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DEVELOPING ARCTIC TECHNICAL MEANS OF MATERIAL SUPPORT

Abstract. *The Arctic region has traditionally been and remains in the sphere of special interests of the Russian Federation. Almost all aspects of national security are concentrated here: military-political, economic, technological, environmental and resource. In modern geopolitical conditions, as well as the active development of polar resources, the expansion of navigation along the Northern sea route and territorial disputes, the Arctic acquires a special status. The main goal of the state policy of the Russian Federation in the Arctic in the field of military security, protection and protection of the state border of the Russian Federation is to provide favorable conditions for the tasks of the personnel of the military units of the Russian armed forces. Based on the previous research, tactical and technical requirements and pilot tests, the article presents new Arctic technical means for material support of military personnel performing tasks in the Arctic: kitchen, bakery, tank, fuel tanker. As the base chassis used upgraded two-link crawler conveyor floating DT-30PM with an Autonomous power supply system (diesel power up to 100 kW) means of communication and navigation, as well as heating system thermally insulated compartments, as well as technological and other equipment. When designing these technical means were used advanced technologies and modern equipment, allowing to organize food, baking, transport and storage of drinking water, combustive-lubricating materials in the extremely low temperatures – to minus 60⁰C. Body power and process blocks are executed separately from the basic chassis (to enable transportation of products by all modes of transport) and have a removable roof (to allow Assembly and disassembly of the interior equipment). When designing products, the principle of modularity and unification was used, components and materials were used. The products are maximally unified among themselves in the part of: the base chassis; the bodies of the power and process units; an Autonomous power supply system, heating and lighting; automatic fire extinguishing systems. Technical means allow to carry out all tasks on material support of the military personnel in the Arctic conditions.*

Keyword: *Arctic, kitchen, bakery, tank, fuel.*

The task of the military security of the Russian Federation in the Arctic is to create a grouping of troops (forces) capable of performing the tasks required in difficult conditions: extreme natural and climatic factors;

focal character of economic and industrial development and the low population density; remoteness from major industrial centres, high resource intensity and material security of supplies from other regions of Russia; low stability of ecological systems, defining the biological balance and climate of the Earth [1].

For a comprehensive and complete financial security forces must be created in the Arctic perspective technical material support services tools to meet tactical and technical requirements and operating conditions.

In the far north of the region the most rational option of the vehicle used as a means of mobility, is steering tracked vehicle with best supporting patency and manoeuvrability (Fig. 1).



Fig. 1. Articulated tracked vehicles

Machines of this type can be used effectively as platforms for objects means mobility units. Technical means of material support services designed for organizations providing clothing and food, provision of fuel, oil and lubricants in the Arctic and other areas with harsh natural-climatic conditions. As the base of the chassis it is advisable to use the streamlined two-tier crawler transporter floating DT-30 pm with autonomous power supply (diesel power plant with a capacity of up to 100 kW), communications and navigation, as well as heated insulated compartments, as well as technological and other equipment [2].

When designing these technical means apply advanced technologies and up-to-date equipment to organize food, pastries, bread, transportation and storage of drinking water and petrol, oil and lubricants under conditions of extreme low temperatures up to minus 60 Celsius degree.

Each technical tools (products) includes a power and technology blocks. The power unit is mounted in the first link of the chassis fig. 2 [1], are on the first floor.

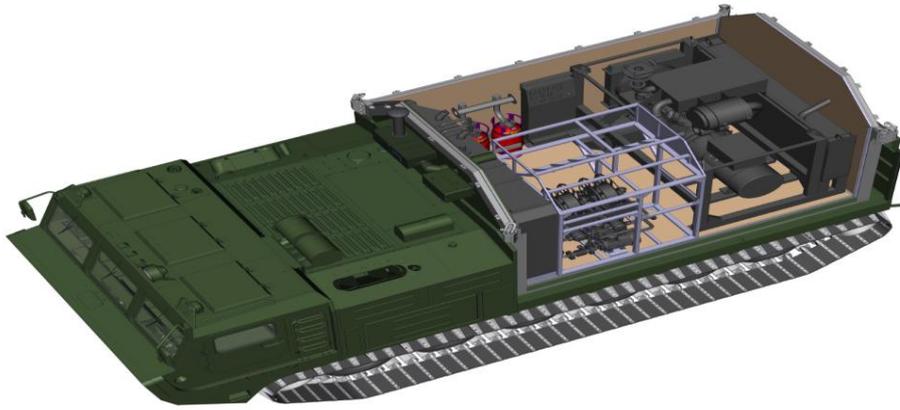


Fig. 2. Power unit Arctic technical means of material support services

Body power and technological blocks constructively implemented separately from the base chassis (to enable transportation of products by any means of transport) and have a removable roof (to allow for the Assembly and disassembly of the internal equipment). When designing products made of the principle of modularity and standardization. In the design of the products components and materials of domestic production. Maximum standardized products among themselves in part: base chassis; bodies of power and technological blocks; autonomous power systems, heating and lighting; automatic fire extinguishing system.

Power products Arctic technical means intended to provide technological unit and other equipment. The composition of the power bloc includes the first link base chassis with installed on it teploizolirovannym body power block hosts: main diesel power station (des) with a voltage of 380 v and a capacity of 100 kW; reserve DES voltage in 280 and power 5 kW; tank with diesel fuel (12:00 am working) for primary and backup DES; automatics systems major reserve DES; automatic fire-extinguishing system; heating and ventilation installation; elements of the lighting system.

Power block heater when driving and the parking lot is done using heating and ventilation installations. To ensure the required temperature modes of DES power block saloon is equipped with automatic shutters, providing a fence outside air and exhaust output to an external Wednesday.

The technological kitchen block Arctic Ka-250/r is designed for cooking, transportation and extradition of hot food from the first, second, third, dishes and boiled water in field conditions for 250 Pax. feeding (fig. 3).

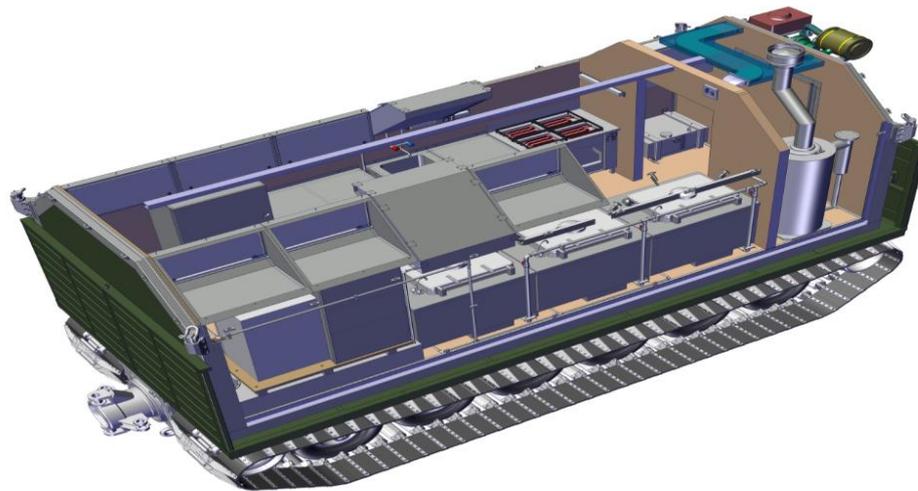


Fig. 3. The technological kitchen block Arctic Ka-250/r

The composition of the technological kitchen unit enters the second link DT-30 pm chassis with installed on it teploizolirovannym body of the technological block cuisine, hosts machines and technical equipment [3]: three boilers pishhevarochnyh on electrical and steam heating capacity 160 l each; electric cooker with grill Cabinet; water tanks; cabinets and tables for production; heating and ventilation installation; filtering and ventilating unit; fire extinguishing equipment; Maintenance Kit and other equipment.

In the vestibule of the technological block steam generator is designed to provide backup power boilers steam in case of failure of the main source of electricity.

Steam generator powered by diesel fuel without using electricity. Its performance allows you to ensure that all boilers.

Kitchen Arctic provides hot food 250 Pax. eating at ambient temperatures, typical of the Arctic zone.

The technological block bakeries Arctic/r 500-HPA is designed for the production of Tin rye-wheat and wheat bread under field conditions, the Arctic and other regions with particularly severe climatic conditions (fig. 4) [3].

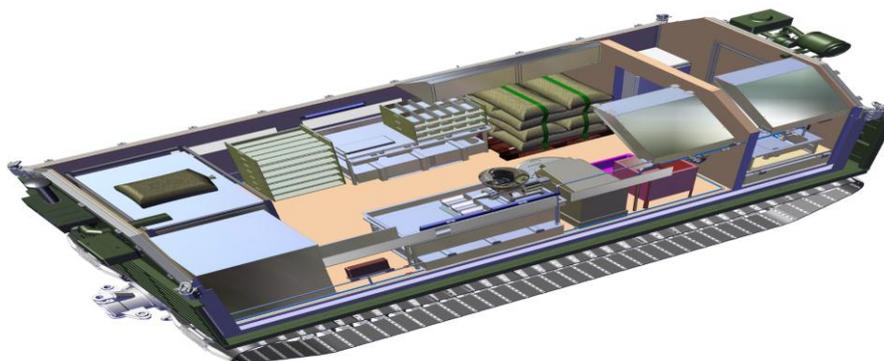


Fig. 4. Technology Unit bakeries Arctic HPA-500/r

The composition of the technological block bakeries 2nd includes Arctic chassis DT-30 pm on it teploizolirovannym and heated body

technological block hosts the main and auxiliary technological equipment: baking oven; Proofing Cabinet; proseivatelnj unit with dosing capacity; machine dough; dough divider; tables for production; water tanks; heating and ventilation installation; filtering and ventilating unit; fire extinguishing equipment; Maintenance Kit and other equipment.

Bakeshop Arctic/r 500-HPA will ensure production of 700 kg/day, bakery raw materials storage at ambient temperatures, typical of the Arctic zone.

Technological tank block Arctic SURF-10/r is designed for transportation, storage and delivery of drinking water in the face of the Arctic and other regions with particularly severe climatic conditions (fig. 5) [4].

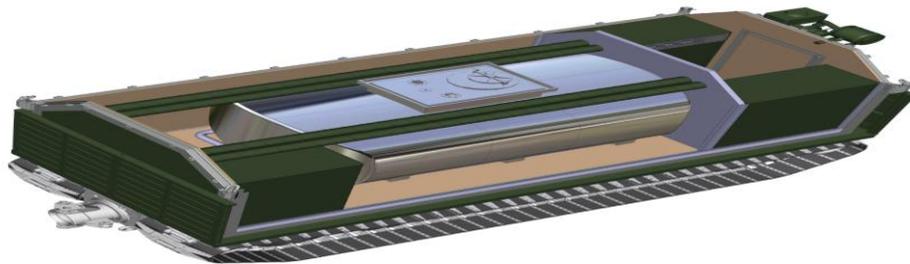


Fig. 5. Process unit tank Arctic CVA-10/30IIM

The technological unit of the tank Arctic includes a second link base chassis DT-30IIM mounted with a heat-insulated body of a process unit, which houses the main and auxiliary equipment: water tank capacity 10000 l; UV disinfection system water; technological equipment for distribution of water; pressure-suction hoses with quick release connecting devices; control modes of working operations; heating and ventilation installation; the filtering and ventilating unit; elements of the lighting system; primary fire extinguishing means; set of spare parts and other equipment.

A special feature of the Arctic tank is the use in its design of the system of ultraviolet disinfection of water, which significantly improves the sanitary and epidemiological characteristics of the quality of the issued water.

Tank Arctic OWL-10/30 p M provides the required level of technical characteristics, guaranteed transportation, storage, UV disinfection and delivery of 10,000 liters of water at ambient temperatures characteristic of the Arctic zone.

The technological block of the oil tanker GTMZ-14-30PM tracked fuel is intended for transportation, short-term storage, refueling with filtered fuel and oil of weapons and military equipment in the conditions of the Arctic zone and in other regions with particularly severe climatic conditions [5].

In the technological unit are: fuel tank; on-Board pump station with pipelines and valves; suction and transfer hoses; means of purification and

filtration of fuel; control and measuring devices; devices for control and accounting of fuel; means of control modes of operation; compressor unit with receiver; heating and ventilation installation; lighting system elements; primary fire extinguishing means; set of spare parts and other equipment.

Technological and special equipment is functionally and structurally placed in power and technological units. The technological unit of the tanker is placed in an unheated modified body of the second link of the base chassis, closed with a lightweight metal roof.

Power unit fuel lube uniform in composition with the power blocks, kitchens, bakeries, water cisterns, except that backup DES DC power of 5 kW, while the power unit is additionally introduced in equipment for storage and distribution of engine and transmission oils and a rack for containers of coolant.

The electric power supply of the heating system of the power unit during the movement and lighting systems is made from the onboard system of the basic chassis.

Thus, the implementation of technical solutions in the design of Arctic technical means of material support will ensure the guaranteed performance of functional tasks on material support services, and the used technological equipment - operation in conditions typical of particularly severe climatic regions of the North, Siberia, the Far East and the Arctic [7, 8].

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