

# European Security & Defence

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# Eastern Mediterranean: Paris Shows Impatience – with Ulterior Motives?

Photo: author



In view of Turkey's actions in the Eastern Mediterranean, France announced that it would increase its military presence there. On closer inspection, Paris is using units of the French armed forces on the ground to take a stand. Two RAFALE B of the 4th Fighter Wing, sent to Cyprus for an exercise from 10 to 12 August, made a stopover in Crete on 13 August. A French C-130FR HERCULES tanker aircraft is also present at the Andreas Papandreou air base in Paphos (Cyprus), also in connection with the exercise.

The helicopter carrier (PHA) TONNERRE with support material on the way to Beirut was temporarily joined by the frigate LA FAYETTE, which was in Larnaca (Cyprus) as part of a bilateral exercise with the Hellenic Navy.

The thick air that has been prevailing for several weeks between Greece and Turkey, this time caused by the Turkish search for gas deposits in the Eastern Mediterranean, has worsened in recent days following Ankara's dispatch of a research vessel. On Friday, 7 August 2020, Turkish President Recep Tayyip Erdogan reacted immediately to a maritime agreement signed the day before between Athens and Cairo by announcing the resumption of exploration. It is intended to regulate the maritime borders between the two countries. And it seems to be a deliberate replica of the agreement concluded last November between Turkey and the official Libyan Government (Tripoli), which in turn serves Ankara as the legal basis for its research and exploration projects in the Eastern Mediterranean. The agreement provoked opposition not only from Greece and Cyprus, but also from Egypt and Israel.

On 10 August, by means of a navigation notification, Turkey informed of the resumption of its research projects with the research vessel ORUC REIS and her remaining in the sea area until 23 August. The disputed zone is the sea area between Cyprus and Crete. The research will take place in one of the Exclusive Economic Zones, either Greece or Cyprus. Pictures from the Twitter account of the Turkish Ministry of Defence show the research vessel accompanied by naval vessels.

The Elysée urged Turkey to stop its unilateral prospecting and to allow peaceful dialogue between NATO members and neighbours. A telephone conversation took place between Greek Prime Minister Kyriakos Mitsotakis and French President Emmanuel Macron. Paris further states that the French President described the situation as worrying. On Twitter he announced his decision to temporarily increase the French military presence in the coming days in cooperation with European partners, including Greece.

Earlier, the French President used the dispute with Turkey as an opportunity to question the value of NATO. In the framework of the EU operation IRINI, an unpleasant incident occurred between a Turkish and a French frigate, in which the Turkish unit behaved in an unduly aggressive manner for a NATO partner.

Although NATO is reluctant to comment, Brussels is following developments closely. On 9 August, the EU High Representative for Common Foreign and Security Policy Josep Borrell invited all parties to dialogue.

"Maritime borders must be defined through dialogue and negotiation, not through unilateral action and the mobilisation of naval forces. Disputes must be resolved in accordance with international law. The European Union is determined to contribute to the settlement of such disputes and disagreements in this area of vital security interest". says the communiqué of the External Action Service. On the morning of 13 August an extraordinary video conference of EU Foreign Ministers was convened for 14 August. Besides discussions on the Eastern Mediterranean, the agenda includes Belarus, Lebanon and Venezuela.

## French Ulterior Motives?

On the surface, Paris may be concerned with "reaffirming France's commitment to the free movement of persons, the safety of shipping in the Mediterranean and respect for international law". There may also be solid reasons why France is taking Greece's side. Paris has been working for some time on a structured and long-term partnership with the Greek maritime industry. It was launched earlier this year. The cooperation plan provided for the creation, with French support, of a centre of excellence for innovation in naval warfare in Greece, the collaboration of over twenty Greek companies with Naval Group, Thales and MBDA, partnerships between universities. An intergovernmental agreement should be finalised before the end of the year. An arms deal, the purchase of two frigates for the Greek Navy, was also part of the discussions. All this seems to be in question following American advances. This will give a different look to the French involvement in the Eastern Mediterranean, side-by-side with Greece.

**Hans-Uwe Mergener**



Photo: Heiming



**In modern combat, the logistics element – based on efficient trucks – is one of the guarantors of successful mission accomplishment.** **Page 50**

Photo: Michał Jarocki



**In the first phase of the WISLA programme, Poland plans to procure two PATRIOT-based batteries.** **Page 94**

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## Raytheon and Rafael to Cooperate in US

(ck) Raytheon Missiles & Defense and Rafael Advanced Defense Systems Ltd, an Israeli defence company, have signed a joint venture to establish an Iron Dome Weapon System production facility in the US.



Photo: Rafael

The new partnership, called Raytheon Rafael Area Protection Systems, anticipates finalising a site location before the end of the year. This will be the first Iron Dome facility outside Israel. The new facility will produce both the Iron Dome Weapon System, which consists of the TAMIR interceptor and launcher, and the SkyHunter missile, a US derivative of TAMIR. Both TAMIR and SkyHunter intercept incoming cruise missiles, unmanned aerial systems and short-range targets such as rockets, artillery, mortars and other aerial threats. Raytheon Missiles & Defense and Rafael have worked together for over a decade on IronDome, which is the world's most-used system with more than 2,500 operational intercepts.

## Feasibility Study for the Mid-Life Upgrade of the HORIZON Frigates

(ck) Today, Naviris, the 50/50 owned joint venture by Fincantieri and Naval Group, has signed a contract with OCCAR for a feasibility study on the mid-life upgrade (MLU) of the four HORIZON frigates. Naviris will work in close relationship with its industrial partners Fincantieri, Naval Group, Leonardo, Thales, Eurosam, MBDA and Sigen. Since its launching in Janu-

ary 2020, this contract is the second one Naviris has signed – after a R&T contract signed in June 2020. The Feasibility Study, to be developed over the next twelve months, will be the first stage of the project and it will be focused mainly on the Anti Air Warfare capability of the four vessels. The project will be carried out by Naviris with the support of Fincantieri and Naval Group and the major Combat System suppliers (EUROSAM, THALES, LEONARDO, MBDA and SIGEN). It aims at identifying and analysing the modifications to be implemented on the French and Italian HORIZON class destroyers to increase their capabilities until the end of their life cycle. The aim of this project is to offer to the nations configurations able to guarantee an appropriate response to the threat scenarios set out by the clients. The study will involve high-qualified engineers and technicians from Naviris, Naval Group and Fincantieri, in close collaboration with working teams set up by the Combat System Suppliers – all based in Italy and France. The HORIZON frigates were originally built between 2000 and 2010 in a joint programme between Fincantieri and Naval Group, providing the Italian and French Navies with two first-class anti-air frigates each. The peculiarity of this highly complex study is that it will involve foremost experts from various companies aiming to be completed in one year only.

## 130mm Gun for Future Battle Tanks

(gwh) Western main battle tanks (MBT) are not widely believed to be capable

Photo: Rheinmetall



of safely eliminating all potential enemy tanks (such as the Russian T14 ARMATA). One way to counter such threats though is to increase the calibre of the main armament. Today, MBT guns with a barrel diameter of up to 150 mm have been developed. Following the first hardware presentation of a 130 mm/L51 gun at Eurosatory 2016, Rheinmetall released a video showing the main armament integrated with a current MBT in July 2020.

The gun itself weighs three tonnes, 1.4 tonnes of which is for the 6.63 m barrel. Thanks to the larger calibre and design improvements, a higher initial velocity can be achieved, which in the case of kinetic projectiles is a decisive factor in determining penetration capability. New types of ammunition have also been developed in order to fully benefit from these improvements. The 130 mm main armament is not only offered for retrofit to existing MBTs (as shown in the video) but also as the primary weapon for the Main Ground Combat System (MGCS), on which development work has begun with Franco-German studies.

## Schiebel CAMCOPTER® S-100 and Nordic Unmanned Carry Out Offshore UAV Flight

Schiebel, together with partner Nordic Unmanned, successfully demonstrated to Norwegian energy company Equinor the cargo delivery capability of its Unmanned Aerial Vehicle (UAV) CAMCOPTER® S-100

Photo: Schiebel



to offshore platform Troll A. This is a world's first in terms of full-scale offshore UAV delivery from shore to an active oil and gas installation. The exercise simulated the scenario of an urgent requirement for specific essential spare parts at the gas production platform TROLL A. The CAMCOPTER® S-100 successfully carried out the long-range delivery flight from Mongstad, where the spare parts were 3D-printed, to the offshore platform TROLL A located in the North Sea. The unmanned delivery distance was 100 km (55 nm). After the UAV supplied the spare parts, it carried out a close inspection around the platform before it headed back to Mongstad. The flight trials also included a successful Search and Rescue (SAR) mission, where a "man over board" dummy was quickly located by the UAV, transmitting the positioning data and live images using the L3 Harris Wescam real-time Electro-Optical/Infra-Red (EO/IR) camera and an Automatic Identification System (AIS).



Photo: Naviris



## ■ First A350 Handed over to the German Air Force

(gwh) Federal Government officials, parliamentarians and members of the German Armed Forces will soon be able to take advantage of the A350-900, one of the most modern passenger aircraft. On 20 August 2020, the future flagship of the Federal Ministry of Defence's (BMVg) Special Air Mission Wing in Hamburg was



Photo: Bundeswehr

handed over in the presence of the Federal Minister of Defence, Annegret Kramp-Karrenbauer, by Lufthansa Technik AG. This is the first time that an A350 will be used as a government aircraft. This is also the first non-commercial use of this aircraft type. In the scope of a contract valued at €1.2Bn, three A350-900s were ordered in April 2019. Airbus is delivering the three aircraft for €640M. Since May 2020, Lufthansa Technik has been equipping the first aircraft to meet the MoD's requirements. €288M are being spent on the aircraft's cabin and interior fittings. Another €229M have been earmarked for the integration of the Large Aircraft Infrared Countermeasures (LAIRCM) system. This includes spare parts and equipment for maintenance and repair. The participating companies will also provide initial training for personnel. Lufthansa Technik has equipped the A350 operated by the German Armed Forces under the designation 10+03 with a provisional (transitional) cabin for political-parliamentary flight operations. The cabin has office and conference space, as well as a multifunctional lounge area. The remaining space is available for delegations. After the two sister aircraft 10+01 and 10+02 (under construction) receive a fully-fledged government cabin from Lufthansa Technik next year, the transition cabin in 10+03 will also be replaced. All three aircraft are scheduled for delivery during the course of 2022, replacing the existing A340-300s. Following certification, the first A350 will be available for government flights from the end of 2020. In addition to VIP transport, the aircraft will be used for strategic air transport of

casualties, as well as for personnel and material transport during humanitarian missions and to support Bundeswehr operations. Dedicated equipment will be provided.

## ■ SPEXER Radar for Qualified Air Defence.

(gwh) A solution is currently being developed in the framework of an emergency programme for the German Army's qualified anti-aircraft defence, which is to be made available for use by the NATO Very High Readiness Joint Task Force (VJTF) in 2023 at the latest. The focus is predominantly on unmanned aerial vehicles (UAVs), which is why the defence system is also known as Counter UAS (c-UAS). The preferred solution consists of a BOXER wheeled armoured vehicle, the mission module which incorporates a remote-controlled Kongsberg PROTECTOR weapon station. The weapon is a 40 mm grenade launcher with airburst ammunition which is programmed to detonate in defined proximity to the target and destroy the target with a dense bundle of projectiles. This form of combat is particularly successful against soft targets such as UAVs. The most important sensor element will be the SPEXER 2000 3D MkIII radar from Hensoldt. The system incorporates the third generation of ground detection radar technology, which is capable of detecting air targets such as helicopters and aircraft, in addition to land and sea targets. The AESA radar (Active Electronically Scanned Array) covers a sector of 120° with a fixed antenna. With up to 16 independent radar beams, small and fast-moving targets such as UAVs can be detected. The update rate is 0.3 seconds and the range 2.5 km. With only one radar beam, the detection range increases to 40 km, but at a reduced sampling rate. With its scan-on-the-move capability, SPEXER can also perform reconnaissance in motion. The system is thus also suitable for the protection of convoys. The compact antenna weighs 35 kg and measures 60x50x20 cm (WxHxD) and operates in a frequency range from 9.2 to 10 GHz (X-band). The signals are generated and processed in the Generation and Process-



Photo: Hensoldt

ing Unit (GPU) which weighs 40 kg and is similar in size to the antenna. In a test shooting with the complete system, SPEXER demonstrated a high classification performance of small targets in very demanding scenarios. The characteristics of micro targets such as UAVs are low radar cross section and high manoeuvrability. After evaluation of the test firing, Hensoldt was commissioned to supply ten SPEXER 2000 3D MkIII. The units are scheduled to be delivered by the end of this year. The ten BOXER vehicles for qualified anti-aircraft defence are to be made available by the end of 2021 at the latest.

## ■ Australia Plans to Buy Fleet of Light Helicopters

(JC Menon) In a two-stage procurement process, Australia plans to buy a fleet of light helicopters for the country's Special Forces. Under the LAND2097 Phase 4 Special Operations Rotary Wing (SORW) capability enhancement programme, Australia's Department of Defence has issued



Photo: Airbus

a Request for Proposals (RfP) which will be evaluated by the end of 2020. "Respondents should be notified of the outcome of the RFP in November 2020," a DoD official informed. According to sources, three bidders have indicated interest in the tender, which is understood to be for about 20-25 helicopters. Besides Airbus, local company Bell is set to offer the Bell 429. Leonardo is also showing interest in the proposal, though this has not been officially confirmed. The RfP is related to, but separate from, the Request for Tender for LAND2097 Phase 4 Special Operations Rotary Wing, which was released on 3 February 2020. Australia's Minister for Defence, Linda Reynolds welcomed the opening of the invitation to Australian industry, which will help ensure Australia's helicopters remain at the cutting edge of Special Operations Aviation. Airbus Helicopters has joined up with over 20 Australian partners to form "Team Nightjar", as the consortium launches its solution to the Project LAND 2097 Phase 4. Team Nightjar will be offering a fleet of the H145M and in-country support.

## ■ SPIKE SR Made in Poland

(ck) The Israeli company Rafael Advanced Defense Systems and the Polish company Mesko, a PGZ company, have agreed to co-produce the shoulder-supported SPIKE SR (Short-Range) ATGM as part of the Polish

PUSTELNIK programme. The PUSTELNIK programme, led by the Armaments Inspectorate of the Polish MoD, intends to select an anti-tank weapon for Poland's Territorial Defence Forces (WOT). The SPIKE SR is an advanced fire & forget missile for ranges of

more than 2,000 metres. The missile is easy to operate and requires very little training. SPIKE SR is portable, weighs only 10 kg, is suitable for day and night operations and is capable of engaging any type of armoured vehicle or MBT. SPIKE SR is fully disposable, a feature that gives the soldier a higher degree of mobility and manoeuvrability after firing. SPIKE SR is the smallest member of the SPIKE ATGM family. SPIKE is in service in 34 countries, including 19 NATO nations, with over 34,000 missiles delivered and more than 6,000 fired in tests and engagements. SPIKE LR is the missile variant that has been in service with the Polish armed forces for around 15 years, with local production of the missile parts and final assembly in Poland being carried out by Mesko since 2003. The SPIKE SR missile is designed for various ground combat scenarios, for tactical manoeuvring forces and for special forces. The SPIKE SR has unique operational characteristics which enable a high level of operational readiness. It can easily be carried by a soldier without compromising manoeuvrability, and provides simple, intuitive and fast operation in just seconds from "cold start" to launch in a variety of operational and environmental scenarios. The lethality of the missile is achieved by a tandem warhead with a precursor charge that defeats Explosive Reactive Armour (ERA), allowing the main warhead to achieve its full penetration of Rolled Homogeneous Armour (RHA). With a high hit probability in all scenarios and ranges, the missile can be deployed under severe weather conditions (from -35°C to 55°C) and in complex combat scenarios, such as engagement of fast-moving targets. The missile's range ensures a higher degree of survivability, as it does not depend on a marking device (e.g. laser), so

that the troops can remain concealed. Since its deployment does not require special training, infrastructure or a designated gunner, SPIKE SR allows operational flexibility. SPIKE SR is an effective, high-performance ammunition that does not require a central command and enables the decentralisation and dispersal of forces to cover more terrain, a relevant operational concept for territorial defence forces.

## ■ Second A330 MRTT Delivered to the MMU

(gwh) NATO's multinational Multi Role Tanker Transport (MRTT) fleet received the second aircraft on 10 August 2020. The first aircraft was handed over on 29 June 2020. Following final assembly in Getafe, Spain, a team from OCCAR, NSPA and the Multinational MRTT Unit (MMU) have been conducting acceptance tests on the A330 MRTT at the Airbus facilities since the beginning of July. The successful acceptance was completed with the issuance of the Certificate of Acceptance and Commitment Letter. Both documents were signed by the takeover team in Getafe and by OCCAR in Bonn due to the ongoing coronavirus pandemic. Airbus has thus delivered the second A330

participating nations as an initial capability. The third, fourth and fifth aircraft are currently being converted by Airbus. The rest of the fleet will follow by the end of 2024. To date, eight A330 MRTT aircraft have been ordered for the entire fleet. As an option, the fleet is set to increase to 11 aircraft. The MMU should reach its target strength of 370 soldiers by 2023. While Germany will provide a share of 62%, the MMU is supplemented by support personnel at the Eindhoven and Cologne/Bonn locations. In addition, there are technical and medical personnel assigned for AirMedEvac missions.

## ■ Successful Test of ARROW 2

(jh) The Israel Missile Defense Organization (IMDO) in the subordinate structure of the Directorate of Defense Research and Development (DDR&D) in the Israeli Min-



Photo: Rafael



Picture: OCCAR



Photo: MoD Israel

istry of Defense, together with the American Missile Defense Agency (MDA), and the Israeli Air Force (IAF), has completed a successful test of the ARROW 2 weapon system. The test was led by Israel Aerospace Industries (IAI) and conducted at a site located in central Israel. Throughout the test, the ARROW 2 system successfully engaged a SPARROW target missile, which simulates a long-range surface-to-surface missile. The campaign was conducted in accordance with the defence establishment's plans. During the test, the updated capabilities of the ARROW weapon system to successfully meet current and future threats, were validated. The interception was conducted by IAF service members together with engineers from the institutions involved in the system's development. The various layers of Israel's air defence mechanism were employed in the test in order to ensure their readiness and efficiency in operational scenarios. The successful interception test complements a series of additional achievements, including the ARROW 3 test campaign conducted by the IMDO and MDA last year in Alaska when both systems demonstrated advanced operational capabilities. The integration of both systems in Israel's air defence mechanism is expected to significantly expand and enhance the country's capability to defend against current and future threats.



## ■ China Imposes Sanctions on Lockheed Martin

(JC Menon) China has imposed unspecified sanctions on Lockheed Martin after the US State Department approved Taiwan's request to buy recertification of PATRIOT Advanced Capability-3 (PAC 3) missiles for an estimated cost of US\$620M. The Taipei Economic and Cultural Representative Office in the United States (TECRO) wants to refurbish its Lockheed Martin built PAC 3 surface-to-air missiles and extend their operational life to 30 years. "China firmly opposes US arms sales to Taiwan. We urge [the] US to earnestly abide by the One-China principle, stop selling arms to Taiwan and cut its military ties with Taiwan, so that it will not cause further harm to bilateral ties, peace and security across the Taiwan straits," Chinese Foreign Ministry spokesman Zhao Lijian said. However, he did not elaborate what form these punitive measures would take. "China has decided to take essential measures. We will impose sanctions on [the] main contractor of this [arms] sale, Lockheed Martin," Lijian said. China sees Taiwan as a breakaway province that will eventually be part of the country again. Lockheed Martin has very little exposure to China. However, the company says, "Foreign Military Sales are govern-



Photo: Author

ment-to-government transactions and we work closely with the US Government on any military sales to international customers. Discussions about sales to foreign governments are best addressed by the US Government." The family of PAC-3 missiles are high-velocity interceptors that defend against incoming threats, including tactical ballistic missiles, cruise missiles and aircraft. Thirteen nations – the US, Germany, Kuwait, Japan, Qatar, the Republic of Korea, the Kingdom of Saudi Arabia, Taiwan, the Netherlands, United Arab Emirates, Romania, Poland and Sweden have chosen PAC-3 and PAC-3 MSE to provide missile defence capabilities. Already in service, the PAC-3 air defence missiles represent an important weapon in Taiwan's high-altitude defence systems and are deployed in major cities and also surround Taiwan's important military facilities, China's GLOBAL TIMES notes.

## ■ A400M for Luxembourg

On 10 August 2020, the single A400M transport aircraft ordered by Luxembourg became the property of Luxembourg's Armed Forces. The aircraft will initially remain in Seville for the installation of special instruments according to the requirements of the Luxembourg and Belgian Armed Forces. The aircraft is scheduled for delivery to Luxembourg in mid-October. The aircraft for Belgium will also be finally assembled in Seville. Delivery of the first two A400Ms to Belgium is planned for



Photo: Airbus

the near future. Luxembourg and Belgium intend to operate their total fleet of eight A400Ms jointly from the Luxembourg/Belgian Vliegbasis Melsbroek base in Belgium. Luxembourg's aircraft, with serial number MSN104, will fly under the military designation CT-01. The Belgian aircraft will be designated CT-02 to CT08. Of the six nations (Belgium [representing

## Avon Respiratory Protection for NATO

**Avon Protection has supplied protection solutions to the UK MoD and other allies since the 1920s and remain the primary supplier of integrated protective equipment to NATO and the US Department of Defense Army, Navy, Marines, Air Force and Special Operations Forces.**

The NATO Support and Procurement Agency (NSPA) has awarded Avon Protection a 10-year contract to supply a complete CBRN personal respirator system. Avon Protection is a world leader in respiratory and ballistic protection, delivering life critical solutions for Militaries and First Responders worldwide. The company has supplied protection solutions to the UK MoD and other allies since the 1920s and remain the primary supplier of integrated protective equipment to NATO and the US Department of Defense Army, Navy, Marines, Air Force and Special Operations Forces. This most recent procurement was led by Finland and Norway to establish technical requirements and demanding end user testing. The frame-



Photo: Avon Protection

work contract will enable NATO countries and partners to purchase Avon Protection's market leading respirator system, based around FM50, full suite of filters, MP-PAPR, (Powered Air Purifying Respirator), ST53 (Self-Contained Breathing Apparatus) and accessories.

Understanding the operational flexibility required by NATO forces, Avon Protection have designed a modular respirator system to protect NATO troops in the most demanding environments.

The FM50 respirator and a suite of filters are at the core of the respirator protection system selected by NSPA. Developed in conjunction with the United States Department of Defense to counter the multiple CBRN threats met in modern war fighting, anti-terrorist and peace-keeping operations, the FM50 is the most operationally proven and widely deployed battlefield respirator in the World.

Commenting, James Wilcox, President, Military at Avon Protection, said: "We are proud to be awarded this strategically important contract from NSPA and we look forward to working with NATO and their partners to continue to support world leading military capability. This contract demonstrates NATO's continued confidence and reliance on Avon Protection to supply product of the highest quality and performance to protect its troops for the foreseeable future."

Luxembourg in the OCCAR programme], France, Germany, Spain, Turkey and the United Kingdom) for which OCCAR is the procurement authority, Luxembourg and Belgium are the last two nations to receive the aircraft.

### ■ GDELS Awarded DRAGÓN Contract

(jh) The Spanish Ministry of Defense has awarded a €1.74 billion (USD \$2.06 billion) contract to a joint venture of General Dynamics European Land Systems-Santa Bár-

Photo: GDELS



bara Sistemas (GDELS-SBS) and three other companies to deliver 348 8x8 wheeled combat vehicles (VCR), including maintenance and life cycle support, as well as support to the vehicles' international commercialisation. The GDELS-SBS contract is for €733 million (USD \$870 million). The programme is expected to grow to a total of approximately 1,000 vehicles. The vehicle, named DRAGÓN by the Spanish Army, is based on the GDELS 8x8 PIRANHA 5 wheeled combat vehicle and is based on Spanish national technologies, as required by the Spanish MoD. The vehicles are to be delivered over a seven-year period. The GDELS-SBS joint venture (JV) will manufacture the 8x8 VCR at GDELS sites in Trubia and Seville, Spain, in the collaboration with the other Spanish JV members. The JV members include GDELS-Santa Bárbara Sistemas, Indra Sistemas, Sapa Placencia, and Escribano Mechanical & Engineering. The Spanish Ministry of Defence mandated a national industrial plan in which Spanish industry participation must be no less than 70% of the total programme. The JV was established to ensure that all operational objectives and needs of the Spanish Army and the Spanish Ministry of Defence are fully met and to fulfil the requirements of the Government's industrial plan. GDELS-Santa Bárbara Sistemas' programme participation will involve approximately 650 direct and 1,100 indirect employees.

### ■ Fourth GLOBAL HAWK for NATO AGS

(gwh) In a flight lasting almost 22 hours, the fourth GLOBAL HAWK RQ-4D was

transferred from Edwards Air Force Base (California) to Sigonella (Sicily), where it arrived on 26 July 2020. At Sigonella, NATO is establishing the Alliance Ground Surveillance system AGS. The fifth GLOBAL HAWK is still missing, but is expected to arrive at Sigonella later this year, thereby completing the air segment of the AGS. Following the flight, the aircraft was taken over by NAGSMA (NATO AGS Management Agency). Once the Italian authorities have approved the aircraft, the GLOBAL HAWK will be handed over for service. In addition to the air segment, AGS includes a ground and support segment. The ground segment consists of mobile and deployable ground stations from which the aircraft are controlled and where the reconnaissance data are processed. The stations are mounted on HX2 trucks from Rheinmetall and connected to each other and also to NATO command centres (e.g. Allied Command Operations and Allied Air Command) via high-bandwidth data links. The support segment is stationed at Sigonella, from

Photo: NATO



where the missions are supported with services. The handover of the first (of six) Mobile General Ground Stations (MGGS) took place in March 2020, thus creating the conditions for initial capability. Full operational readiness of the system is planned for 2025. The GLOBAL HAWK is a HALE-classified UAV for high altitude (over 18 km) and long endurance operations (High-Altitude, Long Endurance platform). The aircraft weighs 14.6 tonnes (maximum take-off weight) and can reach a maximum speed of 575 km/h with a Rolls Royce turbofan engine. It provides a payload capacity of 1.4 tonnes. The main payload elements are the ground surveillance radar sensor (Multi-Platform Radar Technology Insertion Programme, MP-RTIP), as well as an extensive range of long-range and broadband data links.

### ■ SharpEye Radar for Lithuania

(gwh) The Lithuanian State Border Guard Service (Valstybės sienos apsaugos tarnyba) has selected several variants of the SBS-900 X-band SharpEye long-range ra-

dar for remote coastal surveillance. Hensoldt UK's (formerly, Kelvin Hughes) coastal-based radars are specifically designed to meet the operational requirements of port and river traffic operators and government agencies responsible for the

Photo: Hensoldt



protection of coastal and offshore areas. In cooperation with the local integrator Telekonta, the mast mounted SBS-900s were selected to meet the requirements of the Lithuanian Border Guard for detecting small targets at long range. SharpEye does not require an air-conditioned housing for its operation, so system integration and infrastructure costs are low.

### ■ VSR700 Prototype Performs First Autonomous Free Flight

(jh) The prototype of Airbus Helicopters' VSR700 unmanned aerial system (UAS) has performed its first free flight. The VSR700 performed a ten-minute flight at a drone test centre near Aix-en-Provence in southern France. This represents a significant step in the programme following the first flight in November 2019 when the prototype was tethered in order to comply with regulatory requirements. To enable this first free flight, Airbus Heli-

Photo: Thierry Rostang



copters implemented Geofencing, a virtual perimeter which enabled and justified the flight clearance from airworthiness authorities for the flight. The flight test programme will now develop further to progressively open the flight envelope. The VSR700, derived from Hélicoptères Guimbal's CABRI G2, is an unmanned aerial system in the 500-1,000 kg maximum take-off weight range. It is capable of carrying multiple full-size naval sensors for extended periods and can operate



from ships, alongside a helicopter, with a low logistical footprint. The VSR700 prototype has progressed over the last nine months since its maiden flight. The programme has implemented the Geofencing function, as well as a Flight Termination System allowing the mission to be halted if necessary. Modifications have equally been performed on the air vehicle, alongside autopilot software evolutions and updates, as well as structural modifications and reinforcements.

### ■ ESG Delivers Drone Defence System for Field Camp Protection

The Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) has awarded ESG Elektroniksystem- und Logistik-GmbH a contract for the delivery of "systems for the detection, classification / identification of and defence against small Unmanned Aircraft Systems." The scope of delivery includes container-based GUARDION systems for the early detection and effective defence against drones for field camp protection in the theatres of operation of the German Armed Forces and is primarily provided by ESG and its project partner, Hensoldt. The main technological components are Hensoldt's high-performance XPELLER system components SPEXER2000D radars and NIGHT OWL M cameras, R&S@ARDRONIS radio direction finders from the GUARDION cooperation partner Rohde & Schwarz, as well as effectors from HP Wüst. As the main contractor, ESG is responsible for the overall system and, with its integration partner M.Schall, will integrate the individual components. In addition, ESG is responsible for the processing of all sensor data by using its proprietary core intelligence, and for the display of the intuitive situation picture via ESG's military command and control system TARANIS®. The modular drone detection and defence solution, scalable to the respective deployment scenario, is based on, and in particular, takes into account the many years of operational experience that ESG and its cooperation partners Rohde & Schwarz and Diehl Defence have with the GUARDION system. GUARDION was used, for example, to secure various major political events including the G20 summit in Hamburg in 2017, a state visit by US President Obama in June 2016 and the G7 summit in Elmau in 2015, as well as during the German Unity Day celebrations and the international aerospace exhibition ILA Berlin in 2018.

### ■ UK MoD Awards Contract to Demonstrate Electric-Drive Vehicles

(jh) The UK's NP Aerospace has been awarded a £3M contract by the Ministry of Defence (MoD) to demonstrate hybrid electric-drive systems on the FOXHOUND and JACKAL vehicles; the project is being delivered in collaboration with General Dynamics Land Systems UK, Supacat and Magtec. The contract award is part of the Protected Mobility Engineering & Technical Support (PMETS) programme which is being led by NP Aerospace as the engineering authority for the vehicle fleet.



Picture: NP Aerospace

General Dynamics Land Systems–UK and Supacat are the partner vehicle OEMs, and Magtec is the electric drive and battery technology partner. Developed by Magtec in the UK, the hybrid electric e-drive solution for the FOXHOUND and JACKAL is intended to deliver multiple technical and operational enhancements, including (but not limited to):

- Silent mobility
- Enhanced silent watch capabilities
- Off-board electrical power
- Increased onboard power for the insertion of new technologies

This is the first time that this type of technology system has been applied to vehicles covered under the PMETS programme. The production of demonstrator vehicles will enable the MoD to analyse the operational impact of new technical capabilities.

### ■ L3 to Build Medium USV Prototype for US Navy

(J C Menon) The US Navy has selected L3 Technologies to design and build its first medium unmanned surface vehicle (MUSV). The Naval Sea Systems Command has awarded a US\$35M fixed-price incentive (firm-target) contract for the detailed design and fabrication of a prototype MUSV. "This contract includes options for up to eight additional MUSVs, logistics packages, engineering support, technical data, and other direct costs, which, if exercised, will bring the cumulative value of

this contract to US\$281.4M," according to a US Government official. The award follows a full and open competitive procurement process. L3 is one of five companies to bid on the contract. Most of its MUSV work will be performed at Morgan City, Louisiana, and the prototype MUSV is expected to be completed by December 2022. Naval Sea Systems Command says the MUSV programme will provide pier-launched, self-deploying, modular, open architecture surface vessels capable of autonomous navigation and mission execution. MUSVs will support the Navy's ability to produce, deploy and disburse intelligence, surveillance and reconnaissance and electronic warfare capabilities, and provide/improve distributed situational awareness and sensing to the battle force. The Navy defines MUSVs as being 45 feet to 190 feet long, with displacements of roughly 500 tonnes. The Navy wants MUSVs to be low-cost, high-endurance, reconfigurable ships that can accommodate various payloads. Initial payloads for MUSVs are to be intelligence, surveillance and reconnaissance (ISR) payloads and electronic warfare (EW) systems.

### ■ Russian MoD Announcing New Procurement Efforts

(yl) On 12 August, Russia's Defence Minister, General Sergei Shoigu paid a lightning visit to the Eastern territories of Khabarovsk



Photo: UAC

Krai and Irkutsk. Since the aviation plants in Komsomolsk-on-Amur and Irkutsk have built the Sukhoi Su-27/30/35 families, the Minister's visit did not come as a surprise to these facilities. General Shoigu first visited the Gagarin KnAAZ plant in Komsomolsk which is busy fulfilling two large MoD contracts, including the one awarded in 2015 for 50 Su-35 multi-role fighters set to be completed by the end of 2020. Earlier in 2020, KnAAZ delivered four Su-35 to the elite Russian Knights aerobatic demonstration team.. The single seater is the latest derivative of the Su-27 family

and is considered in Russia to be the most advanced and combat-effective weapon system to gain air superiority against any rival. The key features include super-maneuvrability due to its thrust vectoring engines and a huge variety of weapons, including long-range air-to-air and air-to-ground missiles. According to the export organisation Rosoboronexport, the aircraft has a maximum payload of 8,000 kg, while the radar can detect air targets with a radar cross section of 3 m<sup>2</sup> at a distance of 350 km. The plane was tested in combat by the Russian Air Force (VKS) in Syria in order to be fully operational in 2018, though the only confirmed foreign buyer is China which, by April 2018, had purchased 24 aircraft of the export version. The second KnAAZ contract refers to the Russian fifth-generation fighter and the Minister has been assured that the new Su-57 combat aircraft will enter serial production this year in order to meet the contract plans of 76 planes due to be delivered by 2028. On the occasion of General Shoigu's visit, a new contract was announced for 48 Su-35 which is set to be awarded to KnAAZ by the end of the year. The deal is worth 70 billion roubles (over US\$1Bn) and is expected to be completed by 2024. IAPO in Irkutsk could also benefit from the Minister's visit, after being awarded an additional order worth over 100 billion roubles for 21 Su-30SM2 multi-role fighters and 25 Yak-130 combat-training aircraft. The Su-30SM2 is the latest version of the Su-30 double-seater family designed to achieve air superiority. It can employ the same payload as the Su-35 and more. Recently, the Izvestia daily, referring to local experts, reported that the Su-30SM would receive a heavy air-to-

surface missile which most probably refers to the Kh-32 liquid-propellant hypersonic missile, previously used by the Tupolev Tu-22M3 bombers. In total, the VKS and the Russian Naval Aviation have ordered 116 Su-30SM since 2010, and IAPO is set to be awarded an extra 7 billion roubles for logistics support, according to the Minister. Earlier versions of the aircraft were exported to "Russia friendly" nations, including ex-Soviet republics, as well as India (Su-30MKI), Malaysia (S-30MKM), and Algeria (Su-30MKA). The Yakovlev YAK-130 trainer has become a new generation "flying desk" for Russian pilots with over 100 employed at the Serov military college in Krasnodar. It has been exported to a number of nations, including Algeria, Bangladesh, Belarus, Laos, Myanmar and Vietnam to be used as a light combat aircraft. Defence contracts represent the lion's share of business for these two companies, while both also operate as assembly facilities for national civilian aircraft programmes - Sukhoi SUPERJET at KnAAZ and MC-21 at IAPO. In addition to visiting the two aircraft companies, Minister Shoigu also toured the Amurskiy shipyard (ASZ) in Komsomolsk. The shipyard had experienced difficult times in the 1990s but has since enjoyed a period of revival over the last few years. Currently, the plant is busy fulfilling a contract for four Project 20380 corvettes, two of which have already been delivered to the Russian Tikhookeanskiy Flot (Pacific Fleet). The third vessel, ALDAN TSYDENZHAPOV, is currently undergoing sea trials, while the fourth, REZKIY, is still under construction at the shipyard. The ambitious programme for the Project 20380 corvettes also involves the Severnaya Shipyard in

St. Petersburg. Minister Shoigu announced that six additional corvettes are to be built at ASZ with a new contract to be awarded shortly. These contract announcements in Komsomolsk were welcomed by the acting governor of the Khabarovsk Krai, Mikhail Degtiarev, who stated that the entire region could benefit from defence procurement orders to the tune of 630 billion roubles by 2028. The Far East and Siberia federal districts cover two thirds of Russia's territory with just 18% of the national population.

### ■ Air and Surface Surveillance Radars for the Dutch Navy

(gwh) The Royal Netherlands Navy (RNLN) has ordered one NS100 radar and seven SCOUT Mk3 radars for its warships, according to the manufacturer Thales Nederland. The amphibious landing platform



Photo: Thales

dock (LPD) JOHAN DE WITT will receive the NS100 and one SCOUT Mk3 radar. One SCOUT Mk3 is to be embarked on the combat support ship DEN HELDER, which is currently under construction with a planned entry into service in 2024. The DEN HELDER will also be equipped with a Friend-or-Foe Identification System (IFF). The remaining five SCOUT Mk3s are intended for the frigates of the KAREL DOORMAN class operated by the Netherlands and Belgium. The NS100s are part of Thales' 4D AESA radar generation deployed on most of the RNLN's vessels. The dual-axis multi-beam sensor can simultaneously detect a large number of targets while using a single operating mode. The radar's flexible architecture allows for the introduction of new capabilities during its service life. As a result, the NS100 on the LPD ROTTERDAM will be updated to ensure that the two radars are identical. Acceptance testing is scheduled to begin in 2023. The SCOUT Mk3 medium-range radar systems are able to detect very small objects, even in heavy seas or near large objects. It can also automatically detect approaching helicopters and UAVs.

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# Discover PBS TJ100P, the Latest Addition to PBS Turbojet Engines Family

With more than 14,000 aerospace equipment delivered worldwide PBS is a well-reputed small turbojet engine supplier. The high quality and reliability of PBS jet engines is reflected in the fact they have been used and operated by UAV manufacturers worldwide. With the EASA (European Aviation Safety Agency) certified processes of design and production in place, PBS engines stand out from competing engines in their category.



Photos: PBS

The unique ability of PBS to carry out in-house design and development, manufacture and testing of small turbojet, turboprop and turboshaft engines for unmanned systems, helicopter and aircraft auxiliary power units (APU) and environmental control systems (ECS) in accordance with global aerospace standards has greatly contributed to its enduring success on the global market.

This year PBS Velka Bites is proud to announce a further step to expand the range of jet engine family by introducing two new versions of its turbojet engines – PBS TJ100P and PBS TJ40-G1NS.

## The Lightweight and Powerful PBS TJ100P

PBS TJ100P is an oil-free version of PBS worldwide recognized and operated PBS TJ100 turbojet engine. It offers many interesting features. Turbojet engine PBS TJ100P has an unprecedented thrust-to-weight ratio – with only total weight of 17.2 kg its thrust is 1,250 N. ratio. The engine will be a perfect propulsion unit for manufacturers of target drones, modern UAV and UCAV systems.

Customers will definitely appreciate PBS TJ100P engine's lower weight and its design simplification especially in terms of oil-free system. Oil-free version enables its easier storage and service. Another advantage is that the engine may be operated in any position - there is no restriction of the tilt angles during flight and take-off. The PBS TJ100P turbojet engine allows connection of up to 2 power converters with the electrical power output of up to 2.3kW. By this, the engine meets high power supply

sign features all the accessories integrated into the engine, including ECU (electronic control unit). The main features of the PBS TJ40G1-NS turbojet engine are:

- Plug & Play design - all components integrated inside the engine
- Compact design
- Excellent thrust-to-weight ratio
- Low fuel consumption
- Salt-water recovery
- Integrated starter-generator
- Possibility of ground and in-flight restart



**A graphic rendition of a UAV powered by a PBS TJ100 engine**

requirements of modern UAV systems. The engine TJ100P features reliable electrical starting including in-flight start. The main features of PBS TJ100P turbojet engine are

- Fuel-lubricated version
- Excellent thrust-to-weight ratio
- No limitation of engine position at the time of launch
- User-friendly storage
- Low weight –2 kg weight saving compared to engine versions with autonomous oil system
- Possibility of ground and in-flight restart

## PBS TJ40-G1NS Plug & Play

Another member of PBS turbojet engines is PBS TJ40-G1NS specially developed for target drones. The compact Plug & Play de-



**The PBS TJ40-G1NS is particularly suited to target drone applications, and offers salt-water recovery capability for coastal ranges.**

## Aviation Industry Challenges

In recent years, the aviation industry has faced a turning point stemming from the need to move to intelligent and sustainable technologies and systems in a relatively short period of time.

One of the greatest challenges is reducing of the environmental footprint. Environmental. The European Commission plans to make Europe the world's first climate-neutral continent by 2050. Reducing emissions will require large-scale innovation, and this is an opportunity for non-fossil fuels and hybrid aircraft. PBS thus welcomes the possibility of cooperating with Airbus on the supply of cryogenic turboexpanders for the development of liquefied hydrogen powered aircraft.



**The family of PBS turbojet engines**

# The True Nature of Sino-Russian Relations

**Eugene Kogan**

**The oft-repeated mantra praising a special and comprehensive strategic partnership in Sino-Russian relations is more often heard from the Russian side than the Chinese.**

While Russia is certainly viewed by Beijing as a reliable economic and trade partner with its oil, gas and arms exports to China, the Chinese do certainly not over-emphasise this relationship. Instead, China sees Russia as a waning power with its vast territories, supported by armed forces and nuclear weapons, while at the same time prone to endemic corruption and unable to pursue meaningful economic, political and social reforms.

No less important in this relationship is the fact that Russia's illegal annexation of Ukraine's Crimean Peninsula in March 2014 was not supported by China and this remains a thorny issue in the relations between the two states today. Interestingly, this issue is usually omitted when experts discuss this strategic partnership. Whether the potential - and illegal - annexation of Taiwan by China would be supported by Russia or not cannot be taken for granted. Alexey Maslov, Director of the Institute of Far Eastern Studies at the Russian Academy of Sciences believes that "China would need a great-power partner like Russia to help it achieve its global ambitions in the post-coronavirus era" against the US-led democratic world. This assertion is rather far-fetched since China undoubtedly sees itself as the preeminent partner here, something that is obviously rejected by the Russian side, who prefer to believe that they hold equal status in the bilateral relationship. But is Moscow really on an equal footing in this partnership?

## A US-China Cold War

Some voices in Moscow, however, are worried that Russia could end up a loser in the event of a new US-China cold war as Mos-

Photo: Kremlin



***In view of China's growing strength, doubts are growing that Moscow is really on an equal footing in this partnership.***

cow would be unable to maintain its strict neutral position in the long run. As Dmitry Suslov, from the Moscow-based National Research University Higher School of Economics, argues, "a continued intensification of the US-Chinese confrontation presents Russia with serious challenges because the more serious this showdown becomes, the more pressure there will be on Russia to pick a side, something that it does want to do." Russia has no desire to become embroiled in the middle of a serious disagreement between Washington and Beijing, since that could ultimately expose the true nature of the Sino-Russian relationship. Suslov added that "China's increasingly assertive foreign policy was another source of concern for Moscow. In the midst of the coronavirus pandemic, Beijing has adopted a new brand of 'Wolf Warrior' diplomacy, an approach that has led to numerous Chinese ambassadors becoming involved in high-profile spats with their host nations" in order to intimidate and subsequently expose the impotence of those nations vis-à-vis China. Even though Russian and Chinese aversion to US efforts to promote global democracy has served as a key rallying point for the two

countries, Suslov warns that "an emboldened China could eventually demand that Russia follow its lead." The question also remains as to whether an overly gung-ho approach from Beijing might result in humiliation for Russia, not least as Moscow firmly believes in its equal status in the relationship. Whether Russia's leadership will come to their senses and realise that they are being duped and manipulated by Beijing is beyond the scope of this article. Nevertheless, and for the time being, the answer to this question remains 'no'.

## China's Military Build-Up

An additional factor that needs to be highlighted relates to China's military build-up. Yuri Tavrovsky from the Moscow-based Russian People's Friendship University, has claimed that there is a certain degree of apprehension in Moscow regarding this issue. Tavrovsky asserts that "in the long run, we watch China's success and do not rule out any possible scenario because we remember how Beijing's foreign policy changed from the 1950s to the reform period under Deng Xiaoping." It should be

## Author

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noted that in March 1969, the Sino-Soviet border conflict in the vicinity of Damansky Island on the Ussuri River near Manchuria took place, damaging bilateral relations for some time. In addition, US President Richard Nixon and Henry Kissinger, his National Security Advisor, opened US doors to China, which itself eagerly undertook its own overtures towards Washington. Therefore, US President Ronald Reagan's famous adage "trust, but verify" should be borne in mind by the Russians.

Although Alexander Lukin from the Moscow-based Higher School of Economics, has expressed a similar sentiment, namely, "My sense is that there is understanding [in the Kremlin] that someday China could pose a problem," this problem, however, appears to be non-existent for the time being. Despite the fact that Russia and China jointly participate in naval and land exercises both in Russia and in China, it does not necessarily make them strategic partners, but rather partners who watch each other carefully, at the same time remaining distrustful of the other's intentions.

As for the co-development and manufacture of innovative and well-advanced military technology, both sides are not as cosy or close as some researchers or experts suggest. Even though Viktor Murakhovsky, Editor-in-Chief of the *Arsenal of the Fatherland* magazine published in Moscow, asserts that "China will not surpass Russia in the development of key military systems" the reality is already different. China is already ahead of Russia in developing a military application for artificial intelligence (AI), shipbuilding, UAV-manufacturing, introducing anti-carrier ballistic missiles, defence electronics, and civil and military space performance. And China is not interested in any joint production of its military products with Russia, since it prefers to keep its know-how and technology for itself. Perhaps least important in this regard is that China has financial resources to maintain its investments in R&D and preserve the technological edge over Russia. It may, however, sell some of those systems, such as UAVs and ships to Russia, while the Russian leadership is keenly aware of their technological weaknesses and vulnerabilities. It is true that Russia is maintaining its technological edge over China in terms of military aviation and air-defence systems, however, it is not interested in any type of transfer of technology (ToT) to China, its so-called strategic partner.

## Russian-Chinese Alignment

While Russia has reservations about the implications of China's newly found military strength, including China's defence industry



Photo: via author

**A freight train crossing the Russian-Chinese border near Manzhouli. Moscow remains reluctant to open all of its business sectors to Chinese companies.**

strength, it feels that it has no other option than to align itself with China in order to counterbalance the US-led West. The question remains as to whether this alignment can continue to exist for an extended period of time. Most likely not, since this alignment is neither equal, nor strategic, but is rather a more simple cooperation between the two countries against the democratic West.

The Russian-Chinese alignment serves China well since it has capital to invest, and it seeks to co-opt Russian companies into Chinese businesses operating in Russia. Mobile TeleSystems (MTS), Russia's largest mobile operator, signed an agreement in June 2019 with China's Huawei Technologies, the world largest manufacturer of 5G equipment, to help develop network infrastructure in Russia. Likewise, Russia's growing embrace of mass surveillance of its population through facial recognition technology led it to enter into increased cooperation with China's Hikvision, a partially state-owned leader of this technology. And indeed Elsa Kania, Adjunct Senior Fellow at the Washington-based Centre for a New American Security's Technology and National Security Programme, is right when she says that "as pressure grows from US policies and other concerns [on China], Russia is an attractive alternative as a market for cooperation and recruitment of talent for Chinese companies." Russia's increasing reliance on China is set to continue since Russia has no alternative or viable options and the Chinese leadership is aware of this fact and uses Russia as a market for cooperation and recruitment of highly-skilled labour from Russia. In addition, the increased reliance on China exposes the weaknesses

of Russia in terms of technology, economy and small and medium enterprises (SMEs). In other words, the Russian alignment with China does not serve Russia well.

Despite China's technological inroads into Russia, Moscow remains reluctant to completely open all of its sectors to Chinese companies, in part due to a history of Chinese cyber theft of Russian designs or reverse-engineering of Russian military aviation technology. There are also increasing concerns about Russia's smaller and medium companies being dominated by China's global tech firms, thus leaving Russia easy prey to China. Interestingly enough, India recently introduced new restrictions on foreign investment to prevent 'opportunistic takeovers' of its companies by Chinese buyers. Whether Russia will follow India's example remains to be seen.

In conclusion, mutual feelings of resentment are certainly directed towards the US, since Washington is often seen as adopting a belittling attitude towards both countries, but at the same time, China itself tends to look down on Russia and this exposes Russian dependency on China, its so-called benevolent benefactor. In short, let's not to be fooled by the terms "strategic partnership" or "strategic interests". And we might also recall that Russian Emperor Alexander III, once said that "Russia has just two allies, the armed forces and the navy." In modern Russia, in addition to its armed forces and navy, the country relies on its ballistic missiles, nuclear weapons, and permanent seat at the UN Security Council and not simply as a co-operator or unequal partner with China. And that is the true nature of Sino-Russian relations today. ■

# The COVID-19 Saga

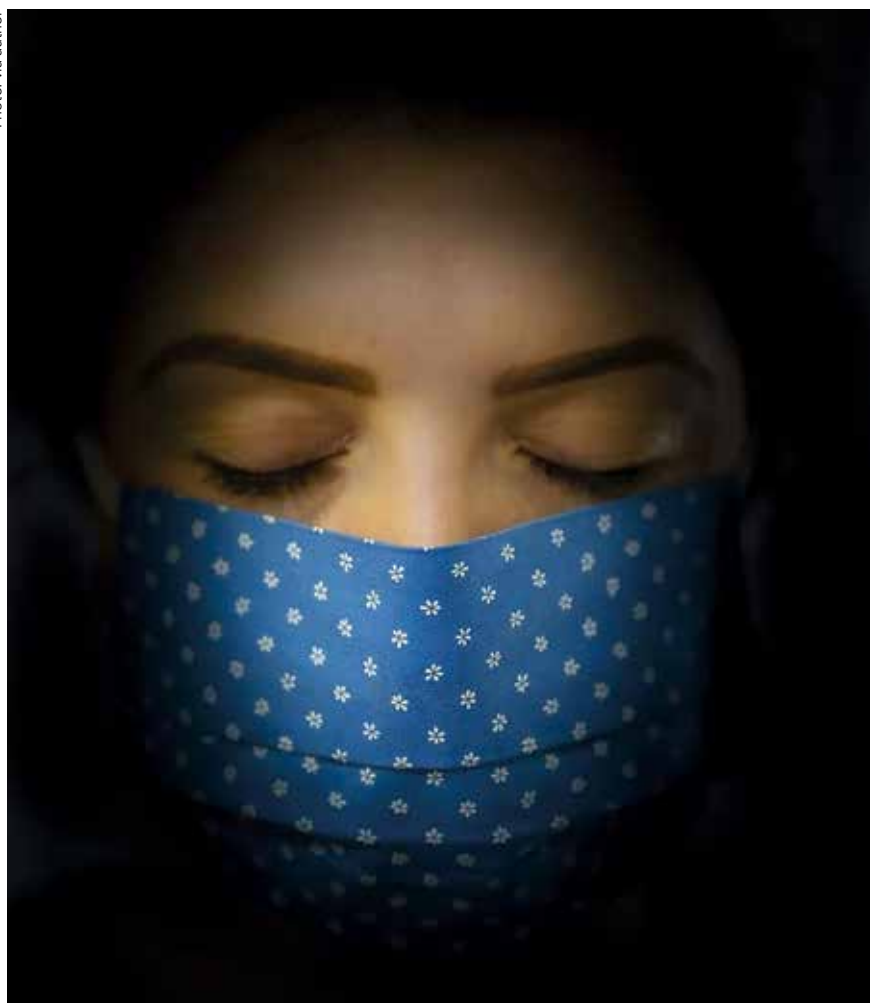
## Global Implications, Geopolitical Trends and the Balance of Power

**Andreea Stoian Karadeli**

**The current pandemic challenges the very global order. Rather than a history-defining moment, COVID-19 is a strong trigger in a global metamorphosis that began even before the virus locked us at home.**

One of the most influential thinkers of the 20th century, Zigmunt Bauman, left us a warning that seems to perfectly reflect today's crisis: "We must be prepared for a long period that will be marked by more questions than answers, more problems than solutions, and in which we will have to advance through the edge of a very equal probability of success and failure." Beyond the pandemic, the current situation challenges the very global order, giving us no other option than to adapt in order to evolve.

Photo: via author



### The "Scholarly Pandemic"

As the COVID-19 crisis has continued to unfold, the international community has been debating intensively as to the potential geopolitical impact of the pandemic, offering up various kinds of judgements, ranging from cautious forecasts to hasty conclusions. Among all the theories presented so far, an in-depth look reveals the trend of a so-called "scholarly pandemic" that overemphasizes the current moment of COVID-19 as a history-defining moment and a cause of global transformation. In times of a pandemic, it is extremely difficult to make predictions and offer definitive forecasts. Indeed, COVID-19 has had, and will continue to have an impact on the global economy, international relations, societies and institutions. But the extent of this impact, together with the unfold-

***COVID-19 is a source of distress and anxiety not only for the individual, but also for the global political order.***

### Author

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ing geopolitical trends, can be considered and analysed as political consequences that occur as a reaction to 'the political side-effects' of COVID-19. In this way, we can avoid falling for the "scholarly pandemic" argument and emphasize the fact that the current crisis has only served to highlight the existing weaknesses in our international system.

In this regard, the pandemic is not expected to result in a complete change in the global order, but rather act as a trigger in

at least three contexts: i) it will bring to the surface developments that had previously largely gone unnoticed, ii) it will act as an accelerant of existing geopolitical trends, in particular the growing rivalry between the US and China and the shift in the economic balance of power from West to East, and iii) it has the power to be a catalyst for change in both the developed and developing world, from the future of the EU to the relationship between many developing countries and China.



## A Brief History of Plagues and Geopolitics

Although far from having the same impact as events such as large-scale and decisive wars that have led to fundamental changes in the world, a brief look at history reveals that pandemics still have the capacity to trigger change and even reverse the balance of power. In the fifth century BCE, during the Peloponnesian War, Athens fell victim to plague and was defeated by the Spartans; in the same way, the Italian Plague of 1629-31 decimated Venice; in the fourteenth century, the Black Death led to the collapse of the British feudal system, which helped lay the groundwork for the rise of the modern capitalist economic system; in the fifteenth and sixteenth centuries, the Aztec Empire was destroyed by smallpox, opening the door to European colonization in the Americas; the Spanish Flu of 1918 killed as many as fifty million people, triggering significant steps in global health governance such as the creation of the League of Nations' Health Organization which later became the World Health Organization (WHO).

Throughout history, pandemics have proved to have the power to accelerate already existing trends, a fact that we are currently witnessing in many areas, most notably in the global economy and politics. Similarly, more recent epidemics and pandemics caused by HIV (AIDS), A/H1N1 or the Ebola virus, have strengthened international cooperation and preparedness.

### "Corona Diplomacy"

To begin with, the current pandemic has had a major impact on international diplomacy, while regional and global cooperation have been put to the test and have largely failed in many aspects. Unfortunately, the European Union did not honour its principles of solidarity and cooperation, thereby leaving the floor open for a dangerous return to national reflexes and bilateral cooperation in humanitarian aid. The pandemic has therefore been "exploited" as the context for power projection through medical supply assistance and support in repatriation efforts – a new kind of international relations tool or we might say, "Corona diplomacy".

Apparently, in an effort to compensate for not being able to prevent the virus from spreading, China sent medical supplies to various places around the globe, including the US and European countries badly hit by the pandemic. Pictures of Xi Jinping's face mask crate shipments to Italy

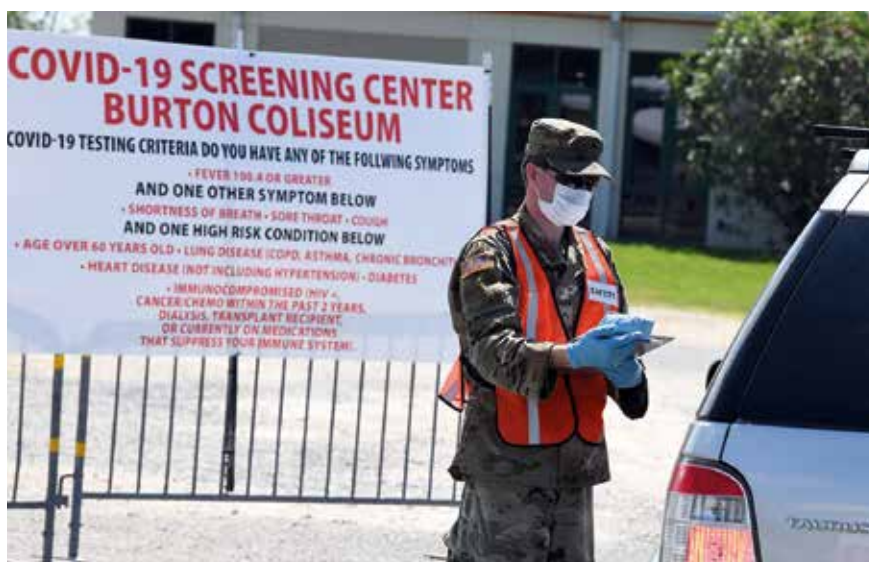


Photo: U.S. Air Force

**The US Louisiana National Guard activated 660 soldiers to assist with the COVID-19 response.**

featured a quote from the ancient Roman philosopher Seneca: "We are waves of the same sea, leaves of the same tree, flowers of the same garden." China sent both medical supplies and doctors to Italy on several occasions during the peak of the first pandemic wave when the EU was overwhelmed by the mounting crisis. But much of the equipment China provided has proven to be faulty, according to EU national authorities. The Netherlands recalled hundreds of thousands of face masks it received from China, while Spain determined that 60,000 testing kits it had received were defective.

Other regional powers such as Russia and Turkey have also pursued "Corona diplomacy" and sent aid to the US and Europe. Russia sent military and medical aid to Italy on planes labelled with "From Russia with love", at a time when most EU countries and other traditional partners have failed to provide the help requested by the Italian authorities. In the same way, Russia sent a plane full of masks and medical supplies to the US. Turkey did much the same for countries in Europe and also the US, while the numbers of cases among the Turkish population were on the rise. Many argued that these types of political manoeuvres were in fact rather dangerous at a time when medical supplies were particularly necessary for national needs.

On the other hand, the crisis has transformed the very core of diplomacy and diplomatic practices. The need to minimise physical contact has promoted digital diplomacy, including the first meeting of the United Nations Security Council on the pandemic and numerous G20 meetings taking place virtually. States developing such platforms and condensing the

required skills and resources will have a significant advantage in the months to come.

### Global Implications

Beyond the direct effect of the pandemic being the loss of human life, there is wide concern regarding the political and economic side-effects of COVID-19. In this regard, two main questions come to the fore: What will the post-COVID-19 world look like? And what opportunities and threats will be presented by the new international environment?

To begin with, the economic impact of the pandemic could prove to be one of the most powerful triggers for change, as many economists predict a deep recession with the world economy shrinking considerably. Based on the estimates provided by the World Bank Group, 60 million people could fall into extreme poverty, while developing economies could be severely afflicted by the health and economic impacts of the pandemic. Unemployment is on the rise, even in developed economies, and countries with weak welfare systems are failing to meet the expectations of their people during these difficult times. The prediction of a global recession would trigger political consequences in many countries, as it will act as a multiplier of already existing social, economic and political problems. Many argue that in the post-COVID-19 period, the world economy will require a recovery programme similar to that of the post-WWII era, while actors with the means to lead such a programme will increase their spheres of influence.

Directly related to the economic impact and prospects of recession, there is an alarming trend unfolding in the rise of na-

Photo: Louisiana National Guard



**US Air Force medical Airmen exit a C-17 GLOBEMASTER III aircraft following the first-ever operational use of the Transport Isolation System – an infectious disease containment unit designed to minimise contamination risk to aircrew and medical attendants.**

tionalist, xenophobic and racist movements exploiting the socioeconomic impacts of the pandemic. It is likely that nativist/populist blocs worldwide will be reinforced and may play on current fears to reduce cultural understanding, increase xenophobic tendencies and aim to use these and such short-sighted attitudes to influence policies and elections that could threaten international cooperation. Therefore, economic recovery is not only the means to prevent an economic collapse in some countries, but it is also a solution to protect social harmony and political stability.

Moreover, the current pandemic has also proven that the global economic environment needs a stronger industrial globalization. The “working from home” trend imposed during COVID-19 times has highlighted the increased need for the development of digital tools that might ignite a new revolution in globalized connectivity with increased virtual commerce and exchanges. At the same time, states will need to develop their own capacities to adapt through hardware and software production. Unfortunately, many are still guided by the wrong impression that we will soon return to pre-COVID-19 times, refusing to understand and accept the reality that only a better, digitalized economy and working platform can provide a better common future.

Globally, the current multilateral order has proved its weaknesses and failed to provide the necessary decisions to counter the crisis and tackle its social, political and economic effects. In the same way, multilateral institutions have fallen short in meeting the expectations of the international community. This fact has already been used as an argument by many nationalist movements across the globe, especially in Europe, to

question multilateralism and to spread nationalist, unilateralist, and in some cases isolationist agendas. While many argue for an end to multilateralism, the pandemic has actually proved the opposite: it has stressed the need for global responses to a global crisis and also for multilateral approaches. Therefore, the problems revealed by the COVID-19 pandemic are not entirely about multilateralism itself, but rather the inefficiency of existing multilateral mechanisms. In an ideal scenario, the pandemic can provide the perfect context to push for efforts to reform multilateral institutions in order to adapt them to our current needs and increase their efficiency. In practice, however, these institutions may prove to be more resistant to reform than we would expect them to be. Regionalism, conversely, is gaining traction. China, which had emerged as the icon for globalism thanks to its Belt and Road Initiative, may now focus even more on its contiguous regions. Another mega project, the China-Pakistan Economic Corridor, is a case in point; this venture links Pakistan’s shores on the Indian Ocean with the Eurasian landmass through Central Asia and Russia. Such connectivity would continue to drive regional cooperation.

The pandemic is also expected to emphasize the concept of strong, self-sufficient states. Bearing in mind the realist national security doctrines, a pandemic is a threat that demands action from the state. As a provider of healthcare services, security and welfare, the state alone comes to the forefront during global pandemics and national epidemics alike. The links between ideas of self-sufficiency and strong states will, in this particular case, become stronger. The pandemic has demonstrated that existing tools for gauging state power fall short in deter-

mining actual state power. While assessing state power, one must now take into account healthcare systems, supply chains and emergency response capabilities, in addition to population size, and military and economic power, on which the realist approach frequently concentrates.

The pandemic and the ensuing recession have placed the state of today’s geopolitics under the magnifying glass. From this angle, COVID-19 should be understood as a catalyst that has accelerated the already existing trends of international politics rather than a catalyst for change: this includes the declining American leadership and strained transatlantic relations, a stress test for the European project, decreasing global cooperation, increasing regionalism and a resurgence of nationalism and great-power politics. Ultimately, however, it is the decisions taken today which will determine whether these trends become reality or simply remain where they were.

## Conclusion

The COVID-19 pandemic is generating the perfect storm of adverse social and economic impacts with unavoidable geopolitical ramifications. Public health, national and global economies, social stability and governance are individually affected by, and linked to the staggering rate of infections and deaths and competing national priorities. Competition between states inevitably creates friction that degrades their ability to cooperate in the best of times, much less act in unison during a crisis. Nowadays, states are weakened in all domains and, in case nothing is done, nationalism and populism will be reinforced. The competing races to catch up in the economic, military, science and digital spheres will only increase already existing tensions and will affect the balance of power. An American expert, Alanna Shaikh, has stated that the “coronavirus is our future.” By this, it is meant that it is our current lifestyle as a whole which, unrestrained, is ultimately responsible for increasingly severe health crises and also for increasingly frequent climate disasters. In both cases, the same lesson applies. Only a change of course, that would not only be geopolitical but also civilizational, can save humanity.

Can we do it — or will we take the easy path of ‘changing’ things so that nothing changes? Simply put, we are at a crossroads. To quote Bauman once more: “We, the human inhabitants of the Earth, find ourselves (more than ever in history) in a situation of real dilemma: we either join hands or join the funeral procession of our own burial in the same and colossal mass grave.” ■



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# How China Used the Pandemic for its Expansionist Pursuits

**Suman Sharma**

**China is using the COVID-19 pandemic as an opportunity for a policy of expansion not only along the Indo-Chinese border, but also in the South China Sea, the Baltic Sea, Taiwan, Malaysia, Indonesia and the Philippines.**

While the world has been grappling with the deadliest pandemic in over a century, with up to 197 countries affected, and upwards of 12 million positive cases causing close to 600,000 deaths, China has in the meantime been busy with other things. Originating in Wuhan in December 2019, the deadly Coronavirus quickly spread across the globe. While badly-hit nations attempted to contain the virus, trying at the same time to learn from one another, Beijing continued to do what it does best - encroaching on the territories of other sovereign nations, under what is now termed its 'salami slicing' policy.

History teaches us much about the Chinese expansionist mind-set, namely that they usually act after a major crisis or event, such as after the Vietnam War, or following the withdrawal of US forces from the Philippines when they expanded their territory in the South China Sea. And now, we are faced with what happens in a post COVID-19 world.

Shrikanth Kondapalli, Professor of Chinese Studies at the Delhi-based Jawaharlal Nehru University says, "Chinese expansionism was always there. The pandemic has acted as an instrument. In October 2017, this policy was debated and decided upon at the Chinese Communist Party's meeting of the National Congress, namely that China seeks to be a global power and intends to assume centre stage, thereby becoming a leader for everyone to follow. The Party Congress issued directions and COVID-19 has only benefited Beijing in looking to achieve this goal, because the world has been busy dealing with the pandemic, so China began to fulfil the goals it set in 2017."

## Author

**Suman Sharma** is a Delhi-based journalist covering foreign policy and defence. Previously, she was an instructor at the Indian Military Academy.

Photo: TOTO LOZANO/PRESIDENTIAL PHOTO



**Armed Forces of the Philippines personnel pose for posterity after inspecting thousands of aid packages donated by the People's Republic of China which arrived at the Villamor Air Base in Pasay City on 21 March 2020. The donation included assorted medical supplies, personal protective equipment and testing kits for coronavirus.**

Border incursions at the Indo-China Line of Actual Control (LAC) have become routine, but the Chinese build-up at the Galwan Valley in eastern Ladakh in March-April 2020 prompted the Indian leadership to take notice. A meeting of senior military commanders on 6 June didn't help much though. The situation took a turn for the worse on 15 June when Indian and Chinese troops engaged in the deadliest border clash since 1975, with 20 Indian soldiers killed in the bloodshed. Senior military officials from both sides met on 22 June and again on 30 June, with diplomatic channels also working in parallel. Finally, Prime Minister Narendra Modi landed at Leh near the Indo-China border on 3 July, which was followed by talks between the Indian National Security Advisor and the Chinese Foreign Minister, after which the disengagement of troops began on both sides.

During his surprise visit on 3 July, Prime Minister Modi addressed Indian soldiers stationed at the Indo-China border in Ladakh and said, "The age of expansionism is over. The world has moved on the path of development. The expansionist forces have ruined the world in the last century. But they have either been defeated or forgotten in history." To this, Beijing responded by saying, "It is groundless to view China as 'expansionist', or exaggerate and fabricate its disputes with neighbours." Chinese Foreign Ministry spokesman Zhao Lijian said, "China and India are in communication with each other through military and diplomatic channels. Neither side should make any move that may complicate the border situation." The statement by the Indian External Affairs Ministry said, "the two sides should not allow differences to become disputes. It was necessary to ensure at the earliest opportunity complete disengagement of the troops



along the LAC and de-escalation from India-China border areas for full restoration of peace and tranquillity. In this regard, they further agreed that both sides should complete the ongoing disengagement process along the LAC expeditiously. The two sides should also ensure a phased and incremental de-escalation in the India-China border areas. They re-affirmed that both sides should strictly respect and observe the Line of Actual Control and should not take any unilateral action to alter the status quo and work together to avoid any incident in the future that could disturb peace and tranquillity in border areas."

In addition, and for the first time, India commented on the Hong Kong issue in a statement which noted that New Delhi was keeping "a close watch on recent developments" and that, "We hope the relevant parties will take into account these views and address them properly, seriously and objectively." New Delhi had previously chosen to remain silent on the issue of Hong Kong during its year-long protests, while China has raised the abrogation of Kashmir's special status at the UN (at the behest of Pakistan), three times in the past year.

Former Indian Ambassador to Japan Sujan R. Chinoy has said, "The border row between India and China could not have erupted at a worse moment. The world is grappling with a once-in-a-century coronavirus pandemic and a global recession that promises to leave no one unscathed. China, which is increasingly censured for obfuscating the origins of the pandemic, appears to have chosen bellicosity, sacrificing all norms of responsible international conduct, as is evident in its aggressive stand on Taiwan, Hong Kong and the South China Sea."

On the geopolitical chess board, New Delhi made one more move in late June. The Indian Government carried out a digital strike on China by banning 59 Chinese apps, which are popularly used by millions of Indians, and which according to experts could cause a revenue loss of up to US\$8Bn to China..

Brahma Chellaney, one of India's leading strategic thinkers, writes, "China's strategy after its disastrous 1979 invasion of Vietnam has been to win without fighting. Deception, concealment and surprise have driven China's repeated use of force—from seizing the Johnson Reef in 1988 and the Mischief Reef in 1995, to occupying the Scarborough Shoal in 2012, and now vantage locations in Ladakh. It has changed the South China Sea's geopolitical map without firing a shot or incurring any international costs."

In addition to handling the global COVID-19 narrative regarding the pandemic's origins, and the fact that it has also been labelled the 'Wuhan virus', the Chinese



***The Line of Actual Control (LAC) is the current border between the territories occupied by India and the People's Republic of China in the Himalayas that have been disputed since the Indo-Chinese border war of 1962.***

Communist Party has also been nibbling away at territory in its neighbourhood. Beijing has been notorious in its neighbourhood right from the beginning and the pandemic has provided Beijing with cover and an opening to carry out its expansionist pursuits.

Let us take a look at how China has been behaving with neighbouring countries since the outbreak of the pandemic.

## USA

Two US Navy aircraft carriers – the USS NIMITZ and USS RONALD REAGAN – were deployed to the South China Sea from May 2020 and were seen conducting exercises and dual-carrier operations to support a "free and open Indo-Pacific." Beijing was reportedly annoyed and warned Washington against any misadventure. Global trade worth an estimated US\$3.37Tr passes through the South China Sea annually, which accounts for a third of global maritime trade. Approximately 39.5% of China's total trade and 80% of its energy imports pass through the South China Sea.

## Japan

In May 2020, Tokyo protested after a Chinese Coast Guard vessel harassed a Japanese fishing boat near the Senkaku Islands in the East China Sea. Japan is trying to promote maritime security cooperation

with a number of like-minded neighbouring countries, in a bid to curtail China's maritime footprint. The Japan-US alliance is vital for maritime peace in the region. Japan is also arming its helicopter carrier JS Izumo with F-35B LIGHTNING-II stealth fighter jets, for future deployments.

## Vietnam

In June 2020, a Chinese survey ship was seen crossing into Vietnam's exclusive economic zone (EEZ), prompting an objection from Vietnam. Vietnam and China have mostly been locked in a spat over the South China Sea. Vietnam's Foreign Ministry has resented Beijing's laying of undersea telecommunication cables at the disputed Paracel Islands. Furthermore, in April 2020, China sunk a Vietnamese fishing boat near the Paracel Islands.

## Indonesia

Usually, China and Indonesia have no disputes between them. Recently though, China forced Indonesia into accepting its nine-dash line claim, triggering a protest from Jakarta in the form of a letter to the UN Secretary General complaining that this was in violation of international law, including UNCLOS 1982. The nine-dash line is a Chinese claim in the South China Sea which includes almost the entire area.



Photo: AP/CS

**Beijing has increased its infrastructure construction along the LAC and the frequency of incursions into areas that are generally accepted as being within Indian control.**



Graphic: author

**A map of the areas disputed between China, India, Pakistan, and Bhutan**

## Malaysia

In 2019, China was reportedly targeting drilling operations and harassing the operatives of Malaysian oil exploration ships carrying out these drills; these ships are provided with security by Malaysian Navy and Coast Guard ships within Malaysia's EEZ.

## Australia

At the World Health Assembly, Australia was one of the first countries to take the lead demanding an independent, impartial, comprehensive investigation into the origins of the COVID-19 pandemic, a move which was supported by 120

countries, including India. Soon after, China announced a ban on beef imports from Australia. This was followed by a cyber-attack against Australia allegedly launched by China which Beijing subsequently denied.

## Taiwan

China has often staked claim over the independent island nation of Taiwan, which does not have a seat in the World Health Organization (WHO). Taiwan claims to have sent an email to the WHO on 31 December 2019 warning about a pneumonia-like disease emerging from Wuhan, which was then apparently brushed under the carpet by the WHO. Later, Taiwan demanded to be a part of the World Health Assembly, a move blocked by Beijing. These bold moves by Taiwan were not received kindly by China and according to Taipei, Beijing sent bombers into Taiwanese airspace six times in a week and eight times in a month. China dislikes other countries' support for Taipei and has often been vocal about its displeasure, as witnessed during the recent four "Freedom of Navigation Operations" (FONOPS) carried out by the US Navy in the South China Sea near Taiwan.

## Hong Kong

China passed a new Security Law in Hong Kong on 30 June 2020, placing Hong Kong under Chinese jurisdiction. Under the new law, Beijing will establish a security agency office in Hong Kong with its own personnel. Stricter rules and punishments have drawn flak from the global community, especially from the expatriates living there. The largest community are Canadians, which number approximately 200,000, followed by 50,000 British and 36,000 Indians. The UK and Australian governments have offered citizenship to Hong Kong nationals which has further angered Beijing.

## UK, France, Canada

Coercive diplomacy was exerted by China's ambassadors to the UK, France and Canada, when these nations rejected Huawei's 5G technology trials in their respective countries.

## Russia

According to reports, China has allegedly claimed the Russian Vladivostok region as Chinese territory and responded to a Russian video by referring to Vladivostok

as Haishenwai - its original name when part of the Qing dynasty's Manchurian homeland, until it was annexed by Russia in 1860 after China's defeat by the British and French in the Second Opium War.

## Bhutan

Usually a peaceful hill nation, Bhutan has also been caught in the crosshairs of China's neighbourhood expansionism and its dirty 'salami slicing' policy after Beijing recently staked a territorial claim over the Bhutanese Sakteng Wildlife Sanctuary. A border dispute already exists between Bhutan and China, as the borders have not been clearly demarcated and both countries have had 24 rounds of ministerial level boundary talks.

## Nepal

China and Nepal have had disputes over the world's highest mountain peak, Mount Everest, located in Nepal, but more recently China has again staked claim to the 8,848 metre peak.

## Singapore

Singapore, mostly seen as a peaceful country, ran into trouble with Beijing some years ago when nine of its infantry carrier vehicles were seized by Hong Kong customs while returning from Taiwan after a training exercise between Taiwan and Singapore. China warned Singapore about adhering to its 'One-China' policy and to avoid having any military relations with Taiwan.

## Philippines

After a Facebook location tag allegedly described the Philippines as a "Province of China", angry Philippine Senators, including Risa Hontiveros, took to social media to reply, stating that, "Philippines was not a province of China: Never were and never will be!" Even the Philippine Foreign Affairs Secretary, Teddy Locsin reacted. Retired Indian Army Lieutenant General Vinod Bhatia says, "China has exploited the pandemic in that when most nations were busy combating COVID-19, China saw this as an opportunity and practiced its tried and tested strategy of military coercion. An expansionist China demonstrated a militarily aggressive behaviour not only along the India-China border, but also in the South China Sea, the East Sea, in Taiwan, Malaysia, Indonesia, the Philippines, Vietnam, and even with Bhutan, laying claims to parts of Eastern Bhutan which was a settled issue."



## Breakthrough for the EAGLE 4x4 and 6x6 Family Concept

After the successful introduction of the EAGLE IV and EAGLE V 4x4 in Denmark, Germany and Switzerland from 2006, General Dynamics European Land Systems (GDELS) successfully implemented the EAGLE family concept now with the orders of the EAGLE 6x6 by two user nations

Like the EAGLE 4x4, the 6x6 is characterised by the same high level of protection, excellent mobility, high driving safety, simple operation and maintenance, but with a significantly increased payload and very large protected useable space. With the acquisition of 80 EAGLE 6x6 Medium Protected Medical Evacuation Vehicles (mgSanKfz) for the Central Medical Service of the Bundeswehr in April 2020, the "big brother" of the EAGLE 4x4 is now also being introduced into the German Armed Forces.

In the scope of German Armed Forces' Protected Command and Functional Vehicles (GFF) programme, numerous unprotected platforms of the Bundeswehr were replaced by protected vehicles in order to increase the security of German soldiers on missions. For the GFF-2 class, a total of 675 EAGLE IV 4x4 and EAGLE V 4x4 from GDELS were ordered and delivered. These vehicles have proven themselves from the very first hour in international missions.

### EAGLE Family Concept

A key finding from these deployments is the requirement for support vehicles, e.g. ambulance, recovery and material transport versions, to follow the very compact and highly mobile command and function vehicles without restriction even in the most difficult terrain, in order to en-



sure prompt and uninterrupted supply and support. The resulting goal of "mobility equality" for a larger vehicle led to the development of the EAGLE 6x6 and thus to the consistent implementation of the EAGLE family concept. A wide variety of mission roles on "one platform" can now be implemented based on the EAGLE family. These can be realised with protected cabins in combination with different cargo areas or mission modules or completely protected large capacity cabins. Here, the generous protected useable volume offers sufficient space for variants such as the Bundeswehr's mgSanKfz. Combined with very high protection against mines, IEDs and ballistic impact, the EAGLE family offers maximum mission flexibility in the field.

### TASYS

The EAGLE 6x6 also prevailed in the Swiss Army in a competitive evaluation. In November 2019, the Swiss Army procurement authority armasuisse ordered 100 EAGLE 6x6 in the Tactical Reconnaissance System (TASYS) configuration. The TASYS is equipped with a multi-sensor system on a telescopic mast and a data processing system for intelligence operations of the Swiss Army.

In contrast to the German EAGLE 6x6 mgSanKfz's large-capacity cabin for the medical care of two wounded persons, the TASYS EAGLE 6x6 uses a medium-sized protected cabin in combination with a large "material compartment". These two configurations on the same carrier vehicle clearly demonstrate the modularity of the EAGLE 6x6 to be equipped for a variety of missions.



**EAGLE V 6x6 TASYS of the Swiss army**

As the EAGLE is completely developed and manufactured by GDELS, new variants and new technologies can be integrated into the EAGLE family with confidence and independence at any time. With this approach, GDELS supports its customers rapidly and reliably to acquire the required capabilities to succeed in tomorrow's missions.

**Jürgen Hensel**



**EAGLE V 6x6 mgSanKfz of the Bundeswehr**

Photos: GDELS



# Pivot to Asia

## Europe's Declining Significance from a Geo-Strategic Perspective

**Ludolf von Löwenstern**

No sooner had Donald Trump and his Secretary of Defence Mark Esper announced the withdrawal of some 12,000 US soldiers than commentators in Germany were largely in agreement: the step, according to public opinion, was a "campaign of revenge" against the renegade NATO member Germany.

In fact, there has been a lot of pent-up friction in American-German relations recently: from the conflict over North Stream 2 to defaulting NATO payments to high EU duties on German cars, to name just a few examples. Nevertheless, the step now announced does not mark a fundamental change of strategy in American foreign and security policy. Quite the contrary: with this plan, the US President is continuing the re-orientation of the world power towards Asia that his predecessors had already initiated. One of the concomitant effects: Germany and Europe are losing their significance.

Some US strategists refer to the 21st century as the "Pacific century". This orientation of US foreign policy towards East Asia - known as the "Pivot to Asia" - began as early as 2011 under President Barack Obama (2009 to 2017). His predecessor George W. Bush (2001 to 2009) also saw China as a future adversary and had corresponding strategies developed with the aim of curbing the country's rise. But China is not the only country that needs to be warned. Trump is also aiming at Germany with his America first rhetoric.

Photo: U.S. DoD



**As part of its Pivot to Asia, the US has been rotating substantial amounts of military equipment into the region. Depicted are US Marine Corps amphibious assault vehicles moving into position during the amphibious assault phase of Exercise Bold Alligator 2012.**

### Author

**Ludolf Baron von Löwenstern** is a family entrepreneur. In addition, he is a co-founder of the European Strategic Institute (Analysis & Think Tank), a member of the CDU Economic Council and, as a naval captain of the Reserve, a Special Representative to the Deputy Chief of the Navy and commander of the fleet and support forces. He acts voluntarily as an expert in the DMI Deutsches Maritimes Institut (German Maritime Institute), the Wirtschaftsrat Deutschland (German Economic Council), the Alsterdorf Foundation and is represented on several company advisory boards. He has written various books, studies, trend reports and articles.

ric, Trump has also declared war on Germany. The fact that the US President openly questions the international involvement of the United States in NATO, for example, raises serious concerns that Western power arithmetic could change fundamentally.

### The Geostrategic Rationale of the US

Trump's foreign and security policy clearly shows that neither the defence of Europe nor the continuation of military engagement in the Middle East are among his priority objectives. In a recent speech to graduates of the US military academy West Point, he said that it was not the military's job to "build foreign nations" and act as "world police". The announced "withdrawal of troops" from Germany should also be seen in this context. The US military bases (over 800 worldwide) in Germany are still of outstanding strategic importance. Therefore, there are no plans for a "withdrawal", but rather a reduction and relocation of troops.

According to recent announcements, some 6,400 soldiers are to be recalled to the USA, and a further 5,600 are to be transferred to other countries such as Belgium and Italy. By the way, Belgium and Italy are even less likely than Germany to keep their NATO promises. There is an agreement with Poland to increase the number of US troops there from the current 4,500 by 1,000 soldiers to shore up NATO's eastern flank. As a reminder: NATO had promised Russia in 1997 to refrain from permanently stationing troops in Eastern Europe. The military headquarters for Europe (EUCOM) is moved from Stuttgart to Mombach / Belgium. This would reduce the total number of US soldiers in Germany from 36,000 today to about 24,000 - this would be an economic disaster for the affected areas. This is not a "criminal act" against Germany. Even if the next US president should be Joe Biden, nothing will change in these plans. This is because they follow a geopolitical and geostrategic calculation that is comprehensible to everyone.

## US Military Bases Around the World

The US maintains about 800 military bases (Army, Air Force, Navy, Marine Corps) in more than 170 countries worldwide. Japan is home to the largest US military force with approx. 55,000 troops, the second largest in Germany with approx. 36,000, followed by South Korea with approx. 26,000, Italy with approx. 12,000 and Great Britain with approx. 9,000. Germany is not home to warring US armies or divisions but "only" two combat brigades. From a geostrategic point of view, Ramstein was, is and remains the most important US base because it is a logistics base and bridgehead for worldwide operations, especially in the strategically important East Asia (Pivot to Asia). Five of the six main operational bases of the US bases are located in Germany.

- Ramstein is the largest US Air Force military airport outside the USA and has important functions for supplies and troop transport for the intervention wars.
- Landstuhl (LCMR Landstuhl Regional Medical Center) is the largest military hospital outside the USA with over 3,300 employees on 49 hectares. It is also one of the most important hospitals for organ donations in the EU.
- Büchel is a US Air Force base. This is where the USA's nuclear bombs are stored and where Air Force Squadron 33 (Tornados) is stationed.
- Vilseck / Grafenwöhr is a military training area and training centre of the army for approx. 15,000 soldiers (including relatives). It is the largest US Army base in Europe (approx. 284 square kilometres). This is where shooting exercises for tanks and artillery are conducted and combat troops are trained.
- Ansbach Katterbach is a US Army helicopter training center.
- The 52nd Fighter Wing is stationed in Spangdahlem in the Eifel: It consists of an F-16 fighter squadron with about 20 aircraft. About 4,000 US soldiers are stationed at the air base. It is considered a strategically important air base for the American armed forces in Europe and has supported missions of the US Air Force and NATO worldwide, from Iraq to Bosnia and Afghanistan.
- In addition, there is the Wiesbaden location and the EUCOM and AFRICOM headquarters in Stuttgart.

Let's remember: President Trump is a friend of deals, and Germany wants to buy F-18 fighter planes in the US to replace the old TORNADOs as carrier planes for US nuclear weapons. There are also urgently needed



Photo: US Navy

**Sailors aboard the aircraft carrier USS GEORGE WASHINGTON in Hong Kong, November 2011. In May 2015, the then US Secretary of Defense Ashton Carter said that the US rebalance to Asia-Pacific is a continuation of its pivotal role over the past 70 years.**

heavy transport helicopters from a US manufacturer on Germany's wish list. The German government would be well advised to seize the opportunity and make a deal: keeping more troops in Germany vs. procurement of F18s and transport helicopters.

## The Eurasian Chessboard

Among the explanatory approaches that make the US foreign and security policy "DNA" easier to understand are the concept of geopolitics on the one hand and the US National Security and Military Strategy on the other. The concept of geopolitics opens up interesting perspectives on the different world views of Europeans, Americans, Russians or Asians and thus on world events as a whole. Geopolitics interprets political connections in the light of geographical circumstances and analyses the connection between the two. It thus opens up perspectives on political events that we would otherwise sometimes find difficult to assess.

The German geographer Friedrich Ratzel, who published a book entitled Political Geography in 1897, is considered the spiritual father. The Swede Rudolf Kjellén then coined the term geopolitics. Besides Sir Halford Mackinder, well-known names such as Henry Kissinger, Samuel P. Huntington, Karl Haushofer, George Hamilton, Rear Admiral and naval historian Alfred Thayer Mahan are among its most important pioneers. The geographical foundations of geopolitics can be traced back to the geostrategic work of the British Sir Halford Mackinder (1861 to 1947). In 1904, he formulated the Heartland Theory as part of geopolitics in The Geographical Pivot of History. This theory states that the domination of the Euro-Asian heartland is the key to world domina-

tion and that Great Britain, as the leading maritime power, must expect the emergence of a dangerous expansionist power on the continent, especially Russia. When Britain's position as a world power came to an end - after all, it was based primarily on control of the world's oceans - Mackinder formulated a geostrategic theory of the importance of the Eurasian landmass at the beginning of the 20th century, which later became known as the "Heartland Strategy". If a state succeeded in gaining control of the Heartland, i.e. Central and Eastern Europe as well as Siberia, Mackinder's thesis was that this state would dominate world politics. In the US, geopolitical considerations have always played an important role when formulating key foreign policy positions. Mackinder's Heartland Theory, for example, was the basis of the "containment strategy" with which the USA sought to contain the territorial expansion of the USSR and the Warsaw Pact during the Cold War. The domino theory, which promoted US intervention in Vietnam and Central America, is also a manifestation of geopolitical thought. After the collapse of the Soviet Union and the dissolution of the East-West divide, the concept of geopolitics and the associated discussion of spatial aspects of world order witnessed a renaissance.

Zbigniew Brzezinski is considered the spiritus rector of modern US geopolitics. The politician, who died in 2017, served for decades as National Security Advisor to various US presidents. His two books "The Grand Chessboard" / "The Only World Power. America's Strategy of Domination" (1997), and "Last Change" (2007) clearly describe how Eurasia - the Eurasian continent - is, from a geopolitical point of view, the "chessboard on which the struggle for global dominance



**US military bases in Germany**

will continue to be fought in the future. This huge, strangely shaped Eurasian chessboard, which stretches from Lisbon to Vladivostok, is the scene of global play". Commenting on Russia's new geopolitical framework, Brzezinski said: "The geopolitical confusion caused by the loss of the Caucasus bordering Turkey, the secession of Central Asia and its natural resources, and especially the independence of Ukraine challenged the very essence of Russia's claim to be the banner bearer of a common Pan-Slavic identity chosen by God."

## The US National Security Strategy

Another important building block for understanding US foreign and security policy is the US National Security Strategy, NSS for short. Contrary to widespread assumptions, the US administration has never made a secret of what geopolitical and geostrategic concepts it is pursuing. Rather, defining and articulating the most important geopolitical linchpins transparently is a defining constant of American foreign and security policy.

Some National Security Strategies have become more or less famous, such as the National Security Strategy of September 2002, also known as the "Bush Doctrine", the first after the terrorist attacks of 11 September 2001, but if one compares the National Security Strategy of 2017 (Donald Trump), with that of 2010 (Obama), 2006 (George W. Bush), 2002 (George Bush) or 1996 (Clinton), one can see that the National Security Strategy of 2017 is the most important one: The central guide-

lines have always remained the same. Again and again it is about Protecting the American people/homeland, promoting prosperity, peace through strength and advancing interests/values, albeit supplemented by "current" events and accentuations. Donald J. Trump added the point "America First" to his NSS.

The situation is quite similar with the National Defense Strategy. This, too, has been characterised by a high degree of continuity for decades. The current version of the National Defence Strategy was published in July 2019. Media coverage in Germany was relatively small, but everyone agreed that the USA, as the headlines read, feared a war with Russia or China. Above all, competition with China is shaping the current view of the American military on the international order. In this context, it is also appropriate to consider the Emerging Security Challenges (ESC), i.e. the new challenges for a modern and effective security policy. The term ESC seems to be gaining ground in order to distinguish security policy challenges in the narrower sense from general political risks.

In brief: In recent years, American foreign and security policy has remained essentially unchanged, but has merely adapted to the new circumstances.

## INF and START Treaty

The USA has also recently put up for discussion the Strategic Arms Reduction Treaty (START) with Russia, which expires in February 2021. It provides for the reduction of the nuclear arsenals of Russia and the USA to 800 delivery systems and 1,550 operational nuclear warheads each. It should be noted that the USA and Russia together hold more than 90% of the world's nuclear warheads in their military stockpiles, with about 6,500 and 6,800 warheads respectively, while China has about 280 nuclear warheads.

What many people don't know: When it comes to medium-range missiles, there has been a lot of progress in recent years, especially among the Chinese. That is why the Americans have terminated the contract with Russia. But the real goal of the USA is to integrate China into a new New Start treaty. Pointing to the disparity in nuclear arsenals, China has repeatedly stated that it has no intention of participating in tripartite arms control talks with the US and Russia. China is also demanding that the US and Russia first make further cuts in their own arsenals, thereby creating the conditions for other countries to join the disarmament

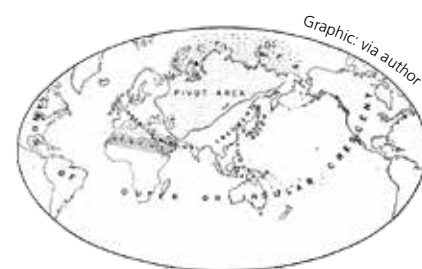
efforts. Moreover, Beijing is open to arms controls. For example, it is a member of the NPT, party to the Iranian nuclear agreement of 2015, a negotiator in the revival of the P5 process, a special forum for the five recognised nuclear weapon states under the NPT, or has coordinated work on a common nuclear glossary. One figure is interesting here: China spends around €260Bn on its military. That is not even one third of the US budget (approx. €730Bn).

## A Wakeup Call for Europe

Despite numerous "warning shots" from Washington, the EU states have so far failed to establish their own foreign and security policy worthy of the name and to form a defence union, nor have they succeeded in developing a defence and security concept in coordination with NATO. Yet Germany and its European partners - after 75 years under U.S. auspices - should long since be in a position to guarantee their own security. And everyone knows that in an emergency, the USA would be there as an ally anyway, in accordance with Article 5 of the NATO Treaty.

The strategic goal of the US is not to dissolve NATO. Rather, it is about expanding its own sphere of influence in the direction of Asia. But the NATO partnership should become more global and reliable. For this reason, they will continue to insist on the two percent of the national gross domestic product agreed in Wales as NATO contribution - especially from Germany. Pacta sunt servanda.

Europe needs the USA. The USA needs the EU. Above all, in order to survive in the global race with China, which is also about defending our values. The fact that the world community is in a global



**According to Mackinder, the pivot area is decisive for global dominance.**

recession, which has gained catastrophic momentum as a result of the COVID-19 pandemic, might make the USA, Russia and China more willing to curb the costly arms race in future. We will see how the great power chess game will continue. ■





# Viewpoint from New Delhi

Photo: Suman Sharma



## RAFALEs: The Game-Changers

Suman Sharma

**O**n 29 July, amid much fanfare and in the midst of the COVID-19 global pandemic, RAFALE, India's newest fighter jet joined the Indian Air Force (IAF). This new addition comes a full two decades after the need for

a new fighter to replace the IAF's aging MiG fleet was first floated in 2000, right after the Indo-Pak Kargil war of 1999.

Out of the 36 RAFALEs ordered in 2016 by the incumbent government, the first batch of five aircraft arrived in Ambala after a two-day journey of 8,500 km which began at the French airbase in Bordeaux Mérignac. Ambala airbase is home to the 17th Squadron, also known as the 'Golden Arrows'. A special VIP welcome awaited the RAFALEs, which were escorted by two Sukhoi-30MKIs as they entered Indian airspace before being received by the IAF's Chief of Air Staff RKS Bhadauria.

### Beyond Visual Range

The RAFALEs are now being touted as "game-changers" and they truly have the potential to revamp the IAF's combat capability and revolutionise the way it fights. The omnirole RAFALE is capable of both air-to-air and air-to-ground combat. The swing-role fighter is armed with the frontalIRST (infra-red search and track) sensor and the AESA (active electronically scanned array) radar.

The AESA is a static radar whose beams are electronically steered through small modules called TR (Transmit Receive) modules. Since it is non-moving equipment, its failure rate is very low. As the AESA uses TR modules, its parameters can vary in a manner so that its performance in dynamic situations produce far better results.IRST is a passive system that seeks hot objects both in the air and on the ground. Presently, there is no counter-measure available for theIRST. Using theIRST sensor and the AESA radar, the RAFALE employs two potent missiles to shoot down enemy aircraft from a considerable distance. These two deadly missiles are active radar guided beyond-visual-range air-to-air METEOR, with a range in excess of 100 km and beyond-visual-range air-to-air multi target MICA with a range of more than 80 km. To put this in context, Gujranwala in Pakistan is less than 100 km in air-to-ground combat potential than Pathankot in the northern Indian state of Punjab near the border with Pakistan. The IAF airbase there was attacked in January 2016 by Pakistani terrorists.

### A Leading Edge

The air-to-ground munitions on the RAFALE come with diverse configurations, which are India-specific. The SCALP EG missile is

equipped with a multi-spectral sensor to guide itself to the target with precision and covers a range of 560 km. The HAMMER missiles have a range of 60-80 km. They both give the IAF a leading edge over its adversaries. For example, Pathankot to Sargodha or Islamabad is only 280 km, and a RAFALE carrying six HAMMER missiles can target trenches and bunkers, six at a time, and while independently engaging different targets. The RAFALE is also capable of carrying the MK82/84 1,000/2,000 lbs unguided PAVEWAY laser-guided bombs and rockets. Other India-specific modifications under consideration for the fighters include the capability to carry the SPICE 2000 weapon, which became famous after being used by the IAF in 2019 to bomb launch pads used by terrorists in Balakot, Pakistan. The RAFALE's Electronic Warfare (EW) Suite has inbuilt jammers to jam the enemy's airborne and surface-based sensors. It has a potent radar-warning receiver and countermeasure dispensing system which automatically dispenses counter measures to counter enemy radar and weapons. It also warns pilots of threats from enemy radar and missiles. RAFALE is not a pure stealth aircraft but it has exceptional stealth features such as a blended design, radar absorbent material, composite structures and automatic emission control, for its own sensor control. A successful example of this is the air attack on the Al-Watiya airbase in Western Libya with spectra coordination, carried out by pro-Haftar countries like Russia, France, Egypt, UAE, etc, against the Turkish-backed GNA, earlier this year.

### Tilting the Balance

With its enormous power and potential so efficiently encompassed in just one fighter aircraft, India now enjoys a cutting-edge over her enemies. With the 1999 Indo-Pak Kargil war in mind, in which the IAF's MIRAGE 2000s participated in an air-to-ground role and engaged 80% of the targets during the successful IAF attacks on mountain targets like Muntho Dhaho and Tiger Hill, Rafale is surely a game-changer, able to change the way in which the IAF fights. Retired IAF Air Marshal B. Suresh, said, however, that "RAFALEs are definitely game-changers and can tilt the balance in our favour as of now, but in the medium to long term, not just technology, but technology with adequate numbers will make a difference."

This is not the first time the IAF has used French fighters manufactured by Dassault Aviation. In 1953, India ordered more than 100 Dassault OURAGAN bombers, also called 'Toofani' which played a crucial role in the 1965 Indo-Pak war, followed by 100 MYSTERE fighters ordered in 1957 from French Dassault which changed the course of the 1965 and 1971 Indo-Pak wars. Both these aircraft types were phased out after the 1971 war and in 1985 another French fighter - the MIRAGE-2000 - was ordered from Dassault; this aircraft remains the IAF's mainstay for frontline operations.

# “I would like to see the EU to take full responsibility for its maritime dimension”

Photo: NATO



**With the new 2019-2024 European Commission came a change in its structure. Reinforcing the EU's defence capacities as an area of priority, the department of the Commission responsible for EU policy on defence industry and space, DG DEFIS, was established. ESD had the opportunity to speak with Vice Admiral Hervé Bléjean, Director General of the European Union Military Staff (DGEUMS) and Director of the Military Planning and Conduct Capability (Dir MPCC).**

**ESD:** Referring to EU's defence, how do you see the result of the Multiannual Financial Framework (MFF) discussions?

**VADM Bléjean:** As an optimistic person, for me the glass is half-full. One could see the €7Bn for the European Defence Fund is much less than the first proposal, but it is on the other hand much more than we could have expected five years ago. The challenge will be to deliver. Thus, the creation of the new Directorate General Defence Industry and Space is an important step in that direction and some funding is already on the table.

As far as defence is concerned: MFF is one issue. However, national funding is very important. I would expect Member States to be responsible in maintaining the right dynamic with national defence budgets.

**ESD:** Which are the most important challenges for EU's security and defence?

**VADM Bléjean:** Firstly, I would say there is the challenge of proving the credibility of the EU in security and defence matters and this is a twofold issue. There is the requirement to enhance efficiency for both the EU missions and the EU operations and here I only can speak as the mission commander for the three EU TM's in Africa as I am not in the Chain of Command for EU Operations.

In order to improve efficiency, my vision is to have a more comprehensive concept for the missions and to increase collaboration with the civilian missions as well. We must be fully cognisant of course, that civilian and military missions have their own characteristics and specifications, which need to be preserved. However, we also have to work to improve the levels of coherence, building on what currently exists. For the first time, we are engaged in a holistic strategic review of the EU missions in the Horn of Africa – they include operation Atalanta, the military mission EU TM Somalia and the civilian mission EUCAP Somalia. What we need is a comprehensive picture and an integrated approach where the differing areas of responsibilities are coherent in achieving the strategic objectives. It seems obvious that putting all the pieces together is required; this is needed to show the coherence of each endeavour, only then will it be headed in the right direction.

Secondly, in my view, operational credibility includes the development of capability in military planning and within the MPCC – this means the ability to plan and conduct all the non-executive missions of the EU. In addition, it also means being able to act as an operational HQ for an executive mission of a Battle Group size. We need to develop that capability and show that we are able to fulfil that mandate.

What I mean is the difference between the political will and the concrete translation of this into a commitment of assets for operations and missions. Force Generation is a real issue and it affects the credibility of EU operations. Let us take

Graphic: EUMS.svg.png



**The Coat of Arms of the European Union Military Staff**

Operation IRINI as an example; there was a significant gap in time from decision until there were sufficient assets to conduct the mandate.

My perspective is to start finding that convergence during the German Presidency. The way to implement it will be the Strategic Compass. It will provide the Member States with a strategic common vision on EU security matters. Much of the work in assembling the information to contribute to the necessary preliminary work already exists, especially in the capability field – PESCO, CARD, EDF. Now, it is time to put it together under the same overarching vision. The challenge is to get the vision of the Member States into a coherent one for the EU. This is where we are right now; gathering information to compile the picture and the substantial work on the Strategic Compass will start in 2021.

**ESD:** In these days, one cannot comment on EU without touching Brexit. What is your take?

**VADM Bléjean:** In my previous assignment in Northwood, I had an in-depth personal experience of Brexit; it was both fascinating and painful, especially as I am a convinced believer in the EU. Because of this, I feel personally sad at seeing a member of the family willing to leave.

In the end, the EU is losing a heavy weight. We cannot discuss any matter of the defence of Europe without having the British included. The big question will be how we can manage their future participation, if they are willing to do so which I am sure they are. I think beyond the political limitations it will depend on an appropriate framework. There are existing examples, for instance in Bosnia's Operation ALTHEA the UK provides the strategic reserve, and London is willing to continue this commitment. All we need is the proper arrangement. Unfortunately, defence and security is not included in the Brexit negotiations. Therefore, we will have to engage in those discussions when the situation permits.

Thus, for me, a priority would be to secure the UK's involvement in operations they are currently involved in. Subsequently, we have to look for the UK as a capability provider; this provides the issue of how to associate the UK as a third state and it will mean that we need to reach an agreement on 3rd state participation within PESCO. This will be one of the challenges of the German presidency but there are already some proposals on the table.

**ESD:** In view of the German Presidency – what are your expectations?

**VADM Bléjean:** As I see it, there are strong opportunities for defence and security policy within the EU and we have to maintain the current momentum. I know that it is one of the German priorities to be relevant in this field. Thus, we must try to put all the pieces together if we are to set up the right conditions to enter the Strategic Compass discussion in the right way. We also need to succeed in achieving results and improvements by the end of the year in a number of areas such as the European Peace Facility (EPF) and Coordinated Annual Review on Defence (CARD).

Knowing that one of the German priorities is to keep the momentum, I look forward preparing the ground for the Strategic Compass and to also develop those issues which are driven by events and crisis on the ground. Developing these will enhance European capabilities, for example in reinforcing medical support and medical evacuation. We have made significant progress here and I recently signed an agreement with the European Air Transport Command (EATC) on Strategic Air Medevac. This concrete result could be pushed and developed further by the German presidency.

**ESD:** Is Corona challenging the EU's approach security and defence?

**VADM Bléjean:** On a provocative note, I would respond that the EUMS is embedded in the EEAS of the EU's institutions', because of this, there is therefore a focus on operating outside of European bor-

ders. With COVID-19, we operated inside the borders. We therefore have to cope with the question whether we have the relevant military tools to look inside the borders in order to enhance solidarity and to strengthen resilience. It is a philosophical and political question that needs to be addressed by the Strategic Compass.

**ESD:** Finally – the EU's maritime heart.

**VADM Bléjean:** As an Admiral, I would like to remark, given the topics we touched upon, that I would like to see the EU to take full responsibility for its maritime dimension. The EU is a maritime organisation, in the sense that the sea is of vital importance to it. When I was Force Commander of Atalanta – I used the example when asked: What is the importance of the sea for the EU? The answer is that, eight out of ten of your Christmas gifts have been shipped and transferred through my area of operations. That illustrates the relevance of the sea for us Europeans!

We need to push forward the maritime dimension. The Coordinated Maritime Presence (CMP) initiative that is being tested in the Gulf of Guinea highlights this aspect and as a concept it needs to be further considered. But implementation needs to be taken seriously to show the relevance of the coordination of the information.

**ESD:** Admiral, thank you very much. Good luck – Fair Wind and Following Seas.

**The interview was conducted by Hans-Uwe Mergener.**



Photo: Bundeswehr

**The European Union Training Mission in Somalia (EUTM Somalia) is a military mission of the EU to provide support to the training of Somali security forces.**



# Armoured Vehicles from Eastern Europe

Alex Horobets

**In addition to ongoing counterinsurgency operations in Africa and the Middle East, recent trends point to the possibility for a greater conflict in the future between equal rivals in view of worsening relations between NATO, Russia and China.**

In the event of such a conflict, the use of armoured vehicles will be key since it is these mobile fighting platforms, which provide the all-important protection and increased mobility for troops on the ground. Nowadays, the global market in armoured vehicles is characterised by a constant stream of contracts and the implementation of new programmes.. Fortune Business Insights estimates that the armoured vehicle market will reach as much as US\$26.12Bn by 2026.

this field, the main players in Europe include Textron Inc., Otokar, a KOC Group Company, NORINCO, Iveco Defence Vehicles, Denel SOC Ltd, Ukroboronprom, Rheinmetall, Oshkosh Corporation, Krauss-Maffei Wegmann GmbH & Co. KG, General Dynamics Corporation, and BAE Systems.

Russia's invasion of the Crimean Peninsula in 2014 highlighted the need for Eastern European countries to replace Soviet-era technology with western

places Soviet-era weapons in the armed forces of Albania, Bosnia and Herzegovina, Croatia, Greece, Northern Macedonia and Slovakia, will help replace those platforms dating from the Cold War period. However, the programme is peculiar in that American equipment will also be delivered and this reduces the capability of European manufacturers to supply these countries. Many European military structures have chosen the eight-wheel drive vehicles, but at the same time, they are not rejecting tracked platforms, which can also see an increase in numbers over the coming decade.

To understand the innovative development trends in the armoured vehicle market, we should pay attention to the American programme, Optionally Manned Fighting Vehicle (OMFV), which is developing a new armoured combat vehicle to replace the M2 BRADLEY. The main priority of this vehicle will be its invulnerability when pitched against other infantry fighting vehicles such as the Russian BMP-3, which is equipped with antitank missiles and medium weapons. The new vehicle has to be sufficiently manoeuvrable when operating in the enemy's impact zone, and also able to transport infantry troops to their destination. In this situation, air transportability becomes secondary as armoured units are rarely deployed by air. Such requirements for the armoured vehicle means it is even more focused on combating the Russian threat in Eastern Europe. It also means that a sufficient number should be available in the countries where the threat is most expected, as opposed to being deployed only after the outbreak of a confrontation.

## Bulgaria

In view of Russia's increasingly active attempts to strengthen its military pres-



Photo: Nuroi Makina

**Hungary has procured the Turkish EJDER YALÇIN 4x4.**

## Overview

The market for armoured vehicles in Europe is highly competitive and involves international leaders in defence contracts and also countries with smaller defence budgets. By 2029, the European continent will be placed in the top three in this market in terms of the size and value of its armoured vehicle market. In

equipment. The increase in military expenditure has caused a surge in the development and purchase of armoured vehicles, not least since Eastern European countries had inherited huge fleets of armoured vehicles from the Soviet period, which naturally hindered the development of new projects.

The European Recapitalization Incentive Programme, a US\$190M fund that re-



Photo: ESD

**The BORSUK programme calls for the procurement of a number of new tracked IFVs, which will eventually replace the currently used vehicles of this class, the legacy BWP-1.**

ence in the Black Sea region, Romania and Bulgaria have accelerated their programmes to modernize their armed forces and replace Soviet-era machinery with western equipment, as Defense News reports.

Bulgaria aims to increase its annual defence spending to 2% of its GDP by 2024. The Bulgarian Ministry of Defence (MoD) plans to purchase 150 armoured vehicles for the country's land forces with several

candidates for the US\$851M contract in the running, including Finland's Patria, Swiss-based General Dynamics Land Systems – MOWAG, Germany's ARTEC (Krauss-Maffei Wegmann and Rheinmetall), and France's Nexter Group.

In 2019, Bulgaria was offered the opportunity to purchase 150 armoured vehicles from Finland's Patria and US company General Dynamics within the tender. According to Patria, the com-



Photo: Kongsberg

**The PATRIA AMV XP with a Kongsberg 30mm M230LF cannon RWS**

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pany offered to supply 150 8x8 multi-role military vehicles, the AMV XP. This included 90 combat and 60 support vehicles.

In early 2019, the Bulgarian MoD postponed the tender of 150 armoured vehicles to a later date. According to the Jane's Defence Weekly, the reason for delay was that the MoD failed to prepare the tactical and technical requirements for the equipment. The relevant requests for proposals were originally planned to be published in late 2018, however, everything rested on the required paperwork for the tender. In fact, no decision had been made concerning the calibre of the ammunition; the 30x173mm Soviet-era calibre is made in Bulgaria and will cost less than the 30x165mm cartridges to be imported. Another unresolved problem concerns the question of whether to order the equipment with antitank systems in place or to purchase these at a later date. For the armoured vehicles in a support role, Sofia is supposed to choose the specific platform it wants – the 8x8, or the 6x6 version, which would reduce costs. The delivery of the support variants is expected to be

carried out by 2026, and the 90 armoured combat vehicles, by 2024.

## Romania

In 2016, the German defence concern Rheinmetall was said to have signed an agreement with the Romanian Uzina Automecanica Moreni on the establishment of a joint venture to produce 8x8 armoured vehicles in Romania. According to these plans, the production of armoured vehicles will replace the Romanian TAB combat vehicles – a version of the Soviet BTR-70. About 1,500 of these vehicles have to be replaced.

In 2017, Romania placed an order for PIRANHA eight-wheeled armoured vehicles from General Dynamics European Land Systems within the Romanian Army's land vehicle modernisation programme. In 2018, as part of the Romanian Army's modernisation of its outdated fleet of wheeled armoured vehicles, General Dynamics European Land Systems signed a contract to supply more than 200 PIRANHA 5 wheeled armoured vehicles in six different configurations. In

2019, General Dynamics European Land Systems launched the production of PIRANHA 8x8 armoured vehicles (fifth generation) in Romania, at its strategic partner's factory Uzina Mecanică Bucureşti. This version of the armoured vehicle is characterised by a higher level of protection, its improved transmission with the possibility to increase the load capacity, and advanced mobility.

This is all part of Romania's accelerated programme to strengthen its military efficiency and implement its NATO commitments. Thus, the country's land forces have thoroughly overhauled their equipment in recent years, and participate in peacekeeping missions with other NATO countries on a regular basis. Also, in the framework of German-Romanian defence cooperation, in 2018, they announced the creation of a joint venture, Romanian Military Vehicle Systems, by Rheinmetall and the Romanian state defence contractor Romarm. The result of this cooperation is the construction of a new armoured vehicle, the AGILIS 8x8, produced according to German technology, with 87% of the components man-

# Exhibition Update – September 2020

**As at 24 August 2020, of those that are relevant to the ESD 2020 schedule, to the best of our knowledge, the following exhibitions have been affected by the COVID-19 coronavirus:**

<b>IDEB</b>	Postponed to 28-30 Oct 2020
<b>BSDA</b>	Postponed to 12-14 May <b>2021</b>
<b>NITEC</b>	Postponed to "Spring <b>2021</b> "
<b>UDT</b>	Postponed to 8-10 December
<b>HEMUS</b>	Postponed to 30 Sep-3 Oct 2020
<b>KADEX</b>	Postponed to 10-13 Jun <b>2021</b>
<b>SEDEC</b>	Postponed to 15-17 Sep 2020
<b>EW Europe</b>	Postponed to 16-18 Nov 2020
<b>ADM Seville</b>	Postponed to 2-4 Feb <b>2021</b>
<b>DEFEA</b>	Postponed to 11-13 May <b>2021</b>
<b>Balt Military Expo</b>	Postponed to 20-22 Apr <b>2021</b>
<b>Close Combat Shrivenham</b>	Postponed to 29 Jun-1 Jul <b>2021</b>
<b>Land Forces Australia</b>	Postponed to 1-3 Jun <b>2021</b>
<b>MSPO</b>	8-11 Sep 2020
<b>SMM</b>	Postponed to 2-5 Feb <b>2021</b>
<b>ADEX</b>	8-10 Sep 2020
<b>DVD</b>	Postponed to 4-5 Nov 2020
<b>AAD</b>	Postponed to 21-25 Sep 2022
<b>Modern Day Marine</b>	Virtual, 22-24 Sep.

<b>NCT Rome</b>	Postponed to 8-10 Jun <b>2021</b>
<b>ADAS</b>	Postponed to 5-7 May <b>2021</b>
<b>SOBRA</b>	24-26 Sep 2020
<b>AIREX</b>	1-4 Oct 2020
<b>itsa</b>	Virtual, 6-8 Oct 2020
<b>AUSA</b>	Virtual, 13-16 Oct 2020
<b>Arms &amp; Security</b>	13-16 Oct 2020
<b>MILSIM CEE</b>	13 Oct 2020
<b>Euronaval</b>	20-23 Oct 2020
<b>Future Forces Forum</b>	21-23 Oct 2020
<b>Milipol Qatar</b>	26-28 Oct 2020
<b>CYSEC</b>	27-28 Oct 2020
<b>IQPC Future Artillery Symposium</b>	Virtual 27-29 Oct 2020
<b>MAST 2020</b>	Postponed to <b>2022</b>
<b>KSK Symposium</b>	21-23 Sep <b>2021</b>
<b>GSOF Europe</b>	26-28 Oct <b>2021</b>

### Notes:

1. This list covers relevant events originally scheduled between 13 May and 31 Oct 2020.
2. This list is compiled according to our best / latest information. No guarantee of degree of accuracy is inferred or implied.





Photo: Ukrainian National Guard

**A Kraz SPARTAN armoured car of the Ukrainian National Guard, based on a Ford-F550 chassis**

ufactured in Romania. The first vehicle is due to be delivered to the Romanian MoD in 2020.

## Hungary

Sooner or later, Hungary, as a NATO member, will also be faced with the need to update its current armoured vehicles dating from the Soviet period. The country possesses a large amount of BTR-80 and BTR-80A AFVs and these vehicles have been upgraded and subsequently received the indices BTR-80M and BTR-80AM. The main emphasis will be placed on armoured vehicles with a high level of crew protection and mine resistance.

In 2019, Hungary was expected to become the sixth country to purchase the EJDER YALÇIN 4x4 produced by Turkey's Nurol Makina Sanayi. The EJDER YALÇIN 4x4 armoured combat vehicle is characterised by a high level of protection and mobility, with a high load capacity. Accordingly, the working load can be integrated on this platform and is able to be used in various configurations – e.g., as a border surveillance and security vehicle, as an air defence vehicle, and as a reconnaissance vehicle.

## Poland

In 2019, Poland signed a military cooperation agreement with the US when the Minister of National Defence, Mariusz Blaszczak, approved and signed a 15-year plan for the technical modernisation of

the armed forces in the period 2020-2035. During this period, Poland plans to carry out a large-scale rearmament of its armed forces with an overall cost of about US\$133Bn. The plan includes the rearmament of the Polish Air Force, the creation of a multilevel and integrated reconnaissance system according to the new programme Obserwator, the purchase of new submarines under the Orka programme, and the further strengthening of artillery assets. There are also four key programmes in the field of modernizing tanks and armoured vehicle fleets: the modernisation of LEOPARD 2A4 tanks to the LEOPARD 2PL standard; the purchase of ROSOMAK wheeled armoured personnel carriers; the acquisition of a new generation of tanks codenamed WILK; and putting the BORSUK infantry fighting vehicles into operation. The purchase of these wheeled armoured personnel carriers under the ROSOMAK programme will proceed with the basic transport version,

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Photo: via author

***The Ukrainian BTR-4 can be used by special military units and marines in various climatic conditions as it is equipped with various types of universal combat modules.***

and in a specialized version with inhabited and uninhabited turrets. The new track-type infantry fighting vehicles within the BORSUK programme to replace the BWP-1 platform will cost about 20Bn Zlotys. The new BMP is produced by the ROSOMAK consortium, Huta Stalowa Wola. The vehicle will be equipped with an uninhabited turret with a 30-mm American Mk44 BUSHMASTER II automatic cannon and an Israeli-made SPIKE anti-tank guided missile launcher. As the Defence Blog reported in May 2020, the Minister of National Defence of Poland, Mariusz Błaszczak, announced that the Polish Army was ready to acquire the first group of 60 ROSOMAK-S APCs, modified to carry SPIKE LR Dual anti-tank guided missiles. The agreement is planned to be concluded in the third quarter of 2020. This purchase will be helpful in the process of strengthening the so-called "Eastern Wall" as these vehicles will mainly be deployed to units located in the east of the country. The Israeli antitank guided missile SPIKE-LR has the capability to engage armoured vehicles at a distance of up to 4,000m.

## The Czech Republic

The Ministry of Defence of the Czech Republic has submitted proposals to replace its outdated Cold War era BVP-2 with new infantry fighting vehicles. In the bid for the US\$2Bn contract, 210 units are expected to be supplied, and will be chosen from the ASCOD, offered by General Dynamics European Land Systems; BAE Systems' CV90; Rhein-

metall's LYNX; and the PUMA, produced by Germany's Krauss-Maffei Wegmann and Rheinmetall.

## Ukraine

With the outbreak of armed hostilities in the east of Ukraine in 2014, the Ukrainian Army was forced to use its Soviet-era military equipment which failed to meet the needs of fighting in the modern era. As the conflict has continued unabated, armoured vehicles of different classes were actively developed by both state and private enterprises. Also, the process of restoration, repair and modernisation of armoured vehicles of the Soviet period continues. For example, the repaired BTR-70 and BTR-80 have been dispatched to the armed forces in large numbers.

Early 2020 was marked by an increased number of transfers of armoured vehicles to the armed forces with open sources reporting that from January to May, about 300 vehicles were transferred, including armoured personnel carriers, infantry fighting vehicles, light and special armoured vehicles, and tanks. The BMP-1 units and the new BTR-4E are also being supplied to the armed forces. In April 2020, Ukrspetsexport, as part of the state concern, Ukroboronprom, launched the process of supplying the Ministry of Defence with 37 BMP-1 units.

The modernisation of the BRDM-2 to the BRDM-2L1 is still in progress. In April 2020, eight units were transferred by the Nikolaev Armoured Factory, as part of the Ukroboronprom to the Ministry of

Defence. During the renewal process, the characteristics of the basic BRDM-2 vehicle were improved, taking into account experience from combat operations, with the installation of the latest navigation and communication equipment, a television night vision system, changes to the crew position, an upgrade in the vehicle's armour, and the reduction in the time for the crew's disembarkation.

Different types of armoured vehicles in Ukraine are produced by the private company NGO Practika. The company is engaged in the modernisation of the Soviet-era infantry fighting vehicles BMP-1 and BMP-2, with the installation of a new engine, a combat module, better mine protection, and improved communications and surveillance equipment. The modernisation of the BTR-60 includes the following characteristics: the engine is situated at the front side of the vehicle and troops being transported are seated in the back; there is also enhanced ballistic protection, mine proof and anti-mine seats, a modern diesel engine, and the ability to install a combat module.

The KOZAK-2 multipurpose armoured vehicle, based on the Iveco chassis, has been serially produced since 2015, with more than 100 units in service with the Armed Forces of Ukraine. The vehicle has an increased level of protection, from small arms fire (7.62 mm calibre) and from mine fragments.

The OTAMAN 6x6 and 8x8 armoured combat vehicle is produced by the Ukrainian manufacturer NGO Practika and was first presented in 2016 at the Defexpo exhibition in India. Based on the BTR-60 chassis, it can be used as an armoured personnel carrier, infantry fighting vehicle or armoured ambulance role. The OTAMAN has a crew of three and is capable of transporting up to ten personnel. A new OTAMAN-3 with the 6x6 wheel arrangement was presented at the Arms and Security exhibition in 2019 in Kyiv and is a collaborative development between NGO Practika and League of Defence Companies of Ukraine and Ukroboronprom. The peculiarity of this version is its compact size and its reinforced armour protection according to the STANAG 4569 standard, (level 2), with the possibility to attach additional ceramic armour. It also has a special suspension system with a greater load carrying capacity, and a compartment for the disembarkation of personnel from the rear of the vehicle. The vehicle was specially designed for the needs of the Armed Forces of Ukraine and marines and was produced according to the requirements of the Ukrainian military forces based on combat experience. In 2020 in Ukraine, the testing of this new armoured personnel



carrier took place, after which it was introduced into the Ukrainian army's arsenal.

The Kraz SPARTAN armoured car, designed in collaboration with the Canadian Streit Group company, is also supplied to the Armed Forces of Ukraine. Basing on the Ford-F550 chassis, the vehicle was designed to transport personnel in high-risk situations. One well-known case occurred recently in June 2020, when a Kraz SPARTAN car detonated a mine while travelling in a convoy on operations in the Donbas; this resulted in injuries to the personnel on board, but with no fatalities, as the cab was able to withstand the blast.

The BTR-4 is produced in Ukraine by the Kharkiv Morozov Machine Building Design Bureau and combines the functions of an armoured personnel carrier and an infantry fighting vehicle for providing fire support to units on the battlefield. The difference with the BTR-4 armoured personnel carrier is the troop compartment in the hull rear, where there is now a possibility to disembark via a ramp under the shelter of the vehicle. The vehicle can also be used by special military units and marines in various climatic conditions. The BTR-4 is equipped with various types of universal combat modules and its power installation is provided by either a Ukrainian 3TD diesel engine with 500 hp, or the Deutz EURO III engine with 589 hp. The modernisation of the BTR-4E includes the new BM-7 PARUS remote-controlled weapon station and the 3TD-3A diesel engine. The vehicle design has now undergone the full cycle from the beginning of the project to being placed in active service on combat operations. It is serially produced in Ukraine and has entered service with the both the Armed Forces of Ukraine and the National Guard, gradually replacing older armoured personnel carriers.

In fact, Ukraine has established the production of a full range of armoured vehicles and combat modules and each one possesses export potential.. A specific feature of the Ukrainian market is the growing share of private enterprises in the state defence sector. The activity of private companies will undoubtedly motivate the state-owned companies to produce competitive technology.

## Ukrainian Experience

As a result of extensive combat experience gained by the Ukrainian Armed Forces over the course of six years of armed conflict, improvements and modifications to their armoured vehicle fleet will mean significantly fewer casualties in the future. Equipment improvements include the introduction of elevating

sights and monitoring instruments, night vision devices, as well as navigation systems and secure digital communications. Ukrainian light armoured vehicles are also supplied with advanced protection against large-calibre bullets and equipped with special run-flat tyres.. Furthermore, their armoured vehicles are now better equipped in the area of mine protection.

This extensive combat experience has also improved the situation in the field of international cooperation with Ukraine's partners. For example: Ukrainian 6TD-3 engines can be fitted in the Turkish ALTAY tank; the ZASLON-L active protection systems are jointly produced by the Spetstechnoexport Company together with Aselsan; and the DUPLET dynamic protection system is implemented jointly by the Spetstechnoexport and Roketsan companies. Both of these systems are envisaged for use in the M60 main battle tank, currently still in service with

the Turkish Armed Forces. As for other Eastern European countries, Ukraine is now in a position to offer joint modernisation of Soviet-era equipment, which is still in service in the inventory of its partners.

## Conclusion

What is certain, however, is that many Eastern European countries are actively purchasing new armoured vehicles in order to gradually replace their ageing Soviet-era equipment. However, this process is often limited by tight defence budgets. Further development and the saturation of the armoured vehicle market can be expected in the nearest future as a result of growing tension around the globe, including border conflicts. Undoubtedly, armoured vehicles will be continuing to play a pivotal role in the protection of armed forces in these conflicts for some time to come. ■



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# EURONAVAL 2020 and the “New Normal”

Photo: SOGENA / EURONAVAL



**The 2020 edition of EURONAVAL exhibition will be held in Paris-Le Bourget from 20 - 23 October 2020.**

**ESD was granted an exclusive interview with Hugues d'Argentré, Director of SOGENA, which organises Euronaval. In this interview, Mr d'Argentré addresses the most pressing topics for would-be exhibitors and visitors to EURONAVAL 2020**

**ESD:** How many exhibitors from how many countries do you expect, and what will be the particular highlights of the event?

**d'Argentré:** Due to the current global health crisis, EURONAVAL 2020 will be a unique event. The exhibition will be the first and only event of its magnitude in 2020 dedicated to naval defence after the COVID-19 crisis. The aim of pushing ahead with the event against all odds is, of course, to support the entire naval sector and the jobs it provides, not only at national level, but also at European and global levels. This bold and risky choice was made with the aim of assuring the resilience of our industry and to demonstrate our entrepreneurial and winning spirit, which must remain despite the pandemic.

At present, we do not know how many exhibitors will attend in October. Up until the last few days, our sales team were beating stand reservations taken this time two years ago for the 2018 edition of the exhibition. We are entering a period of uncertainty due to August and latest developments in the COVID-19 crisis. The health crisis remains serious for some countries, but we will do all we can to enable as many people as possible to take part in this year's event, which is set to be exceptional in several respects.

This year sees the inauguration of the Cyber Naval Hub dedicated to cybersecurity

and cyber defence. Organised in partnership with Compagnie Européenne d'Intelligence Stratégique (CEIS), which also organises the International Cybersecurity Forum (FIC) each year, the Cyber Naval Hub will welcome manufacturers, administrations, and research institutions who will have the opportunity to exhibit their innovative solutions and discuss issues concerning the protection of combat systems on vessels and onshore facilities with the entire cyber and naval ecosystem.

We are also happy to bring back two zones created for EURONAVAL 2018 which received very positive feedback from our visitors:

First, SEAnnovation, a hub welcoming around thirty French and foreign start-ups, selected following a call for applications and representative of the diversity of naval defence and maritime security. During French President Emmanuel Macron's visit to the exhibition in 2018, he expressed particular interest in SEAnnovation and took the time to speak with several start-ups.

Second, the Navire des Métiers, a zone dedicated to training, professions, and jobs in the naval sector. Launched in 2018 at Euronaval in cooperation with GICAN (Groupement des Industries Navales - French Marine Industry Group) and the Campus des Industries Navales, the Navire des métiers was inaugurated by

the Minister of National Education and Youth, Jean-Michel Blanquer.

**ESD:** What will be the subjects addressed in the conference on 19 October?

**d'Argentré:** Euronaval's large inaugural conference that normally takes place in Paris on Monday, the day before the exhibition, was a big success in 2018 with over 600 attendees, cannot take place this year. We have made the decision to replace it with a series of three 'round table web conferences' that will be recorded and made available online across three sessions, in the three weeks before the exhibition opens. They will be led by the Fondation pour la Recherche Stratégique - Foundation for Strategic Research (FRS). The Chief of the French Naval Staff, the Chief Executive of the Defence Procurement Agency (DGA), and the President of GICAN and Euronaval will also be contributing to the web conferences. These can be viewed live or on-repeat via the website [www.euronaval.fr](http://www.euronaval.fr). The topics, dates and times of the three web conferences will be widely published in September. (ed. check [www.euro-sd.com](http://www.euro-sd.com) for more details and links).

**ESD:** To what extent do the French Government and the French Navy support EURONAVAL 2020? Are the Government and the French Navy inviting delegations on their own?



**d'Argentré:** Prior to making the difficult decision to go ahead with the exhibition, we obtained formal backing from the Ministry for the Armed Forces and the DGA. We know we can count on the Ministry's significant political, human and logistical support once again this year. As with each year, official invitations for foreign delegations have been signed by the Minister, the CEMA, the DGA or the CEMM. Euronaval is sponsored by the Minister of the Armed Forces, who is doing the honour of opening the exhibition for us, and we continue to work closely and in great confidence with all directorates concerned in the Ministry of the Armed Forces.

**ESD:** Obviously, this year's exhibition and conference will be affected by the global COVID-19 pandemic. Do visitors and delegation from for example the Americas, Asia and Africa have to expect to be taken in quarantine?

**d'Argentré:** At this point in time, it is too early to confirm the potential implementation of a two-week or other period of quarantine. The situation is changing weekly and we are constantly adapting our health protocols in response to the pandemic and the requirements of health authorities. All health rules in force will be implemented at the exhibition. It goes without saying that we hope the situation develops favourably and enables foreign exhibitors and visitors to attend Euronaval in October in complete safety and with full peace of mind.

**ESD:** So, how many delegations and from which countries do you expect them?

**d'Argentré:** In the current context, it is difficult to give an accurate number of delegations who will attend. Over 150 delegations have received an invitation for the exhibition throughout the course of July. We hope they will understand the benefit of attending the exhibition for the future of their navies and that they will be able to come. We expect fewer attendees compared to Euronaval 2018, but



those who are able to come will be very happy with what awaits them. In normal circumstances, we would have a good idea of the number of delegations due to attend by mid-September. This year, we will most likely have to wait until early October to receive definitive responses. We are dependent on the development of the pandemic. There are still a number of weeks ahead of us to go...

**ESD:** Will there be digital offerings to compensate for the COVID-19 shortcomings? Is there a "Plan B", just in case a second COVID-19 wave excludes the physical presence of the expected numbers of exhibitors and visitors?

**d'Argentré:** We are currently thinking about digitising parts of the exhibition. It has already been confirmed that the press area will be paperless to reduce possible COVID-19 transmissions by paper documents. We are also creating Naval-Online, a digital version of Euronaval that will enable exhibitors to present their products and services online to visitors unable to attend due to COVID-19. Naval-Online will not be accessible by all. It will be restricted to our exhibitors' invitees and visitors from countries banned from travelling to, or being in, France due to the pandemic.

**ESD:** Within the European naval shipyard community there is currently a trend towards consolidation. How do you assess this trend, and which European shipyards have reserved space at the exhibition?

**d'Argentré:** In Europe, shipyards are joining forces to strengthen the services they offer internationally. This year, NAVIRIS, a joint venture by Naval-Group and Fin-

cantieri, will be attending Euronaval for the first time. This new business marks the materialisation of mergers and restructuring within European and global shipbuilding.

**ESD:** Thank you.

**The interview was conducted by Jürgen Hensel.**

# Post-COVID-19 Europe: a New Security Environment With New Challenges

Photos: JCD



**Bear Midkiff is Vice President Sales and Marketing for John Cockerill Defense. The Belgian company, with over 200 years history, presents its modular turrets and weapon systems as a part of a comprehensive solution for customers around the world.**

**ESD:** The COVID-19 crisis has caused a great deal of difficulty in business world-wide. How did the pandemic affect John Cockerill Defense?

**Midkiff:** I am happy to say that we had only a short break in production and that we have adjusted our workspaces and work schedules to be in line with the new safety and health standards. The leadership of John Cockerill took the situation very seriously from the start and made big decisions about how to do business in the COVID world.

There have been additional contracts for both the 90mm LCTS and the Cockerill 3105. The Harimau (BLACK TIGER) programme also got approved and contracted for Low Rate Initial Production (LRIP). We went through a very extensive testing and certification process and aside from the obvious setbacks with transportation around the world, things are going well. Only a few weeks ago, John Cockerill Defense was also selected as a member of the LynkEU project which is designed to bring advanced capabilities to a Beyond Line of Sight (BLOS) Anti-Tank Missile. This one will expand the capabilities of the MMP missile from MBDA. The BLOS programme is under the European Defence Industrial Development Program (EDIDP).

During the so called "Down Time", John Cockerill executed a complete review of the market and accelerated several de-

velopment projects. We are very excited about these new products, as we have already seen serious interest in them from different segments of the market. These systems will round out the John Cockerill portfolio and compliment the 3000 series and our traditional 90mm turrets.

**ESD:** Can we get some details on these new products?

**Midkiff:** We have been working hard on several new products that we believe have great potential for the defence market over the next 10 - 15 years.

- The Cockerill Protected Weapons Station Gen II (CPWS Gen II)
- The Cockerill 1030 light weight 30/40 turret

The CPWS Gen II has passed all testing and the first production prototype is ready for firing trials as we speak. It is a low profile, lightweight turret, with a revolutionary hatch opening. The hatch can operate in four different modes which allows more flexibility – a key feature modern armies are focusing on. Additionally, the hatch makes it an ideal step in the right direction for optionally manned or robotic unmanned platforms. The CPWS II has been designed from the beginning as an optionally manned system, which can be operated from within the vehicle or remotely. It is designed to fit easily onto 4x4 and 6x6 vehicles. The primary firepower for this

system is the M242 25mm x 137mm cannon or the 240LF 30mm X 113mm cannon. There is a COAX machine gun as well and optional ATGM.

We revealed the CPWS Gen II turret on top of the MILREM Type X Unmanned Ground Vehicle last week to an audience from over 40 different countries. There is not another turret in the world right now that provides functional operations for manned, unmanned and unmanned ground vehicles operations.

**ESD:** What other projects has John Cockerill started?

**Midkiff:** Our new 1030 turret is something that we feel will reach a highly desired sweet spot in the medium calibre market. It is a lightweight, low profile medium calibre turret which is capable of hosting 30mm x 173mm, or the 40mm x 180mm cannons.

Due to its modularity, the 3000 series turret is the absolute best turret you can have to base an entire armoured force on. You can have tracks and wheels all using the same basic turret, and have medium and large calibre weapons within the structure. But the cost of being able to mount a 105mm cannon in the turret is one of weight and space.

The 1030 reclaims this space and weight by optimising the turret design for medium calibre operations. Out of the box, the turret will



be able to accept the MK44S 30/40mm cannon and will weigh less than 1.5 tons. That makes a lot of sense for armies that want amphibious capabilities and or specifically only a medium calibre solution. The MK44S is an Air Burst Munition (ABM) capable system. Our test with the US Government during our CRADA (Cooperative Research and Development Agreement) showed that we could accurately hit targets with ABM on the move. We plan to be firing the new 1030 turret in the middle of next year.

rearview mirror. This is not to say the alliance is in any way in danger nor that the relationship between the US and Europe is any less valuable. I am just pointing out that Europe should be looking to find more future cooperation internally.

When I was working issues of NATO Expansion in the 90s, I heard many leaders say "Now my country is safe militarily and we don't really need to worry about it too much." I don't think we can say that today. The militaries of Central and Eastern

than several people on or around the vehicle is still a stretch. That does not mean these vehicles won't have a role to play in the near future, but we believe their roles will be limited for the near term.

We also see a return to large calibre cannons. The tank was originally invented to conduct infantry support. Then the Blitzkrieg tactics made the tank an almost independent combat system. The mission of infantry support didn't go away because the tank evolved, it is still necessary and large calibre systems are important on the battlefield. The fact is sometimes you just need a bigger gun. Customers around the world are returning to a 105mm and the Cockerill 105mm high-pressure cannon is simply the best on the market.

**ESD:** What does that actually mean for ongoing modernisation projects?

**Midkiff:** It means that today's world is different than yesterday's. The world we live in today is different from the world we celebrated New Year's Day with. It just got a lot more dangerous in the geopolitical sense. We felt the threat of Russia during the 2014 annexation of the Crimea; the continuing conflict in the Ukraine has cost over 14,000 lives and displaced more than 1.5 million people. Look at the election in Belarus, the tensions in the Mediterranean over drilling rights...Taiwan and Hong Kong, no shortage of tensions, which could flair into full blown crisis.

Add to that the economic downturn that is happening as a result of the COVID-19 pandemic. What you see is a crossroads of uncertainty that will take strong leaders and also strong friends in order to weather the storm. We are hopeful the European governments will acknowledge all these pressing changes and factors when making the decision for the modernisation of the Land Forces.

John Cockerill believes the solutions lie within the EU. We believe there are accessible and transparent avenues for the Land Forces to pursue in order to put the best equipment into their soldier's hands. It won't be correct to give them "just good enough". We have strong EU partners and we are actively pursuing industry partners and we look forward to working with them and others in order to enhance the ties between our countries and build together a stable EU future for the defence sector.

**ESD:** Thank you.

**The interview was conducted by Stephen Barnard.**



**The CPWS Gen II turret on top of the MILREM Type X unmanned ground vehicle**

**ESD:** The defence market is changing, what are some of the key principles that will change the way we conduct defense business in the next few years?

**Midkiff:** If the COVID-19 pandemic has shown us one thing, it is that the EU has become more important as a unifying organisation, and NATO has become more important as a mutual security guarantor. The last few months brought a significant change to everyone's lives and to the economies of many countries. I believe we will feel the consequences for many more years, which makes having solid and trustworthy allies more important than ever.

We see strains between several countries inside NATO and an even larger, potentially more critical strain in the traditional "Trans-Atlantic Link". The EU Post-COVID recovery money is tied to the strategy of encouraging cross boarder projects and initiatives. These projects will also be strongly encouraged to be environmentally friendly and pointed towards "sustainability and future technologies". I think that the relying on the US military for our security blanket is something that Europe will be forced to put in its

Europe desperately need modernisation and dropping these modernisation projects due to the uncertainties of COVID, will only exacerbate the situation. The time to modernise is today and several countries are not backing away from their programmes, which is encouraging.

**ESD:** What types of trends do you expect in the market?

**Midkiff:** Robotics is an obvious first reply. We see lots of potential in robotic combat vehicles, and we are happy with our cooperation with MILREM Robotics. We believe that robotic vehicles will have a significant role on the future battlefields, and we are making sure that we are on the forefront of this development. We also consider the careful and deliberate development and integration of these technologies to compliment and not detract from our soldiers a must.

It will be several years before we see these vehicles as a normal part of our formations. We have drivers in vehicles today, with co-drivers and ground guides who still drive into or over cars or run into buildings, so making the situation awareness such that an operator will do better

# Limitations on Defence Imports to India

**Suman Sharma**

India is the world's second largest arms importer. Will a ban on defence imports be enough to boost its defence industry, making it self-reliant? Can it duplicate the success of indigenous buying programmes witnessed in the USA, China, Russia and across Europe?

Emblazoned on India's sovereign flag is a spinning wheel. It is there as a symbol of self-reliance. Before Mohandas Gandhi shook the loose the crippling grip of the British Empire, all cotton from India was exported to the UK for processing into textiles and then re-sold to India, making the people reliant on Great Britain for materials it made for itself for at least three millennia. This bound the Indian economy to Britain's financial fortunes and forced India's people into peonage. Gandhi envisioned a self-reliant people capable of extracting its own resources, processing them and producing – and exporting – its own products, starting with the humble spinning wheel sitting at the heart of every rural Indian home and at the cultural core of the nation.

Waving the nation's flag and reaffirming Gandhi's timeless message, Prime Minister Narendra Modi proclaimed his own clarion



**In 2014, Indian Prime Minister Narendra Modi launched his "Make in India" initiative.**

call on 12 May 2020 to the defence industry of India: it must become more self-reliant. The words "Atmanirbhar Bharat" or "Self Reliance", are once again the watch words for the Indian industrial economy. As a modern industrialised nation, rivalling industrial output of any western nation, it needs to also be more like the USA ("Buy American!") and the EU trading bloc in terms of securing its economic and strategic resources, production chains and defence materiel assets. India's Department of Military Affairs under the Indian Ministry of Defence (MoD) has prepared a list of 101 specific weapon systems and platforms whose import will be gradually banned.

Following the Prime Minister's recent announcement, the Defence Acquisition Council (DAC) approved procurement proposals worth approximately US\$90Bn, which includes the order for 106 basic trainer aircraft for the Indian Air Force from the Indian Government-owned Defence Public Sector Units, Hindustan Aeronautics Limited, an upgraded version of the Super Rapid Gun Mount to be fitted on board Indian Naval and Indian Coast Guard vessels from Bharat Heavy Electricals Limited, 125 mm Armour Piercing Fin Stabilised Discarding Sabot ammunition for the Indian Army and an upgrade of the AK 203 and Israeli unmanned aerial vehicle searcher Mk-II HERON.

Following the DAC's procurement approvals, an announcement of 15 light combat helicopters (LCH) and 83 Mk 1A light combat aircraft (LCA) for India's Air Force can be expected. In light of increased border tensions with China, the Air Force already deployed two LCHs in full combat profile to the Ladakh region, bordering on Chinese occupied Tibet. The LCA MK 1A is on the MoD's list of 101 items, with an embargo date of December 2020.

Indian Defence Minister Rajnath Singh articulated on Twitter: "The embargo on imports is planned to be progressively implemented between 2020 and 2025." The rationale behind this policy move is to promote more indigenous defence production and to generate employment for India's youth in order to boost the Indian defence manufacturing sector. This is a similar move President Cyril Ramaphosa took in 2018 to create more opportunities for South Africa's industrial sectors serving the defence establishment. Mr Singh added that: "...all necessary steps would be taken to ensure that timelines for production of equipment as per the Negative Import List are met, which will include a coordinated mechanism for hand-holding of the industry by the defence services". While there has been much cooperation over the years between the Indian MoD and its defence industrial sector, it is clear that more



Photo: via author

## AATMA-NIRBHAR BHARAT

**"Atmanirbhar Bharat" or "Self Reliance", is Modi's clarion call, echoing Gandhi's vision of a self-reliant people capable of extracting its own resources, processing them and producing – and exporting – its own products.**



needs to be done in the area of cooperative technology transfers, joint research projects and clearer guidance on how best to meet India's defence requirements.

Sujith Haridas, Director General of the Society of India Defence Manufacturers (SIDM) affirmed: "The 330 plus SIDM members can meet the requirements of the import embargo list and beyond. Allocating capital budget resources annually for domestic industries, to achieve domestic industry turnover of US\$1.7Tn and exports of US\$350Bn by 2025, shall transform the landscape of Indian defence and aerospace industry during the next 5-7 years."

The list of embargoed products was not created in a vacuum by parliamentarians keen to score government contracts for businesses in their home districts. Rather, India's MoD prepared the list after several rounds of consultations with all stakeholders, including the Army, Air Force, Navy, Defence Research and Development Organisation (DRDO), Ordnance Factory Board (OFB), and private industry to assess current and future capabilities of the Indian industry for meeting India's growing list of defence requirements. This is especially urgent, now that traditional allies Pakistan and the People's Republic of China are both pointing gun barrels at India's norther borders, backed-up by the threat of their own nuclear arsenals. According to India's MOD, the Indian defence industry will manufacture the items placed on the "negative list" (viz. the banned items) by using their own designs, materials, innovations, research and development capabilities. This includes adopting and adapting technologies already developed by the DRDO.

Jayant Patil, Director of Defence and Smart Technologies at Larsen & Toubro Ltd. (a leading defence design and manufacturing firm headquartered in Mumbai) confirmed: "Our strategic sector is a shining example of the stellar capabilities the nation has built in-house, indigenously at a fraction of what the (more) advanced world has incurred and all because it was denied to us. "So, denial became a boon for us to achieve complete self-reliance, plus it's a wake-up call that came from China to stay focused and build (our) domestic industry."

Major Indian defence imports come from France, Israel, Russia, and the USA; ranging from aircraft, repair components and simulators to rockets, radars and artillery. Almost 260 orders of these items were contracted by the Indian MoD at an approximate cost of US\$3.5Tn between April 2015 and August 2020.

With the latest embargo on the gradual import of 101 items, it is estimated that contracts worth more than US\$4Tn will



Photo: via author

**PM Modi and Indian Defence Minister Rajnath Singh paying tribute to the father of the Indian nation**

be opened up to India's domestic industry spanning the next five to seven years. Of these, items worth almost US\$1.3Tn each are anticipated for the Indian Army and the Indian Air Force, while items worth almost US\$1.4Tn are anticipated by the Indian Navy over the same period.

SP Shukla, Vice President of SIDM, while welcoming the announcement said, "This will catapult the Indian Industry into not only achieving 'atmanirbharta' (self-reliance); but, will also create a vibrant defence manufacturing ecosystem for exports."

The list of 101 embargoed items comprises not just simple spare and maintenance parts but also some high-end technology weapon systems and highly-complex platforms. The list also includes, wheeled armoured fighting vehicles (AFVs) with an indicative import embargo date of December 2021, of which the Army is expected to contract almost 200 at an approximate cost of over US\$50Bn. Similarly, the Navy is likely to place

demands for submarines, also with an indicative import embargo date of December 2021, of which it expects to contract about six vessels at an approximate cost of almost US\$420Bn. A senior executive at L&T, however, revealed: "Policies of the Government are all very good; but, it is their implementation (that) is cumbersome, as the implementation is in the hands of the bureaucracy - and most of the bureaucrats are Directors in the Government-owned DPSUs so it is a conflict of interest for them."

The MoD has now split the capital procurement budget for 2020-21 between domestic and foreign capital procurement. A separate budget header has also been created with an outlay of nearly US\$520Bn for domestic capital procurement in the current financial year. Jayant Patil of L&T says, "Budgets will not be split between private and public segments. The reason being that in the past, orders mainly went to DPSUs but now the AONs (Acceptance of Neces-



Photo: via author

**The NAG missile and the NAG Missile Carrier Vehicle (NAMICA) have been developed domestically by DRDO.**



Photo: via author



**The IAF TEJAS is a supersonic light combat aircraft manufactured by HAL.**

sity) granted allow the private sector to freely compete."

With the self-reliance firmly in mind, during India's 74th Independence Day celebrations, Defence Minister Rajnath Singh launched a number of products manufactured by several defence PSUs. One of the weapons showcased was the prototype NAG Missile Carrier developed by the Ordnance Factory in association with a DRDL

Hyderabad lab. Other weapons presented by the Ordnance Factory Board (OFB) include:

- 14.5mm Anti-Material Rifle (fully indigenous)
- Thermal Imaging/Day Sight (upgraded) for T90 main battle tank commanders
- 8.6x70mm Sniper rifle (prototype) developed by Rifle Factory Ishapore for engaging long range targets

- 150<sup>th</sup> Do-228 aircraft produced by HAL, christened IN-259 for the Indian Navy for a maritime reconnaissance and intelligence warfare role
- Linear Variable Differential Transducer fully-designed and developed by BEL for the Indian Navy
- Konkurs Launchers Test Equipment designed and developed by Bharat Dynamics Limited replacing legacy Russian launchers, saving US\$17.7M
- Portable Pedestrian (Assault) Bridge for the Indian Army by Garden Reach

Overlooking what is capable indigenously at this moment, India seems to be keeping pace with its requirements for new and modernised materiel assets and equipment. However, without being neither a pessimist or optimist, the results achieved over the next five years will judge whether "atmanirbharta" – self-reliance – was achieved with patriotic pride or failed with indigenous in-fighting and regional rumbles.

The embargo list will be detailed in the upcoming Defence Acquisition Procedure (DAP) -2020 to ensure that none of the items is processed for import in the future. (<https://mod.gov.in/dod/defence-procurement-procedure>). ■

### DPSU: Defence Public Sector Undertakings

A public sector undertaking (PSU) is a set of state-owned enterprises in India. These companies are jointly owned by the national government or one of the many Indian state or territorial governments. By law, the government must own a majority of a company's stock in order to be a PSU and have some level of preference for fulfilling government contracts, if not exclusivity in some cases. These companies usually fulfil some critical role in the government's own sustainability, such as defence. PSUs are classified according to which level of government owns the majority of shares. as central public sector enterprises (CPSUs, CPSEs) or state level public enterprises (SLPEs). There are nine Central Public Sector Undertakings (companies) under the administrative control of the Department of Defence Production, Ministry of Defence in India. These are akin to ROSTEC in Russia, PGZ in Poland and – to a lesser extent – ARMSCOR in South Africa.

1. Hindustan Aeronautics Ltd. (HAL): is the largest DPSU under the Department of Defence Production, Ministry of Defence, India. HAL has 20 Production Divisions, 11 R&D Centres and one Facility Management Division spread across the Country. It has so far produced 15 types of aircraft from in-house R&D and 14 types under licence.
2. Bharat Electronics Ltd. (BEL): has nine units across India. BEL has core competencies in the defence sector covering radars and weapon systems, sonars, communication, EW, optronics and armoured vehicle electronics.
3. Bharat Dynamics Ltd. (BDL): is a pioneer in the manufacture of anti-tank guided missiles, surface-to-air weapon systems, strategic weapons, launchers, underwater weapons, decoys and test equipment.
4. BEML Ltd. (BEML): formerly Bharat Earth Movers Limited, has nine manufacturing units located at Bengaluru, Kolar Gold Fields

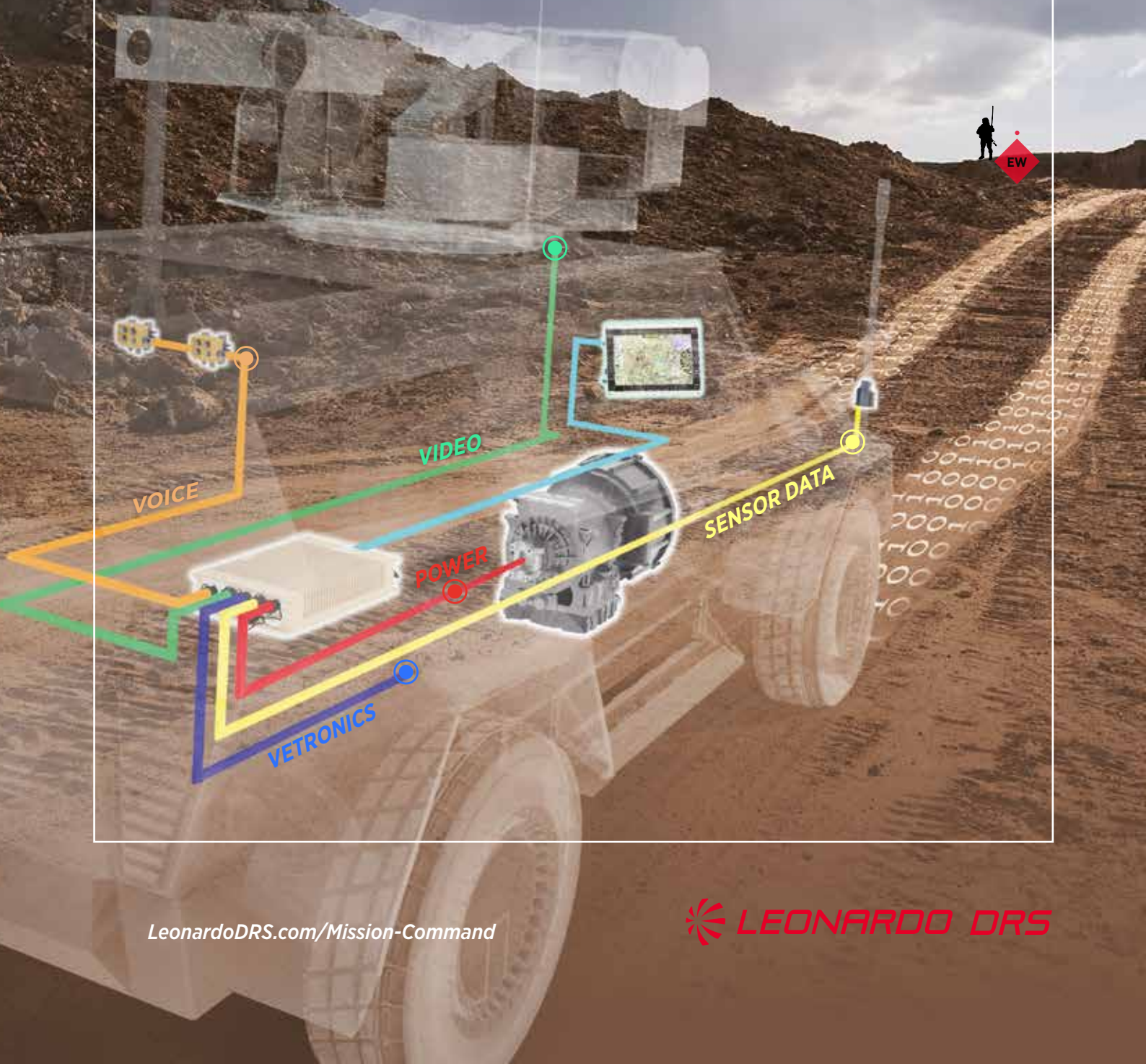
(KGF), Mysuru and Palakkad and a steel foundry subsidiary, Vignyan Industries Ltd., in Tarikere, Chikmagalur District and is engaged in design, development, manufacturing, sales and after sales activities of a wide range of areas of defence products.

5. Mishra Dhatu Nigam Ltd. (MIDHANI): manufactures a wide spectrum of critical and complex alloys, super alloys, titanium alloys, special and stainless steels, soft magnetic alloys, etc. in variety of mill forms using state-of-art production facilities.
6. Mazagon Dock Shipbuilders Ltd. (MDL): is the leading shipyard amongst all defence PSU shipyards engaged in the construction of warships and submarines. MDL is presently building destroyers, stealth frigates and SCORPENE class submarines in order to achieve self-reliance in warship production for the Indian Navy.
7. Garden Reach Shipbuilders and Engineers Ltd. (GRSE): has kept pace with India's expanding maritime interests and is established as a leading shipyard with 14 warships are under construction including two anti-submarine warfare corvettes. eight landing craft utility ships and four water jet-powered fast attack craft. A second ASW stealth corvette (INS KADMATT) was delivered on 26 Nov 2015.
8. Goa Shipyard Ltd. (GSL): is capable of indigenously designing and building sophisticated high technology ships for Indian Defence Forces and other varied clients including export markets. New business development areas identified under diversification include construction of hovercraft for the Indian Army. GSL prides itself in timely delivery of ships at 'fixed cost' and enjoys very strong execution skills.
9. Hindustan Shipyard Ltd. (HSL): is the largest and a most strategically located shipyard. The yard has built 174 vessels and repaired about 1940 vessels for the defence and maritime sector.

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# Europe Builds up Fleets of 8x8

**Christopher F. Foss**

**An increasing number of countries in Europe have now purchased new fleets of wheeled armoured fighting vehicles (AFV) in the 8x8 configuration.**

In some cases, these have replaced tracked AFV while other countries have deployed a mix of tracked and wheeled AFVs. When compared to their tracked counterparts, wheeled AFV have a number of advantages including lower life cycle costs and greater strategic mobility as tracked AFV normally have to be transported over long distances by heavy equipment transporters (HET). But they do have a higher ground pressure than their tracked counterparts. It is worth remembering that Russia and other members of the now defunct Warsaw Pact always deployed a mix of tracked and wheeled APC/IFV and this trend has continued.

While most of the recently introduced 8x8 have been in the armoured personnel carrier (APC) configuration, there is also a trend to deploy these in the infantry fighting vehicle (IFV) role which are normally armed with a one or two person turret armed with a medium calibre cannon or a remote weapon station (RWS) or remote controlled turret (RCT) also armed with a medium calibre cannon.

In addition to being used as an APC or IFV, 8x8 vehicles are also being used for an increasing number of more specialised roles such as ambulances, command post vehicles, mortar carriers and engineer vehicles. Some European AFV contractors have supplied 8x8 not only to their own armed forces but also achieved major export sales to other countries, with some also undertaking local manufacture with the platform optimised to meet their own specific requirements. This especially applies in the key areas of survivability and firepower. Most 8x8 today have a base line hull, normally of all welded steel, to which

Photo: Christopher F. Foss



**The French Army VBCI IFV fitted with a one-person turret armed with a M811 25mm dual feed cannon and 7.62mm co-axial MG**

a modular armour package (MAP) can be fitted with increased protection against mines and improvised explosive devices (IED). There are clearly, however, limits to the amount of armour that any AFV can carry before its mobility is limited.

Operational experience has also shown that, as well as having an NBC system, the platform must have a climate control system to allow it to be deployed in areas with a high ambient temperature. In addition, today's vehicles have an electronic architecture enabling easier upgrades on the future. The increasing number of subsystems that require electric power, such as RWS, battle management systems (BMS), environmental control systems, cameras and in some cases electronic devices to counter IEDs, have driven up the requirement for increased electric power for the platform. Command post vehicles, for example, can have an auxiliary power unit (APU) allowing all of their communications equipment to be run with the main engine switched off to save fuel.

The size and weight of 8x8 AFVs have been increasing as the end user wants more volume, payload and protection. Most customers select the battle management system (BMS), communications equipment and weapon fit. The latter can be govern-

ment furnished equipment (GFE) and, in addition to being used for the 8x8, can also be fitted to other platforms with the obvious logistic and training advantages.

When being used as an APC, 8x8 have typically been fitted with a protected weapon station (PWS) or a RWS armed with a machine gun (MG). The trend is now to fit larger calibre weapons. Most contractors today offer the end-user considerable flexibility as to regarding interior arrangement, seating, roof hatches and and/or ramp or door/doors at the rear to allow for rapid entry and exit of the dismounts. Traditional bench type seats have now given way to special blast-attenuating seats for all dismounts which are fitted with a five point harness for increased crew survivability. There is also flexibility as regards to the powerpack, with Caterpillar, Cummins and Scania being the most popular diesel engines and Allison and ZF for the automatic transmission.

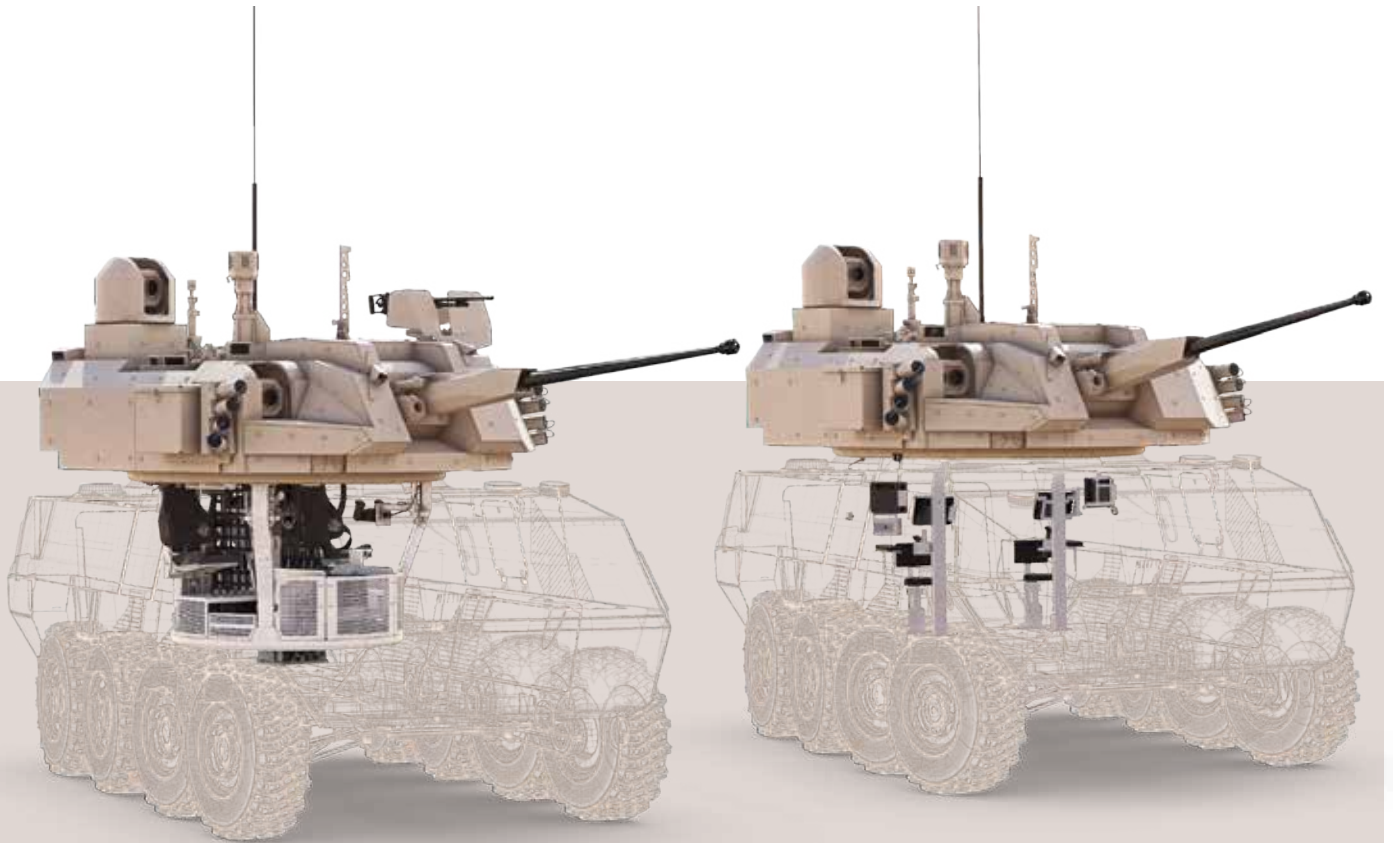
While most 8x8 have powered steering on the front four wheels, two either side, some contractors also offer powered steering on the last road wheels which gives a reduction in turning circle which is useful when operating in an urban environment. The ability to move across terrain is a key

## Author

**Christopher F. Foss** has been writing on armoured fighting vehicles and artillery systems since 1970. He has also lectured on these subjects in many countries as well as chairing conferences all over the world. He has also driven over 50 tracked and wheeled AFVs.



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Photo: Christopher F Foss



**The Nexter VBCI (8x8) fitted with Nexter T-40 turret armed with 40mm CTAS and a roof mounted RWS armed with 7.62mm MG**

requirement for all military platforms, especially 8x8, and many platforms have a central tyre inflation system (CTIS) allowing the driver to adjust the tyre pressure to suit the terrain being crossed. Some also offer the suspension with a height adjustment capability.

In the past, one of the requirements has been for the 8x8 vehicle to have a fully amphibious capability but in most countries this requirement has now lapsed, although the earlier Russian BTR-60/BTR-70/BTR-80/BTR-82 and latest Russian BUMERANG (8x8) retain an amphibious capability.

The first LAV-25 fielded by the US Marine Corps over 35 years ago, had a typical gross vehicle weight (GVW) of around 13 tonnes which compares with the latest PIRANHA 5 which has a GVW of up to 30,000 kg of which up to 14,000 kg is the payload.

While some countries purchase the base-

line platform off the shelf and then modify it to meet their own specific requirements, other prefer to manufacture the baseline vehicle under licence to maintain local jobs and the potential transfer of technology. For some contractors, including Patria of Finland (Armoured Modular Vehicle), General Dynamics European Land Systems – MOWAG of Switzerland (Piranha) and FNSS Savunma Sistemleri of Turkey (Pars), more 8x8 have been exported than sold to the home market.

## Austria

The Austrian company of Steyr-Daimler-Puch (today General Dynamics European Land Systems – Steyr) (GDELS) developed the PANDUR (6x6) APC which was adopted by the Austrian Army as well as some export customers including Belgium, Kuwait,

Slovenia and the US. Further development resulted in the PANDUR II (8x8) which has been sold to Czech Republic and Portugal who undertook local production/assembly. More recently, Indonesia has ordered 23 PANDUR II (8x8) through Excalibur of the Czech Republic as GDELS – MOWAG concentrates its main export effort on PIRANHA 5 (8x8).

## Finland

In close co-operation with the Finnish Army, Patria developed the Armoured Modular Vehicle (AMV) (8x8) as a follow-on to their highly successful XA series of 6x6 vehicles of which over 1,100 were built for the home and export markets. In close co-operation with the Finnish Army, Patria developed the Armoured Modular Vehicle (AMV) with more internal volume and greater payload than the earlier XA (6x6) series and can undertake a wider range of battlefield missions.

The Finnish Army has taken delivery of the AMV in the APC role fitted with a Kongsberg PROTECTOR RWS armed with a stabilised 12.7mm MG plus 18 fitted with the Patria twin 120mm AMOS (Advanced Mortar System). AMV has been a major success on the export market, with sales being made to Croatia, Poland (local production as the ROSOMAK), Slovenia (SVARUN), South Africa (delayed local production as the BADGER), Sweden and the United Arab Emirates (UAE). The procurement of 81 AMV (8x8) for Slovakia has been delayed. This is known as the VYDRA and is fitted with a locally designed TURRA turret armed with a Russian 30mm 2A42 dual feed cannon and 7.62mm co-axial MG.

The UAE took delivery of five AMV in the 8x8L amphibious version from the Finnish production line which were fitted in the UAE with the complete turret of the Russian BMP-3 IFV which is used in large numbers by the UAE. Since then, additional AMV have been supplied from the Polish production line to the UAE and these were fitted with their weapons on delivery. As well as being used as an APC, the AMV is used as a IFV with Poland, for example, deploying a version with a locally manufactured Leonardo turret armed with a Northrop Grumman 30mm MK44 dual feed cannon and 7.62mm co-axial MG. In response to customer's requirements Patria has, using internal research and development funding, developed the PATRIA AMV XP which stands for extra performance, extra payload, protection. The original AMV had a GVW of around 27 tonnes while the latest AMV XP has a GVW of 32 tonnes of which up to 15 tonnes is payload which includes

Photo: Patria



**The latest PATRIA Armoured Modular Vehicle XP fitted with a Kongsberg remote weapon station armed with a 12.7mm MG and JAVELIN ATGW**



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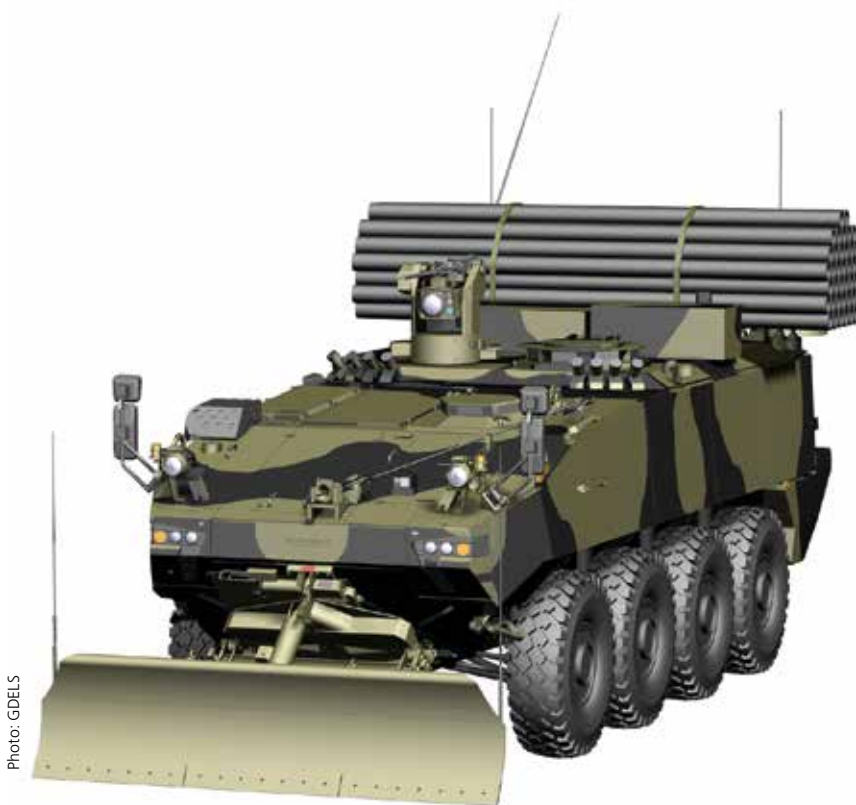


Photo: GDELS

***The General Dynamics European Land Systems – MOWAG PIRANHA 5 has now been adopted by Denmark, Romania and Spain and can be used for a wide range of missions such as an engineer vehicle shown here.***

the armour package, weapon system, ammunition and crew. Development of the AMV XP is complete and it is expected that future customers would opt for this version while existing customers would stay with the standard AMV.

Patria has completed development of the latest Armoured Wheeled Vehicle (AWV) 6x6 vehicle which was launched in 2018 enabling the company to offer potential customers an 8x8 or a 6x6 vehicle. PATRIA AWV 6x6 uses components from the AMV XP and has recently been selected as a joint programme by Estonia, Finland and Latvia to replace their currently deployed PATRIA XA series of vehicles.

## France

The French Army has now replaced its feet of tracked AMX-10P IFV with the Nexter VBCI (8x8), with 630 of these completed at their Roanne facility. Of these, 520 were in the IFV configuration and remaining 110 on the command post (CP) role fitted with a RWS armed with a 12.7mm MG. The IFV has a Nexter one-person turret armed with a 25mm M811 dual feed cannon and a 7.62mm MG that can be laid onto the target by the gunner, seated in the turret, or the commander seated in the hull to the rear of the driver on the left side.

For the export market, the VBCI has been demonstrated fitted with the Nexter T40 turret armed with a 40mm Case Tele-scoped Armament System (CTAS), 7.62mm co-axial MG and the option of an anti-tank guided weapon (ATGW) mounted either side of the turret. This was originally called the VBCI-2 but this designation has been dropped. Qatar signed a letter of intent for

490 VBCI in December 2017 but this has yet to be confirmed. While the VBCI production line is currently closed, it has been used to upgrade earlier vehicles to a GVW of 32 tonnes.

## International

Collaborative AFV programmes have often fallen by the wayside but after some delays one of the major success stories has been the ARTEC BOXER (8x8) Multi-Role Armoured Vehicle (MRAV) which has now been adopted by Australia, Germany, Lithuania, Netherlands and, most recently, by the UK who was one of the original members. The UK placed its order with ARTEC for just over 500 units with production to be undertaken in the UK by Rheinmetall BAE Systems Land (RBSL) and Williams Fairey Engineering Limited (WFEL).

The original mission of the BOXER was typically an APC with the German models fitted with a Krauss-Maffei Wegmann FLW 200 RWS armed with a 12.7mm MG while the Netherlands BOXER are fitted with a Norwegian Kongsberg RWS also armed with a similar weapon. The Lithuanian BOXER are in the IFV role and fitted with a RAFAEL Advanced Defense Systems Sampson Mk II RWS armed with 30mm dual feed cannon, 7.62mm co-axial MG and ATGW.

For Australia, the BOXER will replace its currently deployed General Dynamics Land Systems Light Armoured Vehicle (LAV) (8x8) used in the reconnaissance role. Australian BOXER will be fitted with the latest Rheinmetall LANCE turret armed with a Mauser 30mm MK 30-2 dual feed cannon and 7.62mm co-axial MG coupled to a computerised FCS.



Photo: FNSS

***The Turkish FNSS PARS (8x8) was sold to Malaysian and Oman before it was ordered by Turkey. This is the NBCR (8x8) for Malaysia.***

The detachable rear mission module enables the BOXER to be rapidly re-rolled for different battlefield missions and for trials purposes it has been fitted with the Krauss-Maffei Wegmann 155mm/52 calibre Artillery Gun Module (AGM). Other trials versions include being fitted with a Rheinmetall Air Defence Oerlikon SKYRANGER 35mm air defence system and a roof-mounted laser air defence system. At DSEi held in London in September 2019, the German company of FFG launched their private venture recovery module installed on a BOXER.

BOXER has a typical GVW of around 36.5 tonnes but the UK BOXER, for example, will have a GVW of up to 38.5 tonnes as well as having a 600 kW engine.

## Italy

The Italian Army were the first in NATO to realise the potential of wheeled 8x8 vehicles and took delivery of 400 CENTAURO 1 105mm mobile gun systems (MGS), with Spain taking delivery of 84 units. As a result of downsizing of the Italian Army some of these have been passed onto Jordan.

The CENTAURO 1 MGS was developed by an Italian consortium COI which includes Leonardo (previously Oto Melara) and Iveco Defence Vehicles who are responsible for almost all of the tracked and wheeled AFVs deployed by the Italian Army with the exception of the Light Multirole Vehicle (LMV) which is the sole responsibility of Iveco Defence Vehicles and has been built in large numbers for the home and export markets. These CENTAURO will eventually be replaced by the latest CENTAURO II armed with a turret mounted 120mm smooth bore gun and many other improvements. COI developed the FRECCIA (8x8) IFV to meet the requirements of the Italian Army; it is fitted with a two-person Leonardo HITFIST turret armed with a Rheinmetall Air Defence, Oerlikon 25 mm KBA dual feed canon and 7.62mm co-axial MG.

More specialised versions of the FRECCIA include an ambulance, command post, 120mm mortar and reconnaissance. A recovery vehicle has been designed and built, and this was sold to Spain to support their CENTAURO 1 (8x8) MGS. The first four batches of FRECCIA covered supply of 249 units for one brigade and since then another 30 have been delivered. Currently in production are another 30 under a contract signed late in 2019, with another contract for 11 due to be signed.

For the export market, Iveco Defence Vehicles developed the SUPERAV (8x8) which is fully amphibious and, when fitted with a Leonardo OWS, is referred to as the Veicolo Blindato Anfibio (VBA). Further development of this with BAE Systems in the USA resulted in this vehicle winning the US Marine Corps Competition for the Marine Personnel Carrier (MPC) which is now in production in the USA.

## Switzerland

While Switzerland is not a member of NATO, the now GDELS – MOWAG developed the PIRANHA family of wheeled AFV with the 6x6 version being the first to enter service. Sales were made to Switzerland and Canada with the latter country selecting it to meet its requirement for an Armoured Vehicle General Purpose (AVGP) and with production being



Photo: Otokar

**The ARMA has been developed by Otokar in 6x6 and 8x8 configuration, with this 8x8 model fitted with a MIZRAK-30 turret armed with a 30mm cannon and a 7.62mm coaxial MG.**

## Serbia

Serbia has now re-established its capability in the design, development and production of a wide range of land systems with particular emphasis on wheeled AFV and artillery Systems. The locally developed LAZER (8x8) is being marketed by Yugoimport as a Multi-Role Armoured Combat Vehicle (MRACV), with the latest version being the LAZAR II being marketed with a wide range of weapons systems ranging from a 12.7mm RWS up to a two-person turret armed with a 30mm cannon and a 7.62mm co-axial MG and with a GVW of up to 28 tonnes.

The latest LAZAR has a new hull design with applique armour claimed to have a high level of protection against mines and IED. In addition to its crew of three, it can also carry up to 10 dismounts. These are seated in the rear on blast-attenuating seats facing outwards and are provided with firing ports and associated bullet/splinter proof windows.

undertaken in Canada by the then Diesel Division GMC which became General Dynamics Land Systems – Canada.

In its 8x8 configuration, the PIRANHA is the most widely deployed vehicle of its type in the West and, in addition to being manufactured in Switzerland, is also made in Canada and the US with the US Army version being called the STRYKER. GKN (today RBSL) manufactured the PIRANHA (8x8) under licence for the export market with sales made to Oman and the Kingdom of Saudi Arabia (KOSA). Development of the PIRANHA has been continuous with the latest model being PIRANHA 5 which has more volume and payload and can be fitted with an armour package optimised to meet the end users requirements. The first customer was Denmark who is taking delivery of 309 units in various configurations to replace its upgraded M113 series of tracked APC and variants. The second customer is Romania where local production is now under way with up to 227 to be delivered to replace older locally manufactured TAB



Photo: Christopher F Foss



**The latest BTR-4 (8x8) from the Ukraine fitted with a remote controlled turret armed with a 30mm cannon, a 7.62mm co-axial MG and two ATGW on the right side.**

(8x8) APC. The latest customer is Spain who is to take delivery of an initial batch of 348 PIRANHA 5 being supplied by a consortium consisting of GDELS – Santa

Barbara Sistemas, Indra Sistemas, Escribano Mechanical & Engineering and Sapa Placenia to meet the Spanish Army requirement for the Vehículo de Combate sobre Ruedas (VCR) Wheeled Combat Vehicle, or DRAGON.

The first five prototypes have been completed. Final integration will be undertaken at the GDELS-SBS facility in Seville, with first production deliveries due in 2022 to start to replace the currently deployed BMR-600 (6x6) which were first fielded as far back as 1979/1980, but have been upgraded since then.

## Turkey

The Turkish Army always preferred tracked vehicles although their Gendarmerie has used quantities of Russian BTR-80 (8x8) with some of these upgraded by Aselsan. While the Turkish company of FNSS Savunma Sistemleri are well known for their expanding series of tracked armoured fighting vehicles they are now a key player in wheeled AFVs.

The first customer for their PARS (8x8) family was Malaysia who ordered 257 units with first vehicles from the Turkish production line followed by local production in Malaysia, with some key sub-systems such as powerpack and drive line coming from Turkey. The second customer was Oman; it is taking delivery of a total of

172 of the latest PARS III on 13 different versions and of these 145 are 8x8 and 27 are 6x6. The IFV version of the PARS III (8x8) is fitted with the latest FNSS SABER 25 one-person turret armed with a Northrop Grumman 25mm M242 dual feed cannon and 7.62mm co-axial MG. The latest PARS III customer is the Turkish Land Forces Command (TLFC) who finally placed their contract in 2019 covering delivery of 100 units in 8x8 and 6x6 models which will incorporate locally produced sub-systems such as engine and transmission.

The Turkish company Otokar has developed a wide range of wheeled AFV and using internal research and funding developed the ARMA in both 6x6 and 8x8 configurations, which share many common components to reduce costs. While not adopted by Turkey, the ARMA has been sold overseas, with Bahrain being the launch customer for the 6x6 model. Further development of the ARMA (8x8) resulted in the RABDAN (8x8) for the UAE with a first contract for 100 units. They are fitted with the complete turret of the Russian BMP-3 IFV armed with a 100mm gun, a 30mm coaxial cannon and a co-axial MG.

## Ukraine

Before the breakup of the Soviet Union, the now independent Ukraine was a key player in the production of the diesel-powered T-80UD main battle tank (MBT). Today, the Ukraine has expanded its capability to design and produce not only MBTs but also a complete series of wheeled AFVs, including the BTR-4 (8x8) which is very similar to the German Rheinmetall MAN Military Vehicles FUCHS 1 (6x6) with the commander and driver at the front, power pack to their immediate rear with the troop compartment extending to the rear.

The typical GVW of the BTR-4 is around 20 tonnes. It can be fitted with wide range of weapon systems, including a locally developed RWS armed with a 30mm cannon, a 7.62mm co-axial MG and the locally developed BAR'ER ATGW. As well as being deployed by the Ukraine, export sales have been made to a number of countries.

The earlier GUARDIAN BTR-3U (8x8) manufactured in the Ukraine for the export market is essentially a Russian BTR-80 (8x8) but with a higher roofline to the rear of the commander's and driver's position at the front of the vehicle. This provides greater internal volume and allows the turret to be fitted with a deeper turret basket.

Country	Vehicle	Status
Belgium	PIRANHA	In service
Croatia	PIRANHA	In service
Czech Rep	PANDUR II	In service
Denmark	PIRANHA 5	In service
Finland	AMV	In service
France	VBCI	In service
Germany	BOXER	In service
Ireland	PIRANHA	In service
Italy	FRECCIA	In service
Lithuania	BOXER	In service
Netherlands	BOXER	In service
Poland	AMV	In service
Portugal	PANDUR II	In service
Romania	PIRANHA 5	In service
Serbia	LAZAR	In service
Slovenia	AMV	In service
Spain	PIRANHA III	In service (Marines)
Spain	PIRANHA 5	On order
Sweden	AMV	In service
Switzerland	PIRANHA	In service
Turkey	PARS III	On order
Ukraine	BTR-4	In service
UK	BOXER	On order



# Marketing Report: AVIASVIT XXI

From 13 to 16 October 2020 Ukraine will host the 21st AVIASVIT International Aviation and Space Salon and Arms and Security Exhibition. Ukraine is one of the few East European countries with a national aerospace industry, and both the development and current state of this industry are closely related to the development of the defence industry and directly affect the country's defence capabilities.



Photo: International Exhibition Centre

Considering the strong need for the modernization of the country's armed forces, the National Guard of Ukraine and other military formations, Ukraine is gradually turning into a powerful market for arms and military equipment.

In recent years, the security and defence sector of Ukraine has gained considerable experience, which should be taken into account by all countries in Europe and globally. Ukraine has confidently resumed its presence in the international defence market, along with ensuring its own needs, it has established military-technical cooperation with many countries on the basis of collaboration, joint activities and partnership.

Last year's decision of the United States regarding the removal of the embargo on the supply of lethal weapons to Ukraine has sent a powerful signal to other countries. That is why the interest of western companies in the Ukrainian defence market has dramati-

cally increased. Now the decision to remove the embargo will stimulate this interest even more, and above all – among American companies being in the list of the world's top ten arms manufacturers.

The first one of the top ten – Lockheed Martin Aeronautics, has already registered as an exhibitor at this year's event. In general, according to the US Commercial Service in Ukraine, the American pavilion at the exhibition will include 9 companies, namely Thales Defense and Security, Motorola, Collins Aerospace and Dillon Aero.

Another big newcomer to the exhibition this year is the Brazilian aerospace group Embraer.

Traditionally, this year's exhibition will feature the pavilions of countries that have been demonstrating a clear position of well-developed business relations at the exhibition for many years – these include Turkey, Poland and the Czech Republic. Denmark,

France, Lithuania, Belarus, Kazakhstan will be presented with individual booths.

The exhibition is a rare opportunity to communicate with manufacturers of new types of military equipment developed to meet the requirements on the modern battlefield. In addition, this is an opportunity to meet and communicate with technical and field officers of the Armed Forces of Ukraine and NSU. These officers are an important part of the procurement process as they provide both initial reports regarding products and companies' assessments on the basis of which decisions are made.

We invite all companies to attend Arms and Security and AVIASVIT XXI Exhibitions in order to develop cooperation in the field of both export and import of weapons and aerospace products, design of new technologies, integration of these technologies into single products, as well as joint investments into new products.

# Features of Modern Military Logistic Trucks

**Gerhard Heiming**

In modern combat, often characterised by operations covering extensive areas, it is logistics - based on efficient trucks – that is one of the guarantees of successful action. Military trucks are benefiting from the ongoing development of civilian trucks, but they also require special features.

**R**eliability, high transport performance, tactical mobility and, last but not least, adequate protection, are among the key requirements for military logistics trucks. The planned lifespan of ten to twenty years, often exceeded in practice, requires high growth potential. The German Government's current economic stimulus package offers the Bundeswehr the opportunity to use additional funds to significantly accelerate the modernisation of its truck fleet; up to €10Bn have been made available in the package.

Photo: Rheinmetall



***Rheinmetall's HX2 series has been introduced in large numbers in numerous NATO states (Germany, Great Britain, Norway, Austria, Sweden) and Australia.***

## Vehicle Categories

The military demand for trucks is low compared to the output levels of large factories. Therefore, the standards and development levels applied in the civilian sector represent the starting point when vehicle specifications and requirements for military vehicles are in question.

Military logistics trucks can be divided into three categories depending on their intended use and any adaptations required. If only minor adaptations are required, commercial (handelsüblich, hü) trucks are used by the military in the same way as they are offered on the civilian market. The range of requirements will often include high mileage on well-developed supply routes, but protection against ballistic or blast threats are not considered necessary specifications for these vehicles. Consequently, the procurement and operation of these vehicles are particularly cost-effective.

Vehicles requiring extensive adaptations for military requirements can be categorised as being commercially available, but with special military equipment included in their specifications (handelsüblich mit militärischer Sonderausstattung, hüms). These adaptations might include mountings for military equipment such as weapons and for communications, as well as more robust and raised underbodies in or-

der to increase their suitability for off-road driving. Overall, however, this category of vehicle design remains untouched and the vehicles are approved for public road use without any restrictions.

The third category is militarised vehicles, which are designed and built from scratch in order to meet military requirements. In their production, manufacturers use largely tested parts and assemblies and components from large-scale production. This approach avoids any development risks, increases reliability and reduces manufacturing costs. Protection of crews from threats on the battlefield and armament are among the options frequently implemented in this category of vehicles.

## Framework of Military Requirements

In addition to technical advances in vehicles offered in the civilian truck market,

the requirement for military specifications provide the impetus in the further development of military logistics trucks. High efficiency and adequate protection levels are the guiding features according to which modern trucks are developed for the armed forces.

In Germany, the MoD identifies four areas in which the design of logistics vehicles is determined:

- Fuel resilience: NATO requirements such as the single fuel policy are critical. On the other hand, the vehicles should comply with public road traffic regulations as far as possible, i.e. they should be able to be operated without an exemption permit. This is dealt with in the section "Drivetrain".

- Protection: Soldiers must be given the best possible protection. In the case of trucks, the level of protection mainly relates to the cabin space. Depending on the various deployment scenarios (e.g. international crisis management or national



and Alliance defence), protection requirements are graded. This can be seen, among other things, in the equipment of some trucks with protected cabins and the possibility of arming them, including with remotely controlled weapon stations. The subject of "Protection" will be addressed again later.

- Automation: The use of automation (automatically operated) is required in order to relieve the burden on drivers when operating vehicles. Unmanned driving, as the highest level of automation, also serves, among other things, to protect the soldiers, but is not yet sufficiently controllable from a technical point of view. Individual aspects are described in the section "Operation".

- Separation of mobility and functionality: The three areas mentioned so far are rather technical in nature. The functional requirements include the separation of mobility and functionality. In this regard, the truck becomes a carrier of functional platforms. As a universal means of transport, the truck can be engaged in other tasks once the functional platform has been unloaded and can be temporarily employed as a stationary unit. As a functional platform, interchangeable loading systems, conventional flatbeds, general cargo containers or standard size containers, are used with equipment and/or workstations in the execution of tasks.

## Basics

As mentioned, the production volume of military trucks is low compared to supply in the civilian market. For this reason, the technical development of the large-series trucks and the experience gained from commercially operated vehicles dictate the design framework for new military trucks. Technical innovations and improvements are continuously being introduced as part of model upgrades, meaning new models, but at longer time intervals. In contrast, military vehicles are procured with a planned service life of up to twenty years, are often in service for even longer and do not come close to reaching the mileage levels of their civilian counterparts.

Truck manufacturers have special development branches dedicated for the design of military trucks. They use modular construction kits with components and units that have proven their worth in service and can therefore build trucks that meet military requirements. Modularisation and standardisation have a positive effect on the broad applicability and also on logistical simplification.



Photo: Iveco

**The TRAKKER chassis is the base of Iveco's military trucks, which are used in Italy, Germany, Austria, Switzerland, France, Romania and other countries.**

## Chassis

The chassis is literally the supporting frame of the vehicle. The core is made up of C-profiles of high-strength, high-performance fine-grain steel, which are bolted together with cross girders to form a low-torsion ladder frame. The profiles are painted with rust-protective paint before processing, which guarantees the frame's durability. Design guidelines require several hundred thousand kilometres with a high off-road proportion. The electrical, hydraulic and pneumatic data and power supply lines are laid on the inside of the C-profiles, protect-

ed from wood and stones when driving on challenging terrain, as well as from bullets, splinters and from explosive blasts. In most series, the frame is the same for all variants, except for the length. Occasionally, a reinforcing material is added. At the front of the vehicle, the cab, engine and other units put load on the front axle(s), so the frame is reinforced for the optional protected cab (additional load of around two tonnes).

The frame absorbs the torsion that occurs during off-road driving and provides the connection points (e.g. twist locks) for the rigid load carriers such as flatbeds, swap bodies or containers via torsion-free,

## Electric Drive

In the civilian sector, the first fully electrically driven trucks are being used on a trial basis in regional distribution transport. Series production vehicles from Daimler, Volvo, MAN and Iveco are expected to be available shortly. A total weight up to 30 tonnes, 500 kW engine power and a range of 400 km, as well as overnight charging, enable transport services in a well-defined environment.

The advantages are a local emission-free operation with low noise levels. From a military perspective, high starting tractive effort and reduced (thermal and acoustic) signatures are particularly advantageous. However, a further supply line and security of supply under rapidly changing environmental conditions are disadvantages, as well as reduced tactical range, weight and space consumption.

For hybrid drives, in which an electric motor and a combustion engine provide the propulsive forces, there seems to be little chance of realisation due to the high space and weight requirements, unless there are additional requirements such as the supply of large amounts of electrical energy to internal and external consumers.

The US Army is currently investigating the conditions under which electric drives offer advantages in tactical and logistic vehicles in an operational environment. Mobile nuclear reactors with capacities of up to five megawatts are being developed to supply electrical energy on the battlefield. This could save a considerable part of the transport volume required for operating supplies, even if large-scale consumers of liquid fuels such as tanks and aircraft remain.

Electric drives for military trucks do not appear to be available in the foreseeable future. Driven by developments for civilian trucks, among other things in storage technology (weight, volume, costs), a breakthrough could be achieved in about ten years, according to the Army Futures Command.

While the electrification of Oshkosh's JLTV has been initiated in the USA, the hybrid-powered Scarabee from Arquus is nearing series production readiness in France.





**Introduced in 2019, the ZETROS NG is one of the military trucks from Mercedes-Benz along with the AROCS (not shown here). The cab-behind-engine vehicle was the first protected transport vehicle of the German Army.**

height- and weight-optimised intermediate frames. Containers are currently becoming a standard load and are used, inter alia, for transporting supplies or for providing different mobile functions.

Interchangeable loading systems are optimised for the quick change of load carriers and do not require external equipment for this task. The interchangeable load carriers (racks) or containers, are loaded or unloaded using a hook system. Automated loading systems, such as the automated load handling system (ALHS), which the Australian company Supashock presented with Rheinmetall at the HX2, can halve loading times in the field, regardless of dirt and inaccurate alignment. ALHS can be operated by one person from the protection of the cabin. Fixed superstructures are rare on new vehicles and are found mainly on heavy special-purpose vehicles. Competing with tracked vehicles in the area of special-purpose platforms, the entire vehicle is designed to carry out a special role; current examples include 155 mm howitzers, battlefield bridges or fire control or surveillance radars, which all use the logistical advantage of a uniform base vehicle.

## Modern Cabin Equipment

The cabin is the control centre and living space at the same time. The cockpit corresponds as far as possible to the civilian version, supplemented by controls needed in a military setting, such as light management. Intuitive, user-friendly operations in accordance with civilian standards allows even novice drivers to master the vehicle safely. Swing seats that can be used with protective clothing allow for longer driver endurance times, as does the provision of air conditioning with an optimised airflow and integrated protective ventilation.

It is essential to provide the infrastructure for communication, reconnaissance, armament and electronic countermeasures. This includes electrical/electronic and mechanical interfaces, including vibration-protected racks for housing this equipment. In order to be able to install the often required armament, the cabin roof is prepared to accommodate mountings or remotely controlled weapon systems.

## Drivetrain

Military logistics vehicles are powered by diesel engines; alternative drive systems though are not expected in the foreseeable future. These robust drive units are being further developed, especially with regard to fuel consumption and emission reduction. The exhaust emission standards applicable in Europe set maximum limits for carbon monoxide, particulate matter and nitrogen oxides. The currently valid Euro VI Step D standard requires fuels of a high quality that is often not achieved outside Europe. Euro V is therefore the standard requirement in many countries.

If logistics vehicles are equipped with Euro VI engines, measures must be taken to enable a mixed operation. Depending on the method of exhaust gas purification, components of the exhaust system, in particular the catalytic converter, must be replaced or rendered inoperable before and after operation with fuels of low quality, such as those used under NATO's single fuel concept. Conversion kits have been developed for this purpose and are kept readily available by the armed forces. Conversion by maintenance personnel takes several hours but results in non-certified exhaust operation.

The power output of the engines ranges from about 175 kW to almost 400 kW with torques between 1,000 and 2,500 Nm.

Automated manual transmissions are standard. The Bundeswehr and some other armed forces use fully automatic transmissions which allow propulsion without interruption of tractive power. This is particularly advantageous when operating in difficult terrain, where the driver is fully occupied with navigating the route. A torque converter clutch supports sensitive starting under heavy load. Coupled with a retarder, as in the turbo retarder clutch offered by Daimler and Rheinmetall in their trucks, for example, starting off can be ensured even in difficult off-road situations.

## Running Gear

Two to four - rarely five or more - axles transfer the vehicle weight, including payloads and the driving, guiding and braking forces to the ground via off-road tyres. Usually all axles are driven. Some tractors have non-driven rear axles.

Regarding the front axle, the focus of development is currently on an 11-tonne axle which will become the standard. One reason for this is possible high load due to the increased weight of the protected cab. High wheel loads lead to high steering resistance, which may require special steering gears. For the other axles, the axle load is between 10 and 16 tonnes. A steered rear axle on four-axle vehicles may reduce the turning circle and improve manoeuvrability.

Differential gears are integrated in the axles to compensate for the different wheel speeds when cornering. Self-locking differentials prevent the complete loss of tractive power at one wheel when the ground conditions at both wheels are very different. On off-road vehicles, the differentials can be locked if necessary. Longitudinal differentials are used to distribute the tractive force to the various axles.

Leaf springs are mainly used as springs for vibration isolation in military off-road vehicles. Leaf springs are not effected by damage or dirt, but tend to weaken the suspension at small load changes due to friction. In conjunction with shock absorbers, they enable the necessary large wheel movements in off-road terrain and maintain the ground pressure forces required for tracking and steering.

In some cases, (e.g. in the German Army's protected transport vehicles in the 15-tonne payload class), electronically controlled air suspension (ECAS) is also used to improve traction by shifting the load. In addition, the frame height can



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Photo: Scania



**Scania's R-series of military trucks relies on extreme modularity to reduce the logistic footprint. The armed forces of the Scandinavian countries, the Netherlands and Germany are among the operators of larger Scania fleets.**

be adjusted independently of speed, load and road conditions, while maintaining a high level of ride comfort.

For specialised roles such as the above-mentioned radar carriers, battlefield bridging vehicles or howitzers, adjustable spring/damper combinations are used, such as those realised with active suspension systems. With active suspension, the forces exerted by the ground are used to change the spring characteristic curve and the damper properties in such a way that body movements are greatly reduced and specifically influenced. Hydro pneumatic spring elements controlled by sensors are particularly suitable for this purpose.

## Protection

Due to the change in operating conditions, the protection of the crew has become a major priority. Protected cabins are a standard feature of new vehicles. Protected cabins are made of armoured steel and are designed to resist bullets, splinters and effects from blasts. This includes bulletproof windows, decoupling of seats and pedals from the floor and securing equipment attached to the floor.

The heavy weight and high price of the protected cabins has led to the concept of interchangeable cabins, which has not seen much use until now. In this regard, the chassis is prepared for high loads.

Active protection, in which effectors prevent, or at least greatly reduce the blast effect from shelling, can be integrated into the cabin. At Eurosatory 2018, Rheinmetall

presented a demonstrator featuring the active defence system (ADS). However, active protection is rarely required for wheeled logistic vehicles.

In current procurement projects, around one-third to half of all vehicles are equipped with protected cabs. Unprotected cabins are often prepared to accommodate protective elements (e.g. on the unprotected transport vehicles currently being supplied to the Bundeswehr). This allows scalable protection to be provided. In Great Britain, for example, up to 95 % of tactical trucks can be equipped with add-on protection.

Protection against NBC warfare agents is ensured in conjunction with air conditioning/room cooling systems. On the one hand, all door, window and other openings are sealed. On the other hand, the breathable air is filtered and supplied via the air conditioning system. This creates an overpressure which creates a constant flow of air to the outside.

## Vehicle Electronics

The electrical/electronic equipment of modern trucks is the biggest difference to the predecessor models and at the same time the area with the most dynamic development. The market for commercial trucks leads the way here to a certain extent, but not every innovation offered for civilian applications can be applied to military vehicles. Commercial trucks, for example, are virtually always online with Bluetooth, WLAN, other short-range radio services, radar and mobile radio. In

military vehicles, however, it is imperative to be able to create the "communications silence" state in which all radio devices can be switched off.

In STANAG 4754, NATO has defined specifications for the NATO generic vehicle architecture (NGVA), against which the design of new vehicles is measured. Characteristics are the networking of the subsystems via a common data bus and control via multifunctional operating and display units.

This results in several advantages. It is not just the devices that can be controlled via the well-protected data bus. Furthermore, the states of the subsystems are available everywhere for control and monitoring purposes. The cabling effort is reduced, the flexibility for integrating new devices increases and the effort for electromagnetic protection decreases. The cabling for the energy supply system can be separated from the data lines. This results in short cables with a corresponding weight advantage.

The increasing number of electronic devices places high demands on the electrical power supply. The current on-board voltage of 24 V is not expected to change. With a higher voltage (e.g. 48 V), the required current of the devices will decrease and thus the necessary cable cross-section and weight for the cabling will decrease. High-performance generators supply 120 A to 180 A. As an option, 340 A to 400 A are also available, which is up to 9.6 kW at 24 V. Lithium-ion accumulators with capacities of more than 110 ampere hours (equivalent to 2.6 kWh) are being considered as energy storage devices. Their characteristics include a high peak current, e.g. for the starting process, and a high continuous current for the constant supply of the electronic devices even when the engine is not running. This also enables the energy supply of external consumers, e.g. in the body. The new batteries weigh only a quarter of the weight of lead batteries of various types. The disadvantages are a loss of performance at low temperatures and additional dangers in the event of fire. Due to the extensive digitalisation of the devices and vehicle units, interfaces for controlling the devices are available. These interfaces can be accessed to set different mission modes (e.g. blackout camouflage mode) and to implement autonomous functions.

## Operation

When operating the truck, the crew should concentrate on choosing the optimum route and speed depending on



the terrain and (hostile) environment. Driver assistance systems are available for all other functions.

Traction control on off-road terrain is particularly difficult because practically every wheel has different conditions, which can also change quickly. Electronic drive train management, automatic traction control (ATC) or automatic drivetrain management (ADM) controls the differential locks on all axles, thus optimizing the distribution of traction to improve mobility. ATC, developed by Volvo and offered by Arquus in the latest generation of its trucks, also reduces fuel consumption and tyre wear without driver intervention, reducing maintenance requirements and thus the logistical footprint. The ADM, as used by Iveco in military off-road vehicles, for example, controls all differentials depending on wheel slip in order to achieve the highest possible traction at all times.

With anticipatory driving, terrain utilisation can be greatly improved. Based on current maps and including location-based presentation of other information sources (e.g. aerial and satellite images, gradient maps, contour lines), the vehicle behaviour is simulated and a route is proposed to the driver. Such an off-road driver assistance system was presented by CPA ReDev at the 2020 research conference of the Deutsche Gesellschaft für Wehrtechnik (German Society of Defence Technology).

Anti-skid protection, cruise control, distance control, lane keeping and emergency brake assistance are more relevant for driving on paved roads, but if installed, they considerably relieve the military driver during long distance drives.

These assistance systems, which are particularly widespread in the civilian sector, are components with which the path to autonomous driving can be taken. While assistance systems are almost standard equipment in today's trucks, they are not yet widely used in the military sector. As a result of digitalisation, however, interfaces and, in some cases, actuators are available with which all levels of autonomy can be realised up to full autonomy.



Photo: Arquus

***The newly developed ARMIS follows in the tradition of military trucks from Arquus. Oriented to French requirements, the vehicle is entering the competition to equip the Armée de Terre.***

The use of cameras to replace the numerous rear-view mirrors is still under-developed. The mirrors protrude far out of the vehicle silhouette and are at risk of damage, especially in terrain with vegetation. With a 360° camera system, the side, front and rear surfaces and the surroundings can be observed. Safe reversing without the need for a guide is now possible. With night vision capability of the cameras, the performance of the trucks could be further increased.

## Maintenance/Repair

Military vehicles often only achieve a low mileage of less than 10,000 km/year. Therefore, damage caused by standing is more frequent than wear and tear during vehicle operation. Preventive maintenance is therefore particularly important to ensure that the vehicles function reliably during the actual period of use. Components that are subject to wear and tear and are crucial to their function,

such as the engine, transmission and brakes, can be equipped with monitoring systems - (health and usage monitoring system (HUMS) – using digitalisation to ensure the availability, reliability and safety of vehicles. This allows operating data to be collected and evaluated together with the data from the fault memory. Within the framework of fleet management, the use of trucks can be controlled in such a way that they can be made available for defined deployment profiles and durations without the need for routine maintenance.

The truck industry offers to take over the fleet management and guarantees a defined level of availability of the vehicles. This saves using military personnel for this purpose on the one hand, while on the other hand, the industry is close to the point of use and can immediately gather experience and incorporate this into the development of new vehicles with improved reliability.

## Conclusions

Modern military vehicles offer mobility at the limits of physics. Digitalisation and modularisation enable vehicles to be individualised in accordance with military requirements. By using the experience gained from the production and operation of a large series of heavy duty civilian trucks, proven and robust assemblies are available for military vehicles, with which high-performance military vehicles are created. ■

### Autonomy levels (according to SAE)

Level	Description	Examples
0	No Driving Automation	-
1	Driver Assistance	Cruise Control
2	Partial Driving Automation	Distance Control
3	Conditional Driving Automation	Automatic Parking Systems
4	High Driving Automation	Platooning
5	Full Driving Automation	Unmanned Shuttle Service

# Belgian and Dutch Naval Replacement Programmes

**Jaime Karremann**

**Belgium and the Netherlands will replace almost their entire fleets in the next fifteen years. This will mean six new ships for the Belgian Navy, and 23 for the Royal Netherlands Navy.**

Some of these new ships are being developed jointly by Belgium and the Netherlands, while for some others the Netherlands is seeking cooperation with Germany.

Many vessels in the Belgian and Dutch fleets date back to the eighties and nineties and the Netherlands in particular has long postponed the replacement of many ships. Although Belgium replaced their WIELINGEN class frigates 15 years ago, they did so with Dutch M-frigates from the nineties. Both countries also operate TRI-PARTITE minehunters which are over thirty years old.

Because Belgium bought two Dutch M-frigates, both navies are equipped with the same frigates and also the same minehunters. Both navies have been working together since 1948 and have almost merged in recent years. The Belgian frigates are maintained in the Netherlands and the Dutch minehunters in Belgium. The navies share a headquarters in Den Helder (the Netherlands), their operational and logistics schools are binational, and from 2021 both fleets will receive the same uniforms. It is therefore logical that the two countries jointly replace their frigates and minehunters.

## Mine Countermeasure Vessels

Already in 2013, Belgium and the Netherlands had plans to jointly replace their TRIPARTITE minehunters. Three years later, the Ministers of Defence of Belgium and the Netherlands signed a Letter of Intent for the joint replacement. It was agreed that the Netherlands would lead in the replacement of the M-frigates, while Belgium would take on the new minehunters. A European tender followed.

The project is now in full swing and the consortium Belgium & Naval Robotics, consisting of the French companies Naval Group and ECA Group, is working hard to deliver the first new mine countermeasures



Photo: Belgium Naval and Robotics

***This is what the future Belgian-Dutch MCM Motherships will look like.***

vessel (MCMV) in April 2024 to the Belgian Navy; the Royal Netherlands Navy will follow later. Both navies will receive six ships each.

An important part of the project is the new concept of stand-off mine warfare; the motherships remain outside the mine danger area and MCM tools operate from the mothership to detect, classify and destroy mines from a great distance, often over the horizon.

While the old TRIPARTITES are made of composite, the future MCMVs will be made of steel. They are in fact built around the Launch & Recovery System (LARS) that was specially developed for these ships. With a length of 81.4 m and a width of 17 m, the ships have an uncommon length to breadth ratio for warships.

The LARS is mainly intended for unmanned service vehicles (USVs). The 12 m-long INSPECTOR-125 USV can operate with up to six drones in the mine danger area. These drones were developed and built by the ECA Group in Belgium. The drones in question are the T-18M UMISAS towed sonar that is dragged behind the INSPECTOR and thanks to the interferometric synthetic aperture sonar, can transmit high-resolution images to the mothership in real time. The autonomous underwater vehicle (AUV) A-

18M can independently search the seabed and when a contact is made, the crew in the operations room in the mothership can inspect the mine-like object with the camera of its remotely operated vehicle (ROV), the SEASCAN. Finally, the K-STER C will destroy the object.

To operate drones over the horizon, Saab SKELDAR V-200 unmanned aerial vehicles (UAVs) provide communications between the USV and the mothership. The UAV can of course also be used for other tasks.

The latter also applies to the motherships that can accommodate 63 additional crew, in addition to the 29 permanent ship's complement. The ships are equipped with various sensors and weapon systems and will also receive a 40 mm gun, which is somewhat unusual for modern-day MCMVs. At the time of writing, it is still not known which gun will be chosen, nor has a final choice been made for radars and electro-optical sensors.

Construction of the first ship will start on 23 February 2021 and the ships will be built in France by Kership and Piriou.

In anticipation of the arrival of these new ships and especially the new toolbox, the Dutch Navy has leased a civilian vessel, the GEOSEA. Dutch and Belgian naval personnel have been working with this ship and



with drones from ECA since spring 2020 to become familiar with the new systems and to provide the manufacturer with feedback that can be used for the development of future tools. The project team is also planning to test the LARS with the GEOSEA.. Whereas the ships are designed to last at least thirty years, the toolbox will be regularly updated or replaced.

## M-Frigates

The replacement of the M-frigates started in the Netherlands in 2010 with the first studies carried out. It soon became clear that the Netherlands wanted to replace the frigates in cooperation with other countries. Considering Belgium also operated M-frigates, it was the logical partner, but the Netherlands also looked at the German MKS 180 frigates. However, cooperation in this area came to an end when the German ship became too big and too expensive.

Belgium and the Netherlands proceeded with a Dutch design. The replacement project was officially started in the Netherlands in June 2016 and soon thereafter, it became known that Belgium had reserved €1Bn for two new frigates.

Unlike the MCMVs, no European tender was launched for these frigates, but Damen Schelde Naval Shipbuilding (DSNS) was contracted directly. That did not mean that DSNS designed the ships, because that is still largely done by the Afdeling Maritieme Systemen (Department of Maritime Systems) of the Defensie Materieel Organisatie (DMO). Since 2013, several designs have been published, sometimes accidentally. Over the years, the size of the ship increased, but the design has eventually decreased. In 2019, design 22D was presented, and according to DMO, it represented the "ideal ship" that met the requirements. But it did not fit the budget. Research was then conducted into an off-the-shelf design of DSNS, but that ship failed to meet the requirements. DMO



Photo: Belgium Naval and Robotics

**The future MCMVs are in fact built around the Launch & Recovery System (LARS) mainly intended for unmanned service vehicles (USVs).**

then removed systems from the design and some requirements were adjusted.

This resulted in DMO design 22D being modified to a 132-m long frigate, displacing 5,500 tonnes. The MK 41 VLS, with 16 cells, is primarily intended for the Evolved SeaSparrow Missile Block 2 (ESSM Bl. 2), but Belgium has previously indicated that it was considering the Standard Missile 3 (SM-3) as well. With such a weapon, Belgium wants to contribute to ballistic missile defence (BMD).

Although missiles like the SM-3 can be fitted in the MK 41 VLS, the frigate is not designed for BMD. The new frigates are in fact designed with anti-submarine warfare in mind. Since they are required to operate far from the task force in search of submarines, they must also be able to defend themselves against missile attack.

They will therefore have the new APAR Block 2 X-band radar, an S-band radar that has been further developed from SMILE and NS100 and a new fire control concept called Above Water Warfare Suite (AWWS), which has been developed by Thales in the Netherlands for several years. MKS 180 will also receive these sensors.

However, the most important sensor for the new frigates is located in the stern area of the ship, namely the low frequency active passive sonar (LFAPS). This is a DMO development in collaboration with the Dutch research institute TNO and the Canadian company, Ultra Electronics Maritime Systems. The frigate can lower the LFAPS into the sea and detect submarines far better than previously the case using a passive towed array or medium-frequency sonar. The current Dutch M-frigates recently sailed with this new sensor.

The Multi Use Acoustic Support Suite (MUASS) will also be introduced on the ships at the end of this year. This software was developed by DMO and the Dutch Navy together with TNO and is based on an existing TNO sonar model. Data and algorithms have been added to this, such as data from the ship, sensors, environmental information and oceanographic models. It resulted in a package that, as sea tests now show, brings major improvements to anti-submarine warfare by ship and submarine.

Although these important elements are already deployed at sea with the current frigates, it will take a while before the new ships can start looking for submarines.



Photo: Belgium Naval and Robotics

**The 12 m-long INSPECTOR-125 USV can operate with up to six drones in the mine danger area.**

Photo: Damen



**The future HNLMS DEN HELDER**

The contract for the ships is expected to be signed at the end of 2021 with the four ships for the Netherlands and Belgium are scheduled to be delivered in the period 2027-2030. DMO is investigating whether there is a sufficient budget to build the frigates at the Damen yard in the Netherlands and not, as has been usual practice since 2005, at Damen's shipyard in Romania.

## Combat Support Ship

The first new ship the Dutch Navy will receive is not an MCMV or a frigate, but a tanker. The combat support ship (CSS), the future HNLMS DEN HELDER, will be delivered in 2024.

In contrast to the other projects, the CSS project started only recently. After the decommissioning of HNLMS ZUIDERKRUIS in 2012 and the sale of HNLMS AMSTERDAM in 2014, the Dutch Navy lacked a tanker until the arrival of HNLMS KAREL DOORMAN. However, because it was decided not to replace the AMSTERDAM, the KAREL DOORMAN became the only tanker in Dutch service, even though it is a joint support ship (JSS) and replenishing at sea is only one of the tasks of this multifunctional ship.

It was no surprise that when HNLMS KAREL DOORMAN was commissioned, the Chief of the Royal Netherlands Navy said that he needed another replenishment ship. When in late 2016, budget funds became available for 'combat support' for all defence services, the Navy managed to squeeze a 'combat support ship' into the plans. At the time, it was still intended to be a fairly simple tanker that would be based on a proposal that DSNS had already designed for a tender for a new Norwegian tanker. In addition, elements from the JSS would be used for commonality. DMO and DSNS worked jointly the design and specifications. However, the requirements changed gradually, especially when it came to the environment, but

the requirements for shock, blast and signature reduction were also higher than in the beginning. The design boasted a gun, the advanced Thales NS100 radar and a GOALKEEPER CIWS (which is being replaced). But a budget deficit arose because the estimates of the investment budget were not indexed and the Navy feared that the operating budget of the tanker would be too tight. At that time, DMO realised that the design did not fit the budget.

Ultimately, it was decided to increase the budget and simply adjust the design. The weapon systems and sensors were removed from the design, however, provisions for these systems have been spared. On 19 February 2020, Damen and DMO signed the contract for the ship. In February 2021, construction of the vessel will begin at Damen Shipyards Galati, in Ro-

Photo: Royal Netherlands Navy



**HNLMS KAREL DOORMAN commissioned in 2015**

mania. The CSS will arrive in Den Helder in June 2024, after which the combat management system, sensors and weapon systems will be installed. The CSS is scheduled to be commissioned in 2025. The new Dutch tanker will measure 178.3 m in length and will have a displacement of 22,585 tonnes. There is room for 160

people in total, including a complement of 75 crewmembers. Weapon systems will initially be limited to machine guns. The propulsion of the CSS is diesel-electric and the DEN HELDER will be the first naval vessel to sail with the new WÄRTSILÄ 31 diesel generator sets. Combined with the shape of the hull and the design of the propeller, the design yields a saving of 6% compared to a comparable ship with engines of a different brand and type.

## Submarines

The replacement of the WALRUS class submarines (1990) is by far the most complex project of all the current Dutch naval projects. As with the frigates and MCMVs, the plans were already clear in 2013, but it is by no means certain whether the first new submarine can be delivered in 2027.

The complexity of the project relates to its international nature and major political interests. The other naval projects have, however, continued to progress without too much political interference. In the submarine project, however, there have always been conflicts of interest between the Ministry of Defence (the best boat), the Ministry of Finance (the cheapest boat or nothing at all), Economic Affairs (a Dutch submarine) and Foreign Affairs (a decision that does not result in an argument with Paris or Berlin). The Submarine Service, in the end, has relatively little to no influence. The roots for this can be found back in the eighties and nineties. The WALRUS class were more expensive in the 1980s

and were delayed. Despite the fact that the boats were cheaper and have a higher rate of availability than contemporaries of the VICTORIA class (Canada) and COLLINS class (Australia), this is still called the WALRUS affair and politicians still shudder at the thought of the "scandal". Another reason is that, partly due to political dis-



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***HNLMS ROTTERDAM has been on the list of ships to be replaced for some time, but in 2013 it was announced that the replacement programme had been postponed.***

interest, the Dutch submarine shipyard RDM ran out of work from the 1990s and went bankrupt a few years later. Without a submarine builder, the Netherlands had to cooperate with foreign shipyards. Furthermore, the Netherlands wants diesel-electric submarines that can operate far from home. Dutch coastal waters are too shallow for safe submarine operations, so these submarines have been active in the Indian Ocean, and from the Norwegian Sea to the Caribbean. The result is a sensitive international process with a large number of committees, councils and resonance groups, and a lot of delay.

Initially, four shipyards participated in the tender. These were Navantia (Spain), Naval Group (France), tkMS (Germany) and Saab (Sweden). Naval Group has recently started Royal IHC as a partner in the Netherlands, and Saab has been working with Damen on the replacement project since 2015.

In December 2019, under political pressure, the MoD decided to continue the next round with three shipyards and start the competitive dialogue with Naval Group, Saab and tkMS. This led to excessive criticism from experts and from parliament. Nevertheless, the Ministry of Defence wants to continue with this and a final decision will only take place in September.

If the Ministry's plans go ahead, discussions will be held with the shipyards about the requirements and the design. This normally happens between DMO and DSNS, but DMO now want to talk to the three yards at the same time. None of the shipyards though has a design matching exactly the Dutch requirements. The existing submarines are either too small (Saab Kockums A26 and tkMS Type 212CD) or too large (Naval Group BARRACUDA SSN). Although the yards have already submitted proposals in the various RFIs, DMO has not yet told the yards what the requirements are.

Knock-out criteria will determine which yards will drop out prematurely. The contract must be signed in 2022 with the four new submarines expected to be completed between 2027 and 2031.

## Auxiliary Vessels

DMO wants to replace ten smaller ships all at once. In May 2020, DMO sent a letter to the Dutch Parliament regarding the replacement of submarine tender HNLMS MERC-UUR (1987), diver training vessel SOEMBA (1989), four diver support vessels CERBERUS class (1992), training vessel VAN KINSBERGEN (1999), two hydrographic survey vessels SNELLIUS class (2003) and the Caribbean support vessel HNLMS PELIKAAN (2006).

Although the ships are all different and the replacements will not be identical, according to DMO the ships have many similarities and the DMO therefore wants to tender the ships simultaneously. It is still being decided whether this is to be done by a contract directly awarded or by a (European) tender. What the final path looks like will be announced at the end of 2021/ beginning of 2022. The first ship will have to be replaced around 2024.

## Air Warfare and Command Frigates

The air warfare and command frigates (LCFs) entered service in the period 2001-2005. The ships are currently being modernised with AESA radars for, inter alia, ballistic missile defence (BMD), the Thales SMART-L MM / N. In the near future, the frigates will also receive Leonardo's VULCANO 127/64 LW naval gun. These new guns will replace the antiquated 127 mm OtoBreda guns, which were bought second hand from the Royal Canadian Navy. The LCF replacement project was expected to start in 2021, but in 2019 a decision was taken to postpone the timeline by five years because funds were needed to improve buildings instead and because the rising costs for the F-35 had to be covered. The German plans to replace the F124 frigates might also have been a factor. Because Damen will collaborate with the German shipyards Blohm + Voss, Lürssen and German Naval Yards for the construction of the German MKS 180 frigates,

there are talks between the Dutch and German MoDs to replace the LCFs and F124s together. Both ships, incidentally, arose from the failed NATO Frigate for the Nineties (NFR90) and both countries collaborated in the field of sensors and weapons systems. However, the Dutch director of DMO, Arie Jan de Waard said that the Netherlands currently had no plans to build identical ships with Germany. He is currently focused mostly on the subsystems.

## Landing Platform Dock

The Royal Netherlands Navy operates two landing platform docks (LPD): HNLMS ROTTERDAM (1998) and HNLMS JOHAN DE WITT (2007). The ROTTERDAM has been on the list of ships to be replaced for some time, but in 2013, it was announced that the replacement vessel had been postponed.

Incidentally, the ROTTERDAM was modernised in 2019 and equipped with, among other things, the new Thales NS100 radar, a combined operations room and an amphibious warfare centre. The JOHAN DE WITT will also receive a midlife upgrade shortly.

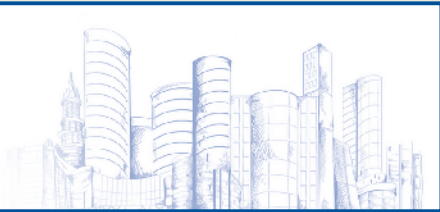
In June 2020, the Dutch MoD announced that it planned to collaborate with Germany on new amphibious vessels. While the German Navy does not possess these vessels, its own Seebataillon (an integral part of the Dutch Marine Corps since 2016) does engage in the amphibious domain.

## Replacement, no Enlargement

Not all plans are set in stone - some are no more than sketches and the future has now become more uncertain due to the Coronavirus pandemic. The high costs that Belgium and the Netherlands, like many other countries, will have as a result of this crisis, mean it is highly likely that projects will experience difficulties in the coming years, although there are no plans for budget cuts so far.

In both countries, there is also much political uncertainty. Belgium still has no government and there will be elections in the Netherlands in March 2021. For decades there have been budget cuts imposed on both navies and especially in the Netherlands, this has led to a large backlog with many relatively old ships still serving in the fleet. The backlog is now being addressed, but the Navy remains very vulnerable. Also, both the Belgian and Dutch Navies, with two and six frigates respectively, are small. However, all efforts are now focused on replacement, as enlargement seems to have been ruled out this decade. ■





# Viewpoint from Tel Aviv

Photos: via author



## Conflicting Signs for Peace

**Tamir Eshel**

**T**wo major regional forces are conducting a power-play in the void grey areas left here since the colonial era –

Syria, Iraq, and Libya, all of which are resource-rich nations and headed by corrupt regimes that have been manipulated by external forces for decades. Turkey is supporting the Libyan regime and expanding its control of large, disputed maritime areas claimed and under development by Greece and Cyprus. Iran's play through proxy groups is more subtle, yet equally persistent, with the extensive involvement in Yemen, Syria, Lebanon, and Gaza. Israel has been a bone in the throat of both regional superpowers, and, therefore, it comes as no surprise that both are turning against Israel, allegedly, in defence of the Palestinians.

The almost complete withdrawal of US forces from Syria and partial withdrawal from Iraq has left the smaller, Western-aligned countries both vulnerable and weary. Similar to the Baltic nations, the Gulf nations have grouped closer together, to form a more significant and meaningful military and economic power, that has become a substantial player, together with other allied nations – Saudi-Arabia and Egypt and the foe from the past - Israel.

This alliance, which has been in the making for several years, also has a few silent members – Israel and Jordan. The Israeli-UAE peace agreement is a manifestation of this trend that, until now, has gone relatively unnoticed. It marks a significant change in perceived interests among moderate Arab nations, indicating that the benefits of aligning closer with Israel are considered more important than the negative approach, which is led principally by Palestinians, and encouraged by Iran and Turkey.

One of the losers in this deal is the Kingdom of Jordan which, until now, has provided a mediating bridge between Israel and the Gulf. For Israel, keeping close relations with Jordan continues to be a priority, but Amman's reluctance has prevented any further growth in these relations. With a large Palestinian minority, a small army and a weak economy, Jordan is vulnerable to regional predators, and maintaining a distance from Israel helps Amman ease this domestic pressure.

In contrast, the UAE is not facing any such pressure. It is financially and technologically robust, and is socially and economically stable enough to pursue its own course. The country is eager to elevate

its relations with Israel, and for both sides to reap the fruits of peace. Through the years of quiet cooperation with Israel, the UAE has also established some level of defence cooperation with Tel Aviv, providing the Arab country with unique access to security and defence technologies.

As this critical milestone is achieved, Syria and Lebanon are both licking their wounds, with Damascus just beginning to recover from a devastating civil war, and Beirut, devastated by a catastrophic explosion that ruined large parts of its seafloor.

It seems to be an opportune moment for Israel to strengthen its position, muster a modern and effective military power, and build alliances throughout the region. Instead, the country is drifting through successive elections and internal unrest over Prime Minister



**During protests against Netanyahu, the police used water cannons against protesters.**

Netanyahu's conduct. With half the population supporting the right-wing alliance led by Netanyahu, the other half strongly oppose him, bringing the whole democratic process to a standstill. Even the large coalition government established after the elections in March 2020 could not save the country from political chaos. Facing a growing opposition within, Netanyahu finds neighbours more friendly and supportive than his own people. Hopefully, the benefits he won as Prime Minister will continue to deliver dividends after his time in power is over.

# The Art of Electronic Eavesdropping

**Doug Richardson**

Signals intelligence (SIGINT) is the general term for the interception of signals. It has two main components – communications intelligence (COMINT) and electronic signals intelligence (ELINT).

As its designation suggests, COMINT involves the interception and analysis of communications between organisations, military units, and individuals. One subset of COMINT is traffic analysis – a process that sets out to determine the flow of traffic between organisations, units, and individuals, and the quantities of traffic involved. Traffic analysis remains useful even if the signals it is studying are encrypted and cannot be deciphered.

ELINT refers to intelligence-gathering by the interception and study of signals that are not related to communications. These include transmissions from radar systems, missile-guidance systems, and IFF interrogators and transponders. ELINT operations will intercept such signals, and will try to determine capabilities, operating procedures, and locations of the hardware from which they originate.

Weapon systems sensors are becoming more complex, featuring higher resolutions, increased data rates and ever more complex data. Signal densities are rising, and a growing number of commercial applications that use frequencies similar to those of military systems. SIGINT and COMINT hardware must be able to cope with these developments. They must be able to deal with frequency-agile threats, while low-probability of intercept (LPI) radars that use techniques such as frequency-modulated continuous-wave (FMCW) pose problems for older ELINT receivers. These may have difficulty in detecting, analysing, and identifying such signals.

Yet given the long operational life of much military hardware – the S-75 DVINA (SA-2 GUIDELINE surface-to-air missile entered service in 1957, but is still in service with around 20 users – SIGINT systems must also cope with these ageing weapons. In

Photo: US DoD



*The USAF operates a fleet of RC-135V/W RIVET JOINT SIGINT aircraft.*

some cases, these weapons have been upgraded, so may have a different electronic signature than that of the original variants. At the same time, SIGINT receivers must also be able to handle the high signal densities created by an ever-increasing number of emitters, and cover ever-higher frequencies, including millimetre-wave bands. Therefore, while older threats may still be viable, older ELINT receivers may be of declining usefulness.

## Classic Airborne Platforms

For major powers, the classic airborne SIGINT platform is often based on a long-range transport aircraft. Best-known example is probably the USAF's RC-135V/W RIVET JOINT version of the Boeing RC-135. The UK's fleet of three NIMROD R.1 SIGINT aircraft were retired in 2011, and the resulting gap in capability was not made good until 2017 when the Royal Air Force received the first of three aircraft based on RC-135W and known as the AIRSEEKER R.1. The Royal Air Force also operates eight SHADOW R.1 intelligence, surveillance, target-acquisition, and reconnaissance (ISTAR) aircraft version of the Beechcraft KING AIR 350. Last year, the UK MoD awarded Leonardo and Thales contracts to supply an in-

tegrated DAS able to protect these aircraft from IR-guided threats.

First flown in 1958, the Ilyushin Il-20M COOT-A SIGINT aircraft is a militarised version of the Il-18 turboprop-powered airliner. A batch of 20 was built, and the type remains in Russian service. These aircraft are reported to carry the ROMB 4 SIGINT system and VISHNAYA COMINT system.

First displayed at the MAKS Air Show in 2013, the Tupolev Tu-214R is intended to replace the Il-20M. It carries the MRC-411 multi-intelligence system, which includes SIGINT sensors, side-looking Synthetic Aperture Radar (SAR), and multi-spectral electro-optical systems.

In 2004, France opted to retire its two Systeme Aeroporte de Recueil d'Informations de Guerre Electronique (Sarigue) SIGINT aircraft. Based on the DC-8 airliner, these carried a sensor suite developed by what was then Thompson-CSF. A planned electronics upgrade by Thales is reported to have been over-budget and suffering from weight problems, factors that may have contributed to the decision to retire the aircraft. With the ending of the Sarigue programme, France's sole ELINT aircraft are two ageing C-160G GABRIEL SIGINT versions of the TRANSALL transport. Both are due to be retired in 2025.

## Author

Following an earlier career in engineering, **Doug Richardson** is a defence journalist specialising in topics such as aircraft, missiles, and military electronics.



Like several other countries, France saw the need to field a next-generation SIGINT aircraft based on a smaller airframe - a move made possible by the shrinking size and weight on modern electronics, and by the ability of high-capacity datalinks that would allow SIGINT specialists to remain on the ground rather than being carried on board the aircraft. In 2018, the French MoD ordered Dassault Aviation to supply three FALCON business jets equipped with Capacité Universelle de Guerre Électronique (Universal Electronic Warfare Capacity) SIGINT systems developed by Thales.

In July 2020, Germany announced that it will purchase three Bombardier GLOBAL 6000 aircraft which will be fitted with the Integrated Signal Intelligence System (ISIS). The aircraft are expected to provide the Bundeswehr's airborne reconnaissance capability from 2025 onwards.

The Israeli Air Force operates three Shavit SEMA (Special Electronic Missions Aircraft) based on the GULFSTREAM G550, and in March 2019, Australia opted to procure four modified G550 aircraft for use in the SIGINT role. These will be designated as the MC-55A PEREGRINE.

Elisra designed its ELK-7065 to be able to cover a large geographic area, detecting emitters that transmit only occasionally. It weighs only 60kg, so can be mounted in aircraft as small as a mid-sized UAV. Once an emitter has been detected from stand-off range, the UAV can fly towards its location, gradually reducing its cruise height. This manoeuvre will allow the emitter to be geolocated.

## UAVs to the Fore

The US Navy's Lockheed EP-3E ARIES SIGINT aircraft are approaching the end of their service life. The planned Electronic Patrol-X (EP-X) due to replace these was cancelled, but the integrated functional capability (IFC) 4.0 version of Northrop Grumman Aerospace MQ-4C TRITON UAV is expected to have a similar level of SIGINT capability. It will carry specialised subsystems provided by Boeing Argon ST and Sierra Nevada.

Useful UAV-based SIGINT capability does not always require such a large and expensive air vehicle. When the US Army needed a small UAV able to support contingency operations in Nigeria and Uganda, it awarded Textron AAI contracts worth US\$46.4M earlier this year for five AEROSONDE MK 4.7, a UAV weighing less than 40 kg. These will be equipped with a multi-sensor installation that includes a day and night video camera and an SIGINT system.

Last year, the US Army released RFIs for EW payloads that could be carried by RQ-7 SHADOW and RQ-11B UAVs. These sensors should be able to identify and geolocate hostile emitters, including those that use LPI techniques.

While the US, Russia, and China operate large dedicated SIGINT satellites under their respective programmes – ORION, also known as MENTOR or Advanced ORION (USA), LIANA (Russia), and YAOGAN (China) – the cost of developing, launching, and operating this class of system can prove prohibitive for other countries, as the UK was to learn when its planned ZIRCON SIGINT satellite had to be cancelled in 1987.

France tested the concept of using formation-flying spacecraft to triangulate the location of radar and communication emitters. Its experimental ESSAIM microsatellites operated from 2004 until 2010, and were followed by the ELISA microsatellites in 2012. These in turn are due to be replaced in 2021 by the CERES (Capacité de REnseignement Electromagnétique Spatiale) formation of three microsatellites built by Thales Alenia Space and incorporating a payload developed by Airbus Defense and Space.

Norway and the Netherlands have adopted a similar approach for their Binational Radio Frequency Observing Satellites (BROS)

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**The US Army's PROPHET system – seen here in vehicle-mounted form – covers the HF, VHF and UHF bands.**



**US soldiers demonstrate the hand-held antenna unit of the Praemittias Systems WOLFHOUD Cooperative Radio Direction Finding System.**



**This Russian Ilyushin Il-20M COOT-A was intercepted over the Baltic in June 2020.**

demonstration programme, which plans to orbit a pair of nanosatellites in 2022. Designated BIRKELAND and HUYGENS, these are intended to use angle of arrival (AoA) and time difference of arrival (TDOA) techniques to accurately geolocate RF signals.

Also scheduled for 2022 is the first launch to be conducted under Australia's Miniaturised Orbital Electronic Warfare Sensor System (MOESS). This envisages the deployment of a constellation of about 20 CubeSats fitted with a range of sensors and monitoring equipment intended to detect and geolocate RF signals from ships and aircraft.

## The Navies Join in

Another classic platform for SIGINT is the surface ship. Russia currently operates seven VISHNYA class (Project 864) AGI (Auxiliary General Intelligence) ships inherited from the former Soviet Union. These are equipped for intelligence-gathering, and have self-defence armament in the form of AK-630 six-barrelled 30mm cannon and STRELA-3 (SA-N-8 GREMLIN) surface-to-air missiles.

Incidents during the 1960s with the near-armed LIBERTY and PUEBLO intelligence-gathering ships has persuaded the US Navy not to operate vessels of this type, but to assign the task to warships. However, unarmed SIGINT ships are operated by other nations. For example, France has the DUPUY DE LÔME, Germany operates four OSTE class vessels, while Sweden has the ORION. The planned replacement for ORION will be the ARTEMIS. Ordered in 2017, this was built at the Stocznia Marynarki Wojennej shipyard in Gdynia in Poland. Following its launch in April 2019, it was transferred to Saab Kockums in Karlskrona, which will be responsible for installing the vessel's SIGINT systems.

The UK's Royal Navy does not operate surface-ship SIGINT platforms, preferring to assign this task to submarines. During the Cold War period, the UK always had two SSNs configured for this role.

These may be an emerging role for unmanned seagoing SIGINT platforms. In the summer of 2020, Captain Marlin Scott of the US charter fishing vessel PREMIUM TIME reported having found a strange object floating in the sea just off the Florida Keys. It consisted of a basic platform floating low in the water, and equipped with an antenna array mounted on an X-shaped frame positioned at the top of a short mast. There was also a small radome.

While the precise configuration of the system seemed novel, the basic craft may have been a derivative of the WAVE GLIDER system developed by the US company Liquid



Robotics. This consists of a surface float that is connected via a tether to a submerged 'glider', and is propelled by the conversion of ocean wave energy into forward thrust, independent of wave direction. It is capable of unsupported autonomous missions of up to 10 months duration, and long-distance transits of up to 1,000 nautical miles in the open ocean. WAVE GLIDER is small enough to have a low likelihood of visual detection, and minimal radar and acoustic signatures. An array of upward-facing solar panels provides 10 W of electrical power for whatever mission payload the user decides to install. One of roles for which Liquid Robotics promotes WAVE GLIDER is intelligence surveillance & reconnaissance (ISR). The example sighted by Captain Scott bore no markings that identified the owner, but may have been deployed by the US to monitor illicit radio transmissions, perhaps those from vessels operated by drug runners.

## Land Platforms

Best-known US land-based tactical SIGINT system is the US Army's AN/MLQ-44A PROPHET Block I. This covers the HF, VHF and UHF bands. While it can be broken down into subassemblies that can be carried by a four-man team, it is normally installed in an M1097 HMMWV. In 2019 General Dynamics Mission Systems was given a US\$296.1M contract to produce the AN/MLQ-44B PROPHET-Enhanced. An upgrade to the AN/MLQ-44A, it is intended to detect tactical emitters at frequencies ranging from 20-2,000 MHz.

A similar upgrade is being applied to the AN/MLQ-36 used by the US Army and Marine Corps. The new AN/MLQ-36A Mobile Electronic Warfare Support System Product Improvement Programme involves a total replacement of the electronics in the original system.

Developed by Leonardo DRS, the SandDust HF DF/Geolocation system is small enough to be mounted in a sport utility vehicle (SUV). It uses a five-element antenna array to cover the 2-30MHz frequency range locating emitters to a bearing accuracy of 5 degrees RMS. France's Thales SAEC (Station d'Appui Electronique de Contact) consists of an armoured vehicle equipped for the ELINT and COMINT roles.

The smaller and lighter a system is, the more readily can it be used in forward locations where it can be used to detect low-powered signals, and emitters that are masked by terrain. Praemittias Systems created its WOLFHOUD Cooperative Radio Direction Finding System for such tasks. Capable of being mounted in aircraft, UAVs, or ground vehicles, it has seen significant use in a man-



Photo: DGA

**Released by France's Direction Générale de l'Armement (DGA), this artwork demonstrates the multi-satellite concept of the CERES (Capacité de Renseignement Electromagnétique Spatiale) system. In practice, the spacecraft will have a more elongated body that is shown here, and will deploy only a single large solar panel.**



Photo: French MoD

**Taken into service in 2006, the French Navy's DUPUY DE LÔME was specifically designed for SIGINT duties under the MINREM (Moyen Interarmées Naval de Recherche ElectroMagnétique) Joint Naval Resources for Electromagnetic Research programme.**

portable configuration. WOLFHOUD consists of an electronics unit small enough to be carried in a backpack, an antenna array, and a display unit based on a small liquid-crystal display (LCD). WOLFHOUD was introduced in 2007, so has now been modernised to incorporate more rugged hardware, including an improved display.

For more than a decade, Russia has been modernising its EW systems, significantly improving its COMINT and ELINT capabilities. By 2025 it is expected to have replaced all its older SIGINT systems with newer hardware. Recent Russian military operations have provided that nation with the chance to test and refine its EW capability. For example, ground-based SIGINT systems such as the RB-636AM2 SVET-KU (covering the frequency range from 25MHz to 18GHz) and R-318T TARAN (covering 1.5-1,000MHz) were deployed to support Russian operations in support of the separatist movement in the Donbass region of Eastern Ukraine.

These Russian SIGINT adventures have not been without cost. On Monday, 17 September 2017, the dangers of conducting SIGINT patrols in a combat zone was demonstrated when a Syrian S-200 (SA-5 GAMMON) long-range surface-to-air missile system accidentally shot down a Russian Il-20M that had just completed a mission over Syrian territory, and was now over the Mediterranean sea and ready to return to Hmeimim air base, the main operating location for Russian aircraft engaged in supporting the Assad regime during the ongoing civil war. The Syrian SAM unit was probably trying to engage several Israeli F-16s that had launched air-to-surface standoff missiles against targets in Syria.

Exploiting the amount of SIGINT information that multiple sensors can detect poses its own challenge. Last year, the US Army released an RFI for a system able to store, exploit, and disseminate SIGINT data, and retrieve information from a national

Photo: Swedish Navy



***In service since the 1980s, the Swedish Navy's SIGINT ship ORION is due to be replaced by the ARTEMIS, a new vessel that meets all international vessel-classification rules, so should have lower operating and maintenance costs.***

SIGINT database. The system should be able to help analysts to identify emitters of interest and determine their capabilities, identify potential malicious behaviour, and highlight the opponent's potential vulnerabilities.

A little-known US programme intended to improve SIGINT capabilities in the HF region is HFGeo (HF Geolocation) project being run by the Intelligence Advanced Research Projects Activity (IARPA). Another IARPA project could have COMINT

implications is the Babel programme. This is intended to develop "agile and robust speech recognition technology that can be rapidly applied to any human language in order to provide effective search capability for analysts to efficiently process massive amounts of real-world recorded speech". Known participants include Carnegie Mellon University, University of California, Berkeley, IBM's T.J. Watson Research Center, and Raytheon BBN Technologies.

Anyone who was tried to use commercial speech-recognition software in an office environment will appreciate the potential importance of IARPA's Automatic Speech recognition in Reverberant Environments (ASpiRE) project. A spinoff from BABEL, this could help COMINT units search for keywords in intercepted voice communications.

## Looking Forward

The density of RF signals poses a challenge to SIGINT operations - how to rapidly detect signals that might be of major importance. Early this year, the USAF issued a presolicitation notice for UNICORN BLUE - a project intended to use real-time processing to automatically extract the contents of RF transmissions, and provide time-critical alerts and other information. Several contracts for the development of prototype systems are likely to be awarded.

A long-standing problem in SIGINT is the need to recognise new types of signal. This is particularly a problem in the case of RF-controlled threats such as UAVs and IEDs. Over the next two to three years, the US Naval Surface Warfare Center Crane hopes that a solution will be developed under its planned Radio Frequency Spectrum Dominance (RFSD) Prototype project. This intended to result in a system able to analyse RF signals between 40MHz and 6GHz, compare these against a baseline of the signals normally intercepted, and automatically alert operators to the presence of new emitters that could indicate a threat.

One emerging trend in the world of SIGINT is the merging of this technology with that of electronic-attack measures in order to create systems that can detect and if necessary counter enemy threats. An example of this trend is Elisra's Air Keeper, which combines ESM, ELINT, and EW functions on a single air platform. Designed to automatically detect, measure, identify, monitor and intercept all ground-based, shipborne and airborne radar signals, the ELINT subsystems provide HF to 6GHz coverage. They are designed to provide advanced demodulation, classification and agile signal detection capabilities, delivering a real-time display of activity even in dense signal environments. This information is presented to the operator, and transmitted to the ground via an aircraft-mounted SATCOM system. The system's ECM functions offers manual and automatic modes for the detection, location, and jamming of selected threats. ■

Photo: Elisra



***As this frame from an Elisra video demonstrates, the company's AIR KEEPER system can be installed on a relatively small aircraft.***



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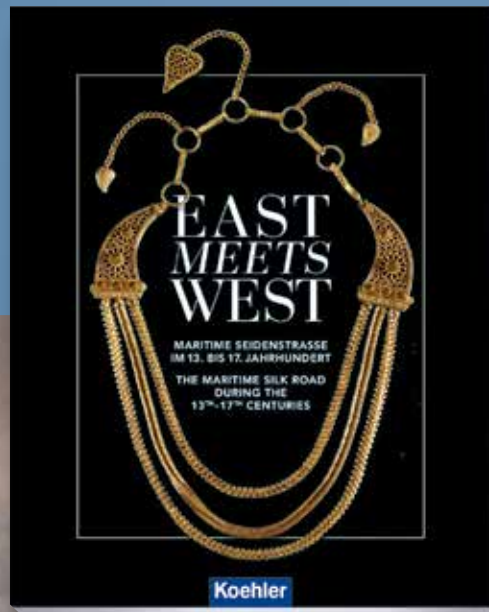
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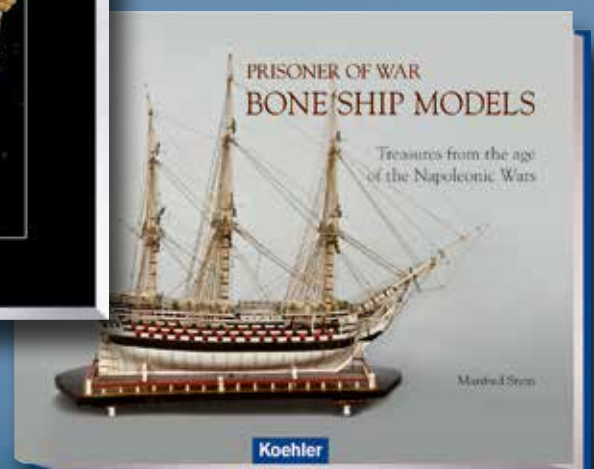
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# European Infantry Fighting Vehicle Armament

**Christopher F. Foss**

While most members of NATO have standardised on 120mm smooth bore tank guns and their suites of ammunition for their Main Battle Tanks (MBTs), there has been a complete lack of standardisation of medium calibre weapons for their infantry fighting vehicles (IFV) with currently deployed vehicles in Europe being armed with 20mm, 25mm, 30mm, 35mm and 40mm calibre cannon.

The clear trend in Europe is to mount larger calibre fully stabilised weapons in one or two person turrets, remote controlled turrets (RCT) or remote controlled weapon stations (RCWS), coupled to a computerised fire control system (FCS) with stabilised day/thermal sights incorporating a laser range-finder for the commander and gunner. This enables the platform to rapidly engage targets, including threat IFV and armoured personnel carriers (APC), under almost all environmental conditions, at longer ranges and with increased target effect.

Older types of medium calibre ammunition such as armour piercing (AP) and high-explosive (HE) rounds have given way in some countries to armour piercing fin-stabilised discarding sabot (APFSDS) and air-bursting munition (ABM) rounds. These are more effective than earlier generation rounds but are more expensive and not fired in significant numbers in normal peacetime training. While this article concentrates on European AFV armament, most contractors listen very carefully to their potential export customer's specific operational requirements, which may well differ for the home customer.

## WARRIOR

A good example is the WARRIOR IFV deployed by the British Army that is

### Author

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Photo: Christopher F. Foss



**The French JAGUAR (6x6) reconnaissance vehicle is armed with a 40mm Case Telescoped Armament System (CTAS) and a roof-mounted 7.62mm remote controlled weapon system.**

currently fitted with a two person turret armed with an un-stabilised and slow firing 30mm RARDEN cannon and L94A1 7.62mm co-axial mm machine gun (MG). Kuwait deploys the DESERT WARRIOR IFV which has a Delco (today General Dynamics Land Systems) two person turret armed with a now Northrop Grumman (previously ATK Armament) stabilised 25mm M242 dual feed cannon, 7.62mm co-axial MG and a Raytheon TOW anti-tank guided weapon (ATGW) mounted externally either side of the turret enabling targets to be engaged out to a range of 3,750 m.

Currently, the largest medium calibre programme in Europe is the CTAI 40mm Case Telescoped Armament System (CTAS) which has been mandated by the French and British armies for their future armoured fighting vehicles (AFV). CTAI is joint venture company formed between Nexter of France and BAE Systems of the UK with its headquarters and main 40mm weapon production facility in Bourges, France, but with ammunition production in both countries. The 40mm CTAS is also installed in the Nexter T40 armed turret with this being marketed in manned and unmanned



configurations and with the option of an ATGW either side.

## Nexter VBCI

The French Army has already replaced its tracked AMX-10P IFV armed with a M693 20mm dual feed cannon and 7.62mm co-axial MG with the Nexter Vehicule Blinde de Combat d'Infanterie (VBCI) 8x8 fitted with a one person turret armed with a Nexter M811 25mm dual feed cannon and 7.62mm co-axial MG, operated by the gunner. The commander is seated in the hull on the left side to the rear of the driver and also has the ability to aim and fire the weapons if required as a panoramic sight for the commander is installed on the roof of the turret.

The Nexter 25mm M811 dual feed cannon is also in service with a number of other countries including installed in a one person turret fitted to the FNSS Savunma Sistemleri Turkish Land Forces Command (TLFC) Turkish Infantry Fighting Vehicle (TIFV) with a 7.62 mm co-axial MG. Early TIFV have a turret armed with a now Rheinmetall Air Defence, Oerlikon 25mm cannon and 7.62mm co-axial MG. For the export market, the TIFV is referred to as the Armoured Combat Vehicle – 15 (ACV-15) with the latter figure indicating a typical gross-vehicle weight (GVW) of 15 tonnes. Export customers often prefer different weapons and the Malaysian ACV-15 are fitted with a one person turret armed with a Northrop Grumman stabilised 25mm M242 dual feed cannon and 7.62mm co-axial MG.

## MARDER

MARDER 1 IFV entered service with the German Army as far back as 1971 and has been constantly upgraded in a number of areas including night vision equipment and additional armour. All are armed with a Rheinmetall 20mm MK 20 Rh 202 dual feed cannon and 7.62mm co-axial MG with provision for a pintle mounted MILAN ATGW mounted externally on the turret which is now being replaced on remaining MARDER 1 by a Eurospike LR ATGW.

## PUMA

The PSM PUMA Armoured Infantry Fighting Vehicle (AIFV) is now in service in increasing numbers with the German Army with the first contract for 350 units, including eight driver training vehicles with the second contract for 210 units.



Photo: Christopher F. Foss

**The British Army WARRIOR infantry fighting vehicle upgraded by Lockheed Martin UK under the WARRIOR Capability Sustainment Programme includes a new turret armed with a 40mm Case Telescoped Armament System and 7.62mm co-axial machine gun.**



Photo: Christopher F. Foss

**The French Army Nexter VBCI (8x8) infantry fighting vehicle is fitted with a one person Nexter turret armed with a stabilised Nexter M811 25mm dual feed cannon and 7.62mm co-axial machine gun.**



Photo: CTAS

**The 40mm Case Telescoped Armament System showing main components including the magazine on the right side.**



Photo: PSM

**The German PSM PUMA Armoured Infantry Fighting Vehicle fitted with a remote controlled turret armed with a Mauser 30 mm MK 30-2 dual feed cannon capable of firing air burst ammunition and a 5.56 mm co-axial machine gun**

PUMA is fitted with a RCT armed with Mauser 30mm MK 30-2 dual feed cannon with a 5.56mm co-axial MG but this will be replaced by a 7.62mm MG. The Mauser 30mm MK 30-2 cannon can fire Rheinmetall 30mm ABM rounds as well as other natures including APFSDS. The PUMA AIFV is being upgraded with a pod of two EUROSPIKE LR ATGW on the left side of the turret to enable targets to be engaged well beyond the range of

the 30mm cannon. The original Mauser 30mm MK 30 cannon was not capable of firing 30mm ABM ammunition and this is installed in the General Dynamics European Land Systems (GD-ELS) Santa Barbara Sistemas Pizarro IFV used by the Spanish Army and the GD-ELS - Steyr Ulan IFV deployed by the Austrian Army. The original MK 30-1 fired ammunition with an aluminium case while the MK 30-2 fires ammunition with a steel case.

For the international market the vehicle is also called the ASCOD for Austrian Spanish Co-operative Development. Rheinmetall has also developed the WOTAN 30 and WOTAN 35 electrically operated cannon with the latter firing 35 x 228mm ammunition.

## CV90

The Swedish Army BAE Systems Hägglunds CV9040 IFV is fitted with a two-person turret armed with a BAE Systems Bofors 40mm cannon which is a development of their towed 40mm L70 anti-aircraft gun. This is designated the 40mm 40/70Ba and is fed with clips of 40mm ammunition from below with the empty cartridge cases being ejected out of the turret roof. A total of 24 rounds of ready use 40mm ammunition are carried including APFSDS-T, Pre-Fragmented Programmable Proximity (3P), Pre-Fragmented HE, Multi-purpose Tracer and associated training rounds.

None of the export customers have opted for the Bofors 40mm 40/70Ba cannon for their CV90 IFV and all have opted for various types of the now Northrop Grumman, Chain Gun, or BUSHMASTER, family of electrically operated weapons which have been built in larger numbers than any other Western medium cannon in recent years. The first export customer for the CV 90 was Norway with their CV9030N being armed with the original 30mm BUSHMASTER II dual feed cannon, although these have now been replaced in the upgraded CV9030N by the more recent 30mm MK44 dual feed cannon.

The 30mm MK44 is used by other NATO countries including Poland which has a version of the Leonardo HITFIST armed with this weapon and 7.62mm co-axial MG installed on their locally built Patria Armoured Modular Vehicle (AMV) called the ROSOMAK. The Czech Republic has a fleet of PANDUR II (8x8) with some of these fitted with RAFAEL RCWS armed with a 30mm MK44 cannon, 7.62mm MG and SPIKE missiles. A key feature of the MK44 is that it can be rapidly converted to fire 40mm ammunition by changing the barrel assembly, feed sprockets, forward feeder assembly the recoil spring set.

Denmark (CV9035DK) and the Netherlands (CV9035NL) are both armed with the 35/50 mm BUSHMASTER III cannon although at present only has the 35mm ammunition nature. Estonia has taken delivery of some surplus Netherlands CV9035NL. Finland (CV9030F) and Switzerland (CV9030CH) also have the 30mm



Photo: BAE Systems Hägglunds

**The Norwegian Army CV9030 IFV in Afghanistan armed with a Northrop Grumman 30mm dual feed cannon and 7.62mm co-axial MG. This CV9030 also has additional armour**



MK44 dual feed cannon which in addition to firing conventional natures of ammunition can also fire an ABM round.

The Rheinmetall Air Defence, Oerlikon 25mm KBA cannon is installed in a Leonardo HITFIST two person turret installed on the Italian Army DARTO tracked IFV and their wheeled Freccia (8x8) IFV. It fires 25 x 137mm ammunition and has been ordered by non-NATO countries, with over 5,000 manufactured for all applications.

## Russian IFV are Well Armed

A number of countries in Europe, including members of NATO, still operate Russian IFV including the BMP-1 and BMP-2 IFV. BMP-1 IFV has a one-person turret armed with a 73mm 2A28 gun and a 7.62mm co-axial MG with a wire guided 9M14 MALYUTKA (US AT-3 and NATO SAGGER) wire-guided ATGW mounted above the 73mm gun, although most users have now removed the ATGW capability. One drawback of the BMP-1 was that the commander was seated in the hull on the left side to the rear of the driver with the one-person turret being operated by the gunner.

The follow-on BMP-2 IFV has a new two person turret armed with a 30mm 2A42 dual feed cannon and a 7.62mm co-axial MG plus a roof mounted ATGW which is typically a 9M113 KONKURS (US AT-5 and NATO SPANDREL).

Prime contractor for the BMP-1/BMP-2 is Kurganmashzavod Joint Stock Company (JSC) which is part of the Machinery and Industrial Group who is now offering a number of upgrades for the BMP-2 including the BMP-2M which has a host of modifications including installation of new stabilised thermal sight for gunner incorporating a laser rangefinder and installation of a 9M120-1 ATACA ATGW externally on either side of the turret.

BMP-1/BMP-2 IFVs were followed by the BMP-3 IFV which is a totally new design and although introduced into service as far back as 1990 is still the most well-armed IFV in the world and is also fully amphibious. The BMP-3 IFV has a two person turret armed with a 100mm 2A70 rifled gun, 30mm 2A72 co-axial dual feed cannon and a 7.62mm co-axial MG and mounted either side of the driver at the front of the hull is a gunner with another 7.62mm MG firing over the frontal arc. In addition to firing conventional natures of ammunition including high-explosive fragmentation (HE-FRAG), the 100mm gun can also fire a 9M117 BASNYA (US AT-10 and NATO STABBER) laser guided projectile (LGP) with the latest model being fitted with a tandem HEAT warhead and having a range of 5,500 m. All the operator has to do is to keep his sight locked onto the target. The BMP-3 can also be fitted with a remote controlled turret armed with a 57mm cannon which is also being used for an increasing number of applications including air defence/anti-unmanned aerial vehicles. The BMP-3 turret has also been shown on other platforms and has been fitted to the RABDAN (8x8) developed by Al Jasoor/Otokar and now deployed by the United Arab Emirates.

Russia has also built the prototype of the T-15 heavy infantry fighting vehicle (HIFV) which is fitted with a new advanced RCT called the EPOCH ALMATY. This is armed with a 30mm 2A42 dual feed cannon and a 7.62mm co-axial MG and a pod of two KORNET EM laser-guided ATGW mounted either side which are being marketed with differ-

## Masthead

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ent warheads including tandem HEAT and thermobaric. The turret is also installed on the Russian KURGANETS 25 tracked IFV and the BUMERANG (8x8) which is the replacement for the BTR-80 (8x8) and earlier Russian 8x8 IFVs. This RCT features a computerised FCS and stabilised day/thermal sights for commander and gunner which also have an integrated laser rangefinder allowing hunter/killer target engagements

to take place. By having a common RCT for at least three platforms offers the Russian Army significant through life savings as well as training advantages, but the high cost of these capable turrets could limit their fielding.

Russia has developed and tested the AU-220M RCT which is armed with a 57mm dual feed cannon and a 7.62mm co-axial MG which has been developed

for installation on new built platforms as well as older platforms to enhance their firepower. It has been shown installed on a number of platforms including the recent T-15 HIFV while mock-ups have been shown on other platforms including the South African MBOMBE (8x8) and was offered as a potential weapon for the ENIGMA (8x8) platform first shown in 2015. ■

## CTAI – The Case Telescoped Armament System

**Currently, the largest medium calibre programme in Europe is the CTAI 40mm Case Telescoped Armament System (CTAS) which has been mandated by the French, British and Belgian armies for their future armoured fighting vehicles.**

CTAI is a joint venture company formed between Nexter of France and BAE Systems of the UK with its headquarters and main weapon production facility in Bourges, France, but with 40mm ammunition production in both countries.

The first French Army application is for their new JAGUAR 6x6 reconnaissance vehicle which is the replacement for the currently deployed Nexter AMX-10RCR 6x6 and Arquus (originally Panhard) SAGAIE 6x6 armoured cars. JAGUAR has a manned two person turret armed with the 40mm CTAS with a roof mounted RCWS armed with a 7.62mm MG being the secondary armament as it has no co-axial MG. Mounted in the right side of the turret is a pop-up launcher for two MBDA Missile Moyenne Portée (MMP) ATGW which are already in service with the French Army in the man-portable infantry version. MMP is the replacement for the older MILAN ATGW which has a range of 2,000 m while the MMP has a maximum range of over 4,000 m and is fitted with a tandem high-explosive anti-tank (HEAT) warhead to neutralise targets fitted with explosive reactive armour (ERA). The French Army is expected to take delivery of 300 JAGUAR with Belgium taking delivery of 60 units.

In the British Army, the 40mm CTAS and a L94A1 7.62mm coaxial MG is fitted in a new two person turret as part of the WARRIOR Capability Sustainment Programme (WCSP) for which the prime contractor is Lockheed Martin UK.

The second UK application for the 40mm CTAS is installed in two person turret developed by Lockheed Martin UK under contract to GD-ELS UK installed on the AJAX reconnaissance vehicle which will soon enter service with the British Army as a replacement for the Alvis SCIMITAR which was deployed as far back as 1975 and is also armed with the slow firing and unstabilised 30 m RARDEN cannon. The 40mm CTAS consists of the 40 CT Cannon with a rotating breech, its suite of ammunition, ammunition handling system which typically holds 70 rounds of ready use ammunition, gun control equipment, gun mount and gun controller. Production of the 40mm

***The 40 mm Case Telescoped Armament System (CTAS) includes the actual 40 CT Cannon, Ammunition Handling System, Gun Mount, Gun Controller and the Gun Control Equipment (CTAI).***



***40 mm Case Telescoped Armament System installed in a typical turret with 40 mm ammunition suite alongside weapon (CTAI)***

CTAS started early in 2016 and so far over 400 have been built with production running at 14 units a month. The UK has ordered 515 40mm CTAS which are supplied as government furnished equipment (GFE) while France has placed an initial contract for 110. Natures of ammunition include APFSDS-T which will penetrate at least 140 mm of rolled homogenous armour (RHA) at a range of 1,500 m, kinetic energy airburst (KE-AB), general purpose round – airburst tracer (GPR-AB-T), general purpose round – point detonating – tracer (GPR-PD-T), general purpose round – kinetic energy – tracer (GPR-KE-T) and associated training rounds. For the export market Nexter are offering alternative turrets for the VBCI including their own T40 armed with a 40mm CTAS. This turret is being marketed in manned and unmanned configurations and with the option of an ATGW either side which would depend of the type normally deployed by the end user. **cf**



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# Equipping Medical Responders for CBRN Scenarios

**Dan Kaszeta**

Chemical, Biological, Radiological, and Nuclear (CBRN) threats are considered differently from conventional “kinetic” threats for many reasons, both in the defence and counterterrorism settings.

A key principle behind categorising these threats differently is that they cause injuries and illnesses significantly different from bullets and bombs. Until the 20th century, disease generally killed more soldiers in wartime than weaponry did. Indeed, the present COVID-19 pandemic shows us all that sickness is still something to be reckoned with.

Military medicine has a century of experience in dealing with CBRN threats, starting with the First World War. Medical care in a military context ranges from self-aid and aid for one's fellow soldier through military medics in the field, ambulances and other forms of medical evacuation, and various tiers of military hospitals. Emergency medicine in the civilian world is often divided into pre-clinical (ambulance crews and paramedics for example) and clinical (hospitals) spheres. For purposes of discussion, “responder” can include a complex and varied number of roles. A lengthy discussion on how medical care is organised does not serve the reader of this magazine terribly well, so this article will discuss both CBRN medical provision in the field (i.e. before hospital) and in definitive care settings such as hospitals.

Generally, new advances in medical countermeasures to traditional CBRN threats move slowly. The budgets and scientific labour devoted to these lines of inquiry are dwarfed by the efforts of the big pharmaceutical firms and academia. Simply put, nerve agent treatments are competing with cancer, COVID-19, and diabetes treatments for money, and will always lose out in such competitions.

Field care in CBRN situations, whether military or civilian, differs according to threat. In chemical situations, there is much that



Photo: US Air Force

**Airmen test their decontamination skills during In-Place Patient Decontamination training on 28 June 2020 at Kirtland AFB. Students worked to decontaminate mock casualties from a terrorist attack using a weapon of mass destruction.**

responders can do to help the injured. In radiological situations, field care is usual limited to decontamination. In biological incidents, there is often no care needed or given in the field as the incident only presents itself days after the attack. As such, given both the broad trends and the specific parameters, new developments in this segment are often scarce.

## PPE

Personal protective equipment (PPE) has always been a consideration in CBRN medical care. There is no point in trying to render care in a contaminated environment if the responders are themselves injured by doing so. In modern militaries, field medics are usually equipped with the same CBRN protective masks and clothing as the rest of the military. CBRN protective equipment specifically tailored for medics seems rare, with the exception of thinner gloves.

In the civil sector, the situation varies widely. There are not many efforts to provide full CBRN kit to emergency medical providers. However, the COVID-19 pandemic has proven the need for PPE for purposes of infection control. Such PPE, like N95 masks and gloves, is generally good for the majority of “B” and “R” scenarios, even if it provided only limited value in “C” scenarios. Efforts to improve PPE use and stocking for COVID-19 will have some value in the event of CBRN incidents.

There have been some long-standing (i.e. pre COVID-19) efforts to have some medical personnel train especially for work in CBRN environments. This correspondent was on such a team for the US government for several years (2002-2006). The UK's National Health Service has fielded the “Hazardous Area Response Teams” (HART). HART teams exist around the UK and are capable of providing a wide variety of medical interventions. They wear full PPE and are well-trained for

## Author

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their tasks. The HART teams could be an example for similar efforts around the world.

One new development has been in the regeneration and reconstitution of clinical (as opposed to military) PPE. Battelle (USA) has been awarded a large (US\$415M) contract for its new "Critical Care Decontamination System." This device uses existing hydrogen peroxide fumigation technology to sanitise medical masks, such as the now ubiquitous N95 masks. This system, packed into a standard-sized cargo container, can fumigate up to 80,000 masks in a day. Such efforts could be extremely useful in improving logistics and safety.

## Decontamination

Decontamination is often a critical component of emergency medical care in CBRN environments. Decontamination is not necessary in every CBRN scenario, but it routinely permeates plans, training, and drills. It can be an important component of medical care, and even in situations when it is not critical for lifesaving, it can prevent the spread of contamination, thus preserving safety and health. An ambulance or a hospital emergency ward that becomes

contaminated becomes part of the problem, not part of the solution.

As has been discussed several times in previous issues of this magazine, CBRN decontamination is a distinct segment of the world CBRN market, with many products and offerings. It is also an area where generic products, often just soap and water or simple bleach solutions, reign supreme. In a field environment, one product that really stands out is "Reactive Skin Decontamination Lotion" (RSDL). RSDL is made by Emergent Biosolutions and is the state of the art for decontaminating chemical agents on human skin. It has regulatory approval in Canada, the USA, Israel, and Australia. It now bears an EU CE mark.

Ambulance decontamination has become an issue in some localities, due to the need to mitigate the spread of COVID-19 and potential harm to ambulance crew. Ambulance decontamination was a concern prior to COVID-19, but largely a neglected one. Several manufacturers have risen to the challenge in this area. Cristianini (Italy) has adapted its military decontamination technology to this mission and has provided documentation on its effectiveness against the SARS-Cov-2 virus. Of particular interest, some of their technologies can



Photo: US Air Force

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**Protection masks inside a Battelle Critical Care Decontamination System Container**

be used on sensitive electronics. Bioquell (UK) has long had part of the health-care decontamination sector and is promoting ambulance decontamination as well. Such efforts could have helped considerably in the aftermath of the Salisbury “Novichok” incidents, as a number of emergency services vehicles were condemned and disposed of after contamination was found in them. The practicalities of a pandemic have shown that simply abandoning ambulances when they are needed most is not practical.

Although most emergency plans call for patients to be decontaminated before entering a hospital, there is always the

prospect of contaminated walk-in patients arriving, or patients evacuated to hospital unknowingly in a contaminated state. The ability to decontaminate arriving patients is important, and new construction and hospital retrofits often take this into consideration. However, effective provision of such decontamination varies widely around the world. In some cases, it relies on emergency services, such as the fire brigade, to conduct temporary decontamination.

Within hospitals, there are an increasing number of sophisticated items of sensitive electronic equipment. Historically, decontamination of electronics has been a troublesome issue, in both medical and

non-medical settings. Cristanini (Italy) has had its SX-34 product on the market for some time, and it can be used on computers, monitors, diagnostic equipment, and other sensitive items. Steris (USA) also has capabilities in this regard. Long an industry leader in healthcare sanitation, their VHP (“vaporised hydrogen peroxide”) systems can be used for many categories of sensitive equipment.

Major incident, not to mention pandemics, can see situations where entire rooms or wards require decontamination. Such decontamination can be labour-intensive. But it also has proved to be lucrative business for contractors. Numerous companies, some of which are long-standing service contractors and others new players, are now widely marketing their services.

## Pharmaceuticals

Work continues on medicines that might be useful in clinical settings for various illnesses and injuries caused by CBRN exposure. Traditionally, there have been drugs available for immediate treatment of nerve agents and cyanides in field settings. The other CBRN threats are generally not amenable to field administration of medicines. The nerve agent and cyanide treatments are generally generic medications. Autoinjectors have been available with atropine and oxime-class drugs for rapid field treatment of nerve agent poisoning for decades. Incidentally, these are the direct ancestor of widely available epinephrine pens for severe allergic reactions. Meridian Medical Technology (USA) has been a leader in that space for decades. Getting nerve agent antidotes out of the military into civilian settings has taken some time and regulatory work, but emergency medical providers in many countries now have access to them. Some work has progressed in the area of drug therapy for chemical warfare agents, but it is generally in the USA where this activity has had the most progress in transition into actual products for use in field or in hospital. An exception to this is the “Cyanokit” – Meridian’s field kit for administering hydroxycobalamin. Although the time window for effective use of this drug is narrow (minutes) after exposure, this drug can be lifesaving in the event of warfare or terrorism using hydrogen cyanide.

Several developments have come up in the area of nerve agent treatment. Although the main drug for nerve agent exposure is atropine, a commonplace generic, it is often accompanied by an “acetylcholinesterase reactivator” such as obidoxime or pralidoxime. Significant work is being done on drugs that are an improvement in



**A CBRN responder disposes of contaminated PPE.**



this class. Work is also being done on anticonvulsants as some have shown that, in laboratory studies, that they can prevent or mitigate long-term damage in nerve agent poisonings. Drugs such as ketamine and midazolam have been fielded or are under investigation. In the area of blister agents (such as so-called "mustard gas"), "Silverlon" dressings made by Argentum (USA) have been investigated for their usefulness. "Bioscavengers" are chemical compounds that can attach themselves to nerve agents in human tissue, thus limiting the degree of injury they cause to the body. Some of these chemicals (such as butylcholinesterase) have been shown in laboratory studies to be useful in situations where nerve agent exposure has been gradual, such as exposure through the skin. (It should be noted that the Salisbury poisonings were all skin exposure cases.) Bioscavengers could also be useful as a prophylactic before exposure, although the history of pre-treatment against nerve agent exposure is troublesome. This is certainly an area to watch for future developments.

So-called "chelating agents" are useful for treating some types of radiation exposure by helping to remove radiological isotopes

from the body. Some work has gone into "radioprotectants" such as high-dose Vitamin E to help protect the human body from radiation damage, but this work still languishes in research stages. One development in recent years has been the approval by the US Food and Drug Administration of the drug filgrastim as a treatment for radiation exposure.

In the biological warfare and terrorism space, much concern is still attached to anthrax, as it is, in many ways, an ideal biological warfare agent. Emergent Bio Solutions has come up with a pair of useful medications for use in pulmonary anthrax illness. "Anthraxil" is an immune globulin and "Raxibacumab" is a human monoclonal antibody. Both are highly useful, in conjunction with antibiotics, in treating pulmonary anthrax. Earlier in this correspondent's career it was thought that, once serious symptoms had set in, pulmonary anthrax was generally lethal. However, advances such as the Emergent product have changed the situation with one of the leading biological warfare threats.

Another serious bioterrorism and biowarfare threat is botulinum toxin. Although antitoxins have existed for many dec-

ades, they had various limitations. A US programme run by BARDA (Biological Advanced Research and Development Authority) has resulted in an improved "heptavalent" antitoxin for treating botulism victims. This has received regulatory approval. Likewise, some bioterrorism threats are bacterial in nature, so are theoretically treatable with antibiotics. However, nobody really knows where the next threat in this area may come from. Some research efforts, including BARDA's CARB ("Combating Antimicrobial Resistant Bacteria) programme, seek to develop broad-spectrum drugs that could be useful against multiple threats

### Regulatory Approval

Readers familiar with the pharmaceutical industry will understand that, just because a scientist has invented a new possible medicine, it will not always be available for us. The phrase "regulatory approval" has already been mentioned several times. For decades at conferences on this subject, that phrase could be rightly used to quell discussion or cause disorder in meetings. Medicines,



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Photo: Battelle



**A complete run of Battelle's PPE stored inside a Critical Care Decontamination System Container**

devices, decontamination solutions, and similar "medical countermeasures" are regulated quite heavily in most countries around the world. There is usually a two-tiered system, wherein military doctors and other medical providers treating military personnel have less of a regulatory burden than doctors providing care to regular civilians. As an example, an army soldier in the US Army can give a nerve agent antidote injector to another soldier, it is not likely legal for that soldier to administer such prescription medicines to a civilian.

Regulatory approval for civilian use can take a very long time to achieve, as lengthy studies are required. Some manufacturers do not see CBRN threats as much of a market motivator and often do not want to spend the time or funds to pursue a lengthy regulatory process. Cumbersome regulatory approval has long been seen in the CBRN community for what it is – an obstacle that could cost lives in an emergency. The US and other countries have worked out expedited regulatory approval schemes for medical countermeasures against CBRN threats and there are now faster routes to approval that have been developed to speed up the action while not sacrificing safety.

## Diagnostics

An area where there is still much work to be done is in the area of diagnostics. Nearly all field care and much of the hospital-level care is done based on medical diagnosis of signs and symptoms. Laboratory results and toxicology can take days, by which time an acutely ill patient could be dead. Not every CBRN threat is easily discerned by external observation. While nerve agents and blister agents have distinct signs, phosgene exposure or viral illnesses may not be easily comprehended.

While there is a good deal of equipment in the detection and identification space for chemical (see previous numbers of this magazine) and radiological spaces, medical responders are usually reliant on specialised teams for such gear. More could be done to train field medics in use of such equipment (along the lines of UK's HART, already mentioned above). Biological diagnostics, particularly instrumentation useful in the field, continue to elude the market. However, the general tendency in biological weapons is that they have incubation periods, so diagnosis is left for traditional laboratory work in hospitals.

## Logistics and Stockpiling

Medical responders need equipment. That equipment comes from logistical channels, supply chains, and (often) emergency reserve stockpiles. The worldwide drama over PPE and the COVID-19 pandemic shows that the unglamorous businesses of supply, logistics, and stockpiling are important. Both mundane and specialised medical items will get expended at unduly fast rates during CBRN crises. From the logistical perspective, a pandemic is really just a "B" crisis. With the appropriate effort, the COVID-19 crisis provides a useful set of lessons on how to manage stockpiles and supply chains for catastrophic events. Efforts to renew, expand, and replenish CBRN medical stockpiles would be important for readiness and resilience, but also as commercial opportunities for companies in this sector.

An important component of the logistics underpinning military medicine and military field hospitals is the provision of clean water. This is particularly important in CBRN situations, as much decontamination is water-based. This correspondent discussed military water purification in this magazine at length in 2019, and much of that article is relevant to military medicine. Some new developments have occurred in this area since the previous article. Icon Lifesaver (UK) has come up with innovative techniques to incorporate graphene technology to purify water. This technology shows prospect for water purification techniques and products that require little or no power. The electrical power requirements behind many water purification products can be a real logistical issue for field hospitals, so improvements in this area are welcome.

## New Advances

Medical countermeasures are an area where the major countries in the CBRN space acknowledge that there are weaknesses. The major investments appear to be in the US, largely through BARDA, and in the European Union, through a variety of expenditure paths, including Horizon 2020 and the European Defence Industrial Development Programme. CBRN medicine is an area where clever ideas out of science, industry, and academia can find grants if there is enough initiative to work through the proposal processes.

Progress can also be expected from the COVID-19 effort. For example, expedited vaccine developments and work into antiviral drugs has been proceeding at a frantic pace. While this work is directed at COVID-19, some of this work will have benefits against other threats. ■



# Protecting NATO's Northern Approaches

**Bo Leimand**

**Governments who operate according to different standards are seeking to exploit opportunities in order to impose their own set of values on the future development and governance of the Arctic region.**

Writing an article about NATO's northern approaches and how to protect the Arctic seems an almost impossible task given the ever-increasing interest in the region. For the sake of simplicity, I will define NATO's northern regions as the Arctic, comprising those countries possessing a legal right to the territory or those who simply have an interest in the region based on security reasons. In the NATO context, this means Norway, Iceland, Denmark (Greenland), Canada and the United States. But there are other countries who also share an interest, either for security or economic reasons and these are Russia and China.

## The Ambassadors

The US Ambassador to Denmark, Carla Sands penned an article earlier in the year about the Arctic, entitled: "Wake Up to the Arctic's Importance". She wrote that the majestic landscape of the Arctic – from the snow-capped peaks of the Brooks Range in Alaska to the vast Greenland Ice Sheet – creates the impression of permanence and timelessness. But she added that with new sea lanes opening and milder inland climates, the Arctic's landscape is rapidly changing. There is much truth in this and the United States is not alone in holding this view.

But for Denmark, another ambassador holds equal importance as Carla Sands and perhaps even more so, at least from a historical perspective. I am referring to the Danish ambassador to the United States during the Second World War, Henrik Kauffmann. He acted independently from the government in Copenhagen during that period as he claimed that the Danish government was not acting freely since Denmark was occupied. In April 1941, he signed an agreement granting the United States certain rights in Greenland which Washington required in order to secure its defence. According to Article X of that agreement:

This agreement shall remain in force until it is agreed that the present dangers to the



Photo: via author

***The beautiful northern lights in Greenland. US President Trump's recent offer to buy Greenland has triggered yet another debate on strategic affairs in the Arctic.***

peace and security of the American Continent have passed.

In one fell swoop, and without any discussion, the United States became an Arctic nation. The Arctic security environment does indeed have direct implications for US national security interests and in 1951, the 1941 agreement was superseded by the agreement; "Defence of Greenland: Agreement Between the United States and the Kingdom of Denmark, April 27, 1951." This agreement remains in force.

## The Geography

Geographically, the Arctic comprises the northern approaches of the United States and represents a potential vector both for attacks on US soil and for US power projection. Approaches to the Arctic Ocean to both the east and west of the United States form strategic corridors for maritime traffic. Arctic sea routes transit through the Bering Strait between the United States and Russia, while the so-called Greenland, Iceland, United Kingdom – Norwegian (GIUK-N) gap

represents a strategic corridor for naval operations between the Arctic and the North Atlantic.

## History

Historically the Arctic region and the issue of who it belongs to, has long been a source of debate and contention. In 1933, Norway and Denmark agreed to settle their dispute over Eastern Greenland in what became known as the "Greenland Case" at the Permanent Court of International Justice in The Hague. Norway lost the case, and following the ruling, it abandoned its claim. In the context of this ruling, it was also mentioned that if one wants to enjoy legitimacy and exercise effective control over an area, then one has to be visible. In 1941, the so-called "Northeast Greenland Sledge Patrol" was established, before changing its name to "The Sirius Patrol" in 1952.

Today the Danish Joint Arctic Command is headquartered in Nuuk, Greenland, with a Liaison Unit based in Torshavn on the Faroe Islands. Its main tasks include surveillance

and enforcement of Denmark's sovereignty and the defence of Greenland and the Faroe Islands. Other tasks undertaken include the inspection of fishing vessels, Search and Rescue, maritime pollution prevention, hydrographic surveys, and miscellaneous support for civilian society.

an economically viable reality. Even though the Northeast Passage (NEP, the sea route north of Russia) makes the route from Rotterdam to Yokohama up to 37% shorter compared to the Suez Canal route, it is unclear whether the route will be economically attractive any time soon.

The economic feasibility therefore depends on the navigation time through the NEP, Russian fees, and fuel prices. While the opening up of the northern passage will slowly be realised, it is improbable that it will become a major game changer in the period up to 2030-35. The NEP has historically been a Russian internal waterway and for practical purposes it is likely to remain as such for at least the coming decade.

### Strategic Challenges

Even though it is unlikely that the Arctic will become a vital maritime highway in the period up to 2030-35, it is still important to monitor developments in the region. As maritime traffic develops, the first challenge will be the search and rescue capacity, since the current infrastructure is not up to the task. This issue will primarily be the responsibility of the littoral Arctic nations.

A more strategic challenge lies in the classification of the waterways. Canada and Russia both argue that the Northwest Passage and the Northeast Passage respectively are internal waters according to the UNCLOS framework. Designating these areas internal waters will give the respective countries full sovereignty over the area, which allows for the control of transiting vessels. As a case in point, in December 2018, Russian President Vladimir Putin signed a law providing the Russian nuclear agency Rosatom control over traffic and infrastructure in the Russian part of the Arctic. All foreign vessels that wish to enter and navigate the water area of the Northern Sea Route are now required to obtain prior permission.

### Conflicts

Different observers note that the prospects for conflict over the Arctic region remain limited. First, the Arctic is governed by eight countries, of which six are littoral Arctic nations. Except for Russia, all littoral Arctic countries are NATO allies and are organised in the Arctic Council, a body dealing with the governance of the Arctic, though with the explicit exclusion of military security. Second, the countries involved are all wealthy and politically stable countries (again, with Russia being something of an outlier), thereby likely posing a lesser challenge to resource governance. Third, almost all natural resources lie within internationally accepted borders, meaning that conflict over these resources is unlikely. Lastly, history has shown that Arctic disputes have so far been resolved through diplomacy rather than through military means. The resolution of the longstanding border dispute between Norway and Russia in the Barents Sea is one

Photo: Bundeswehr



**A US submarine breaking through Arctic ice. With the 1941 Greenland Agreement, the US became an Arctic nation.**

### UNCLOS and EEZ

The discussions about the region have intensified now that climate change is having a serious impact on resource obtainability in the Arctic Ocean and on the navigability of the northern passages. Of the eight countries lying within the Arctic Circle - Canada, Denmark (Greenland), Finland, Iceland, Norway, the Russian Federation, Sweden and the United States (Alaska) - only the US has not ratified the United Nations Convention on the Law of the Sea (UNCLOS). However, the US regards UNCLOS as customary law and as such, abides by it. According to UNCLOS, countries can claim an Exclusive Economic Zone (EEZ), which grants the state exclusive rights to the natural resources in the area. The EEZ area ranges up to 200 nautical miles but can be extended up to 350 nautical miles in the case of a natural prolongation of the territory on a so-called continental shelf. The most recent claim by Denmark overlaps with the claims by Russia and Canada, which can be a potential source of conflict.

### Economy Viability

There is much debate about how soon the melting Arctic ice is transforming the centuries old idea of the northern passages into

There are several challenges when it comes to the NEP. First, the 'just-in-time' principle of global supply chains is at odds with the unpredictability of the NEP. Second, and somewhat surprisingly, the Suez Canal allows for the passage of larger ships than the coastal part of the NEP due to its shallowness. The route for bigger ships lies more to the north, where more sea ice is present. The third challenge is the lack of intermediate ports. Container ships rarely sail from one port to another; the Suez Canal route from Rotterdam to Yokohama passes many large ports on the way, where cargo can be dropped off and picked up and where maintenance and support are possible. Fourth, is the need to make ships 'Arctic-ready' in terms of equipment and crew. Currently, there are Russian icebreakers and Russian pilots for hire to help navigate ships through the NEP, incurring additional costs for shipping companies. Not surprisingly, Russia is building new icebreakers.

The White House has ordered a review of America's ageing and small Coast Guard icebreaker fleet. In the meantime, the Coast Guard is currently planning to build six new icebreakers to substantially increase the size of its fleet, but this review could actually mean even more ships being ordered.



such example. The greatest risk for unrest in this area lies instead in the fact that confrontation between Russia and NATO elsewhere might spill over to the Arctic.

## The Arctic Council

The establishment of the Arctic Council in 1996 among the eight Arctic states – Denmark, Canada, Finland, Iceland, Norway, Sweden, Russia, and the United States – was a landmark accomplishment that continues to serve its members well by providing a multilateral forum for shared, peaceful governance. Because of the Arctic Council, the eight Arctic countries have largely respected each other's sovereign interests in the region. International agreements on scientific research, maritime traffic, search and rescue, and environmental protection are all concrete examples of successful "low tension" regional cooperation. But changes in the Arctic's physical environment are presenting new and complex opportunities and challenges. In this context, it should be noted that Russia is acting according to the rules established by the Arctic Council and therefore all other nations in the Arctic Council are sensitive about implementing changes that might upset the balance and disrupt the current Rules of Engagement.

## Greenland

While Greenland stands on the cusp of a new era of productivity, governments who operate according to different standards are currently seeking to exploit opportunities to bring their own set of values to the future development and governance of the region. As an Arctic nation, and a long-

standing partner, the United States wants nothing more than to see Greenland and the greater Arctic region prosper, but this development cannot be at the expense of regional safety, security, or sustainability. Russia's pattern of aggressive behaviour and increasing militarisation in the Arctic is a looming global concern, despite the fact that Moscow abides by the existing rules, as established by the Council. It has restored many of its Cold War-era bases, established a new Arctic command, created four new Arctic brigades, refurbished old airfields and other infrastructure in the Arctic including deep-water ports, and established new military bases along its Arctic coastline. In 2018, Russia opened an Arctic airfield at Nagurskoye able to accommodate bombers capable of reaching the Thule Air Base in northwest Greenland with little to no warning. Furthermore, Russia is currently expanding the base's 2,500m runway up to 3,500m, far longer than the length required for defensive fighters. These investments in new military capabilities reveal Russia's growing ambitions that challenge the West's shared goal of a peaceful, prosperous region.

## The People's Republic of China

The People's Republic of China (PRC) self-identifies as a "near Arctic state" despite a distance of nearly 1,500km separating the country from the region. The PRC is trying to insert itself into the region because it sees the Arctic as another place to advance its predatory economic interests and project its government's values. It is attempting to gain a physical foothold in the region by building icebreakers, including working on a

nuclear-powered icebreaker, deploying unmanned ice stations, and engaging in large and sophisticated data collection efforts in countries throughout the region, including the United States, Canada, Iceland, and the territory of Greenland.

According to its 2018 White Paper "China's Arctic Policy", the PRC seeks to establish a "Polar Silk Road" by developing Arctic shipping routes. This presence could enable the PRC to project its government's values and advance its self-serving economic interests. The PRC is also trying to seize the region's valuable resources by pursuing dual use, civilian-military infrastructure and securing mining licences for several mineral deposits throughout the region, including uranium and other rare-earth minerals. This is also known as "dollar-diplomacy" whereby PRC pours money into indebted countries, thereby providing the PRC with newly gained leverage.

According to John Bolton, former security advisor in the White House, this PRC policy was the reason behind President Trump's offer to buy Greenland in 2019. After this went public, intensive diplomatic activity between the United States and Denmark took place resulting in the reopening of the US consulate in Nuuk in June 2020. The consulate will serve as the primary platform for increasing daily interaction between United States, the people of Greenland, and the Danish Joint Arctic Command.

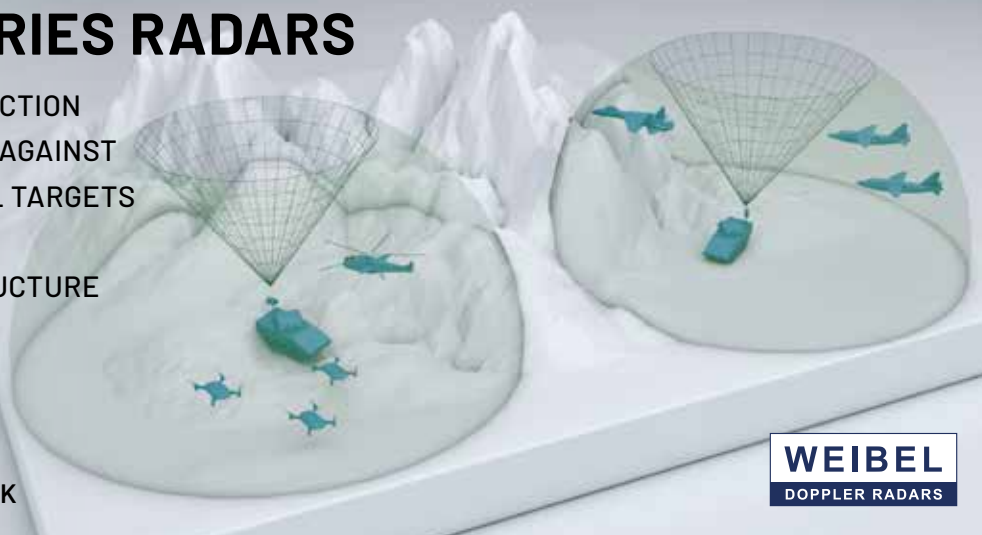
## Arctic War Theatre

When trying to envisage the Arctic war theatre, it is important to consider that the Arctic's huge sea territories are mostly inaccessible during its harsh winters. The

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infrastructure is scarce, except in parts of the Kola Peninsula and it is difficult to launch operations.

There are two probable Russian priorities when looking at the Arctic as a potential war theatre. The first is sea control actions in the Barents Sea, to support strategic nuclear missile armed submarines (SSBN) and sea denial actions in the Atlantic. Second, if a war escalates to exchanges of intercontinental ballistic missiles, a Russian priority in the

## Challenges for NATO

However unlikely a direct military confrontation between Russia and NATO might seem, it cannot be dismissed out of hand. But if a confrontation or crisis did break out in another region, then the North Atlantic and Arctic theatres could be involved. In this case, the ongoing Russian military build-up in the Arctic creates some challenges for NATO.

an aerial refuelling capacity, to reach the Thule radar in northwestern Greenland from the Nagurskoye Air Base in Franz Josef Land?

Furthermore, Russia might opt to occupy the territory of the NATO northern states in a crisis or in the event of a direct military confrontation. The Russian EEZ control zone and Russia's military in the Arctic could be used for military operations on the ground against the Nordic countries, including NATO member, Norway and it should be recalled that parts of the territory of the Nordic countries are in fact located within the Russian EEZ control zone. Military experts have been monitoring the use of military capabilities and have warned that Norway would have difficulty preventing Russia from occupying the northern part of the country.

Finally, Russia might be tempted to occupy the Norwegian archipelago of Svalbard. In this scenario, Russia would be able to strengthen and expand its control in the Arctic and North Atlantic by stationing aircraft and missiles there.

## Credibility and Conclusions

As mentioned previously, although a military confrontation between Russia and NATO countries is unlikely, even in peacetime the three challenges mentioned above serves to weaken NATO in one way or another. NATO can only be a credible alliance if it can show that it can defend itself and is able to prepare defence postures for those different scenarios.

The ability of NATO countries to provide a credible military response is limited by various considerations or caveats. NATO circles are aware that a NATO military presence in the Arctic would be perceived in Moscow as a provocative move. This could help trigger an arms race in the region and undermine the diplomatic cooperation taking place in regional institutions such as the Arctic Council. At the same time, non-Arctic NATO countries believe that the alliance should prioritise other challenges and regions. NATO countries have sought to resolve this by operating with a dividing line between the Arctic (where NATO is not present) and the North Atlantic (where NATO is present). Arctic security issues have therefore been addressed by the five Arctic NATO countries (Canada, Denmark, Iceland, Norway, and the United States) outside of a NATO framework. The most interesting observation is that this area has never had the same focus since the day President Trump offered to buy Greenland. ■

Photo: via author



**Danish military forces patrolling Greenland with a dog sledge**

Arctic will probably be situational awareness and missile defence, from its radar stations and airstrips in the region.

## Russian Assets

In a war against NATO, Russia would face the naval forces of a peer adversary, above, on, and under the surface. In order to support the six available SSBNs, the ambition of the Russian Northern Fleet would probably be to undertake sea control actions in the Barents Sea, with surface ships, naval aviation, and attack submarines, plus some 200 stand-off missiles for sea targets, 30 of them land-based, with 40 on surface ships and 50 air-launched. The remaining assets, mainly submarines with some 90 sea-target standoff missiles, would probably deploy on sea denial actions against trans-Atlantic sea transports to Europe or along the Northern Sea route. Limited infrastructure, one double-tracked railway only, possibly reduces reinforcements for a land operation against northern Scandinavia. The assessment is that the available forces for battles and standoff strike assets, bases, and transport infrastructure make the Arctic war theatre less suitable for a regional war. The emphasis will be on naval actions. In a regional war with NATO, the Arctic is vital for the naval component of Russia's strategic nuclear forces.

First, in a crisis, or in the event of a direct military confrontation between Russia and NATO, the US and Canada would need to use the North Atlantic in order to move troops and military materiel to the European continent. Russian submarines would look to counter this by operating in the North Atlantic as a countermeasure. Russian submarines could cut transatlantic communication cables on the seabed. To reach the North Atlantic however, Russian submarines would need to navigate the seas between Greenland, Iceland and the United Kingdom, the so-called Greenland-Iceland-United Kingdom gap (the GIUK gap). The GIUK gap acts as a bottleneck where it is easiest to track Russian submarines.

Secondly, in a crisis, or in the event of a direct military confrontation between Russia and NATO, Russia could threaten North America (and Europe) with submarine-launched nuclear strikes, land-based missiles, and bombers. Russian strategic submarines would use the EEZ control zone to launch missiles undisturbed. Russia might also use its position in the Arctic to weaken the United States missile defence system by attacking the land-based radars, so crucial for the system's early warning capability. As an example, and as mentioned above, would it be possible for Russian fighter bombers, with



# Light Infantry: a New Tool for the Danish Army

**Michael Johnsson**

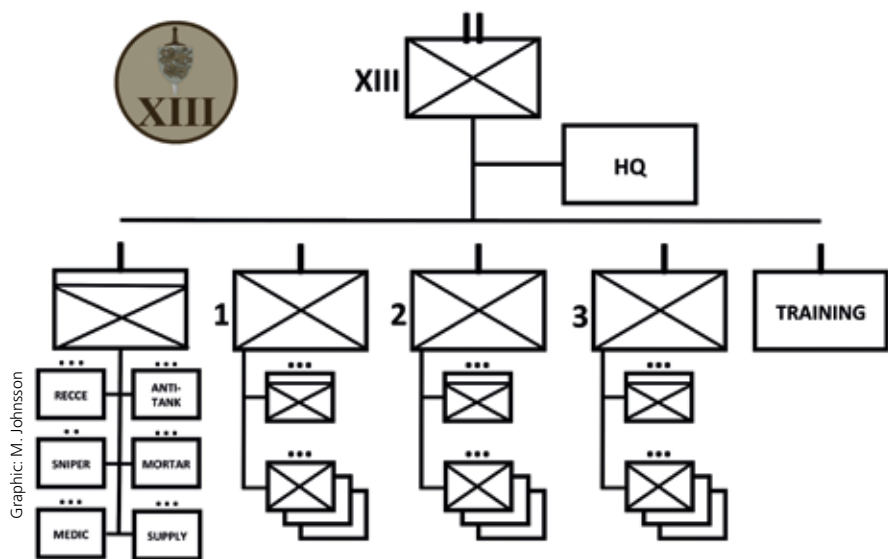
The latest defence agreement in Denmark includes building new capacities for the Danish Army to meet NATO requirements - most notably, the XIII Light Infantry Battalion.

After years of specialisation in counter-insurgency operations in Iraq and Afghanistan, the Danish Army has spent the last six years in transformation in order to meet the new geopolitical challenges, primarily taking place in Eastern Europe. The Danish Army consists of two brigades. The 1st Brigade is an operational brigade that is currently transitioning into a complete standard NATO medium-sized brigade by 2023. Based on heavily armed units, it is equipped with the new PIRANHA 5 APC in different variants, the CV9035 IFV and the LEOPARD II A7 main battle tank. All other vehicles in the brigade are also characterised by a high-level of ballistic and blast protection. Some of the initiatives undertaken to meet NATO requirements for the 1st Brigade include the re-introduction of air defences, brigade artillery, and other brigade assets. The 1st Brigade is foreseen to be a modern and well-equipped brigade by 2023, but it will also be a brigade with units possessing a substantial logistical footprint in every aspect.

The 2nd Brigade is a non-operational brigade comprising specialised units, such as a tank battalion, reconnaissance battalion, and the new XIII Light Infantry Battalion – a battalion that differs considerably from the other mechanised infantry battalions in the 1st Brigade.

## Why so different?

The XIII Light Infantry Battalion is required to perform any operational task - within its capabilities - when deployed on major combat operations. One of the advantages of a light infantry unit is its ability to fight effectively on what are normally considered



*The Training Company is only for training conscripts and later recruitment for the professional parts of the battalion.*

“no-go areas” for large armoured, mechanised formations. Another advantage is that light infantry units are easier to maintain at high-readiness levels and to quickly deploy on national and international operations. Major Henrik Stilling of the Land Capability Development Branch, Defence Command Denmark, explains that the reason for developing a light infantry capacity is “...to strengthen the land forces’ ability to deploy a unit that is specialised in solving the full spectrum of operations in difficult terrain with (poor) or no infrastructure at all.” The Danish Army’s current infantry capability consists primarily of mechanised and armoured infantry units, all equipped with heavily armoured vehicles with high protection levels and massive firepower. However, these systems require a commensurate amount of logistical support when deployed abroad. This is both expensive and time-consuming.

Major Stilling also notes that when in theatre, mechanised and armoured units are not able to deploy their full firepower potential

in close terrain, either urban or mountainous areas. This capability gap will be filled by Denmark’s XIII Light Infantry Battalion as a light infantry unit is capable of responding quickly to critical situations and to fight under difficult circumstances as and when required.

The newly formed XIII Light Infantry Battalion’s Commanding Officer, Lieutenant Colonel. Jesper Stroier, has a clear take on the need for their light infantry role. “We are not heavily armoured and might not bring the big punch to the game, but the strength of the light infantry is based on our ability to react and deploy far and fast with a limited footprint. To this end, the dismounted infantryman can operate amongst the population, against unconventional forces and (within) close terrain in a way (that) heavier formations can’t,” he maintains. “A light force is also easier to operate and be interoperable with its partners – and can easily work with local security forces. So, I find there is great utility for the light infantry on the modern battle field.”

## Author

**Major Michael Johnsson** is a staff officer at Land Capability and Development Branch, Defence Command Denmark.

Photo: Danish Army



***“The Light Infantry Mindset” is based upon physical endurance and stamina.***

## Formation

“No Fight – No Victory!” is the motto under which the battalion was officially formed on 1 January 2019. It is stationed in the Haderslev Garrison in the southern Jutland region. Until 2023, the battalion

will undergo a development, equipping and training regimen to prepare and bring it to operational readiness. As a regular battalion, it will have a battalion headquarters, a support company, three light infantry companies and a training company with conscripts.

## The Light Infantry Mindset

Lt.Col. Jesper Stroier, Commanding Officer of the XIII Light Infantry Battalion, served many years throughout his career in infantry units and with infantry-related projects. His professional career includes deployments to conflict zones – Bosnia and Herzegovina, Kosovo, Iraq and Afghanistan – and also brigade staff service posts. He graduated from the Advanced Command and Staff College at the United Kingdom’s Defence Academy in 2012. Lt.Col. Stroier served as the Danish Army Command Liaison Officer to Army HQ in the UK until 2016. He assumed command as the first Commanding Officer of the XIII Light Infantry Battalion in November 2018. Lt.Col. Stroier has a clear vision of what it takes to be a part of a very light unit: “Commanders and soldiers within the (XIII Light Infantry) battalion will need what we call the ‘The Light Infantry Mindset’ – to succeed and unlock the full potential of the light warrior. This mindset is based upon superior dismounted close combat skills, a better shot, ability to live from what you can carry and with little support, physical endurance and stamina combined with a will to get the job done when things get rough!

Photo: XIII Battalion



***The first Commanding Officer of the XIII Light Infantry Battalion, Lieutenant Colonel Jesper Stroier.***

“We have worked hard on our branding and DNA. We want to create a strong team, where the individual soldier feels they belong to a bigger family with shared values and ambitions. When it comes to training, our aim is to focus our training on the key infantry skills as mentioned above. We want to be clear about what we ask from the commanders and soldiers – and we expect more. We want them to be adaptable and flexible in thinking and we want them to take individual responsibility for their part of the mission... in (the) XIII. To this, we are setting higher standards for physical training than the rest of the combat arms, and we want to build and test their mental strength and flexibility.”

The battalion began with the establishment of its battalion headquarters, followed by the creation of the 1st Company, soon after the battalion’s formation in 2019. On 1 January 2020, the 2nd Company was formed with a 3rd Company to follow in 2021. In parallel, specialised platoons comprising snipers, anti-tank and mortar teams, and medics of the Support Company will be added. When fully operational in 2023, the battalion will consist of approximately 500 specialised regular soldiers and about 150 new conscripts.

## Weapons and Equipment

The core weapons of the light infantry companies include:

- Colt Canada 5,56mm C8IUR assault rifle
- US Ordnance 7,62mm M60-E6 light machine gun
- Colt Canada 7.62mm C20 sniper rifle (for marksmen)
- M72 LAW (light anti-tank weapon) against light armoured threats

Battalion members will receive the same uniform and personal protection equipment as every Danish soldier. The battalion’s heavier equipment is detached to the Support Company in order to keep the infantry companies light and agile.

The Support Company will have a:

- Reconnaissance platoon
- Sniper section - equipped with new 8.6mm Accuracy International AXMC rifles
- Anti-tank platoon - equipped with an AT missile system to counter heavy armoured threats
- Mortar platoon - equipped with 81mm mortars
- Support platoon and,
- Medic platoon

The role of the mortar platoon is to provide initial fire support for the battalion with each infantry company having their own intrinsic mortar fire control teams. Both the anti-tank missile and mortar systems are still in the procurement process.

Typical to combat battalions, its support assets, such as artillery observers, JTACs (Joint Terminal Attack Controller), engineers and others, will be attached to the battalion on a case-by-case basis. Otherwise, Lt Col Stroier warns that “we have to accept our limitations, if operating alone!”

## Light Infantry vs. Heavy Equipment

Although essentially a light unit, the XIII Light Infantry Battalion still requires its heavy equipment and a substantial amount of supplies once deployed. In order to carry the required days of supply (DOS), a number of ATVs, 4x4 vehicles



# Leveraging technology to connect NATO forces



Today's NATO Alliance faces the most complex, most unpredictable security environment since the end of the Cold War. To adapt and prevail, it must close critical defence-capability gaps that range from large-scale platforms to small, man-portable solutions.

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The C79 combat optical sight was first developed in close cooperation with the Canadian Armed Forces and deployed in 1989 on the Colt C7 by the 'C7 countries,' most notably Canada and Denmark. The machine gun variant of this fixed 3.4x optic was then adopted as the M145 by the U.S. and Czech Armies — and remains standard issue across several NATO forces.

The next-generation ELCAN Specter DR dual role weapon sight, designed to meet asymmetric battle requirements in Afghanistan, allows soldiers to switch instantly from close-quarter combat to long-range target identification, and remains available in 1-4x and 1.5-6x magnifications.

As NATO forces are looking to modernise optical sights, ELCAN Specter sights, ITAR-free and designed and manufactured in Canada, are leveraging next-generation technologies to make soldiers even more effective and keep them safer on the battlefield.

**"ELCAN sights are known for the crystal-clear optics, durability, reliable performance and extended eye relief — this is the 'ELCAN Specter DNA' "**

— Dan Pettry, a former U.S. Army Ranger  
Raytheon Intelligence & Space  
Product Manager

"ELCAN sights are known for the crystal-clear optics, durability, reliable performance and extended eye relief — this is the 'ELCAN Specter DNA'", according to Dan Pettry, a former U.S. Army Ranger and Raytheon Intelligence & Space product manager for ELCAN Rifle Sights. "There's an old saying, 'necessity is the mother of invention' — NATO capability gaps are driving innovative new solutions at ELCAN."

As NATO forces continue to modernise, ELCAN Specter sights continue to leverage disruptive technologies to make soldiers safer and more effective.

## **Increasing Reliability**

Raytheon ELCAN has integrated a Picatinny/STANAG rail into the sight casting, making it easier to mount ancillary devices. The integrated rail is lighter and more rugged than a mounting plate, and is available for all dual role and magnified sights with customised reticles.

## **Enhancing Mission Effectiveness**

Approximately 12% of the world's population is left-handed. Traditionally, standard issue equipment has been designed for right-handed soldiers, and those who are left-handed or left-eye dominant had to learn to adapt. The ELCAN Specter DR 1-4x and 1.5-6x dual role weapon sights are now available with an ambidextrous throw lever to make it easier for left-handed soldiers.

"The ambidextrous lever allows both left-handed and right-handed shooters to use their non-firing hand to change field-of-view and continue engagement — it's quicker and safer," said Pettry.

## **Improving Safety**

Lasers have many uses on the battlefield but can also blind a soldier, especially through a magnified optic.

External laser filters help protect users but reduce light transmission, often cause fogging and are easily lost or damaged. Raytheon ELCAN has developed an integrated high-performance laser coating that protects soldiers as effectively as an external filter without negatively impacting sight performance.

Photo: Danish Army



**The CO of the XIII Light Infantry Battalion also requires superior dismounted close combat skills as a part of the special mindset in the light infantry.**

and trucks, will support the battalion's infantry companies. The Support Company will also be equipped with a mix of ATVs, 4x4 vehicles – some with a trailer – and 8x8 trucks in order to transport its heavier equipment and the remaining

DOS. Different vehicle types are currently being tested in order to balance the need for lifting equipment and maintain as low a logistical footprint as possible. However, the battalion must still be able to carry its equipment in a dismounted

role for either air or amphibious deployment, where the battalion will be operating alone for a number of hours or even days before replenishment. Under such circumstances, all heavy equipment – and ammunition – must be equally distributed among the 500 soldiers. Such situations pose a number of weight limitation issues when specifying the equipment required fulfilling the battalion's requirements.

### Becoming an Obvious Choice

While Denmark's 1st Brigade is developing toward a heavy, well-armoured, high-tech "concept", the development of the XIII Light Infantry Battalion and its very light concept, will be very interesting to follow over the next few years. Lt.Col Stroier has very high ambitions for the battalion, as noted in his Commander's guidelines: "We must be the obvious choice for the Army, when there is a demand for a unit that will quickly, professionally and flexibly be able to take on demanding tasks at short notice both at home and abroad, and in the future we must be able to compete with the best of our partners."

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# Enforcing the Arms Embargo: Operation IRINI

Photo: European Union's Satellite Centre (SATCEN)



**RADM Fabio Agostini, Commander, Operation EUNAVFOR MED IRINI**

## Interview with Rear Admiral (RADM) Fabio Agostini, Commander, Operation EUNAVFOR MED IRINI

On 19 January the Berlin Libya Conference brought together the parties committed to step-up the EU's efforts to enforce the UN arms embargo on Libya established by the UN Security Council Resolutions UNSCR 1970 in 2011, and extended with the UNSCR 2292 in 2016 and the UNSCR 2473 in 2019. Finally on the 31<sup>st</sup> of March 2020, after two and a half months of intra-European wrangling and arguing, the EU Council launched Operation EUNAVFOR MED IRINI. (Greek name for "peace") and officially terminated the EUNAVFOR MED Sophia.

The operation, under the control of the EU's High Representative for Foreign Affairs and Security Policy, is mandated initially to last until 31 March 2021. Headquartered in Rome, Operation IRINI is led by the Italian RADM Fabio Agostini, assisted by a 150-strong joint international staff. The personnel assigned to RADM Agostini's staff come from Austria, Bulgaria, Cyprus, Croatia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Czech Republic, Romania, Slovenia and Sweden.

### Biography RADM Fabio Agostini

Born on 15 May 1966, RADM (LH) Fabio Agostini entered the Naval Academy in Livorno in October 1986. Upon graduation as Ensign, in November 1989, he joined the frigate ITS MAESTRALE, followed by an embark onboard the destroyer ITS AUDACE. Subsequently, he joined the frigate ITS GRECALE and from 1995 until 1996 he served onboard the corvette ITS MINERVA as Head of the Operations Department.

After completing the Naval Staff College course at the Istituto di Guerra Marittima in Livorno and a major English course at Melton College in York (UK), in the period 1997 and 1998, he was appointed commanding officer of the patrol boat ITS Cassiopea.

Between September 1999 and 2003 RADM Agostini embarked onboard ITS GARIBALDI, first as Chief Weapons Officer and, from September 2001, as Head of Operations. This was followed by an appointment as Intelligence and Public Information Officer to the Italian-led European Naval Task Force Commander onboard the destroyer ITS FRANCESCO MIMBELLI.

In 2004, RADM Agostini was selected for the Joint Services Command and Staff Course at the Defence Academy in Shrivenham, UK. Upon graduation in 2005 he became teacher at the Centre for Advanced Defence Studies in Rome. Two years later he took the helm of the frigate ITS ESPERO, followed by a tour of duty as Head of the Parliamentary Affairs Section to the Minister of Defence.

The period 2009 and 2010 saw RADM Agostini attending the Legal Advisor Course at the Centre for Advanced Defence Studies and the Common Security & Defence Policy Orientation Course. After a tour of duty as Deputy Head, Alliances Policy Branch at the Defence General Staff he attended the EU Common

Security and Defence Policy High Level Course and the communication course at the National School of Public Administration in Rome.

From September 2013 to September 2014, RADM Agostini served as Commanding Officer of the destroyer ITS CAIO DUILIO and in 2015 he was assigned to the Naval Plans, Operations and Strategy.

Between August 2016 and March 2019, he held the position of Head, Public Information and Communication of the Naval Staff in Rome, subsequently as Head, Public Information and Communication Department of the General Defence Staff between March 2019 and January 2020.

In January 2020 he became the Commander of the Joint Deployable Command of the Italian Joint Operation HQ in Rome and, from 21 February to 31 of March 2020 he served as Operation Commander of EUNAVFOR MED Operation SOPHIA.

RADM Agostini graduated in Maritime and Naval Sciences at the University of Pisa, and holds a Master's Degree in Defence Studies from King's College, London (UK). He is an expert in International Humanitarian Law, Institutional and International Relations and Communication, and is the author of several articles and essays on International Organizations, Maritime Piracy and Terrorism, the Law of Armed Conflict at Sea, and Institutional Communication. He has been a lecturer in seminars held at several organisations including the Centre for Advanced Defence Studies (Rome), the Naval Academy in Livorno, the Air Force Academy (Pozzuoli, Naples), Advanced Maritime Studies Institute (Venice), the Naval NCO Academy (Taranto). RADM Agostini has also organised several seminars on NATO's and the EU's defence and security policy.



**The Operation IRINI Headquarters in Rome**

EUNAVFOR MED IRINI hosts also a Crime Information Cell (CIC) comprising staff from mainly the Italian Carabinieri and law enforcement authorities of Member States and EU agencies. This cell facilitates the receipt, collection and transmission of information on the arms embargo, the illegal exports of petroleum from Libya and on human smuggling and trafficking, as well as crimes relevant to the security of the operation.

On April 28 the initial Force Generation Conference ended, and Operation IRINI was able to start the planning of its 'at sea' operations. The maritime part of the operation commenced on 4 May with the arrival 'on station' of the French destroyer FS JEAN BART and a Fairchild Merlin IVC patrol aircraft from Luxembourg, soon followed by a Polish B-28B1R Antonov Bryza and a German P-3C ORION. The air assets operate from the Sigonella Air Base on Sicily. On June 4 the Greek frigate SPETSAI joined the Operation. The FS JEAN BART detached from the operation on 27 May.

Initially Operation IRINI faced some criticism though. Several member states were worried that this EU's renewed naval presence could become a 'pull' factor with immigrants, i.e. leading to a renewed increase of illegal migration across the Mediterranean, as its vessels could be used to rescue migrants. And other member states did not agree with the procedures for the disembarkation of migrants and port diversions. Early May, Malta announced that it was no longer to commit any military assets and threatened to use its veto to terminate the mission. But eventually an Consensus was reached.

**ESD:** Admiral Agostini, how did you prepare yourself to take command of Operation IRINI? I dare suppose that your appointment as Operation Commander of Operation SOPHIA from 21 February to 31 March 2020 served as a good introduction on how to handle this new operation?

**RADM Agostini:** Indeed, being in charge of Operation SOPHIA proved very useful. Obviously I could profit from the opera-

tional benefits and experiences gained, allowing a seamless handover and ensuring an operational continuity. I would like to point out that Operation SOPHIA was the first naval EU Operation in the central Mediterranean and tested the collaboration with other organizations such as Frontex, EUROPOL, UN Agencies and the Italian Direzione Nazionale Anti-Mafia.

**ESD:** What are the differences between both operations?

**RADM Agostini:** Operation IRINI and Operation SOPHIA are two distinctive operations. Although the Area of Operation (AOO) is almost the same, their mandates and operational objectives differ. Whereas SOPHIA focused on combatting migrant smuggling, IRINI is primarily intended to implement the UNSRs arms embargo. The operation's secondary tasks include the monitoring and gathering of information on illicit exports from Libya of petroleum, crude oil and refined petroleum products; assist in the capacity building of the Libyan Navy and Coast Guard in law enforcement tasks; and contribute to the disruption of the business model of human trafficking networks.

**ESD:** What is a normal working day for you, and your staff?

**RADM Agostini:** Our headquarters in Rome works 24/7. Personally I start very early in the morning, Checking emails and messages on our classified networks, and then attend the Morning Staff Briefing for an update on what happened overnight. Throughout the day we follow the ongoing activities, look at the daily situation reports and the schedules for air, surface and submarine operations. I am also in constant touch with the Force Commander, Rear Admiral Ettore Socci and I have regular secure chats and routine VTC- meetings. The European Union Satellite Centre (SATCEN) provides us satellite and aerial imagery. All this allows us to compile a comprehensive picture of the daily activities in the Mediterranean, almost in real time. When requested or needed, I fly to Brussels to update the relevant Committees about the operation.

**ESD:** Can you provide us some details about the organisation of your staff and what assets are assigned to the operation, or scheduled to join?

**RADM Agostini:** My 150-strong staff is made up of Navy, Air Force and Army personnel from twenty Member States. My deputy is a French RADM, Jean-Michel Martinet, and my Chief of Staff is Greek, Commodore Theodoros Mikropoulos. The IRINI Force Commander and the flagship



**The French anti-air warfare destroyer FS JEAN BART**



are to alternate between Italy and Greece every six months. The current commander is the Italian RADM Ettore Socci who, since June 2019, was the Force Commander of Operation SOPHIA. He will remain in command until 18 October 2020 after which Commodore Mikropoulos will take the helm.

With regard to the assets continuously assigned to the operation, here is the situation as of 19 August: We have the landing platform dock ITS SAN GIORGIO, assuming the role of flagship, the Greek frigate SPETSAL has just left the operation, but will be replaced soon by another Greek ship. And Germany has just given us the frigate HAMBURG. We have two maritime patrol aircraft (MPAs): a SW3 MERLIN III aircraft from Luxembourg, and a Polish B28B1R Antonov BRYZA. The German P-3C ORION has just left. The ITS SAN GIORGIO carries an EH101 helicopter and a boarding team from the San Marco Battalion. In addition, Italy is providing an unmanned aerial vehicle (UAV). Occasionally, an ATR 72 MPA, a Gulfstream G550 Air Early Warning (AEW) aircraft and a submarine are made available. A French MPA and a Greek AEW aircraft are available two days per month. In addition, a number of vessels in associated



**The Greek HYDRA class frigate HS SPETSAL**

support are provided by France, Greece and Italy.

**ESD:** Can you give us some statistics since the start of the operation?

**RADM Agostini:** Since the start of IRINI there have been 500 hailings [as of 19 August - Ed.] of which more than 400 in relation with the arms embargo and 49 related to violations on oil smuggling. We conduct-

ed five boardings concerning the arms embargo and two connected to oil smuggling. Furthermore we detected flight patterns of military planes arriving in Libya.

**ESD:** I suppose that you would like to see more resources being thrown in, such as additional ships, MPA's and drones?

**RADM Agostini:** Launching at the height of the COVID-19 pandemic obvi-

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Photo: Guy Toremans

### ***The flagship of Operation IRINI – the Italian amphibious landing ship ITS SAN GIORGIO***

ously slowed down the force generation process. Nonetheless almost all member states made efforts to contribute to the operation, either through active support (personnel, assets and intelligence), or with standby assets. But more assets should be made available though.

We are doing our utmost with the assets currently available. However we can only achieve our tasks in an effective manner when there is a continuous availability of sufficient assets, in particular air defence warships, air early warning aircraft, as well as air-to-ground surveillance assets such as drones. Assets such as the French air defence destroyer FS JEAN BART are particularly valuable as they can monitor both the sea lines of communication and air traffic flow.

**ESD:** What about the collaboration with NATO?

**RADM Agostini:** The EU and NATO are used to working together closely. Operation SOPHIA and NATO's Operation SEA GUARDIAN cooperated effectively. Currently discussions are underway to establish a similar arrangement for cooperation between Operation IRINI and the NATO operation.

**ESD:** What can Operation IRINI do against a suspect vessel?

**RADM Agostini:** On June 5 the UN Security Council adopted Resolution 2526 (2020) that extends the authorisation to inspect vessels on the high seas off the coast of Libya which are suspected of violating Libya arms embargo. We can implement the embargo by a maritime interdiction operation (MIO) and by monitoring both aerial and land routes.

**ESD:** As you mentioned before, Operation IRINI was launched amidst the COVID-19 pandemic. What is the impact on your operation. How you handle the corona crisis?

**RADM Agostini:** The COVID pandemic has obliged us to take, both internal

and external, preventive and containment measures in order to reduce the risk of contagion. We issued dedicated documents, called Standard Operating Procedures (STANOPS) to deal with the necessary anti-COVID measures. As external measure the member states are obliged to must assign Covid-free assets, in our HQ social distancing is practised, with remote working and constant personnel education applied. All staff members have followed the compulsory Covid-course through videoconferences and there is a thermo-scanner at the entrance and nobody is allowed to enter the building with a temperature of more than 37.5° or without a mask.

**ESD:** What if any of the ships take refugees onboard who could be carriers of the Corona-virus?

**RADM Agostini:** Although not part of our mandate, search and rescue (SAR) operations remain an international obligation. All ships must render assistance to those in peril at sea. Should any of the ships be involved in such incidents, arrangements are in place to carry out it as effectively as possible and to bring the rescued people to a EU member State. In case the ships have to take refugees onboard, we have specific procedures, in line with WHO and EU rules, to avoid the risk of contagion for the crews. Each ship in IRINI has all the necessary materials onboard to avoid contagion.

**ESD:** Although this operation is an effective tool to implement the arms embargo, it only addresses the symptoms. What could be done to better or differently manage these problems?

**RADM Agostini:** IRINI was conceived to assist diplomatic efforts through the application of an arms embargo with the aim to facilitate a permanent ceasefire. I am aware that there are many political and diplomatic difficulties, especially due to

the many international players involved, each with their own agenda. Beyond what the goals of individual nations are, a stable Libya should be everyone's objective, because it will increase regional security. The EU High Representative for Foreign Affairs & Security Policy and Vice-President of the EU Commission, Joseph Borell, underlined that EUNAVFOR MED IRINI is an important part of the solution to the Libyan crisis, but certainly not the solution to all the problems.

**ESD:** According to your experience, what are this operation's strengths, and weaknesses, if any? Which aspects you feel should be objective of greater attention?

**RADM Agostini:** I am aware that there are many political and diplomatic difficulties, especially due to the many international players. To achieve results it is necessary that the political will demonstrated in launching the operation is translated into more concrete contributions to Operation IRINI.

**ESD:** How do you see the Operation evolve, both in the short and long term?

**RADM Agostini:** Despite the few assets currently available, IRINI already showed that we can achieve results in an effective, impartial and balanced manner. I am confident that with further assets Operation IRINI will be even more effective. Obviously this is not a short process and will take some time. The EU's involvement is indispensable as it remains the only regional broker willing to monitor and enforce the arms embargo.

**ESD:** What is the biggest challenge being in command of Operation IRINI?

**RADM Agostini:** It goes without saying that I am honored to be entrusted this important, yet demanding and complex task. This is quite a challenge. Operation IRINI has an ambitious mandate but also a noble and absolutely fundamental objective for the security of the Mediterranean and the control of the southern border of Europe, i.e. to contribute to the EU's efforts for the peace process in Libya.

**ESD:** Is there anything that "keeps you awake at night?"

**RADM Agostini:** When I go home in the evening after at least 12 hours of work I am quite tired And after having had dinner with my wife I fall asleep easily.

**ESD:** Thank you.

**The interview was conducted by Guy Toremans, a naval specialist and frequent contributor to ESD.**



# From Political Symbol to Regional Responsibility

## The Multinational Corps Northeast in Szczecin (Poland)

**Lieutenant Colonel (GS) Ulrich Pfützenreuter**

In September 2019, Headquarters Multinational Corps Northeast celebrated its twentieth birthday. The age of twenty might ordinarily signify reaching a certain level of maturity and even capability, but one would be mistaken to believe that this actually means being fully grown up.

**M**oving with the times and keeping pace with developments, means appreciating the present, careful not to take it for granted as a permanent state of affairs. In the same way, Multinational Corps Northeast is meeting current and future challenges, true to its motto: “Ready Today – Prepared for Tomorrow – Adapting for the Future”.

### Continuous Change as the Constant

NATO’s relevance as the backbone of European security remains unbroken. This is particularly true for the Baltic Sea region, where NATO territory directly borders with Russia. While a broad military invasion of Western Europe may no longer be something to be feared, a regional military intervention in the Baltic Sea region cannot be precluded, not least as Russia continues to use every opportunity to create divisions within NATO. In times of limited resources, the different priorities set by NATO can be best safeguarded by a threat-appropriate and regionalization of its military headquarters (HQ). This way, groups of states dedicate themselves to those threats that are a priority for them. A great advantage of this approach lies in the close cooperation between like-minded NATO member states with similar interests. A more regional NATO posture is to be understood as an



Photos, Graphics: MNC NC

**Multinational Corps Northeast celebrated its 20<sup>th</sup> birthday with the citizens of Szczecin.**



**Headquarters building of MNC NE in Szczecin – state-of-the-art infrastructure in Baltic Barracks**

### Author

Since September 2017, **LTC Ulrich Pfützenreuter** has been employed as Branch Head Policy in the J5 Division at HQ MNC NE. In this function, he is responsible for all corps policy matters.

essential contribution to an appropriate response capability of the Alliance. For the Baltic states and the Baltic Sea region, this regional responsibility lies with Multinational Corps Northeast (MNC NE) based in Szczecin, Poland.

## Political Symbol – and the Spirit of Integration

Headquarters Multinational Corps Northeast was established in the city of Szczecin in north-western Poland on 18 September 1999 upon the joint political decision of Denmark, Germany and Poland. Evolving from the erstwhile German-Danish Corps LANDJUT, it was the first time that, together with the Republic of Poland, a new NATO member was integrated into a multinational formation. Beyond its immediate military tasks, MNC NE became a political symbol of the accelerated transatlantic and European integration processes. The Corps is marked by a number of particularities concerning its creation, composition, tasks, as well as its current and future role. Both within the framework of the second round of NATO enlargement carried out in 2004 and in the course of growing military integration across Europe, these particularities were of increasing importance and continue to be so today.

Being the first newly established NATO military body east of the former Iron Curtain, the Corps attracted interest from new NATO member states from the very beginning. Only ten years after the Corps' inception, the number of participating nations has increased by eight. These are Estonia, Latvia and Lithuania (2004); Slovakia and the Czech Republic (2005); the US (2006); Romania (2008); Slovenia (2009); Croatia (2012); Hungary (2013); and Sweden as the first non-NATO partner in 2014. "In the spirit of integration" was the motto of the Corps at that time.

## Transformation

The decisions of the NATO Summits in Newport (Wales) in 2014 and Warsaw (Poland) in 2016 marked the first turning point in the orientation of the Corps. Having witnessed the events on the Crimean Peninsula and in eastern Ukraine in spring 2014, the transatlantic alliance decided to shift its main focus back to one of collective defence. In the process of implementing the measures contained in the Readiness Action Plan, the Szczecin-based HQ received a decisive role in reinforcing NATO's presence on its eastern flank: the aim - credible deterrence.



Command area of Multinational Corps Northeast

## From Headquarters to Command

The Corps has now grown to a current total of 25. The personnel strength has almost doubled, a new structure has been adopted and certification as a headquarters for high-readiness forces – as a Land Component Command – was achieved in 2017 with a preparation time of just 24 months. Furthermore, the structure of the Corps has changed from a headquarters to a command, complemented by various subordinate units. The Corps is responsible for the command and control of two newly established multinational divisions (Multinational Division Northeast (MND-NE) and Multinational Division North (MND-N)) in addition to four National Home Defence Brigade Headquarters located in Estonia, Latvia, Lithuania and Poland, four multinational enhanced Forward Presence (eFP) Battle Groups, and six NATO Force Integration Units. In this task, it is supported by the Command Support Brigade consisting of three Polish battalions and one German battalion. Thanks to their capabilities, HQ MNC NE can be independently deployed to and employed at any location within its area of responsibility.

In this regard, it is particularly important to have recourse to structures that already exist in the regions, to troops who know the situation in the field as a result of their permanent presence on the ground, i.e. with active situational awareness. To this end, MNC NE can draw on the NATO Force Integration Units (NFIUs) in Estonia, Latvia, Lithuania, Poland, Slovakia and Hungary. They serve as the "eyes, ears and mouthpiece" for the NATO Regional Land Component Command in Szczecin. The NFIUs are perfectly integrated with the local structures and represent the Alliance. Thanks to the excellent relations they enjoy with their respective host countries, they are the ones who enable the rapid

deployment of additional forces of Allied nations in the first place, thus substantially contributing to the credible deterrence and security in the region.

Since 2017, the enhanced Forward Presence Battle Groups are made up of four multinational formations under the command of lead nations United Kingdom, Canada, USA and Germany, which provide the visible contribution of the Allied land forces to deterrence on the north-eastern NATO flank on a rotational basis. These Battle Groups are firmly integrated into the respective national brigades of their host countries Estonia, Latvia, Lithuania and Poland. They provide a significant and highly valued reinforcement to these brigades.

## Regional Responsibility

The three turbulent and challenging years following decisions taken at the NATO Summits in Newport and Warsaw prompted new requirements for the development of the Corps in Szczecin: MNC NE is in the middle of implementing the next "evolutionary stage" – establishing itself as the Regional Land Component Command for the Baltic Sea region. Regionalization, regional focus and regional responsibility may sound unfamiliar at first for an organisation with a 360-degree defence approach, however, the multitude of unique tasks undertaken in the Szczecin-based HQ illustrate that credible deterrence is indeed the framework within which the Corps operates.

While the permanent tasks associated with crisis response are assigned to the eight other NATO Corps Headquarters on a rotating basis, MNC NE is the only permanent NATO Headquarters with a regional responsibility for the Baltic Sea region. It does not have to be deployed – it already is located in its area of operations.



More than “just” a Corps Headquarters, MNC NE is a command structure with a clear mission, area responsibility and subordinate units. In addition, the Corps is the only one assigned and subordinated to a Joint Force Command – JFC Brunssum – in peacetime. MNC NE is therefore already “on mission” and permanently capable of responding. Maintaining a common operational picture, planning and conducting exercises, as well as pursuing collaboration with military and civilian actors, ensures that MNC NE is aligned with the requirements and contingencies of real-time developments.

## Ready for Action at any Time

In numerous multinational exercises, the men and women of MNC NE have demonstrated that, in their function as a Corps HQ, they are able to command and control major formations, counter emerging crises and defeat threats to security in an assigned area of operations – thereby able to act inwards and downwards. The challenge now is to develop, implement and operate the upwards and outwards thinking both at HQ, as well as at the national and local decision-making levels. The objective is to further establish HQ MNC NE as the responsible regional entity and point of contact, and not only to maintain its level of performance and response capabilities, but to continue to develop them. The crucial aspect in this regard is to further strengthen confidence in cooperation across national borders, which is a precondition for continued joint efforts and necessary investment. It is all about establishing a credible deterrence against any threat to peace and security in the Baltic Sea region.

## New Cooperation Partners

The Baltic Sea serves as one of only two strategic access routes to the area of operations, together with the Suwalki Gap between Russian Kaliningrad and Belarus. The aim is therefore to foster closer cooperation between the naval forces in the future, beginning with initial visits and a mutual exchange of plans and information between Corps, the regional German Naval Headquarters in Rostock (Germany) and Allied Maritime Command (MARCOM) in Northwood (UK). Inspired by the HQ's coat of arms, the Pomeranian Griffin, an organic series of exercises named “GRIFFIN” will pool and coordinate the efforts of nations in the area of responsibility and NATO partners, as well as relieve them by creating synergy effects. Establishing a uniform data and information network provides a decisive contribution to interoperability of the individual land forces,



**The Baltic Sea region is a permanently assigned area of responsibility and area of operations of MNCNE.**



**VJTF deployment is subject to annual exercises.**

as well as to permanently monitor and update the cross-border operational picture.

## Cross-Border Cooperation

The desired end-state as a recognized Regional Land Component Command will be implemented in an inward- and outward-looking adaptation process. The personnel structure of HQ MNC NE – only introduced in 2015 – is currently undergoing a rapid adaptation in order to quickly implement the new tasks and missions in a more efficient and effective manner. Command and control exercises, cross-border deployments of units and formations right up to regular live-fire exercises, serve to constantly develop levels of interoperability. In doing so, using tactical English as the working language, command and control, as well as decision-making processes, technical standards and IT networks, are all harmonised and improved. Far more important, however, are cooperation and information exchange with national decision-makers and government agencies in Poland, Lithuania, Latvia and Estonia. It is imperative to create the preconditions with regard to planning, logistics and infrastructure in order to move NATO reinforcement forces more quickly to any potential deployment location on NATO's north-eastern flank. While in the Balkans and Afghanistan, smaller, brigade-size units (about 3,000 soldiers) were the operational

norm, here it is more about rapid deployment, integration and command and control of complex major formations up to division or corps strength. Up to 40,000 soldiers must be able to arrive and operate within the theatre of operations.

Detailed planning for this eventuality is already being carried out from Szczecin, helping to build mutual trust between partners and other actors that has as its foundation the pledge of mutual defence enshrined in Article 5 of NATO's treaty: One for all and all for one.

## Hub of Regional Cooperation

The annual cross-border deployment exercises of NATO's rapid response force (Very High Readiness Joint Task Force – VJTF) undertaken in peacetime conditions illustrates the ability of the Headquarters' members to fulfil the role assigned to the Regional Land Component Command. However, it is vital that both the national and local decision-making levels of all NATO and security partners are confident in including the Regional Land Component Command in each and every consultation, and in every undertaking in the Baltic Sea region; only then, can MNC NE successfully implement its mission as a land force integrator and coordination hub for the region – true to its motto: “Ready Today – Prepared for Tomorrow – Adapting for the Future”.

# Major Polish Procurement Programmes

**Michał Jarocki**

Over the next couple of years, the Polish Armed Forces will continue with the modernisation of its technical park.

With the addition of new weapon systems and the upgrade of those currently still in service, the Armed Forces intend to significantly enhance their operational and combat capabilities, therefore boosting country's security in an increasingly unstable international environment.

## Modernisation of Polish Leopard 2A4 MBTs

For the past several years, the modernisation of the fleet of 142 LEOPARD 2A4 main battle tanks to the 2PL standard has remained a top priority for the Polish Armed Forces. The project is managed by a consortium of ZM Bumar-Łabędy, a subsidiary of the Polish Armaments Group (PGZ, Polska Grupa Zbrojeniowa) and a number of other companies of the Group. German Rheinmetall Landsysteme is a strategic partner in the project.

The contract for modernising the first batch of 128 vehicles was signed at the end of 2015. At that time, it was expected that the project would be finalised by late 2020. The contract included an option for the upgrade of an additional batch of 14 MBTs, which was activated in 2018. The follow-on vehicles were to be transferred to the Army in 2021.

However, according to information provided recently by the Armament Inspectorate, which acts on behalf of the Polish MoD, these deadlines will not be met. According to current estimates, the full fleet of 142 modernised LEOPARD 2PL vehicles should be delivered to the Army by 31 July 2023 (with 43 vehicles in 2020).

On 24 December 2019, the Armament Inspectorate signed an amendment to the original agreement, covering additional works and services which need to be provided as part of the LEOPARD 2PL modernisation. As a result, €124M had to be added to the programme's budget, bringing the total cost of the LEOPARD 2PL modernisation project to €700M.

At the end of May 2020, the Polish Army took delivery of a number of prototype Leopard 2PL MBTs; the vehicles were to be delivered to the 10th Armoured Cavalry

Photo: PGZ



**At the end of May 2020, the Polish Army took delivery of a number of prototype LEOPARD 2PL MBTs. The long awaited delivery was preceded by a series of rigorous field tests, which were to confirm that the modernised platform meets the requirements of the Polish Army.**

Brigade stationed in Świętoszów shortly thereafter. In the two weeks preceding the delivery, intensive work was carried out to complete the tests of the LEOPARD 2PL MBTs and to begin handing over the vehicles to the Army.

"The delivery of the first units is a key stage in the LEOPARD 2PL programme. The acceptance of vehicles by the Ordering Party opens the possibility for our Consortium to deliver further batches of tanks. The LEOPARD 2PL is one of our priorities, and the last few weeks has been a time of intense work in which the new management of Bumar-Łabędy has been very much involved. We can already see the effects, and this is only the beginning, because the next, finished tanks are waiting for the start of handover procedures," said Andrzej Kensbok, President of the Management Board of PGZ.

## Delayed Delivery

Delivery of the first batch of modernised LEOPARD 2PL MBTs was significantly delayed due to ongoing tests of the platform and the requirement to implement a num-

ber of additional improvements, some of which were not originally taken into consideration.

"The tests of the LEOPARD 2PL prototype have not yet concluded due to a number of areas, which still need to be confirmed in terms of their compliance with several dozen requirements included in the Technical Specification," Maj. Krzysztof Platek, the spokesman of the Armament Inspectorate, informed in February 2020. He further added that despite the continued trials of Leopard 2PL prototypes, the whole modernisation programme is well underway. Furthermore, several dozen serial-production LEOPARD 2A4 MBTs were expected to be stored already at the ZM Bumar-Łabędy facilities, waiting for the upgrade. "The contractor verified the technical condition of the stored vehicles and is upgrading them in parallel to ongoing trials," Platek stated. "Particular MBTs are at different stages of the modernisation process," he added.

In reference to Maj. Platek's statement, PGZ confirmed shortly afterwards that "it is not a secret that the modernisation of LEOPARD 2A4 MBTs to the 2PL standard



is delayed. At the moment, we are in the final stages of testing the prototype vehicle, which was manufactured and delivered by our German partner Rheinmetall."

"We can confirm that the agreement contains several amendments, which clarify the terms and conditions it includes. It is a normal procedure in relations between a contractor and a contracting authority, especially in the case of such complicated and technically advanced programmes, such as modernisation of LEOPARD 2A4 MBTs."

"The deadline for the conclusion of the contract is an important factor, but not the only determinant for its proper finalisation, which has to be taken into consideration by both sides of the agreement. (...) Our priority is to deliver a product, which complies with the requirements of the MoD. We work hand in hand with representatives of the department to assure that the upgraded MBTs will reach the Army as soon as possible"

PGZ added that "irrespective of the ongoing trials of the LEOPARD 2PL prototype, ZM Bumar-Labedy is continuously engaged in the initial process of manufacturing and assembly of a number of LEOPARD 2A4 MBTs, which were delivered to the manu-



Photo: Michał Jarczyk

**According to estimates, the fleet of 142 modernised LEOPARD 2PL vehicles should be delivered to the Army by 31 July 2023. However, it remains unsure, whether the industry will actually be able to meet this goal.**

facturer for the awaited upgrade. These works will allow [us] to step up deliveries of manufactured MBTs, once the final configuration of the LEOPARD 2PL vehicle is accepted by the Army."

Overall, the LEOPARD 2PL modernisation programme includes the implementation of a number of new onboard systems and equipment to the platform. This includes: new/upgraded observation and aiming

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sites for the commander and gunner; improved ballistic protection of the turret; a new electronic system for turret traverse and cannon elevation; installation of more effective fire/explosion prevention system; a new command and control system; an additional APU generator; additional cargo carrying equipment and upgraded evacuation/towing system adjusted to the higher weight of the platform; a new fire control system; new ammunition (DM63 anti-tank and DM11 multi-purpose); and a day/night reverse camera for the driver.

### Upgrade of Obsolete T-72M1s

The future fleet of 142 modernised LEOPARD 2PLs will constitute the core of the Polish Army's main battle tank fleet, complemented by 105 relatively modern LEOPARD 2A5s. The country will also have to rely on 270 obsolete T-72M1, Soviet-era MBTs and 233 PT-91 TWARDY vehicles, which are a locally designed modification of the former platform. However, MBTs of Soviet/Russian origin offer minimal combat capability and are considered as not meeting the requirements of the modern battlefield in terms of firepower, speed, range, observation or survivability.

In a move to improve the combat capability of the most obsolete MBTs, in 2019 the Polish MoD launched a programme for an overhaul and minimal upgrade of slightly more than 300 T-72M1 vehicles. The agreement was signed at the end of July 2019 between the MoD and a consortium composed of the PGZ, ZM Bumar-Łabędy and Wojskowe Zakłady Motoryzacyjne (WZM). A number

Photo: PGZ



**Modified T-72M1 MBTs will form a new tank battalion, which will fall under the command of the 19th Mechanised Brigade from the city of Lublin. The battalion will consist of 58 modified T-72M1s. Eventually, the Brigade will be composed of two such units, what will bring the total number of MBTs at its disposal to 116**

of other public and private defence companies, like PCO or OBRUM, were also involved in the project.

The first batch of upgraded T-72M1 MBTs was delivered to the Polish Army in late 2019. Shortly thereafter, the vehicles underwent their first field trials. Deliveries of the modified T-72s should run until 2025, with 46 MBTs planned for hand-over in 2020, 35 in 2021 and in 2022, 34 in 2023, 33 in 2024 and 39 in 2025, bringing the total number to 230 vehicles. The contract has an option for an additional 88 MBTs to undergo modification. The overall programme's value is €382M.

The scope of works under the contract will be limited by the capabilities of the

local defence industry. "We are modernising the equipment, which is in the inventory of the Polish Army. Thanks to this upgrade, main battle tanks will be equipped with modern targeting, navigation and observation systems, as well as new digital comms," said Mariusz Blaszczak, the Minister of Defence. As a result of the overhaul, the T-72s' full operational capability will be resolved.

Despite the fact that the upgrade of T-72-M1 MBTs was long awaited, the programme has been subject to wide criticism. This is mostly due to its limited scope, due to which the vehicles will undergo only minor modifications, which will not significantly enhance their firepower or operational capability. The scope of upgrade works includes the installation of more efficient observation sets for the commander, driver and gunner, which will enhance the situational awareness of the crew, especially in low visibility conditions, as well as new digital internal/external communication systems, such as radios and FONET system from WB Group. Furthermore, the programme has a limited budget. It is a result of a number of other, higher priority modernisation or procurement projects being followed by the MoD at the moment. As a result, the upgrade plan does not include essential modifications such as the replacement of engines and transmissions (and installation of a modern, highly efficient powerpack), stabilized cannon with a fire control system, new ballistic protection kits, such as explosive reactive armour which is mounted on the modernised PT-91s or the procurement of new, more modern ammunition.

Photo: por. Robert Suchy, Polish MoD



**The future of Poland's programme to manufacture a next generation MBT remain uncertain. Especially at the time of the coronavirus pandemic, the country might abandon the plans of procuring a completely new MBT, and instead go for acquisition of a 2nd hand vehicle, like the ex-US M1 ABRAMS.**



## Poland Forms a new Tank Battalion in the East

A new tank battalion is being formed as part of the 19th Mechanised Brigade, stationed in the city of Lublin. The unit will be subordinate to the recently established 18th Mechanised Division, which will have the task of protecting Poland's eastern regions from any kind of military threat.

The formation of a new tank battalion commenced with the delivery of a batch of recently modified T-72M1 main battle tanks. Although it is not known how many tanks were delivered to the unit so far, a video published on social media shows at least two vehicles being transported by trailer trucks. Eventually, the battalion will consist of 58 modified T-72M1 MBTs.

The new tank battalion will be incorporated into the structure of the 19th Mechanised Brigade which will eventually be composed of two such tank units, bringing the total number of MBTs at its disposal to 116. The second tank battalion is currently serving under the command of the 21st Podhale Rifles Brigade, which is also part of the 18th Division, but will be transferred to the 19th Brigade in due course. In return, the 21st Podhale Rifles Brigade will take command of a motorised battalion, which is yet to be formed. The new unit will be



Photo: Michał Jaroński

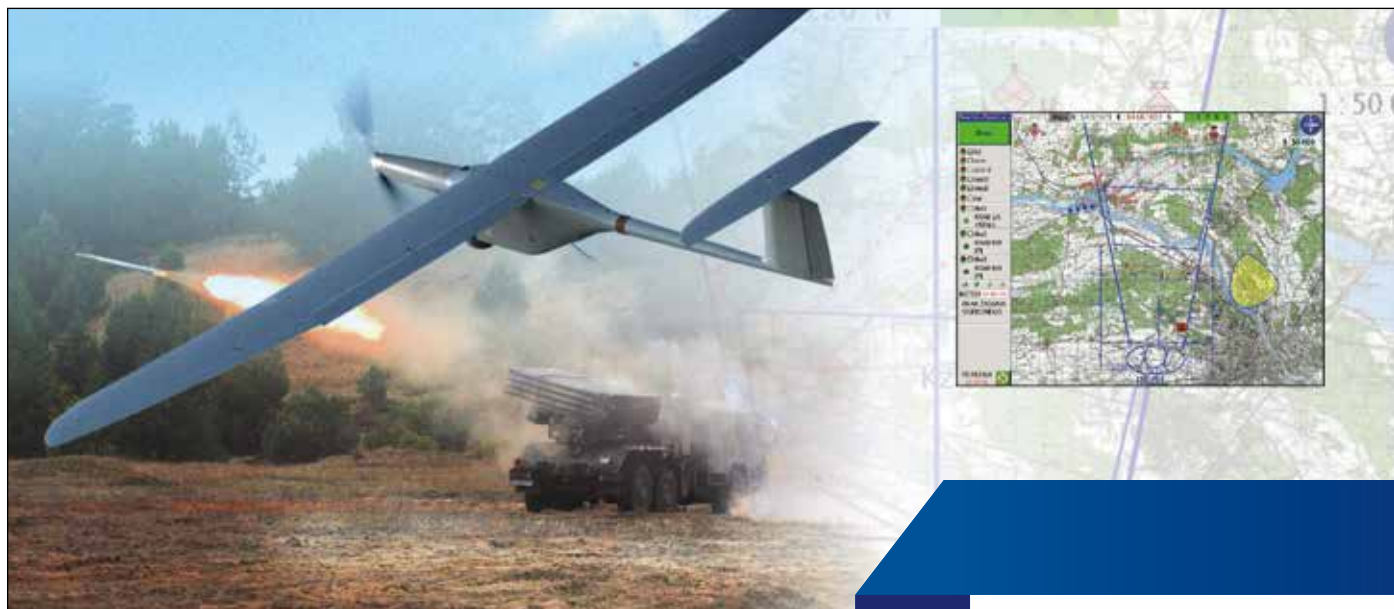
***Under the BORSUK programme the Polish Army intends to procure several hundred of modern, tracked IFVs.***

equipped with ROSOMAK / Patria AMV 8x8 armoured vehicles.

In addition to the tank battalions, the 19th Brigade will consist of the 19th command battalion, 3rd mechanized battalion, 19th mechanized battalion, 19th self-propelled artillery squadron and 19th air defence squadron. The 18th Mechanised Division is also composed of the 1st "Warsaw" Armoured Brigade, which until recently was subordinate to the 16th Mechanised Division.

## The Army Requires Next Generation MBTs

According to the Polish MoD, the programme to overhaul and upgrade the fleet of T-72M1 MBTs is just an interim solution. Its goal is to allow the Army to maintain a significantly high number of main battle tank in active duty units, until the time comes to gradually phase out the obsolete vehicles and replace them with newer



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Photo: MBDA



**The Polish MoD intends to procure a number of modern tank destroyers under the 'Ottokar-Brzoza' programme. The new platform will be armed with anti-tank missiles and equipped with advanced sensors, replacing Soviet-era BRDM-2 vehicles armed with obsolete 9P133 MALUTKA-P effectors.**

ones. "We all await and work for the start of construction of the new generation tanks by the Polish defence industry," acknowledged Minister Blaszczak.

The Polish MoD has already announced its intention to launch a 'Next Generation MBT' programme in the undefined future. It is expected to result in the procurement of several hundred of the next generation MBTs. These new vehicles will allow the Army to phase out obsolete T-72M1s and PT-91s, and will supplement the LEOPARD 2PLs and 2A5s in service for the time being.

At this moment, it remains unclear which path the Polish authorities will choose in order to successfully launch and conclude the 'Wilk' programme. One plan calls for designing and developing the new platform independently, using the manufacturing

capabilities of local industry and scientific institutions and with minimal support from foreign partners.

"We are restoring manufacturing capabilities as regards to armoured vehicle technology. (...) Restoring this capability (...) is another step towards establishing an industrial base for future works on the new main battle tank for the Polish Armed Forces," Witold Słowik, the President of the Management Board of the PGZ at that time, admitted in 2019.

The alternative is that Poland develops a next generation MBT in cooperation with foreign partners. The country could apply for example to become a member of one of the pan-European projects, such as Franco-German Main Ground Combat System (MGCS), in which Poland shows a considerable level of interest.

Over the past several months, Polish authorities have signalled their interest in the project and expressed the intention of becoming a part of it. In a commonly held view, becoming a partner in the MGCS project could significantly benefit the local defence industry and in the long term would allow Poland to modernise its obsolete MBT fleet with the introduction into service of a next generation, European-designed platform.

Regardless which path the Polish authorities choose to follow regarding the procurement of the next generation of MBTs, it seems obvious that the country would need to be open for cooperation with foreign entities and political partners. Developing the new combat platform either independently or in partnership with Germany and France under the MGCS project, Poland would also seek to allow its own defence manufacturers to benefit from the programme.

However, the developments of the past few months, especially with the Coronavirus pandemic, coupled with the economic slowdown, might result in a redefinition of MBT procurement goals by the Polish MoD. It is very likely that the project will be delayed, or even cancelled, even before it is actually ever launched.

Nevertheless, the Polish Army is well aware of the fact that the use of PT-91 and T-72M1 Soviet-era MBTs has almost run its course, and the further use of these platforms is proving to be ineffective when it comes to boosting the country's security. Therefore, the MoD might eventually decide to acquire a significant batch of 'of-the-shelf' or even second-hand and Western-origin MBTs. For the past couple of years, the idea of acquiring ex-US M1 Abrams tanks has come to light. If this were to happen, it would not come as a total surprise since Poland has been extensively procuring US-manufactured weapon systems for decades, as part of its investment in the Polish-US alliance and security of the country.

However, if such an eventuality were to occur, it would lead to the further 'fragmentation' of the Polish MBT fleet, which during the transition period would be composed of Soviet-era PT-91s and T-72M1s, ex-German LEOPARD 2PLs and 2A5s and ex-US A1 ABRAMS MBTs. It would also further complicate the logistical support of the operator and lead to increased costs in maintenance and overhaul of the Army's operational vehicles.

### New IFV will Change the Posture of the Polish Army

Under the BORSUK programme, the Polish Army intends to procure several hundred

Photo: Michał Jaroński



**According to current plans of the Polish MoD the upper sphere of the future Polish integrated air-and-missile defence system will be constituted by the WISLA medium-range AMD system.**



modern, tracked infantry fighting vehicles (IFV). According to some estimates, the country has a requirement for over 2,000 such vehicles. They will replace the currently operated, Soviet-era BWP-1s, which are obsolete and no longer meet the requirements of the modern battlefield.

The new IFV platform is designed and developed by the local defence industry with Huta Stalowa Wola, a subsidiary of PGZ, the leader of the project. During the International Defence Industry Exhibition (MSPO) 2019 in Kielce, the manufacturer presented a prototype of the next generation swimming IFV (Nowy Bojowy Pływający Wóz Piechoty, NBPWP).

The prototype of BORSUK/NBPWP has already undergone a series of intense static and dynamic field trials, during which a number of its capabilities, such as speed, manoeuvrability, survivability and fire-power were tested. The manufacturer also had to confirm that the platform complied

with the high technical and tactical requirements of the Polish Army.

The future Polish IFV will be equipped with a locally designed 30mm turreted, remote-controlled weapon system (Zdalnie Sterowany System Wieżowy, ZSSW-30), which will also become standard equipment in the currently operated Rosomak/Patria AMV 8x8 armoured personnel carriers. The ZSSW-30 turret was designed to fight, destroy and suppress enemy light and heavy armoured targets and other objects – including the enemy's infrastructure – in different climatic conditions, and to provide fire support for units during combat operations, at any time.

According to the manufacturer, the new Polish IFV platform will have a swimming capability, allowing it to cross wide water obstacles, as well as to operate in diversified terrain and various weather conditions. Furthermore, the NBPWP vehicle will be characterised by its high manoeuvrability and

Photo: MBDA



**WISLA will be complemented by the NAREW short range AMD system, which is expected to utilise the IBCS command system.**

ability to be easily transported by air or land. The next generation Polish IFV will provide a high level of ballistic protection for the crews and dismounted soldiers, able to withstand direct impact from firearms and rocket-propelled grenades, as well as the explosion of IEDs or mines. The manufacturer intends to develop several variants of the NBPWP, from a light, swimming vehicle to a heavily armed combat platform.

### Modern Tank Destroyers to Protect the Suwalki Gap

Under the current iteration of the 'Ottokar-Brzoza' programme, Poland intends to procure a number of modern tank destroyers. According to the Armament Inspectorate, five local and international manufacturers have shown interest in the project and submitted their applications to take part in the technical dialogue procedure. This process precedes all major defence-related tenders in Poland.

The future tank destroyers of the Polish Army will be armed with anti-tank missiles and equipped with advanced sensors. They will replace the currently operated, Soviet-era BRDM-2 vehicles, armed with obsolete 9P133 MALUTKA-P effectors. BRDM-2 no longer meet the requirements of the modern battlefield and do not provide enough protection for the crew.

The current technical dialogue is actually a second iteration of the project. Its goal is to allow the Armament Inspectorate to determine and better define a number of technical requirements for the future tank destroyer platform. The initial procedure allowed only tracked vehicles to be considered, while the current round also includes wheel-based platforms.

Photo: Michał Jarczyński



**By 2022, Poland should take delivery of all 6 batteries of the PILICA VSHORAD system. Each battery will consist of 6 fire units, a command post, a radiolocation station, artillery tractors and ammunition supply vehicles.**

Photo: 10<sup>th</sup> Armoured Cavalry Brigade, Polish MoD



**The SONA VSHORAD system will be capable of detecting and destroying hostile aerial targets such as manned and unmanned aerial vehicles or rockets, artillery, and mortar rounds. It will replace obsolete ZSU-23-4 Shilka) air defence systems.**

Photo: kpt. Robert Suchy, Polish MoD



**By the end of 2021, the Polish Army should take delivery of the last of 79 POPRAD anti-aircraft missile systems.**

The list of companies participating in the technical dialogue includes: AMZ Kutno, MBDA UK, Lockheed Martin Global, Rheinmetall Defence Polska – a subsidiary of Rheinmetall Landssysteme GmbH and state-owned PGZ – which acts on behalf a number of its subsidiary companies, such as Rosomak, OBRUM, HSWola, Jelcz, WZM or Wojskowe Zakłady Uzbrojenia.

Lockheed Martin and MBDA-UK are expected to respectively offer their renowned anti-tank missile systems, HELLFIRE and BRIMSTONE 2, as the main armament of the new tank destroyer. Both companies are ready to integrate their missile systems with any kind of tracked or wheeled vehicles selected by the Polish Army.

Which platform it will be, depends of course on the submitted offers. Rheinmetall and AMZ Kutno could present a number of platforms ready for integration with anti-tank weapon systems. However, it is PGZ which seems to be the frontrunner in terms of providing the base frame for the future tank destroyers, as its subsidiaries have already delivered a number of tracked and wheeled armoured vehicles to the Polish Armed Forces, such as the KRAB/K9 or ROSOMAK/PATRIA AMV 8x8. Therefore, the selection of one of these types of chassis for the 'Ottokar-Brzoza' programme would be less risky in terms of operability of the new platform and could allow the generation of extra savings in the programme's budget.

## New Air and Missile Defence Assets

In the new PMT, the Polish MoD confirmed its intention to continue the modernisation of the country's medium and short range air-and-missile defence assets with the procurement of new systems under the WISLA and NAREW programmes. In the first phase

of the WISLA programme, Poland plans to procure two Patriot-based batteries in the initial 3+ configuration, along with the Northrop Grumman-developed IAMD Battle Command System (IBCS) and 208 PAC-3 MSE missiles from Lockheed Martin. The Letter of Acceptance (LoA) regarding this acquisition was signed on 28 March 2018. Deliveries are expected by 2022 and Initial Operation Capability (IOC) between 2023-2024. However, at this time it remains uncertain if these deadlines will be met due to the Coronavirus pandemic, which has affected the speed of implementation of the contract's terms. Furthermore, both parties are still expected to finalise negotiations of the second phase of the WISLA programme, which calls for the procurement of an additional six PATRIOT batteries.

Overall, the WISLA programme will also see the purchase of a new 360° AESA-GaN radar, in the same configuration as the future US Army's radar system, although the MoD is aware of the fact that the eventual acquisition of the current 90° sector scan radar from Raytheon, would be a more affordable option. Poland has also yet to decide on the future low-cost interceptor, which will supplement the PAC-3 MSE missile. In this regard, Raytheon's SKYCEPTOR was considered as the most likely solution, however, MBDA's Common Anti-Air Modular Missile-Extended Range (CAMP-ER) interceptor is apparently also being taken into consideration.

The NAREW is expected to utilise the IBCS command system, therefore making it interoperable with Wisla/Patriot batteries, and allowing the creation of an integrated medium/short-range AMD system functioning under one command structure. NAREW will replace the currently operated, legacy 2K12 KUB and 9K33 OSA AMD systems.

A number of manufacturers have shown interest in the Polish NAREW programme, including Raytheon/Kongsberg and MBDA-UK. The former consortium is willing to offer Poland its proven and globally popular National Advanced Surface-to-Air Missile System (NASAMS), which has already been procured by eleven countries, such as the US, Norway, Finland, Spain, the Netherlands, Oman, Lithuania, Indonesia, Australia, Qatar, and one undisclosed customer. NASAMS utilises a number of technological solutions, which are both proven and affordable, such as the AIM-120 AMRAAM missiles, which are already operated by the Polish Air Force.

MBDA-UK offers a family of CAMM surface-to-air missiles integrated into the IBCS-based command systems and is interoperable with Polish-manufactured observation, tracking and acquisition systems. The manufacturer declares that it is ready to establish cooperation with a number of local companies, most of which would come from the Polish Armaments Group (PGZ, Polska Grupa Zbrojeniowa), such as Pit-Radwar, Mesko, Jelcz, HSW, CTM and WZE in Zielonka.

## VSHORAD Systems still Needed

Despite already having spent a lot of time and effort on procurement – or at least selection – of the preferred medium and short-range AMD systems, like the WISLA and NAREW AMD systems, the Polish MoD has not forgotten about its requirement for a very short-range solution, which is the very essence of every complementary air-and-missile defence system.

In November 2016, the Polish MoD signed a contract for the delivery of six batteries of the PILICA VSHORAD system. The contract has a value of over €169M. Deliveries should conclude by 2022.

The PILICA programme envisions the procurement of six anti-aircraft AAA/SAM batteries, each consisting of six fire units, a command post, a radiolocation station, artillery tractors and ammunition supply vehicles. PILICA will be fitted with 23 mm AA autocannons and locally designed GROM/PIORUN missiles. The system will be manufactured and delivered by a 'PGZ-PILICA' consortium, composed of PGZ, Pit-Radwar, PCO and Zakłady Mechaniczne Tarnów, acting as the system's integrator.

In late May 2020, the Polish Armament Inspectorate, which acts on behalf of the MoD, launched a technical dialogue procedure under the SONA programme, which will lead to working out the main technical and operational requirements for another VSHORAD system.



SONA should be capable of detecting, identifying and destroying a wide range of potentially hostile aerial targets, such as manned fixed and rotary-wing aircraft, unmanned aerial vehicles or rockets, artillery, and mortar rounds (C-RAM). The new system will have to feature a high level of mobility, and as such will be fitted on a tracked or wheeled vehicle, in order to keep up with detachments of armoured or mechanized brigades.

The SONA system will replace the currently operated ZSU-23-4 SZYLKA (SHILKA) air defence systems and the local modification, ZSU-23-4MP BIALA. SHILKA, which originated in the late 1950s, is an outdated, obsolete system, no longer meeting the requirements of the modern battlefield. BIALA is only slightly more capable, however, it also fails to provide the required operational potential.

## More POPRAD Anti-Aircraft Missile Systems for Poland

In late June 2020, the Polish MoD informed that another batch of POPRAD anti-aircraft missile systems had been delivered to the Army. Delivery included an unspecified number of systems which were handed over to the 15th Giżycko Mechanised Brigade.

In total, the Polish Army will take delivery of 24 POPRAD anti-aircraft missile systems this year, including 22 serial production sets and two prototype vehicles, which will be adjusted to the required standard. Aside from the 15th Giżycko Mechanised Brigade, POPRAD systems will be handed over to the 17th Mechanised Brigade and the 19th Lublin Mechanised Brigade, as well as to the Air Force Training Centre.

By the end of 2021, the Polish Army should receive all 79 POPRAD systems, including the two aforementioned prototype vehicles. These will be delivered under the terms of the agreement signed in 2015 with the system's manufacturer, the Warsaw-based Pit-Radwar, which is a subsidiary of the PGZ.

The POPRAD self-propelled anti-aircraft missile system is intended for engaging low and medium altitude targets using heat-seeking missiles. Its basic functions are accomplished by a tracking-aiming observation system, fitted with a number of electro-optical sensors (thermal camera and laser range-finder).

The system also consists of a quadruple launcher of Grom heat-seeking missiles from Mesko, another subsidiary of PGZ. POPRAD uses a fire-guiding computer and a navigation and orientation system.

Photo: st. szer. Wojciech Krol, Polish MoD



**Under a multi-year project to modernise Polish Army's field artillery the MoD intends to acquire five REGINA artillery squadrons composed of 155mm KRAB self-propelled howitzers based on the K9 THUNDER from South Korea.**

Target acquisition is based on a digital data radio-link from the automated air defence command and control system or is worked out autonomously. The missile launching system is mounted on the ŻUBR-P all-terrain, armoured vehicle manufactured by the local company AMZ Kutno.

## Additional RAK Mortars for the Polish Army

In late May 2020, the Armament Inspectorate and a consortium of Polish defence companies signed an agreement for the delivery of an additional 40 120mm RAK mortar systems and 20 command post vehicles (AWD) manufactured by Huta Stalowa Wola and ROSOMAK SA, subsidiaries of the PGZ.

Under the terms of the agreement, deliveries should commence in 2022 and run through to 2024. The deal has a value of €159M. The number of additional RAK mortar systems and command post vehicles is equivalent to five artillery companies. Each unit consists of eight RAK mortars and four AWDs, as well as two artillery reconnaissance vehicles (AWR), three ammunition supply vehicles 8x8 (AWA), a mobile workshop 6x6 (AWRU) and a support vehicle 6x6 (WZ).

"The modernisation of the Polish Armed Forces relates to the procurement of modern combat systems. The RAK is one of the most technically advanced self-propelled mortar systems in the world, designed by Polish engineers," said Andrzej Kensbok, President of the Management Board of PGZ.

The Polish Army currently operates 64 RAK mortar systems and 32 AWDs, which were ordered in 2016. The second agreement, covering the delivery of an additional 16 RAK mortars and eight AWDs, was signed last year. "The agreement for delivery of additional RAK mortar systems is a confirmation of high quality of weapon systems manufactured by PGZ. The initial order was finalised without any delays. We are currently engaged in the finalisation of the second agreement,

signed in 2019," said Bartłomiej Zajac, President of the Management Board of Huta Stalowa Wola.

## Rosomak-S AMVs for Poland

In spring 2020, the Minister of Defence, Mariusz Blaszczak, announced that his Ministry intends to procure 60 ROSOMAK-S armoured modular vehicles designed to carry SPIKE anti-tank guided missiles (ATGM). According to Blaszczak, the contract

Photo: Polish MoD



**In May 2020, the Polish MoD ordered additional 40 120mm RAK mortar systems and 20 command post vehicles (AWD) from Huta Stalowa Wola and Rosomak, subsidiaries of the PGZ.**

with the local ROSOMAK company, PGZ's subsidiary, should be signed in 2020.

ROSOMAK-S is technically similar to the baseline ROSOMAK armoured modular vehicle, a local derivative of the Finnish PATRIA AMV. The main difference is that ROSOMAK-S is not equipped with any weapon systems (ROSOMAK in the standard configuration for the Polish Army is fitted with a 30mm HITFIST turret). Instead, each vehicle can carry up to two SPIKE ATGM launchers along with missiles and operators.

Today, only a marginal number of ROSOMAK-S vehicles are used in the Polish Army. They serve in the 12th and 17th Mechanised Brigades and provide support to artillery companies equipped with 120mm RAK self-propelled mortar systems.

# Another Decrease in Polish Defence Exports

Michał Jarocki

**According to official statistics for 2019, Poland experienced another decline in the export of its locally manufactured weapon systems and military equipment.**

The country's defence industry exported goods and services worth approx. €390M last year, whereas in the preceding year, the value of arms exports was closer to €487M. In comparison to previous years, Poland's defence export revenue significantly dropped over the course of 2019. The decline of nearly €100M year-on-year is notable and can most probably be inter-

## Biggest Importers

In 2019, the US was the main importer from the Polish defence industry. However, most of the products and services of interest to US importers were related to local subsidiaries and contractors of the American global defence industry, such as PZL Mielec, Lockheed Martin's company, the

Hawk helicopters over the Atlantic in 2019. This was followed by category ML4, which includes "bombs, torpedoes, rockets, missiles, other explosive devices and charges and related equipment and accessories, and specially designed components," which is the field of expertise of the local Nitro-Chem company, a subsidiary of the Polish Armaments Group (Polska Grupa Zbrojeniowa, PGZ).

The exports to the US in 2019 also included category ML1 equipment, including "smooth-bore weapons with a calibre of less than 20 mm, other arms and automatic weapons with a calibre of 12.7 mm or less and accessories, and specially designed components, as well as from ML11, 'electronic equipment, not controlled elsewhere on the EU Common Military List, and specially designed components.'"

The second most profitable export market for Poland's defence products in 2019 was Ukraine. Procurement orders from Ukraine were dominated by weapon systems from categories ML4, ML3, 'ammunition and fuse setting devices, and specially designed components' and ML6, 'ground vehicles and components.'

The final place on the podium was taken by Algeria, which in 2019 focused on the procurement of equipment from categories ML6, ML5, 'fire control, and related alerting and warning equipment, and related systems, test and alignment and counter-measure equipment, specially designed for military use, and specially designed components and accessories,' ML18, 'production equipment and components' and from category ML10. Also on the list of customers in 2019 were Thailand and Spain.

## Biggest Virtues

Perhaps private entities are the most successful in selling their products and services, not only on the local market, but also abroad. WB Group for example, a globally active and internationally active company, offers a wide range of innovative, modular and highly efficient products, which meet the demands of the most rigorous clients, such as the US Armed Forces.

WB Group is the largest technology company in Poland, offering state-of-the-art solutions for international armed forces in

Photo: PGZ



**PGZ and a number of its subsidiaries has an extensive and ever growing experience in overhaul, upgrade and modernisation of heavy, armoured vehicles. Currently, the Group and its companies are involved in the modernisation of 142 LEOPARD 2PL main battle tanks to the 2PL standard.**

preted as the first sign of a more chronic problem in the country's defence industry. In 2015, the Polish defence industry exported special products and services worth around €421M. Two years later, the value of exports increased to €472M. This growth was due in no small part to a number of multi-year export contracts signed in recent years, many of which have recently been finalised and therefore no longer have any effect on the overall year-on-year export revenue.

largest Polish manufacturer of aircraft, aerostuctures and helicopters.

Most of the revenue from defence-related trade with Washington was from products coded as ML10 in the EU's Common Military List Categories - that is "aircraft, lighter than air vehicles, unmanned airborne vehicles, aero-engines and aircraft equipment, related equipment and components, specially designed or modified for military use." For example, according to public information, PZL Mielec exported eight Black



the following areas: observation and reconnaissance systems, communications, command and battlefield management systems, fire control systems, strike systems, IT and cybersecurity systems, service, support and modernisation of the military equipment and e-mobility solutions.

The key advantage of WB Group's products is their modularity and scalability. This allows a large number of product configurations, making it well suited for multi-domain battlefield management in accordance with user expectations.

As a global company, WB Group has offices and technological centres in the most developed regions all over the globe. From Asia and the Middle East, to the US, the Group employs over 1,200 staff, more than a half of whom are engineers and R&D staff.

The main areas of WB Groups business activities are:

- multi-domain battlefield communications & command systems, which are the flagship solutions in WB Group's portfolio. Currently, WB Group's C4ISR systems are operated not only by the Polish Armed Forces, but also by the armed forces of United States, Sweden, Malaysia, Hungary, Slovakia and India;
- observation and reconnaissance systems, which provide a quick enemy information acquisition and efficient situational awareness at every level of command;
- strike systems, which differentiate themselves by a quick reaction and threat elimination capability, essential to mission accomplishment;
- military vehicles modernisation and support, in which the company has years of expertise. Today, WB Group offers comprehensive, advanced communications, command and electromechanical fire

command systems operating according to NATO standards;

- IT systems, since WB Group is an engineering technology centre gathering a group of renowned experts in the field of dedicated electronic solutions, special communications, cryptography and electronic solutions;
- e-mobility solutions, in which WB Group offers innovative solutions in the field of electromobility. The team of engineers is developing the mobile transport platforms for heavy loads and integrating the growing autonomy of cars.

Photo: st. sz. Wojciech Król, Polish MoD



**PZL Mielec, a Lockheed Martin company, specialises in the production of aircraft, aerostructures and helicopters. For the past couple of years the entity focussed on the manufacture of BLACK HAWK helicopters.**

**NITRO CHEM**



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## Leading European supplier of explosives and filling services

Chemical Works NITRO-CHEM JSC POLAND

NITRO-CHEM is the biggest EU producer of explosives like TNT, RDX, HMX, NTO and their compositions. Company provides filling services of aerial bombs, high calibre projectiles, antitank and sea mines, charges and boosters. Owned installations allows to fill any shape with explosives using cast press or screw-threading method.

We invite You to contact us and join our worldwide business partners group.

Photo: por. Robert Suchy, Polish MoD



**WB Group is the largest technological company in Poland, offering state-of-the-art solutions for international armed forces.**



Photo: Michał Jaroński

**One of WB Group's flagship products is a mini class UAV FLYEYE, a modular system characterised by the ease of assembly and disassembly. Launch readiness can be achieved in less than 10 minutes.**

### A Growing list of Products

The list of the most popular WB Group's products includes C4I Systems, a new generation of systems designed to ensure communication on the battlefield and increase security and interoperability. The company offers a wide range of products within the C4I family of systems, such as: FONET Digital Communication Platform, comprising a single scalable, modular and platform-agnostic solution. The FONET's hardware allows end-users to select appropriate mission-relevant C4I configurations for tactical ground vehicles; TOPAZ Integrated Combat Management System, a fully Integrated Combat Management System enhancing situational awareness and providing support in strategy, mission planning; observation and command system U-GATE, a C4ISR-E(xtended) system which enables Special Forces to direct strikes from loitering munitions; Universal Artillery

Calculator UKART-2, which may be used to calculate firing solutions for any type of armament and acts as an alternative computational asset to be compared with TOPAZ; the family of personal communications systems, including ultra-modern, user-friendly military radios and software with a reliable voice and data transmission at all operational levels, such as PERAD 6010 or COMP@N.

WB Group is the leader in the field of UAV technology, offering a wide range of unmanned platforms, loitering munitions, command systems and specialist war- and multipurpose heads. One of its flagship products is a mini class UAV FLYEYE, a modular system characterised by the ease of assembly and disassembly. Launch readiness can be achieved in less than ten minutes. It is hand-launched, and has no additional equipment, which allows it to be operated in tight spaces and confined areas.

The list of UAV products in WB Group's portfolio also includes: FT5 Tactical UAV, a short-range tactical unmanned aerial platform intended for the execution of missions requiring reliability and prolonged flight endurance and WARMATE R Loitering Reconnaissance System, a fixed-wing unmanned aircraft that is used for intelligence and surveillance, designed to complement the WB Group's observation capabilities.

WB Group has many years of experience in the design and production of technologically advanced reconnaissance systems. Automation and battlefield management have led to the development of

### NITRO-CHEM: An Explosive Reputation Beyond Poland

As a member of the Polish Armaments Group (PGZ), **Chemical Works "NITRO-CHEM" JSC**, is an experienced and globally-renowned producer of explosives and leading European supplier of explosives and filling services based in Poland. For more than 70 years, NITRO-CHEM has provided its products for the Polish Armed Forces and some of the world's largest ammunition producers.

NITRO-CHEM has at its disposal dedicated installations for manufacturing explosives, as well as expert production lines designated for filling ammunition and

Photo: NITRO-CHEM



**Powderised TNT manufactured by NITRO-CHEM**

producing commercial blasting materials. It specialises in production of high-energy materials like TNT, RDX, HMX, NTO and its compositions. NITRO-CHEM provides filling services for tank and artillery ammunition, aerial bombs, anti-tank and sea mines, demolition charges and boosters.

As another international Polish success story, today, NITRO-CHEM export its products to many countries worldwide, including USA, Great Britain, France, Germany, Spain, Sweden, Turkey and Israel.

NITRO-CHEM's solid leadership team recognises that its fruitful and long-term cooperation in export markets – on almost on all continents – results from investing in and developing stable and healthy customer relationships. This is at the foundation for creating and projecting the Company's positive image abroad and reinforcing NITRO-CHEM's reputation for innovation and openness to various forms of business cooperation.

#### Chemical Works "NITRO-CHEM" JSC POLAND

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strike systems that can adapt to the requirements of a multi-domain battlefield. The list of products in this area includes: the SWARM System, a state-of-the-art, complex reconnaissance and strike system integrating WB Group's UAVs and strike vehicles; WARMATE loitering munitions, a combat unmanned aerial vehicle (CUAV), which is a multi-role system performing multiple tasks depending on a type of the head installed; and WARMATE 2 Loitering Munitions, a new and upgraded version of one of WB Group's flagship product.

The WB Group offers modernisation packages for older types of weapon systems and arms equipment, such as electromechanical equipment for howitzers and self-propelled mortars, like the 155 mm KRAB and 120 mm Rak, the self-propelled multiple rocket launcher Langusta, anti-aircraft artillery systems, helicopter armament and naval artillery systems.

### Continued Success on Export Markets

In the summer of 2020, WB Group announced an extension of the licence agreement for the production of the digital vehicular communication platform FONET in the United States.



Photo: PGZ

**PGZ has also an extensive experience in production, surveillance and the overhaul of the family of ROSOMAK 8x8 armoured vehicles operated by the Polish Armed Forces. ROSOMAK 8x8 is the licensed version of the Finnish PATRIA AMV 8x8.**

Comprising a single scalable, modular and platform-agnostic solution, FONET hardware allows end-users to select the most appropriate mission-relevant C4I configurations for tactical ground vehicles and small maritime craft in order to ensure full compatibility between voice communications and data exchange.

"The American licensee was intent on extending the contract, as the FONET system continues to be rolled out on military vehicles across the US Army and their allies. Thanks to the cutting-edge technological solutions, we're more than capable of negotiating the most favourable terms with the American partners," said Adam Bartosiewicz, Vice President of WB Group.

The licence agreement between WB Electronics and L3Harris, beneficial to both parties, has been renewed for a further three years, and stipulates the opening of several maintenance centres in the US.

"It is worth noting that FONET is ahead of its time. It has been delivered unchanged to the US Army and allied countries through military aid for over a decade," added Bartosiewicz.

FONET has established the binding common standard in the Polish Army. It has outpaced anything available on the market and forged ahead of its competitors. In this regard, FONET has completely changed the approach to vehicular systems' integration in the Polish Armed Forces.

"FONET, exported to many countries all over the globe, is considered the most advanced internal communication system designed for military vehicles. Several comparative tests with other vehicular communication systems have clearly shown the indisputable advantages of the system, both in terms of functions and economic aspects," stated Bartosiewicz.

FONET is constantly being developed to meet the end-users' requirements. The



Photo: Michał Jarocki

**HSW plays a major role in a number of projects, including production of 155mm KRAB self-propelled howitzers...**



Photo: Michał Jarocki

**...and 120mm RAK self-propelled mortar systems.**

system creates the base for the battlefield management systems such as the TOPAZ Integrated Combat Management System, manufactured by WB Group.

### State-Controlled Export Initiative in a State of Collapse

State-owned companies of the Polish defence industry, especially those grouped within PGZ, are less active and therefore unsuccessful on export markets than private entities. For many years, their main area of activity was to provide support in the technical modernisation of the Polish Armed Forces, therefore most of their marketing and sales activities were directed internally. However, PGZ and its particular subsidiaries have gained extensive knowledge and experience in a number of fields related to the design and manufacture of modern and operationally capable technological solutions, as well as the overhaul and modernisation of currently operated weapon systems. The Polish Armaments Group is the biggest capital group in the country's defence industry. It concentrates several dozen production plants, service facilities and research centres.

The Group designs and manufactures innovative systems and solutions used by the Polish Armed Forces and allied nations. Among the most crucial products in PGZ's portfolio are: radiolocation and radar systems, small arms, optoelectronics, wheeled and tracked armoured vehicles, various calibre artillery systems, unmanned aerial vehicles and battle management support systems.

PGZ is the main industrial partner of the Polish MoD in its Technical Modernisation Programme. Furthermore, over the years, the Group has entered into partnerships with some of the largest defence manufacturers in the world. These partnerships enhance its position on the global market and allow the company to promote and present its most modern and innovative products for potential export clients.

Among the products and services provided by PGZ and its subsidiaries, which might elicit interest of potential export clients, are armoured and automotive systems. PGZ's competences relate especially to two fields of specialisation: the modernisation of armoured vehicles by enhancing their operational and combat capabilities, as well as extending their service life, and the modernisation of missile and barrel artillery.

Over the past two years, PGZ and its subsidiaries have gained extensive knowledge and experience in carrying out a major, multi-billion project for the Polish Armed Forces, namely the modernisation of a



Photo: Michał Jaroński

**PGZ and its subsidiaries, including HSW, are engaged in the BORSUK programme, which calls for development of a modern infantry fighting vehicle fitted with ZSSW-30 remote controlled turret (with a BUSHMASTER 30mm cannon and launchers for SPIKE anti-tank guided missiles). ZSSW-30 will also be adapted for use on ROSOMAK 8x8 vehicles.**

fleet of 142 LEOPARD 2A4 main battle tanks to the 2PL standard. The programme calls for the improvement in the tank's firepower, ballistic protection and situational awareness, as well as crew safety and comfort. The value of the contract, together with annexes concluded in 2018-2019, is PLN3.29Bn.

The project is conducted by a consortium of PGZ and Zakłady Mechaniczne Bumar-Łabędy in cooperation with Germany's Rheinmetall. A number of other PGZ subsidiaries, such as PCO, OBRUM, Rosomak, Wojskowe Zakłady Motoryzacyjne from Poznań and Zakłady Mechaniczne Tarnów, are involved in the project.

The Group also has extensive experience in production, surveillance and the overhaul of the family of ROSOMAK 8x8 armoured vehicles operated by the Polish Armed Forces. ROSOMAK 8x8 is the licenced version of the Finnish Patria AMV 8x8. Since 2004, over 820 vehicles have been delivered to the Polish Army and a few foreign clients, such as the United Arab Emirates, in many dedicated variants.

A number of PGZ subsidiaries provide maintenance and repair services for foreign-origin vehicles used by the Polish Armed Forces. Wojskowe Zakłady Motoryzacyjne from Poznań specialise in the servicing of LEOPARD 2A5 main battle tanks within the newly completed Service and Logistics Centre, while Zakłady Mechaniczne Bumar-Łabędy in Gliwice are currently engaged in the upgrade and overhaul of T-72M1 tanks.

### HSW's Heavy Armoured Vehicle Specialisation

Huta Stalowa Wola (HSW) armaments factory is one of PGZ's most notable subsidiar-

ies. It provides the Polish Armed Forces with modern artillery systems; it also develops innovative technologies in the field of armoured and mechanised platforms.

In recent years, due to the change in the security situation in the Central and Eastern Europe region, Poland has identified a number of requirements in the field of artillery and armoured vehicles, modernising the existing weapon systems or procuring completely new units. HSW plays a major role in a number of projects, including:

- 'Regina' artillery squadrons based on 155mm KRAB self-propelled howitzers (SPH);
- RAK 120mm self-propelled mortars based on fully autonomous and automatic M120K mortars with command and logistic vehicles;
- KRYL 155mm light self-propelled howitzer on a wheeled chassis;
- LANGUSTA-2 in-house proposal for further modernisation of the BM-21 / WR-40 / RM-70 rocket artillery systems with full automation of fire settings and automatic setting of the artillery part on target;
- BORSUK – development work on the new amphibious infantry fighting vehicle;
- 'ZSSW-30' - development work on a remote controlled weapon system with BUSHMASTER 30mm cannon, integrated with SPIKE anti-tank guided missiles and adapted for use at ROSOMAK 8x8 APCs and in the BORSUK IFVs;
- 'Baobab' - development work on a new erratic minelaying vehicle on a wheeled chassis with a fully automated minelaying process;
- WISLA - the production and assembly of PATRIOT missile launchers.



# Poland's Aviation Procurement Programmes

Michał Jarocki

Over the past several years, Poland set out a number of priority procurement programmes, which are expected to change the posture of the Polish Air Force, as well as the Army's aviation fleet.

In early 2019, Polish authorities signed a contract for the procurement of 32 F-35A LIGHTNING II 5th generation multirole fighter aircraft. A few months later, an agreement for the delivery of four Agusta Westland AW101 helicopters in ASW/SAR configuration was also reached. Currently, the Polish MoD is in the process of defining requirements for the procurement of a number of other fixed- and rotary wing platforms. The modernisation process might, however, be disturbed by the ongoing Coronavirus pandemic, and an expected reduction in procurement funds as a result of the economic slowdown, or due to a redefining of acquisition priorities.

In February 2019, Poland's Minister of Defence, Mariusz Błaszczak, presented a new Technical Modernisation Plan (TMP) for the country's Armed Forces. The document, which was later revised and updated in the autumn of 2019, outlined a number of priority procurement and modernisation programmes in the field of fixed- and rotary wing platforms.



Photo: st.szer. Wojciech Król, Polish MoD

**F-35A LIGHTNING II multirole fighter aircraft will replace the obsolete Su-22 fighter/bomber and MiG-29 fighter aircraft and supplement the fleet of 48 F-16C/D Block 52+ jets. The latter is nearing the time of the Mid-Life Upgrade.**

The first project was finalised at the end of January 2020, when a Letter of Offer and Acceptance (LOA) was signed by Minister Błaszczak at a ceremony held at the premises of the 4th Training Aviation Wing in Dęblin. The document covered the acquisition of 32 F-35A LIGHTNING II multirole fighter aircraft and had a value of €4Bn. The agreement also included logistical and training packages. The second programme is still ongoing. At the moment, it is very hard to predict when it will be finalised and which platform will eventually replace the currently operated Mi-24s in the field.

The rest of the Polish Armed Forces' helicopters, as well as combat aircraft, are composed of locally manufactured W-3 and SW-4 helicopters, as well as Soviet-era Mi-2s, Mi-8s, Mi-17s, and Mi-14s, in addition to ex-US SH-2G and Su-22 fighter/bombers and MiG-29 fighters. Most of these platforms no longer meet their operational requirements, due to a number of factors, such as age, overexploitation, technical condition or obsolescence. Only the W-3s, SW-4s and Mi-17s remain in an acceptable condition, which allows them to remain in service for some time longer.

## New Multirole Fighter Aircraft

Deliveries of Polish F-35A fighter aircraft should commence in 2024 and run through to 2030. Under the current estimates, each year Poland will receive a batch of four to six aircraft. In the period 2024-2025, the first six F-35s will be temporarily stationed in the US, where they will serve for the training of pilots and maintenance personnel in one of the US Air Force's bases. These aircraft should eventually be transferred to Poland by 2025-2026, following this training period. It is expected that as many as 24 Polish pilots and 90 maintenance personnel will undergo the training course on US soil. As a result, they will receive an instructor certificate, allowing them to conduct the training of future pilots and ground crews directly in Poland.

According to the agreement, most of the Polish F-35A fighters will be delivered in the Block 4 configuration, which will be the most modern standard at the time. However, the contract also includes a modernisation package, which will cover the upgrade of a few aircraft which will be originally delivered in a less advanced version to the de-



Photo: Leszek Chemperek/CO MON

**A contract for 32 F-35A LIGHTNING II multirole fighter aircraft for the Polish Air Force was signed in early 2019. It has a value of €4Bn.**

The most current TMP document, which has a value of €118Bn and covers the period of 2021-2035, sets the goal for procurement of new, fifth generation multirole fighter aircraft and a number of modern attack helicopters under the HARPIA and KRUK programmes.



**Boeing's AH-64E APACHE/GUARDIAN helicopter is considered to be one of the most favourable platforms offered in the Polish KRUK programme.**



**Boeing argues that the AH-64 platform is in service with the armed forces of a number of Poland's closest allies, such as the UK and US. Therefore, by choosing it as its future attack helicopter, the country assures better interoperability with allied forces on the battlefield.**

sired configuration – most probably the less stable Block 3. This means that a small batch of Polish F-35s, probably those which will be temporarily stationed in the US for the training of pilots and maintenance personnel, will be from an earlier production lot, indicating that they might have originally been manufactured for another user country. The Polish MoD envisions that the country's F-35A fighter aircraft will reach their Initial Operational Capability (IOC) only after a number of requirements are met. These include the acceptance of the delivery of at least eight jets, training of a sufficient number of pilots and maintenance personnel, as well as delivery of necessary spares and operational equipment.

### Additional F-35A Probable

Although at this point Poland declares its ambition to only procure 32 F-35 fighter jets, some MoD officials have already indicated that the fleet of Polish 5th generation aircraft could increase in the future. Wojciech Skurkiewicz, the Secretary of State at the Ministry, has suggested that Poland might decide to acquire an additional batch of 16 F-35s at the later date.

However, it is not sure if the MoD will eventually decide to increase the number of F-35 fighter jets in the future, due to a

number of reasons. First of all, the ongoing Coronavirus pandemic will most surely result in an economic slowdown, which in turn would impact on the country's procurement capabilities. Secondly, the new TMP also outlines a requirement for an additional batch of F-16 multirole aircraft, as well as modernisation of the existing fleet of the fighters, which are considered less operationally capable compared to more modern aircraft, but at the same time more affordable.

Although it was not immediately explained which variant of the F-16 aircraft could be eventually procured, it has become obvious that these fighters would supplement the fleet of 48 F-16C/D Block 52+ jets, that are currently operated by the Polish Air Force.

### Requirement for Light Multiroles

The plan to procure a series of light, multirole aircraft was first revealed in 2012. However, over time, a handful of other investments, such as the planned acquisition of medium multirole helicopters (which ended up with the procurement of Airbus CARACAL rotorcraft, which was eventually cancelled in 2016) or modern attack helicopters were prioritised, de facto setting the PERKOZ project aside.

This programme was not even included in the current TMP. However, in early May 2020, the Armament Inspectorate, which acts on behalf of the Polish MoD, officially launched the project for procurement for 32 light, multirole helicopters.

According to the statement made by the Armament Inspectorate, the new helicopters will be procured in three variants: direct fire support; command; and observation / reconnaissance. They will have a load carrying capacity of up to 1,000 kg of cargo or five soldiers in full combat equipment. Additionally, new rotorcraft will be required to have an advanced training capability, which means that it would have to be a two-engine platform with a doubled steering system. During combat operations, the helicopter should be capable of carrying a full team of dismounts, as well as weapon systems and supplies. It should also be equipped with opto-electronic observation and self-defence systems.

New multirole helicopters will replace the currently operated and obsolete Mi-2s and some specialised versions of the W-3s. Mi-2s entered service over 50 years ago. Their further use might prove to be impractical and even hazardous. According to recent data, in 2019 the Polish Armed Forces operated 61 of these helicopters (41 in the Army, 16 in the Air Force and 4 in the Navy), but no more than 40 of them were operationally capable. Shortly after the PERKOZ project was launched, the Inspectorate informed that it had received a dozen applications from local and international companies, which show interest in the project. These included: Works 11, Polish Armaments Group (Polska Grupa Zbrojeniowa, PGZ), Air Force Institute of Technology (Instytut Techniczny Wojsk Lotniczych), PZL-Świdnik (a subsidiary of Leonardo), Łukasiewicz Research Network - Institute of Aviation (Sieć Badawcza Łukasiewicz – Instytut Lotnictwa), PZL Mielec (a subsidiary of Lockheed Martin), Hindustan Aeronautics (HAL) with Helicopter Division Hindustan Aeronautics, Cobham Aviation Services UK, Airbus Helicopters, Bell Textron, Elbit Systems and Boeing Company. A handful of participating entities will be able to offer fully equipped and operational rotorcraft, while other companies could submit particular onboard systems.

In mid-June, Bell Textron informed that it intended to offer Poland its H-1 family platforms, the A-12 VIPER and UH-1Y VENOM, for a number of the country's procurement programmes, including PERKOZ and KRUK. The manufacturer states that this duo is successfully operated by the US Marines Corp and has recently been selected by the Czech Armed Forces, which procured four VIPER and eight VENOM rotorcraft.



Other bidders could offer the following platforms for the PERKOZ programme: AW169M or AW109 (PZL-Swidnik), S-76 (PZL Swidnik / Lockheed Martin), H145M or H135 (Airbus Helicopters), and Dhruv (Hindustan Aeronautics). In due course, the Armaments Inspectorate will select a number of offers which will receive a Request for Information (RfI), and will be subsequently invited to participate in the Technical Dialogue procedure, which should be finalised by December.

## The KONDOR Naval Helicopter Programme

In mid-2018, the Polish MoD publicly confirmed that the country has a requirement for a number of modern naval helicopters, which would replace the currently operated ex-US Kaman SH-2G SUPER SEASPRITE rotorcraft. The Polish Navy has to consider the decommissioning of the SUPER SEASPRITES due to the fact that their OEM concluded offering technical support to the platform's operators. Moreover, out of four Polish SH-2Gs, only one or two are flight-capable, while the rest are used for training purposes or as a source of spare parts.

Poland acquired four SH-2G SUPER SEASPRITES in 2002-2003 for operations from two OLIVER HAZARD PERRY class frigates (ORP GEN. K. PUŁASKI and ORP GEN. T. KOŚCIUSZKO), which were transferred to Poland following their decommissioning from the US Navy. They were manufactured in 1992-1993 and now serve in anti-surface and anti-submarine warfare roles, as well as SAR and logistical support missions. They serve under the Naval Aviation Brigade of the Polish Navy.

The KONDOR programme was launched on 31 December 2019 by the Armaments Inspectorate. At that time, its goal was to acquire four to eight multirole rotorcraft with a maximum take-off weight of no more than 6,500 kg, capable of performing ASW operations and target acquisition with the use of onboard radar systems. New multirole maritime helicopters will be subordinate to the Naval Aviation Brigade of the Polish Navy. Nine manufacturers signalled their intention to participate in the Technical Dialogue procedure. This included four local Polish companies: Enamor, Polish Armaments Group, PZL Mielec and PZL Swidnik, as well as five foreign entities: Airbus Helicopters, Bell Textron, Elbit Systems, General Dynamics Mission Systems – Canada, and Kaman Aerospace Corporation.

Through the technical dialogue process, the Armament Inspectorate will define a number of technical requirements in connection



Photo: Michał Jarczyk

**Boeing puts also a lot of effort to promote its CH-47F CHINOOK heavy lift helicopter for Poland. The platform was presented and opened to visitors during the MSPO 2019 exhibition.**

with the planned procurement, which will be related to such issues as desired weapon systems, communications, self-defence, navigation, EW and Identification Friend or Foe systems.

However, it is expected that due to the Polish Navy's strict requirements related to the platform's MTOW, only a handful of manufacturers will ultimately decide to make a bid in the future tender.

Bell has already confirmed that it will bid a specially modified version of its UH-1Y VENOM helicopter for the KONDOR programme. While Leonardo could propose its AW159 WILDCAT rotorcraft, which has already been selected by the Philippines, the Republic of Korea and UK. In return, Airbus might consider promoting its AS565 platform already operated by the navies of, inter alia, Bulgaria, France, Indonesia, Israel, Mexico and Saudi Arabia.

On the other hand, Kaman Aerospace Corporation, which in the past manufactured SUPER SEASPRITES, as well as General Dynamics Mission Systems – Canada, have the requisite experience and capability of offering modernisation packages for the Polish Navy's SH-2G rotorcraft. Both companies might present an offer for the extension of the operational service life of the Polish SH-2Gs.

The new helicopters would be deployed on a number of Polish Navy's operational vessels, such as the OLIVER HAZARD PERRY class frigates, or the ORP SLAZAK (241) patrol corvette, which was commissioned in late 2019, as well as a series of MIECZNIK class coastal defence vessels, which until recently the defence services planned to procure in the future.

## KRUK Awaits Finalisation

The Polish MoD is still expected to launch its long-touted tender for the procurement of 32 modern attack helicopters under the Kruk programme. This project calls for the

replacement of a fleet of obsolete, Soviet-era Mi-24D/W rotorcraft, which no longer meet the requirements of the modern battlefield, with a more combat effective and multipurpose platform.

The analytical phase of the Kruk project was launched in 2014. However, ever since the Armament Inspectorate failed to start the formal tender procedure, in the meantime, there are repeatedly changing priorities and technical requirements for the project. The tender was expected to finally be launched in 2020, however, the COVID-19 pandemic forced the MoD to once again postpone commencement of the competition. It left the Polish Army's aviation with the no answer to the question about when it might receive new combat helicopters, which are needed to significantly enhance its operational and combat capabilities and also allow for the development of new tactics for enhanced cooperation with various types of units on the modern battlefield.

In recent years, Boeing (with its AH-64E) has been viewed as the favourite in the competition. The US manufacturer placed a lot of effort into promoting its platform among local experts and decision-makers. Aside from undoubted combat and operational capabilities, which the rotorcraft could add to the Polish Army's aviation, Boeing has also highlighted that the same platform is already in service with Poland's major allies, such as the UK and US, which would benefit Poland through commonality of combat systems and enhanced interoperability on the battlefield.

Furthermore, the company entered into agreements with a number of Polish defence manufacturers, most of which are subsidiaries of the Polish Armaments Group. Consequently, local entities could get involved in the production of specific elements of the future Polish AH-64E APACHE, as well as their future service, overhaul and maintenance, bringing revenue to the country's economy.



**The list of other major competitors in the KRUK programme include: Turkish Aerospace (T129 ATAK), Leonardo (AW249) and Airbus Helicopters (TIGER).**



**The fleet of approximately 30 Mi-24D/W combat helicopters, which still remain in service, is considered to be obsolete, not meeting the requirements of the modern battlefield. However, it may take as long as ten years between the selection of the Mi-243's successor and the time the new platform actually enters service. Therefore, the modernisation of Soviet-era rotorcraft is deemed a necessity in order to maintain at least minimal combat and operating capabilities of Polish Army Aviation.**

However, despite the intensive promotion of its combat platform, Boeing still has to prepare itself for an extensive competition with a handful of other manufacturers, all of which bodes well for the Polish KRUK programme.

The other frontrunner for the Polish KRUK programme is Bell. The company perceives Poland as one of the most attractive export markets in the Central and Eastern Europe region. Therefore, the company has high hopes regarding Polish Army's plans to acquire new attack rotorcraft.

Bell continues to promote its AH-1Z VIPER in Poland, convinced that the platform offers not only new combat capabilities, but in the long run could also allow the operator to benefit from significantly lowering the cost of platform's purchase, production and sustainment.

Particularly, it hopes that Poland might also consider the acquisition of the other H-1 family platform, the UH-1Y VENOM utility, multirole helicopter. The manufacturer explains that both rotorcraft share 85% commonality of parts, which means significantly lower maintenance and sustainment costs. Aware of Poland's traditional and strict re-

quirement for the procurement of any new weapon system to involve the local defence industry in its production, Bell has already entered into partnerships with a number of local industrial entities, such as the PGZ. As a result, the country could see extensive involvement if its own manufacturers in the production process and the establishment of a local service and maintenance facility in Poland, which could serve other operators of the H-1 family across the region.

The list of other major competitors in the KRUK programme include: Turkish Aerospace (T129 ATAK), Leonardo (AW249) or Airbus Helicopters (TIGER).

Competition for the KRUK programme will significantly stiffen as soon as the formal tender procedure is launched, especially given the fact that the project could prove to be even more profitable than originally seemed to be the case.

Although the original plan of the Armaments Inspectorate was for the procurement of an initial batch of 32 attack helicopters, the overall requirement for such a platform in the Polish Army's aviation branch is believed to be around 100 units. Even if this number is never met, it seems

probable that the KRUK programme might eventually bring even more revenue to the selected OEM.

The initial batch of 32 attack rotorcraft could be procured in two tranches, each consisting of 16 helicopters (the contract would simply most likely include an option for the second tranche). Assuming that the project continues according to the most current plan and time schedule, the first combat squadron of the Polish Army's aviation branch could be equipped with new attack helicopters as soon as 2026.

## Delayed Modernisation of Mi-24s

In 2019, the Armament Inspectorate launched a technical dialogue to determine a preferred scope and timeline for the planned modernisation of a fleet of Polish Mi-24 combat helicopters. The project called for the enhancement of the platform's combat and operational capabilities, and an extension of its operational service until the new platform, procured under the KRUK programme, entered the field.

The technical dialogue was expected to lay the groundwork for specifying the best and most affordable options for the modernisation of a fleet of approximately 30 Mi-24D/W combat helicopters, which remain in the service of the Polish Army's aviation. The main focus was placed on the acquisition of new weapon systems, such as new guided, anti-tank missiles, as well as more modern communication, self-defence, IFF, navigation and electronic warfare equipment.

A number of local and foreign defence companies have already shown interest in the technical dialogue procedure. Among them are: MBDA UK, Paramount Aerospace Systems, Megmar Logistics & Consulting, Elbit Systems Advanced Technology Center, Israel Aerospace Industries, Lom Praha Trade, Aselsan Elektronik Sanayi ve Ticaret, PGZ, Green Aviation (representing Motor Sich), Ibcol Polska, Elbit Systems EW and SIGINT – Elisra, SCAT Security Consulting and Training, BAE Systems, SAAB Technologies Poland and Roketsan.

For the modernisation of the Mi-24s, MBDA UK plans to offer Poland a wide range of multifunctional, guided weapon systems for air-to-surface and air-to-air applications, like Brimstone or Mistral ATAM.

Another UK-based company, BAE Systems, has also confirmed its readiness to supply the Polish combat helicopter fleet with modern combat and auxiliary equipment, offering multiple technologies for attack helicopters, such as aircraft survivability equipment, transponders, data links, and precision munitions.



During MSPO 2019, a consortium composed of PGZ's subsidiaries, along with the Air Force Institute of Technology (AFIT) and Israeli Rafael Advanced Defense Systems, proposed a modernisation package for the fleet of the Polish Army's Mi-24D/W attack helicopters.

The modernisation programme includes the installation of modern communications, navigation and observation systems, as well as new weapon systems and more efficient avionics, including new head-up and multi-function displays. New self-defence mechanism, with missile warning receivers and infrared countermeasures equipment, are also part of the upgrade package.

The helicopters could be armed with a family of SPIKE ER2, LR2, NLOS anti-tank missiles from Rafael, as well as locally designed PIORUN air-to-air missiles, NLPR-70 and WW-15 rocket launchers and 12,7mm machine guns.

As a result of the proposed modernisation process, Polish Mi-24s could regain the ability to detect, localise and engage the enemy's tank and armoured vehicles, including those on the move. They could also conduct a wide range of missions, such as ISR, coordinating air combat operations and air-to-air combat, also while operating with other manned and unmanned aerial platforms.

The proposed modernisation of Poland's Mi-24D/W attack helicopters has been labelled an 'interim solution', which is necessary to implement, while the Armed Forces awaits the selection to the future attack helicopter through the KRUK programme.

It could take as long as ten years between the time Poland selects its new attack helicopter, and when that platform actually enters service. In the meantime, it will be for the obsolete Mi-24s to provide fire support



Photo: Michał Jaroński

**Rafael Advanced Defense Systems calls for equipping the Polish Mi-24s with a TOPLITE EOS system and arming them with a wide range of its guided anti-tank missile systems.**

to ground units during combat operations. Therefore, the Soviet-era platform requires an in-depth modernisation and enhancement of its operability.

### New EOS for Polish Rotorcraft

In spring 2020, Israeli Rafael Advanced Defense Systems and the Polish PCO announced the signing of a Memorandum of Understanding (MoU) regarding cooperation in the production of the TOPLITE EOS system for the Polish Armed Forces.

The agreement was originally signed on 25 February. However, it took both companies over one month to publicly announce entering into a new partnership.

The MoU refers to cooperation in the production of the TOPLITE EOS system for the

long-awaited modernisation of the fleet of Polish Mi-24D/W attack helicopters.

"Recently, Rafael signed a MoU with PCO for the transfer of technology and common production of the TOPLITE EOS for the Mi-24 upgrade programme. This cooperation will enhance the industrial base of the programme and we're sure it will benefit additional programmes in which we can offer our advanced EOS," said Gal Papier, Director of marketing and business development at Rafael's Precision Tactical Weapon Systems. Under the terms of the agreement, PCO will become the sole supplier of TOPLITE EOS systems for clients within the country. This would include not only the expected upgrade of Mi-24 helicopters, but also any other modernisation or procurement programmes, which might materialise in the future, such as KRUK, which calls for the procurement of a number of modern attack helicopters.

Following the agreement, PCO could become a member of Rafael's TOPLITE EOS global supply chain. The Israeli company makes a point about the fact that "TOPLITE optoelectronic heads are fully integrated with SPIKE missiles manufactured by another PGZ daughter company - Mesko. The system will supplement PCO's OE payloads portfolio by adding a solution dedicated for the air domain", a Rafael spokesperson said. Entering into cooperation with PCO, as much as with other Polish defence companies, could significantly improve Rafael's chances of participating in the Mi-24s modernisation programme. Especially, since that Rafael extensively promotes the idea of arming Polish attack helicopters with a wide range of its guided, anti-tank missile systems, such as SPIKE ER2, SPIKE LR2 and SPIKE NLOS.



Photo: PGZ

**By 2022, the Polish Navy should take delivery of four AW101 helicopters in ASW/SAR configuration.**

## AW101 for Poland

In April 2019, an agreement was signed between the Polish MoD and PZL Świdnik, a Leonardo company, for the delivery of four AW101 ASW/CSAR helicopters for the Polish Navy by 2022. New rotorcraft will be manufactured in the ASW/CSAR configuration. The deal is worth €374M.

"We have signed a contract, which provides PZL Świdnik with a growth potential. Lately we've acquired helicopters for Special Forces, and now we will also significantly enhance our capabilities to perform anti-submarine warfare (ASW) operations from the air. These helicopters will also be suited for search and rescue (SAR) operations," said Mariusz Błaszczak, Poland's Defence Minister, who attended the ceremony. "PZL Świdnik's role will be crucial not only as prime contractor for this new contract, but also for the modernisation of other platforms," he added.

AW101 helicopters will supplement and eventually replace the currently operated fleet of Mi-14PŁ and Mi-14PŁ/R helicopters, which most likely will have to be phased out by 2023.

The contract for AW101 was signed only after the Polish MoD and a number of other companies, such as Leonardo MW, Thales DMS France and MES (Meccanica per L'Elettronica e Servomeccanismi), reached an agreement on the offset programme accompanying the helicopter project.

The offset agreement is worth around €90M and will lead to the establishment of a maintenance and overhaul centre for AW101 helicopters at the Military Aviation Works No.1 in Łódź, a subsidiary of the PGZ (Polska Grupa Zbrojeniowa). The new centre will support the fleet of Polish AW101 ASW/CSAR helicopters through their whole service life.

Photo: st.szer. Wojciech Krol, Polish MoD



**The Polish MoD still has to make the final decision on the future of the 'Drop' programme, which calls for acquisition of a fleet of medium transport aircraft to replace Lockheed Martin C-130E HERCULES. The country is in discussions with the US government on the possible procurement of five secondhand Lockheed Martin C-130H HERCULES aircraft, which, if ever was to be finalised, would surely put an end to the 'Drop' programme.**

## Uncertain Future of the 'Drop' Programme

On 13 July 2020, the Armament Inspectorate informed that the analytical phase of the 'Drop' programme had been placed on hold. The project called for procurement of a number of medium transport aircraft which were to eventually replace the currently operated Lockheed Martin C-130E HERCULES. The Inspectorate stated that the analytical phase had been stopped due to the 'redefinition of operational requirements' of the project. Therefore, the whole project will most likely require redefining and a re-evaluation of its goals, before it is once again back on track. The 'Drop' programme was originally launched in May 2019. Shortly after a technical dialogue was launched and a number of international manufacturers, Leonardo, Airbus Defence & Space, Embraer, Lockheed Martin and Boeing, applied to take part. However, the future of the 'Drop' programme is overshadowed by the fact that the Polish MoD continued nego-

tiations with the US Department of Defense regarding the possible acquisition of five secondhand Lockheed Martin C-130H HERCULES medium transport aircraft. If negotiations with authorities in Washington turn out to be successful, the 'Drop' programme will most likely be formally cancelled and Poland will end up procuring the ex-US Hercules aircraft instead, which will replace those which had previously been acquired in the same manner.

## S-70i BLACK HAWKS for Polish SF

On 20 December 2019, the Polish Special Forces Command took delivery of four S-70i BLACK HAWK helicopters. The ceremony took place at the 1st Airlift Base (1. Baza Lotnictwa Transportowego) in Warsaw and was attended by, among others, the President of the Republic of Poland, Andrzej Duda, and the Minister of National Defence, Mariusz Błaszczak.

The contract for four new S-70i BLACK HAWK helicopters in the SF configuration was signed on 25 January 2019. It had a value of €155M and covered the delivery of helicopters, as well as technical and training packages and installation of additional, specifically selected onboard equipment.

The new S-70i helicopters, which were manufactured by PZL Mielec, the local subsidiary of Lockheed Martin, are expected to significantly enhance the air mobility of the Polish Special Forces.

During his speech, President Duda admitted that the requirement of the Polish Special Forces for new transport/multirole helicopters is much larger than just these four rotorcraft, adding that he hoped that Poland will be able to fill this requirement in the near future. ■

Photo: Michał Jaroński



**In late December 2019, the Polish Special Forces Command took delivery of four locally manufactured S-70i BLACK HAWK helicopters. However, the total requirement for such rotorcraft is much bigger.**



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