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Defence Industry

Russia Supplies its Special-purpose vehicles to Azerbaijan

The Russian Company 'Ulyanovsk Automobile Plant' has concluded a contract for supply of 325 motor-cars to Azerbaijan.

Azerbaijan is buying UAZ-3962 ambulance vehicles, UAZ-Hunter off-road vehicles and UAZ-3303 all-wheel drive vehicles from the Russian enterprise. This year, a total of 415 vehicles have been supplied to Azerbaijan from Russia.

There are also plans to procure 450 KamAZ lorries in the near future.

Defence Industry

The Russian Army Has Completed the Trials of the BTR-90 Armoured Personnel Carrier

The Interdepartmental Committee of the Ministry of Defence of the Russian Federation has approved the results of the trials of the new-generation armoured personnel carrier designated GAZ-5912 (BTR-90).

The series production of the armoured personnel carriers (APC) will be carried out at the Arzamas Machine Building Plant (AMZ) which is a subsidiary of the GAZ Joint Stock Company. At present, the AMZ has started the procedures to enable the BTR-90 to enter service with the Armed Forces of the Russian Federation.

This enterprise has a long experience in producing armoured vehicles. It produced BTR-60s, BTR-70s and BTR-80s. The most interesting among the latest developments is the upgraded BTR-80A.

Development of the new 8x8 APC commenced early in the 1990s. The first prototype was tested in 1994.

The layout of the BTR-90 is identical to that of its predecessors BTR-80 and BTR-80A. The commander and the driver are positioned in the fore part of the hull, the two-man turret is located in the middle part of the hull with 8-person troop compartment being located behind the turret.

The BTR-90 is fitted with a multi-fuel liquid-cooled supercharged 500 hp diesel engine and a hydro-mechanical gearbox. The vehicle features an independent wheel suspension. The APC can move on a highway at a speed of up to 100 km/h. The speed when afloat is up to 9 km/h. The cruising distance is up to 700 km.

The main turret armament comprises a 30 mm 2A42 automatic gun. The auxiliary armament includes a 7.62 mm PKT coaxial machine gun, a 30 mm AG-17 grenade launcher and an anti-tank missile launcher.

According to the top managers of the plant, the latter is ready to commence the series production of the new vehicle.

Defence Industry

Turkey and Russia Have Good Prospects of Cooperation in the Defence Area

On 6 December, the Russian President Vladimir Putin made an official visit to Turkey. The visit procedures included a meeting of the Russian Federation's Minister of Defence Sergey Ivanov with official representatives of the Turkish ministry of Defence.

Both the presidents and the ministers of defence discussed the prospects of military and technical cooperation of the countries.

Vladimir Putin expressed his hope that Russian companies will be given in Turkey the same conditions as are given to other companies present in the market. Speaking on the matter, Mr. Putin mentioned the negative experience of Russia's participation in the tender for supply of helicopters.

Up to the present, despite a huge potential, the relations of the two countries in this field has been almost equal to zero.

As a matter of fact, Turkey has had good opportunities to get to know the capabilities of the military equipment produced in Russia and other former Soviet republics, in particular, during the trials of the above-mentioned helicopter as well as the comparative evaluation trials under the Turkish Main Battle Tank Project, the participants of which included Ukraine.

Turkey has several dozens BTR-80 series armoured personnel carriers, although they are in service not with the Army, but with the Gendarmerie. But the opinion of the latter about the BTR-80 is definitely positive.

Defence Industry

Meggitt is Buying the Schreider Canada Company

The American California-based company Meggitt Defense Systems (which is a part of the British Meggitt PLC) has bought the Canada-based Schreiner Canada company for $5.3 million.

Meggitt Defence Systems (MDS) is an international company with representative offices in more than 50 countries. The company specialises in development, production and operation of special-purpose equipment, such as targets (and relevant support equipment) for aircraft and ground vehicles, as well as remote-controlled vehicles.

Before being sold, the Schreiner Canada company had been involved in the same kind of activities, and, according to representatives of Meggitt, in the year 2003 Schreiner sold various products for a total amount of $7.4 million.

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Defence Industry

India aspires to modernise its T-72 MBTs

In 1997, the Indian Land Forces filed a request for modernisation of 1500 T-72 MBTs. In the year 2001, the Ministry of Defence tokk a decision to carry out the modernisation in batches. The first batch consisting of 300 T-72s are to be modernised by the year 2007.

The modernisation, as planned, will cover all the main characteristics of the tank. The cost of modernisation of one tank may be above 1.5 million dollars.

Many leading companies of the world have sent their proposals. By the time being, the preliminary trials have been carried out in India with the so-called 'narrowed-down' list of contenders being determined. For examples, the thermal imaging system to be used might be the French Thales-developed Catherine-FC thermal viewer or the Matis thermal viewer developed by the Sagem company, also in France. Radio equipment has been offered by the British BAE Systems company and the Electro-Optics Industries Ltd of Israel, while the contenders for supply of navigation equipment include the Israel Aircraft Industries Ltd and the German LITEF company.

The final stage of the trials is to be carried out at the beginning of the next year.

By the time being, India has only taken its decision as to the power pack. Earlier this year, three-month-long evaluation trials have been carried out (the participants included five T-72 tanks fitted with upgraded V12 engines developed by the Indian State-owned Company Heavy Vehicles Factory, and five T-72 tanks fitted with Russian 840 hp V-84MS engines which are similar to those installed in the T-90S tanks). The trials showed clearly that, under desert conditions, the Indian engines got overheated and suffered a loss of performance. As a result, the V-84MS engines have been selected.

The Indian Ministry of Defence has announced that representatives of the LandForces Headquarters are holding negotiations with the Russian Rosoboronexport company on the matter of concluding a contract for procurement of the tank diesel engines. The constract may be signed by the end of this year. The V-84MS engines will be installed in the first 300 out of 1,500 T-72s which are to be modernised by the decision of the Land Forces Headquarters. The preparation for the signing of the tank engine supply constract is almost completed, with a decision on the prices still pending.

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Defence Industry

Russian Motor-cars in Africa

Two Russian companies, which are involved in the production of military motor-cars, viz. UAZ and KamAZ, have carried out a presentation of their products in Nairobi, the capital of Kenya.

Up to the present, the military of Kenya, as well as other countries of West Africa, have been buying motor-cars for military applications mostly in Great Britain. Nowadays Russia has also decided to struggle for this market. In particular, the KamAZ company is attempting to get the contract for supply of 400 lorries to the Kenyan Armed Forces.

In Nairobi, the Russmotors Limited company established a regional office to promote Russian-produced motor-cars. The activities of this office are to cover not only Kenya, but also Ethiopia, Tanzania, Sudan, and the Democratic Republic of Kongo.

The UAZ and KamAZ enterprises started a campaign to promote their products in East Africa. Recently, the representatives of the UAZ and the KamAZ carried out a presentation of their motor-cars, both proven and newly-designed vehicles, in the capital of Kenya.

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Defence Industry

Germany Has Increased its Arms Export

According to the results of 2004, the export of arms and military equipment from Germany has increased four times as much in compared with the previous year.

According to the report of Mr. Wolfgang Clement, Minister of Economy and Labour of the Federal Republic of Germany (FRG), in the year 2004 the scope of export in the defence field has reached the value of 1.3 billion euro, while in 2003 the figure was just 318 million.

In this parameter, Germany takes the sixth place in the world after USA, Great Britain, Russia, Ukraine and France. And this has occurred despite the fact that the dollar has been getting weaker against the euro, which is to have a negative effect on the competitiveness of European-produced goods in the international market. Besides, the arms sale restrictions in Germany are the severest in the world.

The above increase has been quite an achievement for

the FRG, which nowadays has become Number One supplier of armoured vehicles for Europe and the trendsetter in this field.

One can see a thought-out approach to the sales. In connection with the stabilisation of the situation in Europe and enlargement of NATO, Germany withdraws from service a large number of battle tanks and sells them at a considerably lowered price (or sometimes Germany gives it out free of charge). In so doing, the country that receives such a 'present', becomes a permanent client of German suppliers of spares, with auxiliary vehicles having to be bought also in Germany.

The countries that received Leopard 2s, such as Greece, are interested in equipping their military units with up-to-date infantry fighting vehicles (IFV) to support tanks. And the most probable supplier of these is also Germany which offers its surplus Marder IFVs.

Defence Industry

Military and Technical Cooperation of Pakistan and USA

The United States and Pakistan have reached and agreement about supply of weapons to Pakistan for the total amount of $1.2 billion.

It is envisaged that Pakistan will receive 2,000 anti-tank guided missiles, electronic intelligence aircraft and other equipment.

Sheikh Rashid Ahmed, Pakistan's Minister of Information, has reportedly said that this step will enhance the defence potential of Pakistan, but it will pose no threat to the neighbouring countries, in particular, India. However, the Indian Ministry of Foreign Affairs has expressed its concerns related to this arms supply and has informed the USA about these concerns.

Supplies of weapons from the United States to Pakistan have become possible after the lifting of the embargo imposed against this country after it had carried out nuclear tests. The lifting of the embargo has been caused by the support rendered by Pakistan to the actions of the coalition forces in their fight against Taliban and Al-Qaeda.

Defence Industry

Austria to Purchase Mobile Air-Transportable Dingo 2 Vehicles

Austria has placed an order with the German company Krauss-Maffei Wegmann for twenty 4x4 armoured cars designated Dingo 2. This deal is the first export order of these new vehicles.

Earlier, the German Army ordered 147 Dingo armoured cars to establish three military units. The vehicles already took part in operations in Afghanistan as well as Bosnia and Herzegovina.

The Dingo 2 is a high mobility vehicle based on the 'of-the-shelf' chassis Unimog Model U5000, which is produced by another German company, Mercedes-Benz. According to the Krauss-Maffei Wegmann company, the vehicle has a high degree of protection against small arms fire, artillery shrapnel and splinters as well as anti-personnel and anti-tank mines.

The Dingo 2 can be transported by NATO-standard aircraft C-130. Besides, it can be transported as suspended under the belly of the CH-47D Chinook helicopter.

The vehicle can accommodate 8 infantry soldiers, fully equipped. It can move on hard-surface roads at speeds of up to 90 km/h with the fuel distance being 1,000 km.

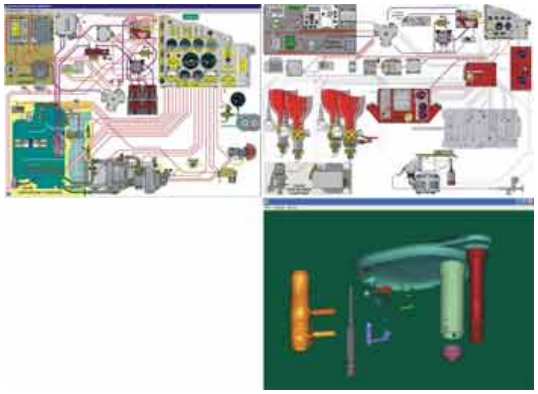
The vehicle is fitted with an air-conditioning system and an engine-independent heater, brake anti-locking system, rear view camera, GPS-based navigation system, modern external and internal communications system as well as collective NBC protection system.

Apart from the capability to act as an armoured personnel carrier, the vehicle can be used for fulfilment of special missions, such as intelligence, command and fire support. The German Army requires around 1,600 vehicle of this class, 52 of which have already been delivered. Dingo 2 licensed production rights have already been acquired by the American Textron Marine and Land Systems company, which is going to produce it within the framework of the US programme 'Foreign Military Sales'.

In December 2004 Austria received the first Dingo 2 vehicle. The remainder (19 vehicles) will be supplied during the year 2005.

Training And Simulators

Principles of Design of the Fighting Vehicle Crew Training Aids



The latest years have seen a considerable increase

in the use of computer-based equipment for training of the personnel of the Land Army, Navy, Air Force and Air Defence Force. Based on the gained experience, one can determine the most popular hierarchic structure of computer-based armoured vehicle crew training aids as well as the general principles of their design.

The computer-based armoured vehicle crew training aids can be divided in the following groups:

- Technical training aids: training software, video films, operating training models.
- Individual crewman combat training aids: various complexity level simulators (tabletop, static and motion-based simulators).
- Armoured vehicle crew teamwork training aids: individual crewman combat training aids united into an integrated armoured vehicle crew training simulator.
- Armoured vehicle-based military unit combat interaction training aids: vehicle crew training simulators united into one network to enable combat cooperation on a simulated range.
- Inter-unit combat cooperation training aids to enable joint actions on a simulated range.
- Strategic inter-branch cooperation training aids.

Development, production and introduction of the simulators into the army is intended to achieve the following:

- to increase the combat capabilities of the crews due to the increase of training time, variety of simulated combat situations on digital maps of terrain (both imaginary and based on a real terrain), increase of the number of trainees (ranging from ordinary soldiers to those who occupy pinnacles positions in the army) involved in the training, practise of teamwork within the crew, unit, between units and between branches;
- to carry out crew training under the conditions which cannot be arranged with the aid of real vehicles (e.g., conditions of use of mass destruction weapons, use of vehicles in urban environment among the civil population);
- to considerably reduce the cost of training due to the savings of fuel and service life of combat vehicles and equipment.

The wide use of computer-based simulators is caused by the fact that the up-to-date computers have become more or less inexpensive, and that the technical characteristics of computers make it possible to simulate real conditions rather realistically, and that the pay-back of the most expensive simulators (e.g., motion-based computer-based simulating systems) can achieved, depending on the intensity of operation, within 6 to 12 months.

Technical Training Aids

The training software composed on the principles of two-dimensional animation is efficient both in individual training in computerised class-rooms and in group training in the process of lecturing. The animated image provides a visual demonstration of the principle of operation of armoured vehicle systems by means of simulating their operation.

The training software composed on the principles of three-dimensional animation, and the training video films provide theoretical knowledge of the design and technical maintenance of units and systems of armoured vehicles.

The practical skills in technical maintenance of units and systems of armoured vehicles can be acquired by trainees on operating training models which provide a full-scale simulation of the units and systems being studied.

Individual Crewman Combat Training Aids

The individual crewman combat training aids include various complexity level simulators, viz. motion-based, static and tabletop simulators. The most efficient individual combat training aids are motion-based training simulators, the static and tabletop simulators being just their less complicated and less expensive versions. The latter are intended to develop skills in operating separate instruments (e.g., sights) being placed on a tabletop, or to further develop sensomotive skills in the static version.

The motion-based armoured vehicle crewman training simulators are based on the same principle and consist of the following main components:

- motion platform with a control system;
- cabin containing a crewman station;
- software with mathematical models;
- visualisation system;
- instructor's station.

The motion platforms can be provided with either electromechanical or hydraulic drives. A number of well-known producers, including Krauss Maffei Wegmann of Germany, Lockheed Martin of the USA, Thales Training & Simulation of France, use platforms with hydraulic drives for their simulators. Many of them are two-level ('two-storey') ones:

- the first level ('storey'): motion drive
- he second level ('storey'): crewman's cabin

This approach is caused mostly by the continuity and commonality with the aviation simulators that started to be produced much earlier.

The Ukrainian developer of simulators – State-owned Enterprise Kharkiv Morozov Machine Building Design Bureau, as well as some other developers, use electromechanical drives in their motion platforms. The advantages of the electromechanical drive over the hydraulic drive are as follows:

- small overall dimensions
- higher efficiency
- higher safety and reliability

A motion platform is usually multi-purpose and can be used for installation of any cabin containing a crewman station provided the cabin does not exceed the maximum admissible overall dimensions.

Cabin Containing a Crewman Station

The observation and sighting devices, control panels and controls of the simulator are identical to those of a real vehicle, and are connected with the mathematical models of armoured vehicles by means of interface devices which can be of distributive or unitary type.

The distributive type of interface device is a set of processor units fitted with a required number of analogue and discrete inputs and outputs. Each processor unit is individually built into a sight, control panel and other devices and is united by means of CAN–type interface to other units to crate a network.

This version has good characteristics, but it is more expensive than the unitary-type version. The unitary interface device is a single processor unit fitted with a required number of analogue and discrete inputs and outputs. This unit receives all signals from all the devices located at a crewman station. The unitary interface unit can be either external or built-in.

The external interface unit is admissible for static and tabletop simulators. It can be located outside the cabin. However, the external interface is not admissible for motion-based simulators because of the low reliability of the moving joint of the cable if the number of signal is large.

The built-in unitary interface unit is the best option regarding the issues of price, quality and reliability. The interface unit of the kind is installed inside the cabin and is connected to the computer that computes the models of vehicle movement, by means of a Ethernet-cable. In this case, the high reliability is ensured.

The software comprises the whole spectrum of mathematical models ranging from the simplest logical models to the complicated models of engine and vehicle movement. The mathematical models that are used in up-to-date simulators, make it possible to realistically simulate various processes, such as engine starting, vehicle movement on various types o ground, target ranging, operation of the armament stabiliser, auto-loader and ballistic computer, engagement of targets by means of various natures of ammunition, etc. Some mathematical models are matched with visualisation system and carry out computation of collisions with obstacles.

The visualisation system makes it possible to display realistic three-dimensional terrain models, which are built on the basis of real digital maps, with simulation of terrain surface details, stones, grass, bushes, trees, and buildings. Visualisation makes it possible to place a large number of various types of targets on the terrain, with the virtual appearance and dimensions of the targets being matched to the real targets, as well as to display weather conditions (rain, snow, fog) and various time of the day (day, night) and various seasons (summer, autumn, winter, spring).

The instructor's station enables its operator to pre-set the initial conditions (weather conditions, season time of the day), to monitor the sequence and correctness of actions of trainees at signals displayed on the monitor. The software of the computer that ensures operability of the instructor's station, makes it possible to record the actions of a trainee with the possibility of subsequent re-display and printing-out of the examination sheet.

To monitor the actions of a trainee, the simulator cabin can be fitted with and video observation camera. The field of view of the camera is displayed at the instructor's station.

Armoured Vehicle Crew Teamwork Training Aids

The aids of the kind include crew training simulators which are created by means of uniting the individual combat training aids (particular crewman training simulators) into a network. In this case a crew of a vehicle as a whole (tank crew, or armoured personnel carrier crew, etc.) is trained on a simulated battlefield to become a well-trained crew.

The simulator of the kind makes it possible to increase the efficiency of crew teamwork under the conditions that similar to combat ones, to practise interaction both within the crew and with the superior commander (in this

case the instructor acts as a superior commander).

On the simulated battlefield, the crew can get involved in duel-type engagements with both simulated enemy that can return fire and with the crew of another armoured vehicle simulator connected to the same simulated battlefield. The latter is a step towards the next level of interaction training aids, viz. military unit combat interaction training simulators and inter-unit combat cooperation training simulators.

Armoured Vehicle-based Military Unit Combat Interaction Training Aids and Inter-unit Combat Cooperation Training Aids

The armoured vehicle crew training simulators can be united into a network to carry out joint actions in one simulated battlefield, whatever the skills to be trained are (tactical cooperation training, column driving training, joint actions on simulated terrain that is similar to a would-be real battlefield or to a real training range). The hierarchy of this network of simulators is only limited by the financial capabilities of the customer (it may be tank platoon training simulator, or tank company training simulator, or tank battalion training simulator).

Strategic Inter-branch Cooperation Training Aids

The simulators of the kind are intended for senior commanding officers, staff officers, etc., and are analogues of on-line strategy computer games.

The training aids in question are based of digital maps of real terrain provided with a database containing information about the military, economic and political potential of a particular region.

To arrange training of commanding officers, the NATO countries established special computer centres, which make it possible to carry out headquarters (staff) exercises inside the country and international exercises. One of the considerable disadvantages of such a training consists in the lack of involvement of rank and files that are supposed to do the actual fighting in combat.

In order to eliminate the above- mentioned drawback, it is expedient to involve the rank and file as well as junior level commanders and various afore-mentioned simulators in this kind of training. It is quite probable that, in future, the development of computer-based training aids will go along the lines of uniting the simulators of various levels into one hierarchical structure.

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Defence Industry

Russia's Arms Export Scope Keeps Increasing

According to the preliminary results of Russia's defence export efforts during the year 2004, the total scope of defence export amounted to $5.6-5.7 billion, which shows an increase by 200-300 million if compared with the year 2003.

This progress was achieved due to enlargement of the markets in North Africa and on the Arabian peninsula. It

is worth while mentioning that the afore-mentioned high results were achieved despite the gradual exhaustion of the Soviet technological margin.

In general, in 2004 the structure of defence export was traditional as to its nomenclature and geography.

As in the previous years, almost half of the export consisted of supplies of aviation-related weapons and equipment. In so doing, the lion's share of this consisted in deliveries of Su-30 series aircraft.

The largest supplies in the naval armament field included the hand-over of a submarine under the contract signed in 2002, which envisaged deliveries of a total of 8 submarines to China, and supply of a new frigate to India and a hovering craft to Greece.

In 2004, four battalions of S-300PMU1 air defence systems were handed over to China.

The exported land weapons systems included 17 BMP-3 infantry fighting vehicles and anti-tank missile systems supplied to South Korea and a batch of 50 BMP-2 infantry fighting vehicles supplied to Yemen (under a contract envisaging supply of 180 BMP-2s). The same year saw completion of the contract for supply of 310 T-90S tanks to India.

China and India still remain the main buyers of Russian weapons. More or less large supplies were carried out to Greece, Vietnam, Yemen and Sudan.

90% of the Russia's defence export was carried out by the State-owned Enterprise Rosoboronexport. Apart from it, weapons were exported by the Tula Instrument Design Bureau (mostly Kornet-E anti-tank missile systems) and some other specialised enterprises.

In 2004, the Rosoboronexport signed a number of contracts for a total amount of $5.5 billion. As a result, this company's portfolio of defence-related orders amounted to $12 billion.