaches. The success of combating missile submarines in a fiord area depends to a great extent on the organization of agent intelligence (agenturnaya razvedka) and radio intelligence (radiatorazvedka), which in this case partially perform the functions of antisubmarine observation.

Summing up this brief examination of the basic problems of organizing and waging combat against enemy missile submarines, it is possible to draw the following conclusions:

1. Combat against enemy missile submarines is an intricate complex of combat operations and measures carried out not only by the navy but also by the armed forces of the country as a whole.
2. Successful combat against missile submarines at sea requires the creation of special highly effective antisubmarine forces and means and the use of them in a quantity which ensures high probabilities of destruction of enemy submarines.
3. Despite the over-all complexity of combat against enemy missile submarines at sea, it can be sufficiently successful if there are the following: a system of anti-submarine defense previously deployed during peacetime, high combat readiness of antisubmarine forces, and mobile use of them during combat operations.