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Sławomir Kułakowski

Born on May 31st, 1952 in Jelenia Góra. Graduated from the Faculty of Law and Administration of the Nicolaus Copernicus University (1975), Reserve Officers School (1976) and Postgraduate Studies at the General Staff Academy (1989). Reserve colonel. Held many important functions in the institutions of the Ministry of National Defence (1976-1992 and 1996-98). Between 1992-1996 served as adviser of the head of the National Security Bureau at the President of Poland Office for Economy and Defence Affairs. President of the Polish Chamber of National Defence since 2001.

Ladies and Gentlemen

Every company, especially operating in the armaments sector, is trying to cope with the dynamic changes and challenges brought by today's constant development.

One of the areas that the defence equipment manufacturers are currently focused on are new technologies allowing not only to cut costs, but also increase productivity. In a wider perspective, Polish producers create innovative solutions through research and new technologies – they introduce new products, services or even business collaboration models.

The wide range of possibilities offered by Polish manufacturers and the highest quality of their products provides customers with a full range of solutions and services tailored to the current and future needs of the dynamically growing army.

Polish defence industry products are still actively used. They meet the needs of our troops, not only in the country but also in different parts of the world where they serve. This is the best proof that the quality of equipment produced in Poland is very high.

In this edition of our Polish Chamber of National Defence Magazine, we wish to share examples of first-class solutions, characterized by excellent quality and durability.

I wish you an enjoyable read,

Sławomir Kułakowski

President of the Polish Chamber of National

Polish Chamber of National Defence Manufacturers



On the 11th September of 1995 a constituent meeting was held, at which, a resolution to establish the chamber, initiated by the representatives of the Polish defence industry, has been adopted. A temporary management and an auditing committee has been elected by the representatives of the 67 founders, in the presence of General Henryk Mika from the Ministry of Defence and the Colonel. Sławomir Kułakowski from the National Security Bureau.

During the past 10 years, the Chamber has been initiating activities to advance the technical level and product quality for the national defence, promoted the cooperative relations, inspired projects which led to an increase in the production for the domestic and foreign markets, as well as has inspired and supported the restructuring and modernization of the Polish industry while preparing its integration with the European structures.

During that period, the organization of trainings for the representatives of the Polish industry and the facilitation of foreign contacts has been a significant element of the Chamber's activity. Besides the above, it has organized experience exchange within the areas of technical, organizational and trade solutions.

DURING THE PAST 10 YEARS, THE CHAMBER HAS BEEN INITIATING ACTIVITIES TO ADVANCE THE TECHNICAL LEVEL AND PRODUCT QUALITY FOR THE NATIONAL DEFENCE

Since 1998, the Chamber has been a co-organizer of the BALT MILITARY EXPO exhibition in Gdansk, and has co-organized the "Cto i Granica" (Border and Customs) Fair in Warsaw since 2004. In 2000, the Chamber has initiated and coordinated the Polish Defence Industry Days in Lithuania, during which, the associated companies have handed over equipment worth approximately 4 million Zloty, including the Chamber's contribution of 700 000 Zloty, to the Lithuanian part of the LITPOLBAT battalion. In 1998, the Chamber has been assigned to represent the Polish defence industry at the NATO Industrial Advisory Group (NIAG), and since December of 2000 it has actively taken part in the meetings of the Group.

In 1999, the Chamber initiated an industrial cooperation within the Visegrad Group. Two editions of the Polish and Czech defence industries were organized (1999 and 2001), I Visegrad Group Defence Industries Forum (2001) in Warsaw, II Forum (2002) in Trenczyn and III Forum (2004) in Warsaw.

In Poland, in addition to the agreement on cooperation with the Ministry of National Defence (12.08.1999), the Chamber signed cooperation agreements with the Army Workers Trade Union (1997), "Solidarity" National Section of Defence Industry (1998), Polish-Arab Chamber of Commerce (2004), National Association of Equipment Manufacturers (1999) and the Employers' Association of Defence and Aviation Industry Enterprises (2003).

In 1999, the Chamber issued the only catalogue of the Polish defence industry. In 1996 the Chamber started issuing the BULLETIN OF THE CHAMBER. In 2003 the Chamber started publishing a bi-monthly POLISH DEFENCE INDUSTRY (in English), and a quarterly ECONOMIC – DEFENCE REVIEW in 2005.

Currently, the Chamber associates 147 public and private enterprises. These include market leaders such as BUMAR Sp. z o.o., the Polskie Zakłady Lotnicze Sp. z o.o. (Polish Aviation Works), Stalowa Wola S.A., MESKO S.A. and RADWAR as well as small businesses and private companies.

POLAND

POLAND IS THE LARGEST OF THE EAST EUROPEAN COUNTRIES WHICH JOINED THE EU IN MAY 2004. POLAND IS COMPARABLE IN SIZE TO ITALY OR GERMANY (IN USA LARGER THAN NEW MEXICO) AND WITH A POPULATION OF APPROXIMATELY 39 MILLION (E.G. MORE THAN CALIFORNIA) IT RANKS AMONG THE MOST INFLUENTIAL AND REMARKABLE COUNTRIES IN CENTRAL AND EASTERN EUROPE. POLAND IS A STABLE DEMOCRACY WITH A TRULY FASCINATING HISTORY, GREAT CULTURAL HERITAGE AND SEVERAL AREAS OF OUTSTANDING NATURAL BEAUTY.



PARTICIPATION IN PEACEKEEPING MISSIONS

From the initiative of the United Nations and other international organizations, activities are carried out to maintain peace and prevent armed conflicts in the world. Poland has been participating in peacekeeping missions and operations since 1953.

Between 1953 and 2009, Polish soldiers and civilian employees of the army participated in 83 peacekeeping missions and operations, 35 of them were organized under the auspices of the United Nations. The total number of professional soldiers, compulsory military service soldiers, extended military service soldiers, and civilian employees of the army that took part in the missions and operations amounted to 90,234 thousand.

In 2009, Poland took part in 9 (continuing and new) peacekeeping missions and operations.

Of the 7,138 people delegated in 2009 to serve in peacekeeping missions, 6,606 professional soldiers, 362 – compulsory military service and extended military service soldiers and 170 – civilian employees of the army.

In addition, from 2003 to 31 October 2008, Poland was part of the International Stabilisation Force in Iraq. During this period, the Polish Military Contingent (a total of 10 shifts) amounted to 15,839 people, including 13,260 professional soldiers and 2,154 compulsory military service and extended military service soldiers and 425 civilian workers.

| POPULATION IN COMPARISON | | |
|--------------------------|------------------|------------------|
| RANK (IN THE WORLD) | EUROPEAN COUNTRY | POPULATION (mln) |
| 1 (12) | Germany | 82.1 |
| 2 (20) | France | 58.9 |
| 3 (21) | Great Britain | 58.7 |
| 4 (22) | Italy | 57.3 |
| 5 (23) | Ukraine | 50.7 |
| 6 (29) | Spain | 39.6 |
| 7 (30) | Poland | 38.7 |
| 8 (44) | Romania | 22.4 |
| 9 (56) | Netherlands | 15.7 |
| 10 (70) | Greece | 10.4 |

| SIZE IN COMPARISON | | |
|---------------------|------------------|-------------------------------|
| RANK (IN THE WORLD) | EUROPEAN COUNTRY | POPULATION (km ²) |
| 1 (43) | Ukraine | 603 700 |
| 2 (47) | France | 543 958 |
| 3 (50) | Spain | 505 992 |
| 4 (54) | Sweden | 446 964 |
| 5 (61) | Germany | 357 022 |
| 6 (63) | Finland | 338 145 |
| 7 (66) | Norway | 323 877 |
| 8 (67) | Poland | 312 658 |
| 9 (69) | Italy | 301 268 |
| 10 (76) | Great Britain | 244 100 |

MEMBERSHIP IN MAJOR INTERNATIONAL ORGANIZATIONS

- European Union
- United Nations
- Council of Baltic Sea States
- Central European Free Trade Agreement
- International Monetary Fund
- United Nations Educational, Scientific and Cultural Organization
- United Nations Children's Fund
- World Health Organization
- World Trade Organization
- Central European Initiative
- Organisation for Economic Co-operation and Development
- North Atlantic Treaty Organization

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POLAND

THE BATTLE OF GRUNWALD

The Battle of Grunwald is one of the greatest battles in the history of medieval Europe. It was fought on the 15th of July, 1410. The battle was a part of the great war between the forces of the Teutonic Knights, assisted by West European knights, under the command of the Grand Master Ulrich von Jungingen, and the combined Polish and Lithuanian forces, under the command of the Polish king Wladyslaw II Jagiello. The battle ended with the victory of the Polish-Lithuanian army and a crushing defeat of the Teutonic forces. The outcome of this battle had a major impact on political relations in Europe of that time. Not only did it break the power of the Teutonic Order, but also elevated Poland and the Jagiellonian dynasty to the rank of the most important ones in the continent.

THE BATTLE OF VIENNA

The battle was fought at Vienna on the 12th of September, 1683 between joint Polish, Austrian and German forces under the command of king John III Sobieski, and the army of the Ottoman Empire under the leadership of Vizier Kara Mustafa. The Turkish army numbered close to 140 thousand people. It was the largest army that was mobilized in the seventeenth century. Austria has managed to gather 32 thousand soldiers. Jan III Sobieski called up about 27 thousand Crown troops, including 25 hussar regiments, and marched to the relief of Vienna. The battle ended with the defeat of the Ottomans. This battle is considered to be one of twenty groundbreaking battles in the history of the world.

THE ROAD TO INDEPENDENCE

The Treaty of Versailles that ended World War I sanctioned Polish independence – before that Poland disappeared from the map of the world for 123 years as a result of partitions. The official date of the foundation of the Second Republic of Poland is the 11th of November, 1918, when Jozef Pilsudski took over the military authority in Warsaw. As a result of his actions the German troops withdrew from the city, and the Polish state institutions that were being formed conferred to him the title of the Chief of State.

INDEPENDENT SELF-GOVERNING TRADE UNION "SOLIDARITY"

"Solidarity" was a national trade union formed in 1980 to defend the rights of workers. Until 1989 it was also one of the main centers of mass resistance against the rule of the Polish People's Republic. One of the leaders of the workers' strikes that led to changes in the whole Europe was Lech Walesa, who later became a Nobel Peace Prize laureate. He was elected President in a two-round general election held in November and December of 1990.

THE POLISH POPE

John Paul II was the first Polish pope, as well as the first non-Italian Bishop of Rome in 455 years. The election of a person from a communist country for the head of the church had a significant influence on the events in Eastern Europe and Asia in the 80s of the 20th century.

PEOPLE COUNTRY HISTORY

ARMED FORCES

The Polish Armed Forces are divided into: the Army, the Air Force, the Special Forces and the Navy. Their main task is the defence of the Polish borders against outside attacks and cooperation with NATO. The armed forces are an essential element of the national defence system, designed for the effective implementation of the security and defence policy. The Polish armed forces number nearly 100 000 troops. They have taken and are taking part in a number of foreign missions of the UN, NATO and the EU.

LEGISLATURE

In Poland the legislature is a bicameral parliament consisting of the lower house – the Sejm and the upper house – the Senat. In direct, universal and secret elections, Polish citizens elect 460 members of the Parliament and 100 senators. Both MPs and senators are elected for a four-year term.

CONSTITUTION

The Constitution of the Republic of Poland is the most important Polish legal act and the foundation of the Polish state. It guarantees the rights and freedoms of citizens, determines the relationships between the legislative, executive and judicial branches, decides on the form and way of appointing key national institutions such as the Parliament, the Senate, the President and the Council of Ministers. The Constitution has a direct influence on the form of the judicial system, local governments and state control bodies.

SOCIETY

According to data from 2011, the territory of the Republic of Poland is inhabited by 38.5 million people. In terms of population Poland occupies the 29th place in the world and the 8th in Europe. The Polish population represents 5.3% of the European population and 0.65% of the population of the world.



NEWS

POLISH GROM ROCKETS WILL GO TO LITHUANIA

Mesko signed a contract for the supply of PPZR Grom rockets to Lithuania.

At the exhibition in Kielce, a ten-year contract amounting to 34 million EUR for the production and delivery of Grom MANPADS for the Armed Forces of Lithuania.

The contract was signed by Czesław Mroczek, Secretary of State of the Polish Ministry of National Defense and the brig. general Gintautas Zenkevicius representing the Lithuanian Ministry of Defense. Polish Minister was accompanied by representatives from Mesko S.A., which will execute the contract.

Signing of the contract is tantamount to the start of the production phase. The first delivery (for 4 million EUR) will take place later this year. Besides producing rocket sets, the contract also encompasses the transfer of the necessary equipment and training. Lithuania will become the fourth foreign user of PPZR Grom - after Indonesia, Georgia and Japan.

WZMOT POZNAŃ SIGNED A CONTRACT FOR THE RENOVATION OF MILITARY ENGINES

The contract between Wojskowe Zakłady Motoryzacyjne S.A. in Poznań and MTU from Germany was signed on the second day of the MSPO exhibition. Signed in the presence of the Secretary of State in the Ministry of Defense Czesław Mroczek, the document will allow the construction of Authorized Repair Center of military engines in Poznań.

The contract was signed by the chairman of WZM in Poznań, Elżbieta Wawrzynkiewicz and a representative from MTU. The document grants four licenses for the repair of engines of this company by the plant in Poznań. This is part of a wider program associated with the plan to build Center of Military Engines in Poznań. Its mission is to perform repairs and renovations, but also to produce all engines for vehicles used in the Polish Army.

In practice, the creation of the Center of Military Engines ensures unification in this regard, as required by the Modernization of the Armed Forces Plan. From the very beginning it also assumes polonization - increasing the range of domestic substitutes. Thus, it creates a starting point for future implementation of comprehensive production of engines in Poland. In a situation when our armed forces have thousands of vehicles of different types, this is an important element of our security.

OFFICIAL INAUGURATION OF PAG

On September 2, during the XXII International Defense Industry Exhibition in Kielce, an official inauguration of the Polish Armaments Group. The meeting was attended by the Minister of National Defense Tomasz Siemoniak, Minister of Treasury Włodzimierz Karpiński and CEO of PAG - Wojciech Dąbrowski. "The army was waiting for this moment. For a long time we wanted to have one partner on the side of the industry. Many projects were bogged down because of competition between Polish state enterprises" - said the head of the Ministry of Defense.

PAG will be comprised of more than 30 companies (from the defense, shipbuilding, offshore and new technologies industries) with an annual turnover of 4.5 billion PLN and more than 19 thousand employees. As a result of the ongoing consolidation process, one of the largest defense companies in this part of the world is being created.

The group already includes companies belonging to the State Treasury and the Industrial Development Agency. Production and trade departments that are currently concentrated in the Polish Defense Holding Group will be consolidated in PAG in the next stage of formation of PAG. The consolidation process is to be completed in 2014.

The strategic objective of PAG is to build a strong and modern business organization - an important element of national security. The Group's ambition is to achieve a position of a leading manufacturer of technologically advanced equipment for the modern army.

POLISH CONSORTIUM TO MODERNIZE WRÓBEL ANTI-AIRCRAFT GUNS

During the MSPO Defense Industry Exhibition in Kielce, Zakłady Mechaniczne Tarnów, PCO, Military University of Technology and Research and Development Center for Marine Technology signed an agreement setting up a consortium that will modernize Wróbel anti-aircraft guns.

In total, since the seventies of the twentieth century, the plant in Tarnów more than 90 units of 23mm Wróbel anti-aircraft guns for the Polish Navy. It is equipped with hydraulic drives. Since 1984, Wróbel II guns have increased ammunition magazines, fluid-cooler barrels and a table for mounting anti-aircraft missile launchers. The range of weapons of this type, where the cannon was controlled from the operator's cab, was up to 2000 meters.

In connection with the growing demands of the modern battlefield, an idea was born to improve the effectiveness and increase the range of Wróbel artillery to 2500 meters and even up to 5500 meters with rockets. These are the assumptions that underlie the newly established consortium that, based on the agreement signed during the International Defense Industry Exhibition, is comprised of: Zakłady Mechaniczne TARNÓW, PCO, Military University of Technology and Research and Development Center for Marine Technology.

The guns may be equipped with stabilized optical heads and friend-or-foe recognition system. In addition, to increase safety, a solution can be applied to handle reduced optical, thermal and electromagnetic visibility. Wróbel III is to be fully remote controlled and furthermore equipped with the Emergency Control Station, situated aboard and coupled with the firing position, having the ability to automatically guide the fire to the target through optical fiber.

AMZ KUTNO PRESENTED BÓBR AND HIPOPOTAM

AMZ Kutno booth at MSPO International Defense Industry Exhibition featured wheeled armored personnel carriers Bóbr and Hipopotam, as well as Jeep J8 serial car.

Bóbr armored transporter with 4x4 drive premiered at MSPO International Defense Industry Exhibition in 2013. It was constructed as

a result of a program co-financed by the National Research and Development Centre. The vehicle is considered to be a successor of the BRDM-2 wheeled transporters. The current armor provides level 2 ballistic protection (compliant with STANAG 4569). Vehicle weight is 10 tonnes. Cummins 6ISBe285 diesel engine with maximum power of 285 hp allows driving with a maximum speed of 120 km/h and offers 1000 km range on one full fuel tank. It allows floating thanks to propulsors placed under the rear part of the hull.

Hipopotam (with 8x8 drive) is a heavy, wheeled, floating armored personnel carrier. Armor (made of composites) allows it to attain ballistic protection up to level 4 (complaint with STANAG 4569). A specially design floor protects the crew from mine explosions. TCD 2015 V08 DEUTZ engine with 653 hp allows the transporter weighing up to 26 tons to move at a maximum speed of 110 km/h.

38 BILLION PLN FOR NATIONAL DEFENSE IN 2015

According to the draft budget for national defense published by the Ministry of Finance, 38.387 billion PLN will be spent in 2015. This is because the payment for multirole aircraft F-16 amounting to 5.363 billion PLN is due next year. Remaining funds, i.e. 33.024 billion PLN, will be allocated to defense in accordance with the Act on the reconstruction and technical modernization of the Armed Forces (1.95% of the estimated GDP for the current year).

Capital expenditure will amount to 13.775 billion PLN, of which 5.363 billion PLN will be spent on F-16 fighter jets. After deducting that amount, the share of capital expenditure in the total amount of funds allocated for defense requirements will amount to more than 25% and will be compliant with the regulations obliging to maintain capital expenditure at the level of at least 20%.

TWO COMBAT VEHICLES FROM PHO

During MSPO International Defense Industry Exhibition in Kielce, the visitor were interested in light armored all-terrain vehicles from PHO booth, which may soon go to the Polish Army. One of them is a candidate for successor of legacy vehicle Honker in a special variant called the "Łomot". The second one is the LPU-1 "Wirus" light assault vehicle. Interestingly, both constructions use the components of the popular off-road vehicle Toyota Hilux.

LPU-1 Wirus was already presented at last year's MSPO. This light-weight LSV-class (Light Strike Vehicle) machine was designed for special, airmobile and parachute formation units. Priorities were light weight, high mobility and high capacity.

Thanks to modern solutions, it was possible to obtain a vehicle weighting 1700 kg with a maximum lifting capacity of 1.3 tons. At the same time it can move at speeds up to 140 km/h and its maximum range on the road amounts to 1200 km.

Wirus has level 1 protection compliant with STANAG 4569, which protects against small arms fire. Weapons can be installed in three positions (front, top and rear). It can mount a wide range of machine guns from 5.56 mm to 12.7 mm and 40 mm automatic grenade launcher. The machine also has the ability to carry 60 mm caliber mortar and MANPADS GROM launcher.

Wirus uses multiple components of the popular Toyota Hilux off-road vehicle, which make sit easy and cheap to acquire spare parts in almost every corner of the world. Striving to reduce vehicle weight, however, forced the use of a different, lighter frame.

"Łomot" vehicles use Toyota Hilux components to a much greater extent. It belongs to the family of multipurpose vehicles offered by

PHO in the proceedings codenamed Mustang. It concerns the supply of about 1,600 cargo-and-passenger high mobility vehicles for the Polish Army. They will replace the currently used Honker vehicles.

"Łomot" is the most heavily armed vehicle based on Hilux. It is dedicated to special units and features three weapon stations. Composite armor provides level 1 protection compliant with STANAG 4569, but it is possible to mount heavier armor.

The modular design provides the ability to adapt to different tasks, and the use of civilian components greatly facilitates maintenance and reduces costs. The vehicle features special, personal and freight setups, but its modular design makes it easy to create different variants, eg. to build over specialized systems or other equipment.

THE FIRST SESSION OF THE SCIENCE AND INDUSTRY COUNCIL BY THE MINISTRY OF NATIONAL DEFENCE

The Secretary of State in the Ministry of National Defence Czesław Mroczek took part in the inauguration session of the Science and Industry Council by the Ministry of National Defence. The first meeting of the representatives of the army, industry and science associated within the Council, took place on September 19th of this year in Warsaw. The Secretary of State in the Ministry of National Defence Czesław Mroczek and the Chairman of the Council gen. bryg. prof. Zygmunt Mierczyk handed nominations to thirty members of the council. "To ensure modern equipment, meeting the highest global standards - the standards we need - to the Polish Armed Forces, the commitment of scientific and industry environments is necessary" - said the Secretary of State in the Ministry of National Defence Czesław Mroczek. The members of the Science and Industry Council include, among others, the representatives of the Polish armaments industry, the Polish Academy of Sciences, civilian and military research institutes, military universities as well as chancellors of Polish technical universities. The members are appointed by the Secretary of State in the Ministry of National Defence for four-years terms at the motion of the chairman. The Science and Industry Council shall be responsible for preparing expert opinions, opinions regarding the justifiability of commencing development projects and strategic programs with the participation of the National Centre for Research and Development and the National Science Centre as well as providing opinions on the actions taken by the European Defence Agency (EDA) in the scope of science, research and development works. The Council will also investigate the concepts of using previously commenced strategic programs and development works. In the nearest time it shall look into, among other things, the program of anti-aircraft and anti-rocket defence system construction for the Polish Army.

NEW SIMULATORS FOR THE KTO ROSOMAK

The Armament Inspectorate has issued a call for tenders for the supply of nine similar devices for the drivers of the Wheeled Armored Vehicle Rosomak in the years between 2015 and 2017. The time limit for the submission of tenders is October 21st 2014. Unfortunately, the detailed requirements for the simulators/trainers for the KTO Rosomak drivers are not known. These will be Specified in the Terms of Reference - a document which will only be provided to the contractors invited to lodge initial tenders. It is only known that the simulator shall consist of a moving platform including the driver's cabin equipped with all necessary components, as in 8x8 KTO Rosomak, an IT system, a visualization system, an independent stand for the instructor-operator and registration devices. Additionally, the procurement includes the so-called logistical package, within which a training of 20 instructors-operators is planned.

MSPO Defense Industry Exhibition in Kielce

The defense industry exhibition in Kielce is the most important defense industry event in Central Europe and the third largest in Europe. Every year, International Defense Industry Exhibition sees the latest developments in the defense industry and logistics systems used for protection and rescue.

In the past twenty-two years, International Defense Industry Exhibition has become globally recognized; a meeting place for profes-

sionals associated with the military and defense: soldiers, politicians, businessmen, journalists and academics. The exhibition offers a unique opportunity to learn about the latest trends in weaponry, equipment and military equipment. It also allows an exchange of views and experiences.

The exhibition of Polish Armed Forces became a permanent element of the Kielce exhibition, which is a great opportunity to show-

case the changing face of the Polish army - its new equipment and increasing skills that allow soldiers to operate in the harshest and most demanding operating environments.

"The huge interest in the defense industry exhibition confirms that technical modernization plan for the army enters a decisive phase, during which we will be making decisions regarding the equipment of the armed forces. I am glad that our ambition to build defense capabilities are recognized and appreciated in the world" - said the Secretary of State in the Ministry of Defense Czesław Mroczek during the XXII edition of the International Defense Industry Exhibition in Kielce.

The Kielce exhibition was attended by, among others, by three producers participating in the tender for the multi-purpose machine for

the armed forces that is going to replace the Mi-8 and Mi-17 helicopters, representatives of the consortia that build air defense and medium-range anti-missile systems, as well as potantates constructing the most modern submarines. Their presence only confirmed the words of the Deputy Minister. All significant defense industry companies in the world were present, and in the future they may apply for contracts for the supply of equipment for the Polish army.

- The technical modernization plan assumes the implementation of 14 major programs that will change the face of all kinds of armed forces and types of troops. We are willing to spend approximately 130 billion PLN for this purpose. It's a great hope for the armed forces, but also for the Polish defense industry; it is an opportunity for dynamic development, a real technological leap - emphasized Minister Mroczek.





One of the goals is the consolidation of the domestic defense industry within the Polish Armaments Group (PAG). Its functioning was inaugurated on September 2, during the exhibition in Kielce. At the moment, PAG integrates several state-owned companies, and by the end of the year it is planned to incorporate the Polish Defensive Holding, together with its affiliated entities. In the near future, PAG - as one of the largest armaments consortium in this part of Europe - will be able to race for military contracts.

A successful business climate for the Polish technical thought is confirmed by prizes that are awarded every year during the exhibition to the participating companies. The last day of the Kielce exhibition has seen a summary of this year's edition and special awards were given - "Defenders" - awarded for the best defense and secu-

urity products. They are given for products that were already implemented or that are in the process of implementation, distinguished by originality, innovative technical ideas and operational qualities.

Important talks and trade negotiations were carried out during the International Defense Industry Exhibition. This year we managed to sign two important agreements, both with foreign partners: Wojskowe Zakłady Motoryzacyjne from Poznań signed a contract with MTU from Germany to build Authorized Repair Center of Military Engines. Ultimately, it will be tasked with providing the supply and maintenance services for all motor vehicles used by the Armed Forces. MESKO signed a contract for the production and supply of "Grom" rockets for the Lithuanian army.



RECOGNIZED PRESTIGE

International Defense Industry Exhibition has been aiming to become a global event since the first edition held in 1993. MSPO exhibitors include the most important arms manufacturers in the world, including: BAE Systems, Boeing, MBDA, Raytheon, Thales and Saab.

International Defense Industry Exhibition is an event of great significance for the Polish defense industry, directly contributing to increasing cooperation between Polish and European or global corporations. The most recent example of such contract is Wojskowe Zakłady Mechaniczne from Siemianowice Śląskie, which obtained a license from the Italian company OTO Melara for installation, main-

tenance, modernization and export of Hitfist-30P turrets for Rosomak vehicles.

French National Exhibition

International Defense Industry Exhibition 2014 was accompanied by French Defense Industry National Exhibition. France's biggest arms manufacturers presented their products, including: EADS (aircraft, electronics, missiles, artillery, space rockets), Safran (electronics), Thales (electronics, military vehicles, missiles, light weapons, ammunition), DCNS (ships), Eurocopter (aircraft), CEA (aircraft), MBDA France (rockets) and Nexter producing military vehicles and ammunition.



Defenders and the award of the President of Poland

At the end of the XXII International Defense Industry Exhibition, the director of Armed Forces Supervision Department in National Security Bureau, gen. Lech Konopka, presented the award to the President of Poland Bronisław Komorowski for the best product that increases the safety of the soldiers in the Polish Armed Forces.

In this year's edition of the Exhibition, the Commission recommended three products for the prize of the President of Poland. The prestigious award was given to PIMCO Sp. z o.o. from Warsaw and TELDAT from Bydgoszcz for automatic contamination detector PRO-METHEUS integrated with JAŚMIN platform. Award of President of Poland was first awarded in 2009.

XXII International Defense Industry Exhibition Council also awarded the Defenders - awards for entrepreneurs from the defense industry. The Council received 76 applications from companies presenting their achievements during the exhibition.

Defenders, which were given by the Secretary of State in the Ministry of Defense Czesław Mroczek went to:

- PCO S.A. from Warsaw for stabilized observation and targeting optoelectronic head
- Wojskowe Centralne Biuro Konstrukcyjno-Technologiczne Spółka Akcyjna from Warsaw for "PEGAZ" airport tug
- Military Institute of Hygiene and Epidemiology from Warsaw for mobile laboratory for environmental sampling and identification of biological threats
- KongsbergDefence&Aerospace AS from Norway and PIT-RADWAR S.A. from Warsaw for NSM missile system (coastal missile squadron - NDR)
- LUBAWA S.A. from Ostrów Wielkopolski for "TITANIA" light anti-shrapnel suit
- Microflown AVISA BVM from the Netherlands for AcousticVector Sensor for locating sniper and artillery projectiles, intended for the integration with unmanned micro and mini class airplanes
- Air Force Institute of Technology from Warsaw for ATRAX Unmanned Air Ship
- Zakłady Mechaniczne Tarnów S.A. from Tarnów for basic and advanced training facility for small arms users
- PIT-RADWAR S.A. from Warsaw in cooperation with EUROTECH Sp. z o.o. from Mielec for BSL E-310 Unmanned Air System
- Military Institute of Armament Technology from Zielonka for Cartridge with long-range fragmentation-high-explosive projectile for "RAK" 120mm self-propelled mortar

Special awards were also given, including award of the Minister of National Defense, which was received by "ŁUCZNIK" Radom Sp. z o.o. Weapons Factory from Radom and the Military University of Technology from Warsaw for 5.56mm standard carbine (basic) and 5.56mm representational rifle from the Modular Arms System Arms caliber 5.56 mm (MCBS - 5.56).



Air Force Institute of Technology on the 22nd International Defence Industry Exhibition Kielce 2014



Air Force Institute of Technology

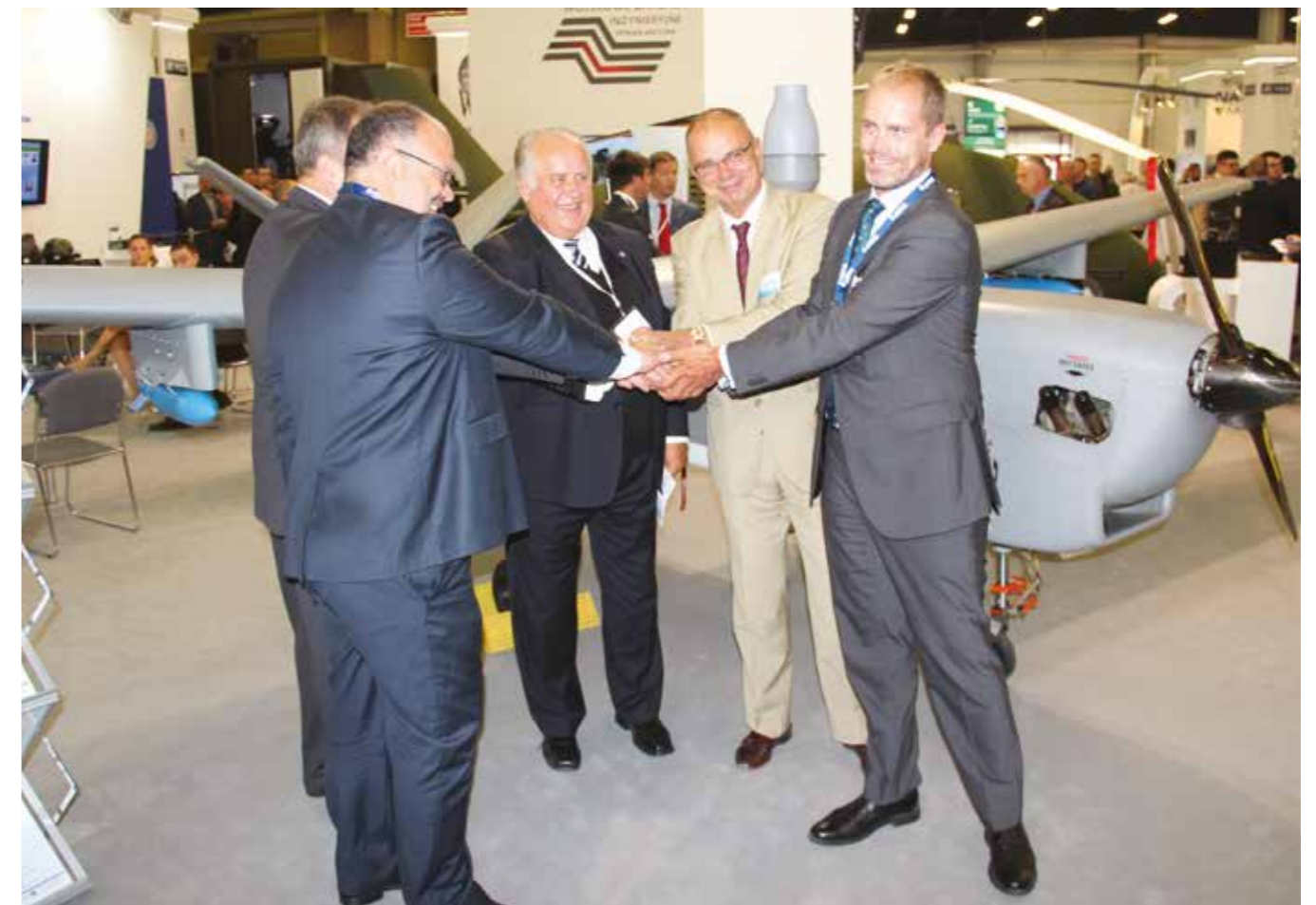
At the 2014 International Defence Industry Exhibition in Kielce, the Airforce Institute of Technology presented a wide range of unmanned machines for performance of various tasks and other innovative developed projects. These included a "Mi" series helicopter modernization station, aircraft self-defence subassemblies and the SAMANTA and TURAWA IT systems for the support of logistics. The newest and largest ITWL machine exhibited at the Defence Industry Exhibition in Kielce was the IT-AIR1 Tactical Unmanned Aerial Vehicle, developed in cooperation with Airbus Defence and Space. The name of the aircraft – selected by means of a contest – was given at the Kielce Exhibition. IT-AIR1 is an airframe developed by Airbus Defence and Space, which is currently at the stage of optimization by ITWL. The optimization relates to, among other things, the rapid take-off and landing, performing long-standing reconnaissance tasks and the potential application as a weapon carrier. With a mass of 570 kg,

IT-AIR1 measures 8 meters in width and 5.47 m in length. In its current configuration, the machine is able to carry a payload of 100 kg and to remain in air up to 14 hours while ensuring data transmission at a distance of 250 km. The standard observation system is the ITWL day and night optoelectronic head and the SAR radar. The IT-AIR1 type machine may be used both for military applications and for reconnaissance, support, anti-pirate operations, patrols and for missions relating to border surveillance, fire detection or determination of natural disaster results. UAV Atrax, a patrol and reconnaissance quadrocopter is at the other end of the scale of unmanned machines. The mass of this vehicle is 7 kg, at a load carrying capacity of 15 kg. It is a small, universal unmanned platform which can take off and land vertically and may reach altitudes up to 1000 m. The modern glass and carbon composite material of the frame ensures small mass and high durability. Atrax was developed as a response to the needs



of the Polish uniformed services and other clients seeking a stable platform capable of vertical takeoff and long hovering. Most of similar machines may remain in air for 15-25 minutes, while the Atrax may fly for an hour – including a possibility to extend that time to 1.5h by applying an additional battery pack. The use of four pairs of opposing rotors (two motors per each of the arms) ensures high in-flight stability and the possibility of safe landing even in case of damage to more than one motor. The machine is equipped with an optoelectronic head with infrared vision and an autopilot system providing for a possibility to plan a route. Currently, ITWL works on enabling the quadrocopter to carry light weaponry. During this edition of the exhibition in Kielce, a prestigious Defender prize was awarded to ITWL for the Atrax unmanned aerial vehicle. Another proposition of a different weight class, which has been also presented at previous exhibitions, is the ILX-27 unmanned helicopter which is manufactured completely in Poland (Institute of Aviation, AFIT, MAW No. 2). The vehicle is a module system which allows for adaptation for various types of tasks. The load-carrying capacity of 300 kg (there are works in progress to increase this parameter to 500 kg), the maximal altitude of 4000 meters and the maximal speed of 215 km/h allow to apply the ILX-27 both for observation and reconnaissance purposes and as a combat platform. In the latter option, it is possible to carry e.g. multi-barrel machineguns, light bombs and non-guided missiles. Currently, tests are being performed to fire guided rocket missiles such as AGM-114 hellfire from the ILX-27. It should be noted that this year, the possibility of operating the machine in navy operations from a vessel was tested. Due to its compact size and the application of fenestron as well as high resistance to landing g-loads, ILX-27 may be success-

fully used as a shipboard machine (the landing gear is adjusted to up to 5g landings), e.g. as a carrier of MAD sensors, which are used for the detection of submarines. This is an interesting direction of development and broadens the possible applications of the machine. In Kielce, the ITWL has also presented solutions dedicated for manned machines. The Institute conducts a wide range of research concerning the modernization of helicopters to adjust them to a modern, network-centric battlefield. The research is largely based on the experience gained from the support of the Polish Air Force machine exploitation and the development of digital avionics for machines such as the W-3PL Głuszec helicopter or the PZL-130 Orlik TC-II Glass Cockpit aircraft. During the exhibition, a mock-up of the "glass cockpit" for the Mi-17/Mi-8 helicopter was presented. It is based on solutions applied in the W-3PL Głuszec helicopters which are used by the Polish Armed Forces. Based on the same, unified components it is possible to increase the operational capacity of the Mi-17 helicopter – not only due to the application of modern visualization methods and navigation solutions, but also due to the "digitalization" of the mission planning and control as well as the communications. Such type of solutions may be implemented not only in Mi-17, but also applied in the modernization of Mi-24 attack helicopters and other currently used machines. This would increase the capabilities of the machines significantly and adjust them to the requirements of the modern battlefield. Along a suitable exploitation program, the life of the machines could be extended, as it is done in other NATO states. ITWL currently conducts a wide range of programs related to the exploitation of both the machines currently applied by the Armed Forces and the ones which may soon be adopted for use.





TACTICAL UAV IT-AIR1

Tactical UAV IT-AIR1 was presented at the 22nd International Defence Industry Exhibition in Kielce. IT-AIR1 has been developed in collaboration of Airbus Defence and Space in Poland and Polish R&D Entity - Air Force Institute of Technology. Naming ceremony took place on 2nd September 2014.

The ceremony was attended by Prof. Ryszard SZCZEPANIK PhD. D. Sc. Eng. AFIT General Director, PhD D.Sc. Eng. prof. ITWL Andrzej Zyluk Scientific and Research Director and representatives from Airbus DS – Ivan Valcuende CFO of Airbus Defence and Space in Poland, Agustin Bennasar Commercial Director of Airbus Defence and Space Military Aircraft, Felipe Comunion Steinmetz and CEO of Airbus Defence and Space in Poland and Director of Airbus Defence and Space UAV program Alberto Martinez.

IT-AIR1 was developed as a result of cooperation between the two companies based on an existing design. This Tactical UAV is, unprecedented among Polish products, designed to be a useful and accurate tool for military and civilian end users. The previous version of IT-AIR1 was the first UAV in Europe allowed to fly in segregated airspace.

Airbus Defence and Space and AFIT engineers decided to create a structure that will meet the most exacting demands of buyers. With the latest generation solutions (e.g. optoelectronic head, SAR radar, security systems, integrated interference system) the UAV can provide precise data from aerial reconnaissance during day and night flight as well as in difficult weather conditions.

In addition, AFIT and Airbus Defence and Space minimized the takeoff and landing path length which increases the UAV's operational capabilities; optimized the design in terms of aerodynamics and structure to prepare IT-AIR1 to carry weapons; and developed data transmission systems between the aircraft and ground station. AFIT will be also responsible for developing systems for operator and maintenance staff training. The UAV is planned to be produced in Poland.

Purpose:

- Reconnaissance and support for ground forces
- Fighting against terrorism and piracy
- Border protection
- Situational data collection (natural disasters)
- Search And Rescue operations
- Monitoring of infrastructure (pipelines, transmission lines, roads etc.)

Technical data:

Length – 5,47 m
 Wing span – 8 m
 Height – 1,99 m
 Max. takeoff weight – 570 kg
 Max. payload – 100 kg
 Duration – 14 h
 Data transmission range – 250 km+150km



WB Group on MSPO 2014 Exhibition

WB Group stand will gather all five Group's companies: WB Electronics S.A, Radmor S.A, MindMade Sp. z o.o., Arex Sp. z o.o. and Flytronic Sp. z o.o. and the following products will be exhibited:

- FONET system extended by the chemical & radiological detection unit PRS-1W and the latest personal radio "PERAD"
- Artillery C4I system TOPAZ, presented in the form of simulator and cooperating with the system BSP FlyEye
- Handheld chemical & radiological detection device – PSS
- SDR radio model '3507'
- a simulator of GROM rocket launcher

- a platform to integrate communications and cryptography systems

- our latest UAVs: 'Manta' and 'Watsar'

At the stand we will also host BS9 Consortium which has been established to address the needs of the Polish armed forces and comprises of leading Polish enterprises as well as the scientific and R&D institutes.

The company as last year received an award from MSPO fair stand for, that is to say, the quality of the presented products.



Sikorsky S-70i BLACK HAWK Helicopter

THE MODERN S-70i™ BLACK HAWK HELICOPTER INCORPORATES ADVANCEMENTS THAT CONNECT THIS REMARKABLE AIRCRAFT INTO THE FAST-PACE, DIGITAL INFORMATION WORLD THAT EXISTS TODAY. SO WHATEVER YOUR MISSION IS, THE BLACK HAWK HELICOPTER WILL PROVIDE EXCELLENT SUPPORT TO YOUR EVERYDAY NEEDS.

Polskie Zakłady Lotnicze Sp. z o.o. – PZL Mielec – is a largest aircraft manufacturer in Poland. Thanks to development of R&D base and expansion of the production to S-70i™ BLACK HAWK helicopters the company is currently, from the technological perspective, the most advanced representative of the state aviation industry.

Company's current products line includes:

- Sikorsky S-70i BLACK HAWK™ – an utility helicopter intended for international market
- Cabin sections for UH-60M BLACK HAWK™
- Helicopter's structure elements (tail cone and pylon)
- M28 – STOL (short take-off and landing) dual turboprop engine aircraft, used for cargo and passenger transport, parachute jumps, medevac, patrolling and maritime reconnaissance and for search and rescue actions.
- M28B Bryza – military model of M28, used for special operation (depending on the installed equipment)

Currently the company has 2200 employees, including the technical-engineering and production staff with highest professional qualifications, as well as it has adequate technical, organizational and production capabilities to manufacture aircrafts and conduct the aviation development programs.

S-70i helicopter is a BLACK HAWK type helicopter intended for international customers and manufactured using international suppliers chain. It is also the first BLACK HAWK helicopter to be manufactured in Europe and at the same time, the first helicopter to be manufactured in PZL Mielec in Poland. The deliveries of those machines are being successively increased until reaching, after 2012, an intended production level, which foresees the production level of 20 complete helicopters per year.

PZL Mielec, a Sikorsky Aircraft subsidiary, as a manufacturer of S-70i BLACK HAWK helicopters plays a leading role in creation of a modern product which has a high reliability, proved itself in the field and provides the highest usage values and technical performance.

From the beginning of the S-70i BLACK HAWK production in 2010, Polskie Zakłady Lotnicze manufactured 19 complete helicopters and had delivered them to customers in USA, Saudi Arabia, Mexico, Colombia, and Kingdom of Brunei.

The company with a success still manufactures and sells the aircrafts of its own construction M28 and M28B/PT. The aircrafts are manufactured in civil and military version intended for variety of missions including transportation, landing operations, passenger and patrol.

ILX-27 is a highly specialized, new generation tool that meets the needs faced by the development of technology in the service of the country for the near future. It is the only European construction of unmanned helicopter of this type that uses only Polish technologies.



A Sikorsky Company

INDUSTRY-LEADING SERVICE AND SUPPORT

Sikorsky Aerospace Services brings together its OEM expertise with the unique strengths of our leading aircraft service companies to provide innovative platform solutions to meet your demanding aviation service needs.

PILOT AND MAINTENANCE TRAINING

- Basic to advanced courses
- Partnered with Flight Safety International

HELOTRAC® 2X MAINTENANCE MANAGEMENT TOOL

- Significantly reduces maintenance record keeping
- INTEGRATED VEHICLE HEALTH AND USAGE MONITORING SYSTEM
- Speeds entry into service after maintenance

FLEET MANAGEMENT OPERATIONS CENTER (FMOC)

- Provides predictive data to reduce operational costs and increase aircraft availability

PILOT AND MAINTENANCE TRAINING

- GE-T701D Engines with Integral Particle Separator
- Wide Chord Main Rotor Blades for Improved Performance
- Glass Cockpit with Digital Automatic Flight Control System
- Four Landscape Color MFDs
- Integrated NVG Compatible Displays and Lighting
- 4-axis Autopilot through Coupled Flight Director
- Dual Embedded Global Positioning / Inertial Navigation Unit, Honeywell H-764
- Active Vibration Control
- Dual Raytheon MX-4027 UHF/VHF – AM/FM Radios
- APX-117 IFF Transponder
- Artex C-406N ELT
- VOR/ILS
- Low Frequency Automatic Direction Finder
- Terrain Awareness and Warning System
- Wire Strike Protection System
- Dual Independent Hydraulics with additional backup.

Note: This Enhanced Utility Configuration is available for delivery contingent upon approval of required U.S. Government export licenses.



ENHANCED UTILITY CONFIGURATION

AVIONICS

- Troop Commander ICS + Antenna
- Digital Map Software (Regional Maps)
- Integrated Vehicle Health Management System (IVHMS)
- Cockpit Voice Recorder/Flight Data Recorder (CVR/FDR)
- ARC-220 HF Radio

FUEL SYSTEM

- Auxiliary Fuel Pump (External / Internal)
- Auxiliary Internal Fuel Tank 200 Gallon Provisions and Completions (Crashworthy)

INTERIOR

- Custom Paint Scheme
- Armored Pilot/Co-Pilot Seats with Armored Wings Crew
- Chief Seats (LH/RH) (2)

AIRFRAME

- Cargo Hook, 9,000 Pound Capacity
- External Electric Rescue Hoist
- Fast Rope Insertion/Extraction System (FRIES)

ARMAMENT AND SURVIVABILITY EQUIPMENT

- Engine Exhaust Suppression System
- Cockpit Armored Floor and Doors
- Cabin Armored Floor, Lightweight Removable
- M60 / MAG-58 / M134 Structural Provisions
- M134 Electrical Provisions
- M134 Ammo Pallet

| PERFORMANCE | | |
|---|-------------|------------|
| Maximum Takeoff Gross Weight | 22,000 lbs | 22,000 lbs |
| Maximum Gross Weight with External Load | 23,500 lbs | 23,500 lbs |
| Maximum External Load | 9,000 lbs | 9,000 lbs |
| Maximum Cruise Speed* | 160 kts | 160 kts |
| HIGE Ceiling** | 15,000 ft | 15,000 ft |
| HOGC Ceiling** | 11,000 ft | 11,000 ft |
| AEO (All Engines Operating) Service Ceiling** | 20,000 ft | 20,000 ft |
| Number of Engines | 2 | |
| Engine Type | T700-GE701D | |
| Cabin Width | 7.0 ft | 7.0 ft |
| Cabin Height | 4.5 ft | 4.5 ft |
| Cabin Area | 88 sq.ft | 88 sq.ft |
| Cabin Volume | 396 cu.ft | 396 cu.ft |

*Standard day, sea level
 **Ceiling for 18,000 lbs GW (8,165 kg)

ONE HELICOPTER, MANY SOLUTIONS

The S-70i helicopter's durable, straight forward design allows for maximum flexibility under extreme conditions. Rigorously tested and combat proven, the BLACK HAWK helicopter is an ideal solution for

- Personnel Transport
- Cargo Transport
- Medical Evacuation
- Search and Rescue (SAR)
- Special Warfare Operations
- Border Protection
- Law Enforcement
- Armed Fire Support
- Forestry Services and
- Land Management
- Humanitarian
- Assistance

RELIABLE

Nearly 3,000 BLACK HAWK helicopters are in service today. This fleet has flown more than 9 million flight hours in some of the most rigorous conditions known, successfully completing missions ranging from utility transport, search and rescue, to combat assault armed support, and beyond.

LEGENDARY

The Sikorsky BLACK HAWK helicopter has earned its standing as the preferred utility aircraft of militaries worldwide. Designed to strict military standards, its ruggedness, dependability and versatility have made this aircraft a legend.

SUPPORTABLE

Sikorsky Aerospace Services (SAS) brings together its OEM expertise along with unique experiences to support the S-70i™ helicopter. From spares, overhaul and repair to programs such as performance-based logistics, contractor logistics support and military depot partnerships, SAS offers innovative services designed to increase flying time, improve ease of use and reduce cost of ownership, allowing you to focus on your mission.

AFFORDABLE

Many mission equipment options are available for the S-70i helicopter, enabling you to configure your fleet to suit your unique requirements. Options range from wide chord rotor blades, extended range fuel tanks, medical litters, crashworthy seats, armament, ballistic protection, sensors, radar, cargo hook, external rescue hoist, and more.



ONE VEHICLE - MANY POSSIBILITIES

THE DESIGN OF THE ROSOMAK VEHICLES PROVIDES MOBILITY, LARGE REMAINING CAPACITY, ABILITY TO SWIM AND WADE, OVERCOME SIGNIFICANT OBSTACLES AND INCLINATIONS, AS WELL AS A BUOYANCY RESERVE FOR THE INSTALLATION OF SPECIAL EQUIPMENT. THIS MAKES THE ROSOMAK AN IDEAL VEHICLE FOR THE ARMY AND SOLDIERS.

Every device being a component of the Proteus performs a strictly defined task. The vehicles are capable of carrying 11 soldiers, including the driver, and the turret operators in the combat version. The design of the chassis and suspension of the Rosomak vehicles allow for a fast repair and replacement in case of a failure. The design of the integrated suspension arm proved itself to be more resistant to booby-trap

explosions and more effective in case of repairs in the field conditions. An important condition for the introduction of the Armored Modular Vehicle to the Polish Army equipment is the gradual transfer of the production to Poland. Currently, a significant part of the components, starting with the armor plates and ending with the advanced electronics, comes from the domestic manufacturers and

suppliers. Also the special versions incorporated in the Rosomak vehicle are mostly Polish designs and solutions. Due to the solutions and the commitment of the domestic potential, the process of transferring the production to Poland is progressing faster than planned.

THE EFFICIENCY AND ERGONOMICS

The first testimony on the fulfillment of the expectations concerning the vehicle modernization, are the changes and improvements made so far, to the structure and the equipment of KTO Rosomak.

■ Since the commencement of the production in the April of 2005 to the present, more than 200 changes and enhancements have been introduced, newer equipment has been added, providing better parameters, higher reliability and fully meeting the expectations concerning the exploitation or improving the technical parameters. The design allowed for the modification of hydraulic and pneumatic systems, to ensure the correct and long-term operation at higher temperatures and lower atmospheric pressure and was a result of the experience gained in the operation in Afghanistan – says Zbigniew Chabera, Development Unit Director.

Tires more resistant to high temperatures and rocky surfaces have been introduced. The air-conditioning and the cooling systems have been improved, a number of measures required for asymmetric operations, such as side cameras and screens for the troops have been introduced. The system indicating the sector of fire has been installed, the vehicles have been adapted for the mounting of active jamming devices and the Blue Force Tracking system. For the servicing time, the fire protection switch has been applied; the vehicles have been equipped with additional compartments and containers for equipment placed in the propeller locations, previously used while swimming.

■ Many of the changes are to improve the ballistic resistance of the vehicle. First of all, the vehicles used in the ISAF mission are additionally armored to meet the level IV according to the STANAG 4569 and equipped with a light system of shields against the HEAT projectiles fired from handheld antitank grenade launchers. The RPGNet system can be mounted and dismantled by the crew, which allows for a simple air transportation of KTO Rosomak – says Michał Rumin - Marketing Specialist”.

NEW IDEAS BY ENGINEERS

The light netting system covers all the types of Rosomak vehicles used by the Polish Task Force in Afghanistan – from the combat types, through the versions with open turrets, ending with the Rosomak-WEM medical evacuation vehicles. The KTO's design has also allowed to improve the ergonomics by removing the two seats from the landing compartment. The WZM SA now offers the replacement of seats with a special explosion-proof construction including multi-point safety belts, which can significantly offset the kinetic energy of an explosion under the vehicle or in its vicinity. The drivers now have a new passive device for night driving characterized by a significantly improved performance and viewing angle. The engineers have developed a new type of battery fitted with a unit of rectifiers in a universal casing. This solution improves the energy balance of the vehicle, resulting in a longer operation of the electrical and electronic components of the weapons without the main engine operation. One of the latest ideas of the WZM SA's development engineers is the modular design of the turret plate to enable the installation of various turret solutions or special systems according to the specific needs of the user by upgrading one element of the vehicle's top plate. This functionality is the result of the experience with the installation of the MAHSW automatic mortar and the 105mm CT-CV turret using the KTO Rosomak chassis.

THE CONSTANT DEVELOPMENT OF THE SPECIAL VERSION

The special versions of the KTO Rosomak are developed systematically. In addition to the well-known basic version of Rosomak and the combat version including the Hitfist 30P turret used in the mechanized battalions, the army has commissioned the Rosomak

Medical Evacuation Vehicles, which undergo a complete cycle of the commissioning, including the swimming. The MEVs have a 4-person crew and the ability to carry three wounded on stretchers and four injured in a sitting position, to whom the first aid and support of the vital functions is provided during rapid evacuation and transportation from the battlefield, in a safe armor, to the nearest medical point. The Rosomak MEV is equipped with day-and-night devices for the search of the wounded in a battlefield, modern medical and resuscitation equipment and the roll-in stretchers capacity compatible with the NATO standards. The MEV vehicles serving the Polish soldiers in Afghanistan are characterized by the ballistic resistance and the resistance against HEAT projectiles, just as in the combat vehicles – says Michał Rumin - Marketing Specialist”.

Since the beginning of 2010, the vehicles delivered to Afghanistan have been painted in a uniform desert camouflage, which has been tested in terms of properties preservation for military equipment in accordance with relevant provisions and standards. A new version of the vehicle painting, using washable paints for winter conditions is also available, and has been tested in accordance with the provisions of military masking and camouflage. The ISAF version of the Rosomak vehicles for the Polish Task Force in Afghanistan has different parameters to those of the vehicles used for training in the country. Most of all, they have been provided with a greater ballistic resistance and combat functionality due to the installation of the additional combat equipment related to the operations in Afghanistan – said Michał Rumin, WZM Spokesman. The maximum weight of the vehicle has been increased from 22 500 kg (to this value, KTO Rosomak provides the ability to swim with about 20 percent displacement margin) to 26 000 kg. For the purposes of the expeditionary operations, two versions of Rosomak with open turrets have been manufactured. For the operation in the European Union's Forces (subsequently taken over by the UN) vehicles with light and automatic turrets have been designed for the application of a wide range of arms and an automatic grenade launcher for the Polish ISAF contingent. The Rosomak-S version is designed to transport Spike sets with the operating crew. The vehicle allows for an efficient and rapid transport of two teams to the area of operations and the maintenance of a stable communication between the vehicles and the command center. The operational compartment has been adapted and retro-fitted in relation to the basic version of the KTO. The vehicle retains all the other functional and operational features of KTO Rosomak.

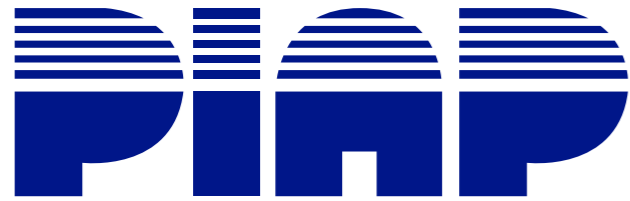
■ The Rosomak-WD, configured as a tactical level command vehicle of a mechanized subunit, with respect to the specification of the operation and the commander's needs, will be characterized by similar functionality. The vehicle is to be equipped with communication systems, data transmission and fire control to ensure full control at this level of command – says Michał Rumin - Marketing Specialist”.

The implemented Rosomak variants:

- Medical Evacuation Vehicle – Rosomak MEV (Rosomak WEM)
- Vehicle for the transportation of the Spike team
- KTO Rosomak suitable for PKW ISAF (M1M version with the HEAT resistant RPGNet QinetiQ and the Armstal 550 steel hull by the Huta Stali Jakościowych)
- KTO with the automatic open turret for the PKW ISAF
- KTO with the light open turret for the PKW CZAD
- Rosomak NJ – training vehicle
- Multi-Sensor Surveillance and Reconnaissance System – Rosomak WSRiD Within the development, procurements or direct operations, the WZM SA has developed new special versions of the KTO:
 - The Contamination Reconnaissance Vehicle – Rosomak RSK
 - The Technical Support Vehicle – Rosomak WPT
 - The Technical Reconnaissance Vehicle – Rosomak WRT
 - The Anti-aircraft Command Vehicle – Łowcza, Rega

- The Tactical Level Command Vehicle – Rosomak WD
- Training Vehicle – Rosomak NJ
- The General-Military Reconnaissance Vehicle – R1 command version and R2 line version
- The Fire Support Vehicle based on the CT-CV 105 mm turret





PROTEUS IS A STATE-OF-THE-ART INTEGRATED SECURITY SYSTEM INTENDED FOR COUNTER-TERRORISM AND CRISIS MANAGEMENT OPERATIONS. OPERATIONS OF THE EMERGENCY SERVICES ARE TO BE SUPPORTED BY THREE MULTI-FUNCTIONAL ROBOTS, UNMANNED AIRCRAFT AND MOBILE COMMAND CENTRE. THE SYSTEM IS TO BE COMPLETELY INTEGRATED, WHICH IS AN INNOVATION ON A GLOBAL SCALE AND POSES A SERIOUS CHALLENGE TO ENGINEERS INVOLVED IN THE PROJECT.

The Proteus Project, on which the works started in August 2008, is being realized by consortium of leading Polish research centres headed by the Industrial Research Institute for Automation and Measurements (PIAP). The project is scheduled for years 2008-2013. The idea of development of an integrated security system sup-

porting anti-terrorism and crisis management operations was conceived as early as in 2003 at PIAP as a response to new challenges faced by emergency services. Violent weather phenomena, terrorism, chemical and biological threats, and the increasing presence of technology in everyday life require cutting-edge, system solutions. That is the word "system" which is the key in case of the Proteus.

TO BREAK TECHNOLOGY BARRIERS

Every device being a component of the Proteus performs a strictly defined function, and simultaneously is an integral part of the system. Elements of the Proteus are already used in rescue services and police structures, but bringing them together to create one operational unit is innovative even on a global scale. It is only the

beginning for this kind of solutions to be developed in the world, and additionally they are created virtually exclusively for the military purposes.

The IT system of the Proteus will allow for the presentation of the gathered data in a clear way, their comparison with reference data, and with aid of GIS systems (Geographic Information System is a system for acquisition, processing and presentation of data with reference to geographic location) it will enable, for instance, determination of direction in which spreads chemical contamination or fire. It will significantly enhance and speed up decision making processes, enabling the supervision and insight into the region under threat. Interconnection of existing elements and solutions into an integrated system capable of performing various tasks depending

on the needs, is the essence of originality of the Proteus Project. Every device being a component of the Proteus performs a strictly defined function, and simultaneously is an integral part of the system. Elements of the Proteus are already used in rescue services and military structures, but bringing them together to create one operational unit is innovative even on a global scale. It is only the beginning for this kind of solutions to be developed in the world, and additionally they are created virtually exclusively for the military purposes. The IT system of the Proteus will allow for the presentation of the gathered data in a clear way, their comparison with reference data, and with aid of GIS systems (Geographic Information System is a system for acquisition, processing and presentation of data with reference to geographic location) it will enable, for instance, determination of direction in which spreads chemical contamination





or fire. It will significantly enhance and speed up decision making processes, enabling the supervision and insight into the region under threat. Interconnection of existing elements and solutions into an integrated system capable of performing various tasks depending on the needs, is the essence of originality of the Proteus Project.

SYSTEM COMPONENTS

The Proteus "brain" is to be Mobile Command Centre (MCC) designed by scientists and engineers from Poznan University of Technology. The MCC is a large truck equipped with complex communications and operation systems. This is where, owing to data acquisition and interpretation, decisions affecting the action will be made. Apart from processing and integration of data coming from the system components taking part in action (robots, unmanned aircraft), the MCC will be in continuous communications with command posts of police, fire service and crisis management centres.

With the selection and integration of GIS data deals the Space Research Centre of Polish Academy of Sciences, which is also responsible for construction of position sensors and project promotion. On-line data from the operation site will be provided by the developed at Poznan University of Technology unmanned aerial vehicle (UAV). Owing to cameras and other sensors installed on-board the person in command of action will have at their disposal a wide picture of situation from the place of intervention. Directly to the operation site are to be sent mobile robots of three types, every one of different functionalities and purpose. The Small Mobile Robot (SMR) is a robot of small dimensions and very high mobility, intended for operations in places of hard accessibility. Owing to on-board video and thermovision cameras it will be able to perform inspection in places which would be impossible to reach by human or a larger robot. In turn, Mobile Intervention Robot (MIR) is a technological equivalent of special forces – its task is intervention. Larger and heavier, it will be equipped with manipulator and set of sensors intended for determination of threat levels. The largest of three robots will be the Mobile Enhanced Functionality Robot (MEFR) – heavy cavalry of the Proteus. Mass of about 300 kg, capability of carrying weights of mass up to 40 kg with a manipulator of range of 2 meters, structure enabling the installation of additional devices: sensors, negotiation package or pyrotechnic guns – those are its basic features. To the site of operation all robots will be carried by Mobile Robot Operator Centre (MROC) mounted (similarly as the MCC) on a chassis of a truck. The MCOR is to be equipped with devices for rapid loading and unloading of robots, portable robot operator stands (PROS) and a system of communications with command centre. All components of the Proteus will be mobile, which will enable their transportation to the place of intervention, and modular structure of the whole allows for rapid adaptation to the specifics of the particular action.

THE PROTEUS IN THE FUTURE

The Proteus in assumption is addressed to satisfy needs of the emergency services in Poland: the fire service, police, border guard, crisis management centres. The project will finish with the development of a demonstration version of the system, whose presentation is planned in August 2013. A simulated emergency operation will enable the assessment of effectiveness of the complete, integrated system. "Our ambition is to build a demo version of the system that will be so advanced in terms of structure and technology that developing it into a fully operational prototype of the Proteus system will take very little time", promised Paweł Wojtkiewicz, project coordinator. It would be possible to hand over the prototype like that to the Polish services for conducting a series of tests. From that point there is a quick way to commercialisation not only of the system as a whole, but also its particular elements developed as a result of research work conducted during the project. We are currently working on the implementation of RMF and RMI robots -they will be available on the market within several months.



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Wojskowe Zakłady Mechaniczne was established in Siemianowice Slaskie in 1952 and since then is strongly involved in overhauls, modernization and special Production for necessity of Armed Forces.

Military Mechanical Works developed in scope of documentation and production following equipment:

- T-72/SKZ-T-72/ tanks field control stands
- Tracked vehicles SKS – G engines' field Control stands
- Maintenance and lubrication equipment
- Compressor installation
- Power generation

Factory started repairs in scope of following engines: Henschel, Ikarus, Star 200, Leyland, Jelcz.

In 1996 upgrading works of the BRDM-2 armoured reconnaissance care began. As a result of this work the whole family of upgraded armoured reconnaissance vehicles was generated: from the BRDM-2M96i model through the BRDM-2B, BRDM-2A and BRDM-2M96iK "Szakal".

A number of vehicles were produced, which have been successfully exploited in the Polish Army, especially during peace keeping missions. Now the persisting construction works tend to follow upgrading of these vehicles, for the purpose of upgrading their reliability and battle possibilities.

In the year 2001, Ministry of National Defence invited Wojskowe Zakłady Mechaniczne, among other companies, to participate in a tender for the delivery of Wheeled Armoured Transporters (KTO) for the Polish Army. In this tender, WZM offered a fourth generation armoured modular vehicle AMV 8x8 designed by Finnish concern Patria, armed in combat version with HIFTIST 30mm weapon system of Italian concern OTO Melara.



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Industrial Research Institute for Automation and Measurements - PIAP (Pol: Przemysłowy Instytut Automatyki i Pomiarów - PIAP) is a leading Polish research institute, active in the fields of robotics, automation, vision and measurements systems. PIAP was established as a government-owned research institute in 1965. For over 15 years we've been performing innovative works developing mobile robotics applications for security and defense. Our long-term experience and vast network of partners allows us to create and implement complex security system solutions. We are one of the main suppliers for:

- Army,
- Police,
- Fire Brigades,
- Other forces Responsible for public security, crisis management and civil protection.

We are the only producer of the high quality mobile robots for counter-terrorism applications in Eastern Europe. From the very beginning of the development works, both on these and other PIAP's mobile constructions, the future end users of the devices have been taking an active part in the process, which ensures the best quality of our products and their perfect tailoring to the needs and tasks they will be faced with. Currently, PIAP's family of robots includes seven different constructions for C-IED and reconnaissance purposes.

All PIAP's robots have been designed to work with a range of equipment used by the uniformed services. They can be equipped with devices such as a pyrotechnical disrupter, RTG device, command wire for remote detonation of explosives, fiber optic cable roller and many more.

PIAP is focused on creating a wide spectrum of devices and systems dedicated to various applications, including:

- C-IED and EOD operations
- Border and infrastructure protection
- Convoys and patrols escort
- Reconnaissance and remote observation
- Surveillance and patrolling
- Crisis management
- SAR operations



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Polskie Zakłady Lotnicze Sp. z o.o. – PZL Mielec A Sikorsky Aircraft Company is the biggest Polish manufacturer of aircraft, currently expanding its production profile to include aerostructures and helicopters. On March 16, 2007, 100% of the shares of Polskie Zakłady Lotnicze Sp. z o.o. were purchased from ARP S.A. by United Technologies Holdings S.A. (UTH), a subsidiary of United Technologies Corporation (UTC). The new era was initiated not only in the history of Mielec aviation industry but also in the history of the company itself. As a part of UTC, PZL initiated cooperation with Sikorsky Aircraft Corporation – a world leader in helicopter production, including the UH-60 BLACK HAWK, S-76 and S-92 models.

Our current product line includes:

S-70i BLACK HAWK – multitask helicopter for international markets.

M28 – a turbo-prop, twin-engine, STOL class (short takeoff & landing) aircraft designed for passenger and/or cargo transportation, paradrop, medical evacuation, marine reconnaissance and patrol flights, and Search & Rescue missions.

M28B Bryza – the military version of the M28 model, designed for special operations (depending on configuration).

M18 Dromader – a single-engine aircraft used in agricultural, fire fighting and forest protection operations.

UH-60M BLACK HAWK™ Cabins, the major structural assembly used to build the Sikorsky UH-60M BLACK HAWK™ Helicopter.

Following the free market rules and operating in accordance with Polish Commercial Code, we pursue manufacturing and commercial activities in the field of PZL designed aviation products and introducing them to international markets. We also cooperate with such aviation industry leaders as: Sikorsky Aircraft, Spirit Aerosystem, Pratt & Whitney Canada and SAAB Aerostructures.



Air Force Institute
of Technology

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The Air Force Institute of Technology is a research institute supervised by the Minister of National Defence. The Institute's mission is to support the aviation technology in the field of scientific research.

The contribution of the Institute in the development of the Polish Air Force results mainly from the activities in the field of reliability and flight safety in a broad sense. The significant achievements, valued both in the country and abroad, include hundreds of scientific-research, experimental and construction studies which have been applied by the Polish Air Force

The institute conducts the following innovation activities

- The design and integration of airborne systems
- Systems for logistics
- Reliability and safety
- Unmanned aircrafts
- Training systems, including e-learning
- Aircraft armament
- Airport and road infrastructure
- Substitute fuels, working liquids and lubricants
- The use of bio-components in oil and lubricant products for the air industry

AFIT provides a wide variety of complex ground and in-flight tests, including aircraft and helicopters certificate tests. It also tests pilot's individual equipment, airborne high-altitude and rescue systems, airborne and ground systems to transmit or display flight parameters, and it designs and develops of flight-test dedicated measuring and recording systems.

It also provides certification tests of aeronautical products introduced into service with the Polish Air Force, including air armament, as well as simulation tests based on models of aircraft flight dynamics. AFIT additionally develops and tests aerial rocket targets used for air defence forces training.

AFIT can upgrade weapon systems for aircraft, as well as develop new designs of air weapons and aerial targets (bombs, airborne rocket launchers and bomb fuses), and new ground-based and flying testing systems for air forces. It also tests air weapons after warranty periods guaranteed by deliverers/OEMs to extend service-life, upgrades the onboard attack avionics systems for aircraft and helicopters. Aircraft simulation, training and modeling.



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WB Electronics, a private company of Ożarów Mazowiecki, with entirely Polish capital, is one of the major companies of the Polish arms market.

The company, as one of the major supplier for the Armed Forces of the Republic of Poland, has been actively contributing to improving the defence capabilities of the Polish army for more than twenty years. This contribution consists in creation of new technologies as well as modernisation of military equipment.

Compared to large world corporations, WB Electronics is a small company, but with a comparable range of product offerings. WB ELECTRONICS for years has consequently been conquering new areas of electronics and IT applications in the military technology.

Proprietary solutions in new technology make it possible to develop innovatory products with unique utility properties. The offerings of WB Electronics include mainly military electronics, software as well as services associated with integration of military vehicles. The primary client of WB Electronics are the Armed Forces of the Republic of Poland. The company is also actively involved in overseas trading.

The technology offered by WB Electronics is based on long – term experience resulting from the use of the company’s solutions implemented in the Polish army as well as from participation of WB Electronics in international tenders and long – term cooperation with the most demanding customers from around the world.

WB Electronics is a resilient and rapidly growing company, which undertakes new challenges in the field of development and modernization programs for security and defence. Consistency, perseverance, commitment and the belief in continuing development makes company one of the best participants in the Polish and foreign arms markets.

The strategic directions of development of the offer of WB ELECTRONICS S.A. include:

C4ISR systems – integrated command support systems and battle-field visualisation systems,

Software – integration of platforms and systems

Military Electronics – gun and cannon automation, communication systems, sensors, computers and terminals,

Integration of Military Vehicle Electronics – in combat vehicles, command vehicles, reconnaissance vehicles, specialist vehicles as well as gun and cannon automation.



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