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Modular Air Defence System KOBRA

INSTEAD OF PRODUCTS, WE OFFER TECHNOLOGY PAGE NO 20

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 times by constant development.

One of the areas that the defense 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.

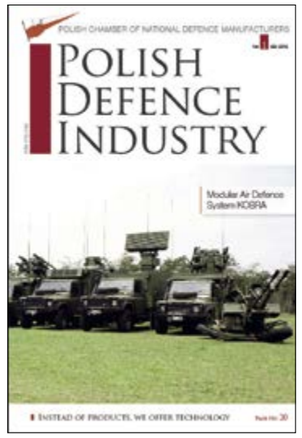
The wide range of possibilities offered by Polish manufacturers and the highest quality of their products provides customers with a full range of solutions and services tailored to the current and future needs of the dynamically growing army.

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.

It is with great pleasure that I invite you to be become acquainted with the profiles of some selected manufacturers operating in our market, as well as the most interesting examples of military defense equipment.

I wish you an enjoyable read,

Slawomir Kulakowski
President of the Polish
Chamber of National Defence



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EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND

POLAND

Poland is situated in the central part of the European continent. It covers an area of 312.683 square kilometres, placing Poland as 9th in Europe and 63rd the world. Poland is situated between the Baltic Sea to the north and the Sudeten and Carpathian Mountains in the south, in the Vistula and Oder basin.

BORDERS

Poland's shape resembles a circle with a distinctive knob – the Hel Peninsula (34 km long with an average width of 500 m). Poland is bordered by Germany (467 km) to the west, by the Czech Republic (790 km) and Slovakia (541 km) to the south and Ukraine (529 km), Belarus (416 km), Lithuania (103 km) and Russia (210 km) to the east. Furthermore, Poland's northern boundary is in the most part set by the coast of the Baltic Sea.The Polish exclusive economic zone in the Baltic Sea is bordered by Denmark's and Sweden's economic zones.The total length of Poland's land and sea borders is 3496 km.

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 defense system, designed for the effective implementation of the security and defense 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.

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.

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.

ECONOMY

In terms of GDP, at the end of 2011 Poland was the 6th economy in the European Union and the 20th in the world. Poland's economic system can be described as a mixed economy. The state sector now generates about 25 percent of the GDP. This is a level comparable to countries such as France and Norway. Foreign investments in the period between 1990 and 2006 amounted to over 87 billion dollars.

FOREIGN POLICY

The Republic of Poland is a rapidly developing country, a member of many international organizations. Poland is a member of the European Union, NATO, the UN, the World Trade Organization, the Organization for Economic Co-operation and Development, the European Economic Area, the International Energy Agency, the Council of Europe, the Organization for Security and Co-operation in Europe, the International Atomic Energy Agency, the European Space Agency and the G6. Poland is the co-founder of organizations such as the Central European Free Trade Agreement (left in 2004), the Council of the Baltic Sea States, the Visegrad Group and the Weimar Triangle. It is also a signatory of the Schengen Agreement and is considering joining the euro area.

Polish Defence Industry

POLISH HISTORY

Poland is situated in the central part of the European continent. It covers an area of 312.683 square kilometres, placing Poland as 9th in Europe and 63rd the world.
Poland is situated between the Baltic Sea to the north and the Sudeten and Carpathian Mountains in the south, in the Vistula and Oder basin.

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 crashing 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.

ALEX 7,26 mm sniper rifle

TARNOW MECHANICAL WORKS

(ZAKŁADY MECHANICZNE TARNÓW)

In 2012, Zaklady Mechaniczne Tarnow celebrate the 95th anniversary of its industrial activity, making the company one of the oldest companies in Tarnow.

The company proudly offers a wide range of armaments and military equipment, most importantly, machine guns and sniper guns, grenade launchers, mortars, artillery and artillery-rocket anti-aircraft units as well as training equipment.

The Mechanical Works has been recognized as a supplier of military equipment for the Polish armed forces, other uniformed services, as well as foreign customers. The company's offer also includes cooperative services in the field of forming, plating, thermo-chemical technologies and machining.

Such a wide offer is possible as a result of the fusion of Zakłady Mechaniczne Tarnow S.A.with the Mechanical Equipment R&D Centre Limited Company in 2012. This year also marks the beginning of the dynamic activity in the defense industry.

The new center for defense technology is able to create innovative products for the military and uniformed services, and has a future perspective to grow among the leaders of the Polish defense industry, developing the foreign sales.

We would like to invite all companies and institutions interested in the defense technology development to cooperation We would also like to propose business cooperation to companies engaged in the civil market.

SNIPER RIFLES

Zaklady Mechaniczne Tarnow is a manufacturer of modern sniper rifles – specialized rifles for precise shooting at the very large distances. The arms manufactured in Tarnow has been included in the armament of the Polish Army and combat-proven by snipers in the toughest conditions.

The ZMT S.A. offers bolt-action and self-loading 7,62 mm (,308 Winchester), 8,6 mm (.338 Lapua Magnum) and 12,7 mm (,50 BMG) sniper rifles. The manufactured arms are mainly for the military and uniformed services.

All sniper rifles have been designed as stockless, which distinguishes them from the classic constructions. This system allows for a very long barrel while minimizing the overall length and makes a compact design possible. A characteristic feature of the stockless system is the change of the magazine and the trigger mechanism's place to behind the gun's grip. The center of gravity of the weapon is located near the grip, making it easier to maneuver a rifle. The use of the stockless system allows to minimize to gun jump during a shot and achieve higher accuracy.

ALEX7, 62 SNIPER RIFLE

The Alex-7,62 bolt-action sniper rifle is compatible with the 7.62 mm x 51 NATO bullet and is used to engage living and lightly armored targets at a distance of 800 meters. The gun is equipped with a universal mounting rail at the top for embedding an optical sight and an extra set of mounting rails for attaching night vision and other accessories. Alex-7,62 has an effective muzzle brake as well as a folding bipod and rear support.

ALEX-338 SNIPER RIFLE

The Alex-338 bolt-action sniper rifle is compatible with the 8,6 mm x 70 bullet and is used to engage living and lightly armored targets at a distance of 1200 meters. The 8,6 mm caliber high energy bullet has both a very long range and high explosive power, while maintaining the best accuracy and minimum weight of a rifle.

WKW SNIPER RIFLE

The bolt-action, multi-caliber sniper rifle utilizes the WKW 12.7 mm x 99 NATO (.50 BMG) ammunition and is designed to precisely destroy important enemy structures (specialized technical equipment, command posts, communication facilities, fuel tanks, radars) and incapacitate its equipment at a distance of 1800 meters and more. It is used in counter-sniper operations to effectively eliminate shooters terrorizing the surroundings.


WKW 12,7 mm sniper rifle

Weapon properties
- **Compactness**
- **Short overall length**
- **Easy to maneuver**
- **Reliable**
- **Minimized gun jump**
- **Effective muzzle brake**
- **Higher accuracy**

NSW UTIOS MACHINE GUN / WKM-B

The multi-caliber NSW Utios machine gun with 12.7 mm x 107 ammunition fed from right is an automatic weapon designed to combat the enemy troops, both lightly armored ground targets and low-flying air targets. Its other version is the WKM-B used with 12,7 mm x 99 NATO (.50 BMG) ammunition.


Trainer TR-23-2

RGP-40 SEMI-AUTOMATIC GRENADE LAUNCHER

The RGP-40 semi-automatic caliber 40 mm grenade launcher is a six-shot construction to control and incapacitate manpower, destruct technical equipment, buildings, fire units and light armored vehicles and for making smoke screens. The grenade launcher shoots 40 mm x 46 NATO bullets manufactured in the country (SBAO-40 system) or abroad.

RGP-40 has an six integral 140 mm long chamber barrels , which allows the use of a wide variety of ammunition, including special types. The weapon is fully adapted for the right and left handed shooters.

The grenade launcher has an adjustable stock length and a universal mounting rail for mounting a reflector sight (mechanical sights may also be used). Three mounting rails have been placed at the cover of the barrel for additional accessories.

THE ZUR-23-2KG ANTI-AIRCRAFT ARTILLERY AND ROCKET UNIT

The ZUR-23-2KG Jodek-G 23 mm caliber anti-aircraft artillery unit, with Grom rockets and electric drive for rotation and raise, is designed for attacking low-flying aircraft: airplanes, helicopters, winged rockets, landing aircraft and lightly armored ground targets.

ZUR-23-2KG may operate in an external fire control system. It is equipped with a programmable CP-1day and night reflector sight of and a laser rangefinder with ballistics or a CKE-2 reflector sight.

The system can fight the enemy with the use of 23-mm API (BOD) armor-piercing ammunition, against armored, flammable targets, with a tracer element for observation purposes , HEI-T (OFZT) High Explosive Incendiary Tracers and APDS-T and FAPDS-T sub-caliber Armor Piercing Discarding Sabots – Tracers.

NAVAL ANTI-AIRCRAFT ZU-23-2MR ARTILLERY AND ROCKET UNIT.

The Naval anti-aircraft ZU-23-2MR 23 mm caliber artillery and rocket unit "Wrobel II" (sparrow) is mounted on vessels designed to fight aerial targets using cannons or anti-aircraft Grom missiles. The cannons can also be used to attack lightly armored water surface and ground targets. The unit is 4,8 m in length, 1,87 m in width, and 2,23 in height and it weighs 2500 kg.

TR-23-2 TRAINING SIMULATOR

TheTR-23-2 training simulator is designed to train the crew in respect of the ZUR-23-2KG use. It allows to train in the crew in near-actual conditions concerning the operation, kinematics and dynamics as well as procedures pertaining to combat operations. The sight has been replaced by a computer battlefield simulator.

The TR-23-2 is a mobile unit, adapted for towing, equipped with wireless-connected instructor's and operator's posts. The unit is 3.6 m in length, 2,0 m in height during transport, 1,7 m in its working position and weights 600 kg. The horizontal artillery range is 360 ° ,the vertical range spans from -5 ° to +75 °.

The TR-23-2 can be used for training in the following areas:
- **The operation of electro-mechanical equipment and unit check-up,**
- **detection, identification and tracking of air, ground and water surface targets on a simulated battlefield**
- **selection of the artillery or rocket working modes, depending on the tactical situation,**
- **fire tasks for air, ground and water surface targets, moving in any direction with the specified speeds,**
- **the observation and improvement the fire effectiveness.**

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ALEX 338 sniper rifle

PIMCO

Pimco Sp. z o.o. (llc) is a trade and manufacturing company with over 20 years of experience in broadly understood safety and security industry.

A wide range of specialised equipment encompasses, among others: devices for detecting mass range weapons, chemical contamination detectors, radiological, biological and close range nuclear explosion detectors, narcotics, explosives and metal detectors, anti-explosion uniforms and pyrotechnic equipment, anti-chemical uniforms, portable X-ray machines, luggage transportation systems and devices critical to the smooth operation of airports, including: boarding bridges, airport emergency vehicles, and others.

BMR Peterson

President of Pimco Sp. z o. o.

"Pimco employs professionals in all the areas of the company's activity, including pyrotechnic, chemical and biological threats experts. Moreover, it possesses its own R&D (research and development) department, which specifically deals with designing new solutions in terms of protection against mass range weapons. Its main task also consists in adopting all kinds of equipment solutions for the targeted projects' needs and requirements of the ordering party. We realise research and development projects, targeted projects and financial grants from the Ministry of Science and Higher Education. In these terms we co-operate with such institutions as the Military Chemistry and Radiometry Institute, Military Institute of Armament Technology and Military Academy of Technology. In 2010, the company was awarded a medal during the "BRUSSELS INNOWA 2012" trade fairs for the "BIODES" biological contamination detector, manufactured in co-operation with the Optoelectronics Institute of the Military Academy of Technology.

Thus, we make it possible to provide solutions tailored to the individual requirements of the ordering party, e.g. fitting and integrating of CHERDES II system for the needs of PT-91M tanks within the Malaysian contract executed by the Bumar company."

CHEMICAL AND RADIOLOGICAL WARFARE AGENT DETECTOR CHERDES® II

- CHERDES® II is designed to be mounted into tanks, armoured vehicles, military and civilian shelters.
- Chemical Warfare Agent Detection Block is based on GID-3 detector. GID-3 the detector of choice for the US department of Defence, fullfilling their requirement for the M22 ACADA detector and use widely throughout NATO, there are currently more than 40,000 units deployed around the world.
- NATO Stock Number (NSN): 6665-43-0008569

FEATURES:

- Detection of chemical warfare agent and toxic industrial chemicals using IMS technology.
- Two detection „lines" for detection of blood, blister and choking agents.
- Generation of alarm signals after chemical warfare agent detection (turning on filter-ventilation system).
- Detection of selected TIC's (chlorine and ammonia – from the highest admissible level of detection).
- Near Range Nuclear Blast Detection (up to 6 km) – protection against shock wave, switching off vehicle engine.
- Measuring dose rate and gamma radiation dose.

CHERDES® II IS CURRENTLY MOUNTED ON:

CHERDES'III

CHERDES®III system is designed for:
Detection of chemical warfare agents CWAs using IMS technology (Ion Mobility Spectrometry)

- **Detection of selected toxic industrial chemicals – TICs (chlorine and ammonia) from very low level**
- **Warning from the highest admissible concentration level.**
- **Detection of Near Range Nuclear Blast (up to 6 km) – protection against shock wave,**
- **switching off vehicle engine.**
- **Measuring dose rate and gamma radiation dose.**

Detector CHERDES®III can be optionally equipped with two modules:

- **Dimming system of vehicle's window panes – ECLIPSE,**
- **Meteorological weather sensor MAWS (from IRDAM company)**

THE ECLIPSE

The ECLIPSE system integrated with the CHERDES III® detector enables automatic dimming of the window panes of the combat vehicle in the event of detection of a close nuclear explosion, to protect the vehicle crew from the glare caused by a high intensity light flash.

The system is equipped with filters shutting off the harmful UV radiation. The window pane sizes can be tailored to individual needs of purchasers and installed behind the armored window panes protecting the vehicle crew

BIODES

Biological Agents Detector BIODES® based on Laser Induced Fluorescence of biological substances technology provides in real time detection of suspect bilogical agents in the air.

BIODES® is a result of common works of Optoelectronics Institute of the Military Technical Academy and Pimco Sp. z o.o.

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ASDS 24/7

Automatic Stationary Chemical/Radiological Detection System

System Automatically:

- **Detects and identifies dangerous substances including:**
  - **Chemical Warfare Agents (CWA)**
  - **Toxic Industrial Chemicals (TIC)**
  - **Radiological Contamination**
- **Informs about level of threat**
- **Sends information(data) to the command center trough, cable, wireless.**

System main features:

- **24/7 continuous monitoring against CWA, TIC's and also radiological contamination**
- **Easy to install**
- **Maintenance free**
- **Very low level of false alarms**

PIAP SCOUT ROBOT

PRZEMYSŁOWY INSTYTUT AUTOMATYKI I POMIARÓW – PIAP

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 10 years we do innovative works over the development of mobile robotics applications for security and defence.

PRODUCTS

PIAP offers research and development works in systems integration and special products, covering design, realisation, start-up, implementation, maintenance and training activities. For many years we design and develop technologically advanced electronic and mechanical systems, dedicated to military and police applications. Over ten years of our work is devoted to mobile robotics and tele-operation issues. Our mobile robots and specialised devices are successfully used by various forces responsible for safety and security (Police, Polish Army, Border Guards).

PROJECTS

The Institute is very active in realisation and coordination of international and national multi-partner projects. First EU Framework Programme project was executed within 3rd FP edition in 1993-1995. Currently, we execute and coordinate about 20 international research projects. We have a well established European cooperation also within NATO, EDA and ESA research programmes, as well as with US and Israeli partners.

CERTIFICATES

PIAP has implemented international quality standards – ISO 9001:2009, AQAP 2110:2009, and national Export Control System. The Institute is certified with Industrial Security Clearance of First Class, and it is prepared to handle EU SECRET and NATO SECRET classified materials.

FIELDS OF ACTIVITY AND APPLICATIONS

For many years we have executed projects and developed solutions in security and defence domain. Specialised internal unit – Intelligent Defence and Security

Systems Department – is focused on creation of 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**

TECHNOLOGIES

Many years of work over the research projects and specialised products development allowed us to build a wide range of competencies, supported by vast experience. Not only the constant efforts of our engineers, but also an active participation of the end-users in the development process of our solutions, have let us to create a potential of capabilities, which cover:

- **Robots constructions of a high mobility**
- **HMI and MMI**


PIAP IBIS ROBOT


PIAP SCOUT ROBOT


PIAP INSPECTOR ROBOT

- **Data transmission, including satellite communications**
- **Tele-operation and control systems**
- **Environment recognition**
- **Manipulation and gripping**
- **Autonomy**
- **Data processing and analysis**

SYSTEMS

Integration of many different solutions into one, efficient system is a tendency, which is well observed in all security-related fields. Our strong competencies and wide experience built upon the long and close cooperation with the security sector in Poland and Europe allow us to realise even the most ambitious projects. The main areas of our activity are:

- **integration of IT systems**
- **S/W and H/W integration.**

Challenges faced by the forces responsible for public safety, security and defence in XXI century have increased the demands and expectations towards the innovative solutions, able to integrate the newest technologies available on market. Our long-term experience and vast network of partners allows us to create and implement complex system solutions in the security area. We are one of the main suppliers for:

- **Army,**
- **Police,**
- **Fire Brigades,**
- **other forces responsible for public security, crisis management and civil protection.**

MOBILE ROBOTS

We are the only producer of the high quality mobile robots for counter-terrorism applications in Poland. The history of Polish pyrotechnical robots has begun in 1999, when the prototype of the INSPECTOR robot was created. From the very beginning of the development works, both on that 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 are faced with. Currently, PIAP's family of robots includes five different constructions for C-IED and reconnaissance purposes.

PIAP INSPECTOR ROBOT

Inspector is a big and strong robot designed for urban operations.

– The INSPECTOR can tow vehicles left in any gear of a mass of up to 1500 kg.
– Front tracks (remote control of tilt angle) increase traction abilities, longitudinal stability and enable smooth motion on stairs, as well as highly uneven terrain.
– The manipulator is able to lift 30 kg on extended arms and 60 kg on folded arms.
– The turn of the manipulator's base amounts as much as 400°.

PIAP EXPERT ROBOT

Expert – robot designed for missions inside the means of transportation.

EXPERT's construction combines two unique features: manoeuvrability in tight places achieved thanks to the mobile platform's small size as well as broad range and high load capacity of the manipulator.


PIAP GRYF ROBOT

PIAP SCOUT ROBOT

PIAP SCOUT is a robot designed for quick reconnaissance of field and hard-to-access spots, i.e. vehicles' chassis, places under seats in means of transportation, narrow rooms or ventilation ducts.

The PIAP SCOUT robot's basic moving assembly consists of a hybrid system (tracks-wheels), but if necessary, moving wheels can be dismantled.

Solid construction combined with small dimensions and light weight as well as a dynamic driving system ensure remarkable manoeuvrability and high speed of the robot (7 km/hr).

By mounting additional devices to the robot's mobile base, its scope of application is significantly broadened.

PIAP IBIS ROBOT

IBIS is a robot for pyrotechnic and combat missions.

It is designed especially for operations in difficult and diverse terrain (including sand, rocks). High speed of the robot enables taking dynamic actions. Robot's manipulator provide big range of activities and applications. Precision drive system gives fluidity of the movement of every part of the robot, even during fast ride.

PIAP GRYF ROBOT

PIAP GRYF is a robot designed for quick reconnaissance of field and places difficult to access.
PIAP GRYF robot's basic moving assembly consists of a hybrid caterpillars-wheels running gear. However, moving wheels can be dismantled when necessary. Solid construction combined with small dimensions and light weight as well as a dynamic driving system ensure very good manoeuvrability and high speed of the robot (3.6 km/h).


PIAP EXPERT ROBOT

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INSTEAD OF PRODUCTS, WE OFFER TECHNOLOGY

What are the assets of the Polish defence market? Is the world financial crisis likely to pose a threat to the producers? Why are we to have an offer for foreign recipients that is even better than such powers as the USA of Germany? Mr Sławomir Kułakowski, the Head of the Polish Chamber of National Defence Manufacturers is here with us to answer these questions.

How would you evaluate the condition of the Polish defence industry?

It is without doubt in a much better condition than a few years ago. The industry has undergone a deep process of restructuring, it has reduced in quantity with the quality raised and the work efficiency perfected. A few cases aside, none of the companies are in bad financial condition. The only ache of this particular industry nowadays is the lack of significant and successful export ventures which this sector deserves. However, we are at the stage of commencing promotion of the defence sector, which will soon cause this problem to change. The reconnaissance of the domestic market is well advanced in the military sector. Itis the main provider of equipment for the Polish defence forces and the most modern military armament equipment. Also, the industry participates in the developmental programmes of the armed forces, which allow for designing long-term developmental strategies. Additionally, it enables a closer co-operation between the armed forces and the domestic market. All of these aspects result in us having a really strong position on the domestic market and it is high time we returned to some of the strategic markets abroad. In the case of Asian countries, these are India, Malaysia, Vietnam and Indonesia.

A lot has been spoken recently about the world financial crisis. What will the condition of the defence market be like in few years' time?

In the case of the defence industry I would refrain from using the word 'crisis'. The defence industry is based on the budget of the National Ministry of Defence, thus having a statutory coverage. In practical terms, it means that at least 1,95% of GDP is dedicated to the army. 24% of this amount must be spent on the modernisation, or in other words, the purchase of new armament and restoration. Owing to the fact that the Polish budget is gradually increasing, there is more and more money every year, so despite the crisis in Poland, the expenditure for buying the armament products will also increase respectively. Every year, the domestic companies have the chance to provide products of greater value. Hence, the Polish defence market is extremely attractive to both the foreign and domestic producers. Put simply, the world's financial crisis will certainly not pose any threat to the defence sector.

Is there a risk that such optimistic attitude will coax the producers to gain too much self-confidence, thus preventing them from providing top quality products?

Of course not. Although the financial means are planned, it is the army that can be the only one to feel secure, since regardless of all it will receive the equipment it needs, but the purchaser is not clearly defined. The industry must do its utmost to secure its position.
Considering a very strong competition, unless the industry presents top quality products and comparative prices, the army will make its purchases from the foreign producers. It is important to remember, however, that our producers, supported by the strategic programmes of the Ministry of Defence and the 1,95% GDP mentioned earlier, have ideal means and opportunities to develop good products for both Polish and foreign purchasers.

So how will the quality of services rendered and high professionalism count in the day-to-day business?

Here is how: According to the directive no. 81/2009, the armament market of the European Union was opened for all of the interested subjects. What it means is that the same criteria on the Polish market prevail for the companies from Germany, France and our own producers, and the other way round – Polish companies have the same chances on other European markets. Consequently, if our Polish producers want to make a brand for themselves, they must represent some standard which boils down to high quality products and large expenses for innovativeness, irrespective of the target market. The army, realising a given strategic target, which is the support of the domestic defence system, will not serve as a helping hand no matter what the costs. That is why, the industry must provide the army with modern equipment of good quality. Nobody will buy it just because it has been produced in Poland.

You mentioned in one of your earlier interviews, that without money for research, the market will not be able to respond to the army's needs in the foreseeable future. How do the producers tackle this issue nowadays?

It seems that the companies are aware of the benefits arising out of investing in research and development. Our producers spend more and more on this endeavour every year. The Ministry of National Defence and the National Research and Development Centre are in possession of funds for this very purpose. I personally believe that all the resources should be handed out by the Ministry of Defence exclusively as it will be the only entity setting the developmental trends of the defence industry. Briefly speaking, the army itself would pick and choose the most needed equipment and order it in accordance with a given developmental programme. On

the other hand, in the present model the companies have greater autonomy and can develop and produce equipment according to their own strategies. This fact certainly translates into a great number of exceptionally innovative solutions presented by the producers.

Are the research resources from the National Research and Development Centre and the Ministry of National Defence sufficient for the Polish defence market to be competitive on the international stage?

Polish producers use various sources of financing. It is also worth remembering, that the case is different for the Treasury companies than it is for the private undertakings, which as a rule are more innovative than the state ones, owing to the capacity to make quick decisions on investments and financial expenses. However, in both aspects the process looks very much alike. If a company engages in the development of a given product, it searches for the financing of the entire project, with the use of several sources. These come from the National Research and Development Centre, the Ministry of National Defence, their own assets and EU grants. I must point out here that the EU grants are not dedicated to the research and development in the scope of defence. The 7 framework programme intends to grant funds only to cover safety. This notion is slightly different. Within this programme, one can realise projects pertaining to the securing of borders and conducting CCTV monitoring at stadiums.

One could also apply for the resources to purchase production devices that may help creating the defence industry products. It is worth mentioning, however, that the companies are divided into those that are successfully managed and those that are not, as opposed to the government and private division. If a company has good stewardship with a perspectivist angle of thinking, there is no problem with orders and development of modern products. Huta Stalowa Wola S.A. is one such instance. A few years ago it was in a very difficult financial situation, but it managed to restructure and rid itself of any old debts. It focused on research, innovativeness of production and competent management staff. Nowadays, the company is highly specialised in artillery systems in this part of Europe. Today it has a order package for the next 5 years and works on products which will not be in offer until next 3 or 4 years. We could name more producers like this in Poland.

What can the Polish defence industry offer to the investors in Indonesia?

We should view this question in terms of politics and economy. As far as the political element goes, which may be interesting for every foreign partner, Poland is a mid sized country in the scale of the world that does not lay down any political conditions during the venture. Poland does not play the role of an empire and does not impose the policy of their own ways via orders and contracts. Another significant factor is that in our offers we do not stress the sales of the product itself, but more importantly, we offer the entire package of services. We want to make the technology transfer, pass on the whole technical documentation, train the personnel and start the manufacture of products offered for the Polish army at the premises of the foreign partner. In this way, they will also be able to produce the said equipment for their own needs in few years. It is a perfect collateral for the investor, who instantly ceases to be dependent on good political relations, distance or regular delivery of components. Poland would like to aid in the development of its foreign partners and is ready to co-operate in terms of research and development of such equipment, since it has been known for a while now that with collaboration one can achieve a lot more. It is only the benefits that arise from this situation – new products and a better proposal for the potential purchasers. The forms of co-operation can vary in kind, from a regular construction of a production site up until the emergence of corporations and joint production. Unless the producer is ready for this at a very early stage, or it is not profitable on his side, we still have the top quality equipment in our offer anyway.

Why should the investors from Indonesia be interested in the offers of Polish producers and not of the American equipment for example?

At a first glance, the US offer is exceptionally beneficial for the client. He receives a credit for the entire order, so theoretically he can receive the required equipment without spending a dime. On the other hand, the USA lays down a long list of conditions one has to meet with every order. For instance, Indonesia in the 70s, so not that long ago, was dependent on the American equipment. The moment the Americans suddenly started to resent their recipients, they blocked the deliveries of spare parts without a word uttered. The equipment was not developed for quite a few years, and the investors from Indonesia should still have it in their memory. Poland does not introduce such practices as it is not an empire and has no political interest in such actions. Additionally, our offer which is the high quality equipment has been covered by a Polish state credit, which Indonesia decided to take. Part of the armament purchase that Indonesia made was with the subsidy of the credit granted by the Polish government. Hence, if we objectively assess all of the offers I can state with full responsibility for my words that Polish products are one of the best.


Combat helicopter – GLUSZEC

AIR FORCE INSTITUTE OF TECHNOLOGY

The Air Force Institute of Technology is a research institute supervised by the MOD. The Institute's mission, for almost 60 years, 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**

GROUND AND FLIGHT TESTS

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 designes 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.


Rocket launcher to helicopter WW-15

AIRCRAFT WEAPON SYSTEMS

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 on-board attack avionics systems for aircraft and helicopters.

AIRCRAFT SIMULATION, TRAINING AND MODELING

The aircraft simulation and modeling capabilities of AFIT include formulation of mathematical models of aircraft--flight dynamics and air weapons, performance of radar stations and missile-guiding stations, certification tests of aircraft-flight simulators, and development of multimedia training systems (e-learning). It also provides training systems and flight simulators for flight control officers, interception navigators, pilots, and air-traffic controllers.

AIRCRAFT SAFETY AND RELIABILITY TESTING

AFIT emphasis on reliability and safety means It provides air-accident investigation development, computer-aided systems to assist aircrafts' operational-phase management, and testing of materials used in aeronautical structural components. It also supplies systems to record parameters of aero-engine performance, non-destructive testing of structures engineering objects, service-life tests of structural components, and flight-data decoding systems.

UNMANNED ARIAL VEHICLE – KOLIBER

SRCP-WR guided missile

Helmet mounted display system SWPL-1 Cyklop

In addition, it examines operational damage and failures to aeronautical structures, and can help extend aircraft service-life and the time necessary between overhauls.

The aim of the Division for Air Armament is development and upgrading of air armament.

ESSENTIAL RESEARCH AND DESIGN LINES:

- Reliability and safety tests by means of analyzing reliability of airborne armament and correctness of air weapons performance;
- Examination of systems of operating the weapons;
- Investigating into feasibility of prolonging service lives of air weapons after the warranty periods guaranteed by manufactures/suppliers have expired;
- New design air weapons;
- Upgrading the aircraft and helicopters' on-board equipment by means of applying new, technologically advanced solutions to attack avionics;
- Development of new systems of the engineered means to provide the air force units with ground-based and flying training.
- Evolving new methods of field and flight tests of air weapons on the grounds of research work in the following lines: dynamics of objects, ballistics, effectiveness of combat applications, pyrotechnics, opto-electronics, and navigation.

Flight symulation system cases

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HUTA STALOWA WOLA

HSW S.A. specializes in designing and manufacturing of innovative products which are extremely attractive to the armed forces.

HSW S.A. specializes in the production of special products for the artillery and military engineering, conducts research, development and performs implementations for mechanized army and navy. Moreover, it runs a cooperative for the production of large-scale weldments (of up to 25 tons). Stalowa Wola Steel Mill S.A. has the potential to independently inspire activities beneficial to the country's economy.

The Stalowa Wola Steel Mill S.A. has the longest history of being both, the manufacturer and the supplier of products for the military in the Polish defense industry, operating within the areas of design, construction, manufacturing and trade. The HSW S.A's experience in the field of special production dates back to 1938, when the first products have been shipped from the Zakłady Południowe (Southern Plant).

While conducting our business, we focus on delivering product solutions that combine:

- **the features and the performance in line with the clients' expectations**
- **the creative contribution of the designers and technologists to the creation of the product starting at the earliest stages,**
- **custom solutions, which are possible to introduce at the stage of design and production**
- **the guaranteed level of quality and after-sales service, resulting from the manufacturer's liability for its own product,**
- **system solutions in the form of ready-to-use armament modules.**

Workshop repair weapons and electrinics

155 MM Self Propelled Howitzer Krab

The professionalism that has been confirmed throughout more than 70 years of effective operation within the field of special production has an impact on our cooperative activities – we manufacture products and deliver technical services based on documentation created for or supplied by the customer,

The Stalowa Wola S.A. has been able find their proper place in the market during the transition period. The company continues the excellent tradition of military production in the Central Industrial District. In the recent years we have maintained a steady growth in our organization and product range. The HSW's separate Military Production Center division has provided a greater mobility in new construction developments and increased the rate of production deployments. This may be illustrated by the complete delivery of the WR-40 "Langusta" rocket launcher fire unit, the implementation activities for the fire module (codename Regina) as well as the innovative technical solution for the 12mm caliber, automatically loaded mortar implemented within the 120 mm self-propelled mortar Company Fire Unit "RAK" program.

A positive aspect to mention is the increase in the co-operation between HSW S.A. and the universities and military institutions as well as the active participation in the competitions organized by the Defense and NRDC to develop new military programs within the consortium formed under the leadership of HSW S.A.. The programs are: the multi-guide launchers system codenamed HOMAR and the command fire unit of light self-propelled howitzers, codenamed KRYL. Another example of the pro-innovation approach of the Military Production Centre is the participation in the consortium activities which aim at the construction of a new lightweight crawler platform with a hybrid drive. This has resulted in two joint patent applications with along with the AGH University of Science and Technology for an innovative suspension system, which eliminates steering shafts and for the active track tensioner assembly.

The HSW engineers have also the ability to expand their specializations beyond artillery equipment and engineering equipment for the military. The cooperation with the Military University of Technology provides another example of an implementation of an innovative system of special protective bulkheads for special structures and the automatic air intake valve for the structures, which is controlled by a special NBC threat sensors. The latter solution was awarded the WAT Chancellor's Special Award.

In January of 2012, an organized part of the company (the HSW S.A. division I), concentrated on the con-

struction machinery (design, research and development, manufacturing, sales and servicing), has been sold to an investor (Liugong Machinery Poland)The obtained means allow for unprecedented investments by Stalowa Wola. The investment process has started and during the.next 5 years it will cover all operation areas of the company.

Research, development and manufacturing will be closely aligned to the perspective of the activities associated with the Polish participation in the international security system. The strategic plans for territorial state defense , the participation of the national armed forces in the allied forces stabilization, surveillance and humanitarian missions, require the implementation of innovative and unique technical, technologic and operational solutions, For this purpose, the HSW has already commenced research and development of devices providing maximum reliability, strike precision , versatility, mobility, efficient logistics and use, as well as providing safety for the crew. This results in a significant increase in the level of weapon systems automation and the standardization and unification of the equipment used by the armed forces as well as improves the mobility of artillery systems in particular.

In the years 2012-2016 HSW S.A. plans to invest about 40 million Zloty in the development of technological resources,30 million Zloty in new technologies and 8 million Zloty in digital technologies, while investing 23 million Zloty in the implementation of product development strategy. The objectives mentioned above will be complemented by capital investments in companies, the acquisition of which will strengthen the Polish defense industry as a sector of the national economy, increase the level of competitiveness of Polish military products in the international markets and will force a technological progress in the heavy industry companies.

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Artillery Battalion of Rocket Launchers WR-40 Langusta

INTERVIEW

KRZYSZTOF TROFNIAK

President of HSW S.A.
Director at HSJ

How your solutions may change the modern army ?

Our role is to provide the latest equipment, which may be used in the interest of the country. It is not our role to prompt the army on how to build their structures. We hear the needs of Polish soldiers and construct an offer that will still be capable to serve threat counteraction within 5, 7, or 10 years from now. We are able to optimize our offer through a dialogue with the military and the Ministry of Defense Imagine that our research and development programs all end up in production! This is the best certificate and guarantee for the products' quality and usability.

Does the quality of products and services, as in other businesses, play the most important role in your branch? How does this influence your offer?

Without exceptional quality there is nothing to look for in the defense industry! Who will take the responsibility for the loss of life of the people in mission, even far away from the country? Without a great quality, accusations arise instantly: who needs state-owned companies, if they are not able to guarantee the security, both to the soldiers and citizens. The times when the money invested in research could have been simply used just for the sake of job positions maintenance, have definitely ended Jobs are important, but in the market economy, the jobs are a result of wise company development. This development consists in the manufacturing of the highest quality products, perfectly adapted to current and future customer needs.

What are your company's key products?

The key products are, of course, the complete artillery systems. The Modules based on the Krab 155 mm howitzer , or the Rak self-propelled 120 mm mortar tower system are ready to use anywhere on the globe. The new WR-40 Rocket Launcher Langusta II, the Kryl and Homar programs as well as others – will be included in the offer in the coming months. We constantly deliver proven loaders and backhoe loaders to the military.

What do you think is missing, and should be done in order to become a major player in the world markets?

An excellent and complete range of cutting-edge products is absolutely essential. Another to mention – the recommendations by our national army. After the Polish army uses the equipment in combat, I believe that the news about a good product will spread. We can't create any artificial demand, can we? The military intelligence has been active for thousands of years and the customers will be attracted... Of course, we have the ambition to become a manufacturer of military products, which accounts for the reputation of the Polish economy. We want all Polish citizens to be proud of our products and we want the export of the products to become the reason of state. We shall see if this can be accomplished.

Modular Air Defence System KOBRA

BUMAR

SP. Z O.O.

Bumar sp. z o.o. is a leading supplier and exporter of armaments and military equipment manufactured in the Polish defence industry.

For over 40 years the company has been a leader in the domestic and international market of weaponry, construction plant, mining and handling equipment. Its extensive experience, world-recognized and distinguishable brand, achievements in implementing new technologies in the Polish industry and in initiating relationships with renowned producers all over the world, professional and skilful personnel are company's main assets. Bumar has been supplying and selling its equipment and services to the Polish Army and in over 40 countries in Europe, Africa, Asia, South America and the U.S., winning many international bids.

Bumar Group's capital accumulated at Bumar sp. z o.o. is equal to PLN 1.644.387.000. Bumar sp. z o.o-.'s leading role in the Bumar Group takes the form of central provision of manufacturing materials and components, designing and financing of the output intended for export and domestic sale, monitoring of production capacity, implementation of changes in the production profile and size, coordination and management of R&D work and implementation of offset contracts. Bumar sp. z o.o. also supplies civil industry products, such as construction, road and mining plant and machinery, railway accessories and other industrial goods, to domestic and foreign markets.

BUMAR GROUP BACKGROUND

The Bumar Group was formed in 2002 as a result of adoption of Strategy for Structural Transformation of the Defence Sector Capacity 2002-2005 by the Polish Government. Bumar sp. z o.o. was appointed the integrator of the newly formed Bumar Group, with the responsibility for exercising owners supervision.

The Bumar Group consists of 22 manufacturing companies from the Polish defence industry (PPO) specializing in munitions radars, rockets, armour and vehicles including 2 trade companies. Some of the dependent companies form capital groups. Bumar also holds shares in other companies, including foreign ones. More than 50 entities belong to the Bumar Group.

Anti-Aircraft gun system LOARA

WRL 100 Liwiec

Anti Aircraft Artillery System UMBRELLA

The internal structure of the Bumar Group form Bumar Electronics SA, two capital subgroups Bumar Amunicja SA and Bumar Żołnierz SA and the product division Bumar Land.

Market activities of the Bumar Group are concentrated around four product groups constituting the subject matter of production and service divisions respectively:

- **BUMAR AMMUNITION:** ammunitions and missiles (shooting ammunition, artillery and missiles, SPIKE, GROM, FENIKS missiles);
- **BUMAR SOLDIER:** the soldier and the official (individual equipment and armament of the soldiers including: pistols, guns, optoelectronic equipmnet, protective meas: gas masks, helmets, bullet-proof jacets);
- **BUMAR ELECTRONICS:** electrionics and IT (commandment systems, radars, sensors, anticraft and anti-missiles systems);
- **BUMAR LAND:** lands paltforms (wheel, caterpillar patforms, military vehicles, tanks, special vehicles, technical backup vehicles, bridges).

The Group mission is to develop consolidated defence industry to secure the demands of the Polish Armed Forces for modern armaments and military equipment, and to secure a leading position for Group companies in the global marketplace.

Main objects of the Bumar Group are:

- **to equip the Polish Armed Forces with special equipment and services in line with the Polan-d`s National Security Strategy;**
- **to adapt its manufacturing capacity to the needs of the Polish Armed Forces, to consolidate that capacity in terms of capital and to gear production toward exports;**
- **to stimulate technological progress and development of the R&D capacity, including through participation and cooperation with international European and cross-Atlantic organizations;**
- **to continuously upgrade production, including mainly armaments and military equipment, in line with the expectations of the Polish Armed Forces and to develop exports;**
- **to achieve economic stabilization of the Bumar Group companies and to increase their market value;**

The Bumar Group consists of operations specializing in military equipment manufacturing, employing 9.400 people with the responsibility to address any customer demands and to ensure professional support services.

The professionalism, experience and quality services and products allow the Bumar Group companies to meet the requirements of even the most complex orders for both defence and civil-use equipment. Bumar reputation and reliability have been recognized by the largest consortia and state governments worldwide.

ANTI-AIRCRAFT GUN SYSTEM LOARA

The LOARA is an autonomous weapon system capable of performing its tasks independently or when interoperating within an air defense system. The 3D search radar, which can operate on the move, ensures early and precise target acquisition and identification “friend or foe”, while renewing its data every second. This, together with the dynamic drives of the turret, guns and the tracking sensor head, enables to achieve the reaction time of the system below 10 seconds.

The armoured turret incorporates multiple state-of--the-art sensors that enable to acquire and engage air targets flying at speed of up to 500m/s. the two 35 mm guns provide effective fire range up to 5000m. the variety of fire control sensors (tracking radar, FLIR camera, TV camera, laser range-finder) make LOARA effective in any weather conditions, day and night.

TRS-15 S-BAND 3D MOBILE MEDIUM – RANGE SUREVEILLANCE RADAR

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HUTA STALI JAKOŚCIOWYCH S.A.

THE COGNOR GROUP

At present, Huta Stali Jakościowych S.A. created as a result of a number of organisational and proprietary transformations, is a part of capital the COGNOR Group and continues almost 70-year tradition of production of quality steel and rolled products in Stalowa Wola.

We would like to assure you of our ability to meet your expectations in the way guaranteeing full satisfaction. Our activity is based on Quality Management System consistent with ISO 9001:2008 standard, implemented and subjected to regular assessment.

Armoured plates produced by Huta Stali Jakościowych SA are widely used for corpuses and armours of military vehicles that comply with protection standards I through IV according to STANAG 4569. Plates made of PM450 (ARMSTAL 450) steel are compliant with the norm MIL-A-12560H class 4a requirements, whereas plates made of 30PM (ARMSTAL 500) steel are compliant with the MIL-DTL-46100E class 1 norm.

Plates produced by HSJ SA meet the requirements of clients from the defence industry in terms of mechanical and resistance parameters. The companies in the armoury industry search for armoured plates, that fulfil the conditions and the criteria of armoured plates selection for the coachwork of armoured vehicles. These types of vehicles are produced for the use of the army, police, border guard and other services appointed to fight against terrorism and stabilise peace in the areas of conflict. The produced armoured plates also find their use in producing bulletproof vests.

HSJ SA is in possession of the technology of making armoured steel pertaining to ballistic security. The armoured plates produced with the thickness from 3 to 15mm from PM450 (ARMSTAL 450) steel, 30PM (ARMSTAL 500) and ARMSTAL 550 are characterised with hardness in quenched and low tempered state, within the scope of 420 to 580 HB and high ductility. Moreover, HSJ SA is the producer of armoured plates with the thickness from 4 to 15 mm made of 2P steel and parameters compliant with GOST 21967:76 and plates with the thickness of 15-30mm made of 43PSM steel and parametres compliant with GOST 21568:76.

The innovativeness of the products manifests itself in the aforementioned characteristics, which locate this product among those that meet the current requirements of NATO standards.

Plates compliant with GOST norms are extensively used on the Indian market, among others. The producers of military equipment, owing to the implementation of the above mentioned armoured plates, e.g. in construction of special tasks vehicles may also produce military equipment with ballistic covers, which can be significantly lighter and cheaper than the solutions used thus far. PM450 and 30PM steel plates are approved by the company named PATRIA as replacements of ARMOX 440T and ARMOX 500T plates used for the production of KTO ROSOMAK. HSJ SA is the only domestic producer of these types of plates, which are used for the construction of such vehicles as wheeled armoured vehicles or VIP cars. The material used protects the users from attacks using handguns or explosives.

In its organisational structure, HSJ S.A. also has an innovative production line specifically equipped with shot-blasting machine, a modern type laser, gas and plasma cutting device and a bending press with pressure load of 800 tonnes. It allows the company to offer a wide quality range of the elements made of armoured plates, both straight and bent, manufactured to meet the customers' needs.

HSJ S.A realises B+R works with the use of its own staff and in collaboration with other companies and research institutes. The production of 30PM and PM450 plates has been implemented within the targeted project, initiated by Wojskowe Zakłady Mechaniczne S.A. (WZMSA) in Siemianowice Slaskie, and the R&D works were performed by Wojskowy Instytut Techniki Pancernej i Samochodowej in Sulejowek. Parts of the R&D works within this targeted project were commissioned to HSJ S.A. The usage of ARMSTAL 550 steel plates was preceded by a comprehensive ballistic research performed by Wojskowy Instytut Techniczny Uzbrojenia.

NUMBER OF PRODUCTS OR PRODUCT MODIFICATIONS

HSJ S.A. produces 250 different types of steel and its variants, cast with the usage of continuous casting device (COS) in the ingot moulds. The steel contribution in the COS device amounts to 95%. The COS cast steel constitutes mainly the capacity meant for long products:

- **square steel billets 50 to 130 mm,**
- **square steel logs 140 to 200mm,**
- **rods of 55 to 120 mm in diameter,**

and sheet plates with the thickness of 3-30 mm.

The complete database of the types and dimensions of the products, including bars cast into the ingot moulds, long products and flat-steel consists of about 11000 items.

The innovativeness of products (on the scale of the company), understood as the chemical composition modifications in order to achieve the required quality parameters, is realised on the go, according to the clients' needs. In this scope of activity a new rolling mill calibrating system has been introduced (the system has b een designed by the University of Science and Technology in Krakow) for producing square billets 110 – 130 mm.

Prepared by
Stanisław Szczęch, Justyna Moskal HSJ S.A.

INTERVIEW

Wojciech Maj

Member of the board
Trade and Sales Development
Director at HSJ

What are the assets of your company?
The main asset of HSJ constitutes almost 75 years of experience in the manufacturing of rolled products. These products are designed for a variety of industry branches with the highest expectations, including defence, automotive, machine, energy supply and mining industries. The company has an integrated production and cost management system. It is a typical mini-steelwork with a fully closed technologic and production cycle, which consists of the electric arc furnace processing (EAF), off-furnace treatment (LF, VD/VOD), constant steel casting, rolling lines and heat treatment. We are also extremely versatile in the reaction to the client's needs which results from us possessing a low capacity furnace, i.e. about 40 tonnes. It is particularly significant in the production of special-purpose steels.

What does HSJ have to offer for the partners in Indonesia?
The offer aimed at the Indonesian market comprises plates and armoured plates elements with the hardness between 400-600HB and ballistic resistance which allows for the design of armours of both military and civil vehicles, as well as military facilities with the security level between 1 and 4, according to STANAG 4569, appendix A. Another offer includes high-endurance and heat-refined plates, with yield point of 690-960 MPa, used mainly for the elements of wall coaching in the mining industry. Similar goes for abrasion-resistant plates made of manganese plate (Hatfield steel, type X120Mn12), and heat-refined plate with the hardness of 350-500HB, designed for the elements with high abrasion resistance. We also offer heat-resistant steel plates with the Cr content from 7 to 25% as well as long products (heat-rolled rods and billets) made of mid and high alloyed steel, designed for the parts of machines and devices.

Why is your offer worthwhile?
We offer top quality products tailored for the individual needs and which have an innovative character. What is also crucial, we ensure short production time with negotiable and competitive prices.

Which HSJ products are in your opinion particularly important and praiseworthy?
There are three types of steel designed for armoured plates that we take particular pride in. The chemical compositions and production technology of the plates have been designed and implemented by our experts. These solutions have been registered as inventions at the Polish Patent Office. These plates found their use as components for corpuses and armours of KTO Rosomak (Wheeled Armored Vehicle) used by the Polish army.

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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 defense 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 Defense and the Colonel. Slawomir Kulakowski 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 defense, 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

Since 1998, the Chamber has been a co-organizer of the BALT MILITARY EXPO exhibition in Gdansk, and has co-organized the „Cło i Granica" (Border and Customs) Fair in Warsaw since 2004. In 2000, the Chamber has initiated and coordinated the Polish Defense 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 defense industry at the NATO Industrial Advisory Group (NIAG), and since December of 2000 it has actively taken part in the meetings of the Group.

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), {1the }Stalowa Wola S.A., MESKO S.A. and RADWAR as well as small businesses and private companies.

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