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## **TECHNICAL MEANS OF MATERIAL SUPPORT OF NATO AND THE POSSIBILITY OF THEIR USE IN THE ARCTIC**

**Abstract.** *In the development of advanced technical means, NATO military specialists prefer the modular principle of their creation. The main technical means of feeding NATO troops in the field are mobile kitchens placed on trailers, containers or other vehicles. In the us army, the main technical means of cooking for the period up to 2030 will remain mobile kitchen SK (Containerized Kitchen). It is designed to provide food for soldiers in the battalion (division). In the future, container kitchen SK will replace all existing outdated samples of field kitchens. For the organization of food of the military forces of special operations and teams "Stryker" mobile kitchen is used AK (Assault Kitchen). It is designed for cooking from collective rations UGR-H&s for company units (batteries). In the German army used mobile kitchen TFK 250. In France, a mobile kitchen SOFRAME ELC500R is used to provide food to units up to and including the battalion. Its equipment is placed in two containers. The main purpose of field mobile bakeries of NATO countries is the production of bakery products in the field. Mobile bakery company "Pavalie" (France) is designed to provide bread and confectionery population of small towns, large buildings and army units. Bakeries Mobile Bakery (USA) are made in containers of 20 and 40 feet and installed on cars. All of the processes associated with the bakery is fully automated. Mobile field bakery produced by Marshall Military Engineering Mobile Field Bakery system MFBS (UK) is designed for the preparation of 5,000 units of bakery products per day. For transportation and refueling of armored vehicles there is a tracked all - terrain vehicle Hagglund BV206-a vehicle designed specifically in Sweden for NATO countries. This all-terrain vehicle is fully adapted to the movement of the water. There is a tanker truck on the basis of a trailer using tanks made of composite materials, developed by THOMPSON (USA). All the above-mentioned technical means are capable of performing functional tasks on the continental part of the European theater. However, specially developed for use in Arctic conditions, technical means of material support is currently in the NATO no.*

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The Arctic region is becoming an arena of rivalry and clash of economic interests of Russia with a number of major and influential powers

of the world, primarily the Arctic countries of NATO – the United States of America, Canada, Norway and Denmark. The dispute over Arctic exploration for the North Atlantic bloc is a real prospect, which is confirmed by their intentions and specific activities, the main purpose of which is the desire to weaken and prevent the growing influence of Russia in the Arctic.

The NATO bloc in the Arctic sees Russia as a potential enemy. The main strategic goal of the Alliance is to counteract the growth of Russian influence in the Far North. Russia sees NATO as the most active, dominant player in the region.

We will analyze the technical means of material support of NATO countries with an assessment of the possibility of their use in the Arctic. The main technical means of the food service to feed the personnel of NATO troops in the field on TVD are mobile kitchens placed on trailers, containers or other vehicles [1-2].

In the ground forces (SV) of the United States, one of the largest technical means of food service for the period up to 2030 will be a mobile kitchen SK (Containerized Kitchen), designed to provide food to soldiers at the battalion level (division). It is planned that the SK container kitchen will replace all existing outdated samples of field kitchens in the future[3].

Kitchen-trailer MT (Mobile Kitchen Trailer) is designed to heat the collective rations UGRA and GR-H&S.

Currently, the supply comes mobile kitchen AK (Assault Kitchen), designed primarily for brigades "striker" and special operations forces. AK is used for cooking of collective rations UGR-H & S for divisions of level of a company / battery (Fig.1).



*Fig.1. Mobile kitchen AK*

In the period from 2020 to 2030 it is possible to enter into service mobile kitchen trailer VK (Battlefield Kitchen), destined to replace the MKT. The purpose of its development and creation is to reduce the damping characteristics due to the release of heat and the appearance of noise during operation [5, 6].

In Germany when you create a mobile kitchen FKH 900 paid attention to universalization, with the aim of ensuring the possibility of its

transportation by various means of transport. It also has a modular design. Thanks to this, the composition of the elements of the kitchen can be changed in accordance with the specifics of cooking in the consumer country. To provide power to the units of the link "company-battalion" in the army of Germany used mobile kitchen TFK 250 [5, 6].

In France to provide power units up to and including battalion used mobile kitchen SOFRAME ELC500R. Its equipment is housed in two containers.

Thus, in the armed forces of NATO power personnel outside the places of permanent deployment will be organized with the help of mobile kitchens that are placed on trailers or other mobile vehicles. The main purpose of the kitchens-heating collective rations, rarely-cooking from raw products. Western military experts in the field of material support of the main directions of improvement of mobile kitchens consider: reduction of their weight at the expense of reduction of component parts and application of lighter materials; use of the modular principle of construction; decrease of the demasking signs caused by release of heat and noise at work, power consumption, and also expansion of the menu of the offered diet. The above-mentioned technical means cannot be used in Arctic conditions due to their open placement on trailers and other non-heated and means of mobility.

The main purpose of mobile field bakeries NATO countries is the production of bakery products in the field.

Mobile bakery company "Pavalie" (France) is designed to provide bread and confectionery to the population of small towns, large buildings and army units. The bakery can be used in countries with any climate, while providing all the necessary conditions of service personnel due to the significant thermal insulation of the body and air conditioning. However, the basic chassis does not meet the conditions of the Arctic [4, 7].

Mobile Bakery bakeries are manufactured in 20 'and 40' containers and installed on vehicles. All cooking processes are fully automated. Electric energy is produced by the generator. There is a reservoir for water storage, as well as a container for storage of spare parts [4, 7].

Bakery Bongard in the container, with built-in diesel generator, capacity 1200 kg/day is made in a secure container with a hook. It can be transported by vehicles equipped with a platform for the transportation of 20 feet containers. It has retractable supports, allows you to organize baking bread in the field. Equipped with rotary kiln with diesel burner. The deployment time is 4 hours. Working staff - 2 skilled bakers, 2 auxiliary workers. Used by the army of France, Tunisia, China, has passed the successful operation of "desert Storm". However, the use in cold climates requires refinement of both the base chassis and the container to create a temperature not lower than 24C0 to ensure the production process of bread baking [4].

Mobile mini-bakery Bassanina Mobile bakery 2500, mounted on the basis of a semi-trailer Euro truck. Equipped with a full set of bakery equipment, bakery allows you to bake 865 kg of products for 8 hours and 2595 kg and with a three-shift operation [4, 7].

Bakery Container OZTI (USA) bakery is designed for baking bread from different varieties of flour in the field. Part bakery part of a mixer trailer, with the monorail frame, a dough dividing unit; two ovens on trailers; two power plants; the prover; two rack to cool and store the finished bread; two collapsible conveyor for feeding the bread to the racks and return the forms to the ovens; tools [4, 7].

Mobile field bakery production Marshall Military Engineering Mobile Field Bakery system MFBS (great Britain) is designed for the preparation of 5000 pieces of bakery products per day. It includes: two transformable container ISO 20 feet with the necessary equipment and diesel generator with power of 200 kW. Container version of the bakery allows transportation by all modes of transport. For the automated production of bakery products bakery is equipped with all necessary equipment [4, 7].

Autonomous mobile mini-bakery Bassanina Mobile bakery 2500 (Italy) is mounted on the basis of a semi-trailer. Capacity of mini-bakery-2600 kg per day [4].

Thus, the experience of operating the above-described mobile bakeries have shown that they are often used in the construction of large hydropower plants, in the areas of development of new deposits of oil, minerals and in the field of deployment of troops. The equipment of mobile bakeries works on many types of the energy carrier, however without essential design improvements of containers, processing equipment and the basic chassis practical use in the Arctic is impossible [4, 7].

In the NATO armies providing troops with fuels and lubricants paid special attention. For transportation and refueling of the car electronics there is a tracked all-terrain vehicle Hagglund BV206-a vehicle designed specifically in Sweden for NATO countries (Fig. 2, 3).



*Fig. 2. Crawler all-terrain vehicle Hagglungs BV206*

Tracked all-terrain vehicle BV-206 consists of two sections. The tractor body is made of fiberglass reinforced plastic, the rear cargo area is made of stainless steel. Low ground pressure enables the BV 206 to cope with a wide range of complex conditions. It is fully adapted to the movement in the water all- terrain vehicle, the speed on the water reaches 4.7 km / h [5].



*Fig. 3. Modernized tanker of aviation technology*

All-terrain vehicle BV-206 can operate in water terrain without preparation due to the rotation of the crawler tracks with a speed of 3 km/h For removal of penetrated into the housing through the damage and leakage of sea water with the bilge pumps with the capacity of approximately 60 l/min [6].

There is an autoloader on the basis of the trailer with use of tanks from composite materials developed by THOMPSON firm (USA) (Fig.4).



*Fig 4. Automatic fuel tanker on Thompson trailer chassis*

Comparative characteristics of domestic and foreign means of transportation and fuel filling show the main advantages of the tracked tanker GTMZ-14-DT. They consist in the fact that the capacity of the tank and the oil tank is several times higher than the existing analogues, the design of the two-link tracked tanker refuels equipment at all times of the year in remote areas in off-road conditions and underdeveloped road network at an ambient temperature of minus 50°C to plus 50°C, with the possibility of short-term work at maximum temperatures of minus 60°C

and plus 60°C, at a relative humidity of 98% at temperatures up to plus 25 °C [5-10].

Thus, the analysis of technical means of material support of the NATO bloc countries allowed to draw the following conclusions:

1. Technical means of cooking and baking bread include: basic chassis, insulated container or body-van for the installation of process equipment. The technical means specially developed for the Arctic are not accepted for supply at present and are not planned for the near future.

2. Technological equipment of mobile bakeries and kitchens works on many types of energy, but without significant design improvements of containers, the basic chassis and technological and special equipment practical use in the Arctic is impossible.

3. Technical means for the supply of drinking water and fuel filling equipment adapted to perform functional tasks in various conditions, including difficult road and climatic conditions. Their technological and special equipment allows to perform tasks for its functional purpose in normal conditions, but it is necessary to fulfill the requirements for trouble-free operation of process equipment in a particularly cold climate.

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