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# Running Into a Brick Wall – a Classic Case



It takes a great deal of application of dialectics to understand how President Donald Trump can hail the NATO summit as a resounding success for his tireless efforts to achieve a punchier NATO. His clumsily presented demand that the two percent target should be made binding on all NATO States by 1 January 2019 is a classic case of running into a brick wall. The effect has been more of a bloody nose than a victory pose. The only problem is that the voters in America don't see it that way and that could cost him what is left of his credibility in Europe, even if things seem to add up at home. It was a minor remark by Mr. Trump, almost as an aside, that cast light on what else, for this President, may be behind the more vehement demands that the Europeans gear up their armament holdings and production: if the European armaments industry is not able to deliver rapidly and adequately, the US can do it, immediately. That would waken a few people up, and sharply. And that is where the Europeans must stand together. For the security of Europe, a capable and efficient armaments industry is just as important as having armed forces that are ready to go into action. This applies all the more when the USA can no longer be regarded as the blindly trusting partner. Taking on additional demands has the aim of making the Europeans more capable in performance, and under some circumstances actually making them more independent. In this context, the scenario simply cannot work that the USA only provide what the European States can already procure from their taxpayers. That then means "Europe first". This is the language that Trump understands.

What Trump achieved in Brussels was that the rest of NATO stands very much shoulder to shoulder, maybe even closer than before the Summit. The contents of his demands, and the way he delivered them, brought everyone to the barricades. The unity which was achieved in the assessment of the security policy situation in the world, and the determination with which NATO has strengthened its security resources, were unfortunately overshadowed on the second day of the Summit. This is also down to our media, who

make sure every Trumpism is broadcast to the world with amplifiers. With more composure in this arena, the discussion would become more factual and more effective. But what remains is a deep and justified mistrust in the bravado of this President in changing tack. At the G-7 Summit he Twittered his withdrawal of his signature under the communiqué when he was on his aircraft. He promised the President of North Korea that a manoeuvre would be called off, without this being discussed with his South Korean allies. At NATO, on the first day he agreed to the passages regarding allocations of burdens in the communiqué, but on the second day he rewrote the chapter. And the meeting with Russia's President Putin was more agreeable than that with the allies in NATO? The fact that this shakes the Europeans' faith is obvious, even if the USA is to fulfil faithfully all the NATO obligations into which they have entered. So anyone who is watching NATO from the outside is well advised not to misinterpret these internal squabbles. NATO stands by the Baltic States; even in discussion with Putin (as far as we know), Trump did not give any ground about the presence and exercise activity of NATO on the northern flank. The facts still hold: No military attack has been made against a NATO member; the security union is working.

In the coming year, NATO celebrates its 70th birthday. This is scheduled to be at another Summit. The Alliance wanted to celebrate this anniversary with a new strategic concept. This idea has somewhat run aground. There were too many differences of opinion, even in Europe, in particular with regard to strategic issues. Nevertheless, NATO is supposed to take on this task. Some years ago a group of experts, specialists, and experienced ex-politicians prepared a paper from which such a concept was developed. It would stand NATO in good stead to accept independent advice and suggestions. In this world, without any real leadership, a clear orientation would be something of high strategic value.

**Rolf Clement**

## Friendly Rivals



Photo: Presidential Palace Iran

Turkish-Iranian Relations

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## Russian Defence Modernisation



Photo: Kremlin

Achievements, Plans, Objectives

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## Rapid Structural Change



Photo: Polish Government

Poland's Defence Industry Base

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## ■ Australia's New Frigates

(df) Australia is investing over €22Bn in anti-submarine warfare frigates as part of its "SEA 5000" programme to modernise its navy. BAE Systems won the corresponding competition. The winning model, GLOBAL COMBAT SHIP – AUSTRALIA, is based on the BAE Systems TYPE 26 frigate that the

Graphic: BAE Systems



company is currently building for the British Navy in Glasgow. However, the nine Australian frigates are being built by ASC Shipbuilding (an Australian state enterprise) in Adelaide, Australia. The frigates will serve in the RAN as the HUNTER class and should be able to carry out a variety of missions independently or as part of units with long range and sea endurance. In addition to the primary mission – anti-submarine warfare – the frigates are also to receive capabilities or modules for scenarios such as humanitarian aid or disaster response. Special features are the CEA phased array radar developed in Australia and the use of the American AEGIS system, which is equipped with an interface specially developed by Saab Australia. According to the RAN, the HUNTER class will boast some of the most powerful warships in the world. The contract to build the HUNTER class is expected to come into force before the end of 2018; production could then start in 2020.

## ■ Colombian Air Defence System

(df) The Colombian Corporación de Alta Tecnología para la Defensa (High-Tech Defence Corporation – CODALTEC) and Spanish company Indra will jointly develop

Photo: CODALTEC



a "cutting-edge air defence system that will meet the Colombian requirements and potentially those of other countries in the region", it has been announced. "It is the first system with these characteristics developed in Latin America, as a result of the success of the collaboration between Indra and CODALTEC." To achieve this goal Indra and CODALTEC have extended their already existing collaboration in the field of radars (resulting in TADER (Tactical Air Defence Radar)) to the development of command and control systems, one of the core capabilities of Indra. This system will receive data provided by different sensors and merge it to present a comprehensive and integrated vision of the real scenario for military officers. Therefore, the system will be capable of immediately detecting any risk and deploying the necessary actions to neutralise it. The TADER radar will be a key element of the sensor network in the future CODALTEC air defence system. In addition, the system will be fully interoperable with any other type of subsystem, so it can incorporate new capabilities as they appear in the future, or integrate the equipment used by the Armed Forces of other countries.

## ■ Military RAMSIS Digital Mannequin

(df) Germany-based Human Solutions GmbH has adapted their RAMSIS digital mannequin to meet military needs. RAMSIS is a digital mannequin used worldwide by car manufacturers for the optimal ergonomic design of vehicle interiors. It can also enter and exit a vehicle in full combat gear, equipped with the most important, up-to-date army equipment, the company announced. This provides vehicle designers with information on the ergonomic requirements of the occupants at an early stage of development and therefore leads to shorter development times and reduced costs for late modifications to the vehicle. "Ergonomic simulation with RAMSIS Defense provides vehicle designers with the practical relevance they need to precisely analyse and design functionality in the vehicle," says Anton Preiß, Director Mobility at Human Solutions. "Our mannequin can be realistically equipped with protec-



Graphic: Human Solutions

tive clothing and equipment. This means that posture, force and consequently the analytic results correspond to actual use." This military RAMSIS was designed in close cooperation between Human Solutions and the German Armed Forces with the core being the integrated equipment library. All important equipment of German soldiers such as combat jacket, boots, protective vest, helmet and the newly-introduced electronic back were digitised with 3D scanners and integrated into the library. The RAMSIS mannequin can therefore be equipped as required to suit the intended use.

## ■ M109 Upgrades With Hybrid GENAIRCON

(df) INTRACOM Defense Electronics (IDE) has delivered first M109 upgrades with hybrid GENAIRCON to the Hellenic Army. GENAIRCON is a fully integrated power management solution for military vehicles and it incorporates a Hybrid Auxiliary Power Unit (HAPU), an advanced Energy Storage System (ESS) and a Vehicle Environmental Control System (VECS), all controlled by an intelligent central Power Management System. The platform-customisable hybrid GENAIRCON is designed to provide extended "True Silent Watch" capability, contributing to increased survivability in field operations. GENAIRCON enables prolonged control of the vehicle's thermal and noise signatures, introducing a force multiplier in the contemporary doctrine of operations. Furthermore, according to the company, the system offers significantly reduced fuel consumption and maintenance requirements, which increase mission sustainability.

Photo: INTRACOM



## ■ Trophy On US ABRAMS Tanks

(df) Leonardo DRS has announced that it has been awarded a contract worth US\$193M to deliver TROPHY active protection systems to the US Army. TROPHY will be installed on the ABRAMS tanks in support of immediate operational requirements. Developed by long-time partner Rafael Advanced Defense Systems (Israel) and currently fielding some 1,000 systems to all major Israeli ground combat platforms, TROPHY provides combat-proven protection against anti-armour rocket and missile threats. "Leonardo DRS





Photo: Leonardo

We are excited to continue to do so with TROPHY” added Moshe Elazar, Executive Vice President and Head of Rafael’s Land and Naval Division. “The majority of TROPHY components are manufactured by the American defence industry and we are excited by the opportunity to increase manufacturing in the US, including for Israeli systems, as the US acquires additional systems.”



Photo: Lockheed Martin

is proud to be a part of this important effort to bring life-saving technology to our warfighters, and we are actively investing to ensure TROPHY provides a solid, American-made foundation for the Army’s coming Vehicle Protection Suite programme,” said Aaron Hankins, Vice President and General Manager of the Leonardo DRS Land Systems division. “This award is the culmination of several years of hard work by a strong, bi-national government/industry team to protect our warfighters and address a critical capability gap in our armoured formations.” “Rafael has provided protection solutions to US service members for over two decades via lifesaving passive and reactive armour on vehicles such as BRADLEY, STRYKER and AAV7.

#### ■ Bahrain Buys F-16 Block 70

(df) Lockheed Martin has received a US\$1.12Bn contract from the US Government to produce 16 new F-16 Block 70 aircraft for the Royal Bahraini Air Force. The Kingdom of Bahrain is the first customer to procure the F-16 Block 70, the newest and most advanced F-16 production configuration, the company stated. The F-16 Block 70 features advanced avionics, a proven Active Electronically Scanned Array radar, a modernised cockpit, advanced weapons, conformal fuel tanks, an automatic ground collision avoidance system, an advanced engine and an industry-leading extended structural service life of 12,000 hours. To date, 4,604 F-16s have been procured by 28 custom-

ers around the world. Approximately 3,000 operational F-16s are flying today with 25 leading air forces, including the US Air Force. Bahrain will also benefit from a wide range of possible weapons. In concert with the US Air Force Lockheed Martin has certified more than 3,300 carriage and release configurations for greater than 180 weapon and store types. “We value our long-standing relationship with the Kingdom of Bahrain and look forward to beginning production activities on their first Block 70 aircraft at our facility in Greenville,” said Susan Ouzts, Vice President of Lockheed Martin’s F-16 programme. “This sale highlights the significant, growing demand we see for new production F-16s around the globe.”

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## ■ Counter-Drone Drone Contract

(df) The US Army has awarded a contract for a counter drone system to Raytheon. The solution will consist of Raytheon's COYOTE unmanned aircraft system (UAS) and the company's Ku-band radio frequency system (KRFS) radar. "Enemy unmanned aircraft are among the biggest threats facing our ground troops today," said Dr. Thomas Bussing, Raytheon Advanced Missile Systems Vice President. "Our small, expendable COYOTE provides the Army with an affordable and highly effective solution for countering the growing UAS threat." Equipped with an advanced seeker and warhead, Coyote can identify and eliminate hostile UAVs when paired with the KRFS radar, which acquires and tracks all sizes of UAS. COY-

Photo: Raytheon



OTES can be flown individually or netted together in swarms. They are adaptable for a variety of missions including surveillance, electronic warfare and strike. Raytheon announced it is finalising development of advanced COYOTE variants that will fly faster and farther. Because of an urgent operational need, the Army is expected to use COYOTE as a counter-UAS solution before the end of 2018.

## ■ GlobalEye Heading To A Flying Start

(df) Saab's new GlobalEye Airborne Early Warning & Control (AEW&C) aircraft achieved a number of significant milestones in 2018, commencing with the roll-

Photo: Saab



out of the first aircraft in February 2018. At the Farnborough International Airshow Saab explained the achievements being delivered with this newest addition to its airborne surveillance system family. According to the company, GlobalEye is a true swing-role multi-mission solution. "It combines multiple sensors and sophisticated data fusion into an intuitive mission system on the Bombardier Global 6000 jet, with fully networked communications," the company stated. "This capability gives excellent flexibility across the full mission spectrum from peacetime to warfighting, and particularly benefits joint force commanders managing combined air, sea and land operations." The Development and Production contract for GlobalEye was awarded at the Dubai Air Show in November 2015 by the United Arab Emirates with an initial order for two systems. An additional order by the UAE for a third system was announced in 2017. "In a period of just over two years Saab

has rolled out and then flown GlobalEye," said Lars Tossman, Saab's Head of Airborne Surveillance Systems. "The flight test programme is running according to plan, with the flight envelope being opened up, whilst on the ground the mission system completed all its rig testing. We are very satisfied with all these results and believe GlobalEye is going to be unrivalled in the capabilities it offers."

## ■ Next Generation V-200B

(df) At the Farnborough International Air Show UMS SKELDAR announced the launch of the SKELDAR V-200B, a modification of their mid-sized heavy fuel engine Verti-

Photo: UMS SKELDAR



cal Take-Off and Landing (VTOL) UAV. The SKELDAR V-200B completed trials earlier in 2018, following an intensive modification audit, based on in-theatre performance feedback and the strategic imperative to further widen its competitive advantage. "It is no secret that more players are attempting to enter the maritime market for rotary UAVs," said David Willems, Head of Business Development at UMS SKELDAR, the UAV joint venture between Sweden's Saab and UMS AERO of Switzerland. "Recent navy contracts have stipulated the role and specification, and this has confirmed our strategy of development is absolutely the right move at the right time. We are able to fly longer - over five hours - at maximum payload capacity through weight savings from design modifications and our 2-stroke engine configuration provides significantly unmatched time between overhauls."

## ■ Sea Lion Subject to Qualification

(gwh) The first flight of the second prototype in series configuration on July 10, 2018 marked the start of the qualification phase for the NH90 Sea Lion naval helicopter in Donauwörth. The helicopter is being tested by a team of representatives of the manufacturer, Airbus Helicopters, and representatives of the Bundeswehr from the Navy, the German Military Aviation Authority (Luftfahrtamt der Bundeswehr) and the German BAANBw procurement

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Photo: Airbus Helicopters

## ■ Multitouch Display for Safe and Easy Operation

(gwh) The new fanless VistaMaster-17 PPC MFD Multitouch Display from ATM Computer enables recognition and processing of information in 16:9 full HD resolution. As on smartphones and tablets, the user makes several simultaneous touches on the display's capacitive touch sensor, which simplifies procedures

jects shown on the display. The projective capacitive (PCAP) technology used by the touch sensor supports the use of the display even with gloves. The VistaMaster-17 MFD PPC Multitouch automatically scales the video input data. With its high, adjustable brightness and contrast, the VistaMaster-17 PPC MFD Multitouch works well under changing light conditions, from sunlight to the use of residual light amplifier glasses. The display has been tested according to current military environmental standards and for electromagnetic compatibility.



Photo: ATM

## ■ New Red Dot Sights

(ck) Aimpoint, the inventor of red dot sighting technology, has launched a new series of red dot sights, the Aimpoint ACRO (Advanced Compact Reflex Optic) series. The small ACRO electronic red dot sights were specially developed for use on pistols and other weapon platforms, because for many years the end users have been demanding a small, closed red dot sight that fits on handguns. The ACRO P-1 offers a closed system that is more durable than open systems. It is also the

as soldiers are used to this kind of man-machine interaction. Multitouch makes it easy to move, select or enlarge ob-



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Photo: Aimpoint



only sight in its size category tested for shock, vibration, temperature range and other environmental hazards. The sight can perform under tough conditions while adding negligible size and weight to the equipment. Tested with at least 20,000 rounds on a .40 cal pistol slide, it is robust and reliable: the ACRO P-1 sight was developed for integration onto pistol slides. The sight can also be used as a backup sight for magnifying scopes or personal defence weapons. The sight is a 1X (non-magnifying) parallax-free optic that features a 3.5 minute of angle (MOA) red dot for fast target acquisition. It is fully submersible to 25 metres and allows continuous operation for over 1 year on a single CR1225 battery. Dot intensity is adjusted with side push buttons.

## ■ Hungary Orders 20 H145Ms

(ck) As part of the "Zrinyi 2026" military modernisation programme the Hungarian Ministry of Defence has ordered 20 H145M military helicopters equipped with the HFORCE weapon management system. Airbus will also provide an extensive training and support pack-

Photo: Airbus Helicopters



age. With a maximum take-off weight of 3.7 tonnes, the H145M can be used for troop transport, surveillance, air rescue, armed reconnaissance and medical evacuation. The Hungarian fleet will be equipped with a fast roping system, high performance camera, fire support equipment, ballistic protection as well as an electronic countermeasures system to support the most demanding operation-

al requirements. Airbus' HFORCE system will allow Hungary to equip and operate their aircraft with ballistic or guided air-to-ground and air-to-air weapons. The H145M is a tried-and-tested light twin-engine helicopter that was first delivered in 2015 to the German Armed Forces and has since been ordered by Thailand and the Republic of Serbia. Powered by two Safran ARRIEL 2E engines, the H145M is the quietest helicopter in its class and is equipped with full authority digital engine control (FADEC) and the HELIONIX digital avionics suite. It includes a high performance 4-axis autopilot, increasing safety and reducing pilot workload. Last year Hungary also acquired two Airbus A319 military troop transporters.

## ■ Modular Air Defence System

(ck) Israel Aerospace Industries (IAI) has unveiled the BARAK-MX, a modular naval and land-based air and missile defence system. The BARAK-MX supports radars and launchers, providing optimised response to fighter aircraft, helicopters, UASs, cruise missiles, surface-air and surface-surface missiles. Based on operationally proven command and control, it supports the use of three additional interceptor rockets: The

Photo: IAI



BARAK MRAD is a short-range, high-speed vertically launched interceptor suitable for addressing threats within a range of up to 35 km. It includes a radar homing head and a single-pulse engine. The BARAK LRAD is a medium-range, high-speed vertically launched rocket for addressing threats at a range of up to 70 km. It has a radar homing head with a dual-pulse engine. The BARAK ER is a long-range, vertically launched interceptor with an accelerator engine, dual-pulse rocket engine and advanced radar homing head. The MRAD, LRAD and BARAK ER share many elements which is a significant advantage when it comes to maintenance and training. As an operationally flexible system, the BARAK-MX allows a choice of radar and interceptor type according to the type of threat at hand. The system's modular nature allows customers to start with

basic configuration and scale up gradually or quickly according to operational needs and budget availability.

## ■ GPS Anti-Jam Navigation System

(ck) Modern navigation, communications and reconnaissance systems, as well as electronic combat systems integrated into modern platforms, depend on the un-

Photo: IAI



interrupted availability of satellite-based navigation and timing for their operation. Despite this dependency, most platforms do not use countermeasures to protect these essential assets, and if they remain exposed, even jammers with low performance can disrupt or even deny the operation of GNSS systems, which impairs the platform's ability to perform its task. To address this threat, Israel Aerospace Industries (IAI) and Honeywell have joined forces to develop a turnkey GPS anti-jam navigation system. The joint product integrates IAI's GPS Anti-Jam system with Honeywell's navigation products, as a subsystem or as an embedded solution. Following successful development, Honeywell's EMBEDDED GLOBAL POSITIONING SYSTEM / INERTIAL NAVIGATION SYSTEM (EGI) will incorporate the IAI GPS Interference Prevention System ADA, an advanced system that protects avionics systems from GPS interference.

## ■ Ten CENTAURO II Armoured Vehicles for the Italian Army

(cl) Senior management from the Iveco – Oto Melara Consortium (CIO) have signed a contract valued at Euros159M to deliver the first tranche of ten CENTAURO II Armoured Vehicles to the Italian Army. CIO was founded on equal participation between Iveco Defence Vehicles and the former Oto Melara company (now part of Leonardo). Iveco is responsible for engines, gearboxes



and all the automotive components, the hull and final integration for wheeled variants. Leonardo's responsibilities are the weapon systems, sights and fire control systems and the hull and the final



Photo Iveco

integration for the tracked armoured vehicles. The systems of the CENTAURO II are highly advanced in terms of power, observation capability, mobility, ergonomics, weapons range, communications and crew protection. The new 8x8 vehicle has a power pack delivering over 700 HP and an H-drive architecture. The system is entirely digital and features a modern turret mounting with a 120/45 mm gun. Summed up, the CENTAURO II will be adaptable to any scenario. In the future, 126 more vehicles will be delivered to the Italian Army.

## ■ FLIR Launches identiFINDER R200-GN

(c) FLIR has introduced its FLIR identiFINDER R200-GN spectroscopic personal radiation detector (SPRD), an addition to its identiFINDER R200-Series of handheld radiation security solutions. The SPRD is able to detect neutron and gamma radiation, alerting first responders to radiation threats. The new neutron capability is an important early warning system as neutrons can penetrate material and travel longer distances than other forms of radiation. Recording and sending real-time dose rates and geotag information via a companion mobile app has been made possible by the integrated Bluetooth Smart wireless technology. The ruggedised pager-sized device is certified according to IP67 and protected against dust and water (up to 1 m depth); it is also certified according to MIL-STD-810G, guaranteeing its resistance against salt and fog, and it meets the 1.5 m drop criteria required by the performance standards for alarming PRDs, ANSI N42.32.

## ■ Iveco Defence Vehicles to Deliver Amphibious Platform

(c) Iveco Defence Vehicles, CNH Industrial subsidiary specialised in the construction of protected and armoured vehicles, will provide

its 8x8 amphibious armoured platform design, core components and services, to support BAE Systems within the framework of their contract with the US Marine Corps.



Photo: Iveco Defence Vehicles

The Amphibious Combat Vehicle (ACV) is open ocean-capable, equipped with a new six-cylinder 700hp engine. The vehicle is mobile in all terrain. The US Marine Corps' Developmental Testing and Operational Assessment has proven its capabilities for water and land operations, payload and survivability. It has a suspended interior seating structure for 13 embarked Marines, and blast-mitigating positions for a crew of three.

## ■ GA-ASI Maximising Fuel Capacity for MQ-25

(c) By employing an integrated fuel tank structure, General Atomics Aeronautical Systems (GA-ASI) can maximise fuel ofload for the MQ-25 unmanned aerial

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### CONTACT:

#### LOCAL INDUSTRY (INDONESIA)

**MS. LISA RUSLI**

Project Manager

M : +62 815 1822 716

E-mail : yulisa@napindo.com

#### INTERNATIONAL

**MS. ERIKE BRIGITHA MALONDA**

Project Manager

M : +62 815 9254 215

E-mail : erike@napindo.com



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refuelling aircraft for the US Navy. The fuel tanks in a large-scale wing box test article and a full-scale wing skin pre-production validation article provide more fuel carriage and delivery capacity. Various inspections verified the production readiness of the co-cured wing and tail components. Fuel containment sealing methods, advanced non-linear buckling finite element analysis models and thick composite laminate construction were validated as well as the MQ-25 tooling concepts, lamination approach and processes. The integral fuel tank shall minimise technical and schedule risk. The validation of the outer mould line tooling approach for the build process enables an accelerated engineering and tooling fabrication for the MQ-25 programme.

## ■ Lincad Launches the ARMADA

(cl) Lincad, UK supplier of batteries, chargers and power management systems, has launched its six-channel battery conditioner, the ARMADA. This battery conditioner is designed for the state of charge (SoC) management of lithium-ion and other battery types. It is compatible with IrDA, SMBus smart batteries

Photo: Lincad



and batteries with no communications interface. As it is able to manage lithium-ion batteries to be at less than 30% SoC, it is designed for users preparing batteries for air transport in line with IATA regulations. Powered from a universal AC mains supply, the automatic charging and discharging of batteries through battery interface adaptors, connected via locking military-standard circular connectors, is carried out by its six independent channels. This process, controlled by the system software, must be initiated through a push-button interface: LED displays give detailed information during operation. As the battery is rugged, it can operate in military environments, and in order to adapt to future technology, the battery conditioner accepts field software upgrades.

## ■ RADA's MHR Radars Selected for US Army IM-SHORAD

(cl) RADA Electronic Industries Ltd., an Israeli provider of tactical land radar for force and border protection, announced that its Multi-mission Hemispheric Radar (MHR) has been down-selected as a part of the Leonardo DRS mission equipment package (MEP) solution for the US Army's Initial Maneuver-Short Range Air Defense

Photo: RADA Electronic Industries Ltd.



(IM-SHORAD) capability. The prototype contract is still to be signed. The radar can be mounted on the Stryker A1 platform. It offers a 360° aerial surveillance enabling the operator to detect and track Unmanned Aircraft Systems (UAS), rotary wing and fixed wing threats. Four MHR radars are included in each IM-SHORAD MEP, capable to be used at the short-halt and on-the-move. This effort needs systems that will be provided in early 2019.

## ■ Rheinmetall to Supply Laser Light Package

(cl) The Federal Office for Bundeswehr Equipment, Information Technology and In-Service Support, the German procurement authority, has signed a contract with Rheinmetall. Rheinmetall is going to deliver 1,745 lightweight assault rifle-mounted laser light packages to the Bundeswehr's Special Forces Assault Rifle (Sturmgewehr Spezialkräfte Bundeswehr, leicht). The laser light package is based on Rheinmetall's Variable Tactical Aiming Laser (VTAL) module. This robust and compact system is designed for today's shorter assault rifles. It features an extremely strong visible red dot laser, a near-infrared dot laser and a near-infrared illuminator, which can be focused, and is compatible with standard image intensifier devices. Both dot lasers can be adjusted with a colour-coded cable switch. Two "Lumenator" weapon lights are as well installed on the weapon, a standard version with a dual LED head and a special version for hostage rescue operations. VTAL can also be coupled with further tactical weapon lights. Conventional optical aiming will

Photo: Rheinmetall



not be reduced, as the VTAL protrudes only about 25 mm above the mounting rail. The watertight metal housing has a built-in MIL-STD 1913/STANAG 4694 interface. This laser light package can work in extreme conditions; it is waterproof to a depth of 30 metres. To make adjustment on the weapon easy, a laser block is integrated at the factory.

## ■ NDMA Awarded Contract to Safran Vectronix

(cl) Safran Vectronix AG, manufacturer of portable optronics equipment, will deliver several hundreds of medium and long range multifunctional thermal imagers to the Norwegian Armed Forces. The company's products MOSKITO TI and JIM Compact were selected by the Norwegian Defense Material Agency (NDMA) as compact and lightweight handheld devices. MOSKITO IT is a monocular handheld system, weighing 1.3 kg. It includes several high performance sensors and modules like an uncooled thermal imager, high grade direct view optics (DVO), Low Light TV (LLTV) channel, a laser rangefinder (LRF), a digital magnetic compass (DMC) and a GPS receiver. JIM Compact weighs 2 kg. It is a binocular and compact long range handheld device. The system combines a cooled high resolution thermal imager, advanced

Photo: Safran



TV channel, embedded "see spot" capability, infrared laser pointer, a LRF, a LLTV channel, a DMC and a GPS receiver. The combination of the two devices will allow day and night observation, target acquisition, artillery correction and fire support, forward observer and Joint Terminal Attack Controller.



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# Russia's Policy of Deception and Denial

Eugene Kogan

**A policy of deception and denial is the cornerstone of Russia's overarching strategy of confusion, paralysis and ultimately defeat of the opponent.**

Consistency, conviction and perseverance are key words to describe the policy of deception and denial. The cases presented below shed light on the consistent pattern of President Vladimir Putin's government to deceive others and depict Russia as the one that comes to the aid of the underdogs, whether in Georgia, Ukraine or elsewhere. Syria is a special case where Russia cannot abandon its military bases to aggressive Western powers. As a result, Russia paints an image of an allegedly bellicose West that wants to destroy what remains of Syria, while Russia is depicted as defending the independence and sovereignty of the country against the obtrusive West. In other words, Russia is good, attentive and caring, while the West is evil, irresponsible and careless.

President Putin has consistently pursued and implemented his policy of deception and denial since the outbreak of the Russian-Georgian war in August 2008, a war which Russia blames on Georgia and in which Russia was obliged to come to the aid of the underdogs Abkhazia and South Ossetia. Despite the ceasefire agreement between Russia and Georgia signed on 12 August 2008, which provided for the withdrawal of Russian and Georgian forces to pre-conflict positions, Russian troops did not retreat to the positions they held before the beginning of hostilities, but remained in the occupied territories of Abkhazia and South Ossetia on the pretext of defending the territories against aggressive and unpredictable Georgian policies. The subsequent Russian policy of integrating Georgian territory in South Ossetia is seen by Putin's government as a normal thing, and weakened Georgia can do little about it if it doesn't want to provoke Russia; Georgia simply complains about being encircled by Russia. Thus Russia can portray its weaker

Photo: Kremlin



**President Putin has consistently pursued a policy of deception and denial.**

opponent as uncontrolled, unpredictable and revengeful. According to Russian politicians, Georgia continues to have a grudge against the independent states Abkhazia and South Ossetia, and one fine day – in the not-too-distant future – Georgia will try to reclaim both areas. Even if this is far from the truth, it is the goal of Putin's government to slander the Georgian government. Consequently, Russia always holds others responsible for any misconduct and represents Russian actions, such as the occupation of territories, as a humanitarian gesture for vulnerable minorities protected by Russia from militant Georgia. The fact that Russia is occupying Abkhazia and South Ossetia and that the occupied territories simply have no choice but to be pro-Russian is denied by Moscow, although the reality in the occupied territories looks quite different. Russian politicians would immediately reject the author's analysis, but that is to be expected. Russia has applied the

same strategy to the annexation of Crimea, which was supposedly necessary to defend the endangered Russian population.

We must not forget that President Putin has repeatedly said that Russia did not annex Crimea, but rather accepted the will of the Russian people living on the peninsula to return to Russia through the referendum on 16 March 2014, which would make the whole story more credible and legally binding. Putin's statement was reiterated by Sergei Lavrov, Foreign Minister, when he said that Moscow "will respect the will of the Crimean people".

Russian media then spread the story that Crimea is legally bound to Russia, and throughout Russia people did not understand why the West showed such a hostile attitude. However, the referendum was considered illegal by most members of the European Union, the United States and Canada, as it took place at a time when Russian soldiers were stationed on the peninsula. Thirteen members of the United Nations Security Council voted in favour of a resolution invalidating the referendum, but Russia vetoed it and China abstained. A resolution of the UN General Assembly was adopted on 27 March 2014 by 100 votes in favour, 11 against and 58 abstentions, invalidating the referendum and confirming Ukraine's territorial integrity. Nevertheless, Russia refuses to recognise the resolution, which underlines Russia's contempt for the international community and shows that Russia's national interests take precedence over the resolutions of the international community.

In addition, the Kremlin's version of the Crimea story was disseminated in English-language media outlets to convince short-sighted Westerners that it was indeed the desire of the Russian majority in Crimea (about 60 percent) to rejoin Russia and not remain part of Ukraine. Whether a similar strategy can be applied in the Baltic States and Kazakhstan, all countries with a large Russian population, cannot be discussed in this article, but this possibility cannot be ignored. In addition, a wealth of articles on this topic has been published since March 2014.

The claim that the people of Crimea welcomed unification with Russia only at gunpoint is absurd, the Kremlin claims. The Russian soldiers on the peninsula were only responsible for the proper conduct of the

## Author

**Eugene Kogan** is a defence and security expert based in Tbilisi, Georgia.

referendum, and that was all. For inexplicable reasons, the West rejected the Russian narrative and unanimously imposed economic sanctions against Russia (with the exception of Turkey as a member of NATO's Western alliance), which still exist despite President Putin's "good will" to improve relations with the West. Putin laments that his country is punished for a non-existent crime (annexation of Crimea) that Russia did not commit because it was the free will of the Crimean Russians to belong to Russia. Sanctions, however, did not prevent Russia from continuing its policy of deception and denial.

If one believes the Kremlin, then the subsequent war in eastern Ukraine has shown that there was no Russian military involvement and that since March 2014 no Russian soldier has fought on the side of the separatists. Western reports of this kind are allegedly shameful lies that are supposed to damage the reputation of the Russian military and President Putin as commander-in-chief. If the European Union and NATO member states provide sound evidence of Russia's involvement in various operations around the world, the Russians claim that this evidence is either not concrete enough or is deliberately intended to denigrate Russia. Russia's refusal to take responsibility for misconduct is therefore in line with its policy of deception and denial. Russia does not intend to change this policy in the near future, as this policy has repeatedly acquitted Russia of misconduct, while the evildoers in the West have repeatedly failed to provide sufficient evidence of Russia's involvement.

In another Russian narrative, Syrian President Bashar al-Assad is said to have called on the Russian military to defend Syria's sovereignty and territorial integrity, while the West came to Syria without invitation and should therefore leave sooner rather than later. Once again, Russia appears as a friendly supporter of humanitarian aid, while the West is a warmonger who does not want to leave Syria. At the same time, Russia has no plans to leave Syria in the foreseeable future, although it often says it is withdrawing militarily. The claim to withdraw from Syria has already become a recurring proverb in Russia. And once again, according to Russian interpretation, Russia is right and the West is wrong. Since the West is involved in the Syrian military operation, it should then also pay for the reconstruction of the country after the war. Yet another Russian narrative refers to the poisoning of Sergei Skripal and his daughter Yulia Skripal in March 2018, who were allegedly poisoned by Russia. As in the cases mentioned above, Russia denies



Photo: Kremlin

**At the 70th session of the UN General Assembly on 28 September 2015, President Putin declared that the West had staged a coup in Ukraine.**

any involvement. It also rejects all allegations from the United Kingdom, because they are allegedly flawed; according to the Kremlin, there are actors who are interested in blaming Russia.

In short, there is a uniform pattern of Russian behaviour based on deception and denial of Russian involvement; any Western evidence is rejected on the grounds that it does not have a sufficient basis and that Russia has acted correctly or is not involved. According to Russian logic, Western accusations are always unfounded and malicious.

This is a consistent pattern, and things will go on like this. In support of the author's claim, I quote James Mattis, US Secretary of Defence, who told reporters in Washington on 27 March 2018: "They remove the badges from the soldiers' uniforms and go to Crimea. They have nothing to do with what the separatists are doing in eastern Ukraine. I'm not sure how they can say that, but they are doing things they obviously want to deny." This has been Russia's way out of a delicate situation. Whether or not the West believes in the Russian narrative is irrelevant to President Putin and his government; having an honest face and smiling behind the backs of naive Europeans and Americans is Russia's way of outwitting and dividing the EU and US politicians and ordinary citizens. We must not forget that Putin has many supporters in the West who, despite repeated fraud, still want to deal with Putin's Russia; Jeremy Corbyn, leader of the UK Labour Party, for example, said on 21 March 2018 that he would "do business" with Russian President Vladimir Putin, although he claimed "all fingers point to Russia on Salisbury", namely to the poisoning of Sergei Skripal and his daughter Yulia Skripal.

Russia's Western admirers can indeed be described as Putin's useful idiots of the 21st century. Many of them live in the Member States of the European Union and propagate Putin's Russia and thus enjoy Western fundamental freedoms, while at the same time praising Putin's autocratic regime and,

surprise, surprise, they see no discrepancy between the freedoms taken for granted and the support of the autocratic regime.

So far the Russian policy of deception and denial has worked like magic in various places around the world; Moscow has little reason to change it even if the West continues to scold Russia. Moreover, Russian politicians feel that the West can always be outwitted, because the West needs Russia more than Russia needs the West. This prevailing view finds support among Western economic circles and lobbyists who are campaigning for a rapprochement with Putin's Russia. After all, these circles are interested in maintaining economic relations with Russia despite Russia's persistent misconduct, which they prefer to overlook. In addition to the moneyed circles, various political left- and right-wing parties are in favour of maintaining cordial relations with Putin's Russia. Once again, Putin's useful idiots continue to stand up for Putin's Russia, despite the latter's consistent policy of deception and denial. It is uncertain whether the West will come to its senses and understand that Putin's Russia is a destructive force, but one thing is certain: Putin's useful idiots will not disappear from the international stage and their numbers will not decline but rise; their voices will be heard constantly, and Putin will continue to count on their support, as in a good old-fashioned marriage.

After all, Russia's policy of deception and denial is consistent. Those who are vulnerable become believers and loyal supporters; they are 100% convinced of Putin's sincerity and become Putin's useful idiots at home and abroad who perceive the West as aggressive and expansive. Russia's policy of deception and denial, including Russia's refusal to take responsibility for misconduct, is a successful strategy for Russia to act from a position of weakness. It remains to be seen whether the West will accept Russia's manoeuvring. It can be said, however, that this is an ongoing issue on which we have not yet heard the last word





# Viewpoint from Kuala Lumpur



## Business as Usual

**Dzirhan Mahadzir**

At the time of writing in July, more than two months have passed since Malaysia elected the Pakatan Harapan coalition into office, overturning 60 years of continuous government by the Barisan Nasional coalition. Ironically the end of the Barisan Nasional's rule was brought about by Mahathir Mohamed, Malaysia's longest serving prime minister from 1991 to 2003, who joined the then political opposition to campaign against then Prime Minister Najib Tun Razak with the result that Mahathir is now once again prime minister of Malaysia. Mahathir's first term as prime minister was often marked by his willingness to speak out against Western politics, although Malaysia continued to strongly cooperate with Western countries behind the headlines, including in defence. Ironically, it was the then Secretary of Defense, Najib Tun Razak, in 2002, who stated in a speech to the Heritage Foundation in the United States that the United States and Malaysia have a long history of military cooperation and will continue to do so.

### The Spratly Islands Dispute

Similarly, Mahathir has now made public statements that he does not want to see too many warships in the South China Sea, but at the working level there have been few political changes in terms of cooperation and engagement with foreign military forces, and no significant changes are ex-

pected to occur, except that such activities could possibly be reduced due to cost-saving measures, as the new government has to contend with a debt of RM1Tr (€210Bn) inherited from the previous government. Mahathir has proposed that the Spratly Islands countries de-escalate and reduce tensions by reducing the presence of their marines and conducting joint patrols in the region only with lightly armed ships. At the same time, he has declared that Malaysia will retain the five islands all claimed under Mahathir's government during his first term as prime minister and where it has deployed forces.

### Foreign Relations

The current developments in regard to Malaysia's position on the South China Sea and Spratly Islands is similar to Malaysia's outlook in Mahathir's first tenure as prime minister, in that the overall situation and claims by countries there are of limited concern to Malaysia so long as it does not affect or touch upon Malaysia's claims there. Mahathir's policies in his first tenure were marked by the fact that Malaysia was open to any arrangement or agreement, as long as the arrangement benefitted Malaysia or its people and was not in violation of international law. Thus Mahathir has stated that Malaysia is open to participation in China's Belt and Road Initiative (BRI) but on the condition that it must benefit Malaysia

and its population, unlike measures agreed upon by the previous administration where Malaysia's participation in the BRI had solely benefitted China. Mahathir and his administration had swiftly moved to cancel all such programmes though it remains to be seen how much Malaysia will have to pay China in compensation for these cancellations. Malaysia's Finance Minister Lim Guan Eng will visit China in late July to discuss these issues and Mahathir himself is expected to follow up with a visit to China in August.

Mahathir and his government as a whole are expected to maintain a balance in relations with the United States and China while ensuring that Malaysia benefits from its relations with both countries. Regionally, Malaysia is expected to follow the principle of non-interference in the internal affairs of ASEAN countries. However, relations with Singapore are likely to be somewhat contentious, given Mahathir's past history of rocky relations with the island state and the perception in some quarters in Malaysia that Singapore benefited too much at the expense of Malaysia during the Najib administration. Relations with Japan are expected to grow significantly, given the mutual admiration that Mahathir and Japan have for each other and Japan was the first foreign country that Mahathir visited after he entered his current premiership though such growing of relations is expected to be more in the economic and technological

sphere rather than in defence and security. Ties with the UK and Europe are expected to be steady, though the contentious issue of the EU's plan to ban palm oil may result in the Malaysian government being less inclined to consider European defence purchases if the ban becomes reality. It remains to be seen how Malaysia's relations with the Middle East will be. Saudi Arabia has yet to react officially to Malaysia issuing the recall order for its two C-130 Hercules and military personnel in Saudi Arabia that formed part of the Saudi coalition against Yemen, which the previous Najib administration had committed to. Beyond that, the current Malaysian Government has not turned much attention to the Middle East.

## Procurement Programmes

At the Ministry of Defence, Defence Minister Mohamad Sabu is finding his way around there. He himself admitted on his appointment that he has much to learn and little knowledge on defence. Unfortunately this means that he has yet to address some outstanding issues in the Ministry of Defence, the main one being the yet-to-be-signed contract for MBDA's MICA surface-to-air missiles that are to equip the under construction MAHARAJA LELA class Littoral Combat Ships which are based on Naval Group's GOWIND design. The first of the six-ship class was originally scheduled to conduct sea trials and commissioned in 2019, but it is now highly likely that this date will slip. The minister has also not address the outstanding issues of upgrades for the Royal Malaysian Air Force's BAE HAWK fighter aircraft, Lockheed Martin C-130 transports and Sikorsky S-61 helicopter fleet. All these were supposed to have been carried out by the previous administration but had

been put on hold due to funding issues and the 2018 General Election. No statement has come from the minister so far as to whether these upgrades will be pursued or alternative plans considered. The opinion of some in the RMAF is for the HAWKs and S-61 NURIs to be replaced rather than upgraded, the HAWKs with the Light Combat Aircraft requirement that the RMAF has formulated (though this is an RMAF requirement that has yet to be endorsed or approved by the government) and the NURIs with additional H225Ms to add to the 12 that the RMAF already operates.

Little has been said also on the Royal Malaysian Navy's Littoral Mission Ship programme. The Najib administration had ordered four of the 68-metre ships, two to be built by China Shipbuilding and Offshore International Co. Ltd and two by Malaysia's Boustead Naval Shipyard, with the first two built in China to be delivered in 2019 and 2020, followed subsequently by the Malaysian-built ships. Post election, controversy has arisen over the costs of the RM1.17Bn contract (€247M) for four ships which were lightly armed with a 30mm gun and two 12.7mm guns, though the ships were planned to also incorporate three mission modules containers of 6 tonnes each. There is also debate around whether Malaysia should be having its naval ships being built in China, given China's claims on the South China Sea included portions of Malaysia's EEZ. The Mahathir administration, on assuming office, stated that all contracts involving China would be reviewed and scrutinised, though no statements have been made in regard to the LMS contract.

Outwardly the biggest indication as to where Malaysia is heading in defence will be in October 2018, when the 2019

budget will be tabled. The Mahathir administration will then indicate any changes in regard to defence plans under the 11th Malaysia Plan of 2016–2020 which outlines the overall Malaysian government spending for a five-year period. The previous Najib administration had not made any significant defence procurement allocation under the 11th Plan. However the Mahathir administration is likely to be cautious on defence spending, given that it campaigned on cutting excessive government spending. After assuming office, Mahathir stated that the previous administration had left Malaysia with excessive debt, thus spending on defence in light of this will be politically unviable.

## Change or Continuity

In conclusion, much remains to be seen in regard to Malaysia's defence policy and development, but for the moment in regard to military engagements with various countries, it remains business as usual. The main exercises include an RMAF contingent of 5 F/A-18 HORNETS and an A400M taking part in the Pitch Black Exercise in Australia held in July–August this year; the joint Malaysia-China exercise Aman Youyi, which will focus on counter-terrorism and maritime security, is scheduled to be held in mid-October this year, with Thailand invited as observers, while around August–September this year, the Malaysian phase of the US CARAT (Cooperation Afloat and Readiness Training) exercise will be carried out, involving at sea and amphibious landing exercises. Thus, overall, no policy changes in regard to military engagement with foreign countries have occurred, though it remains to be seen as to whether this will continue or be changed next year. ■

# Friendly Rivals

## Turkish-Iranian Relations

**Korhan Özkilinc**

A geopolitical perspective on the Turkish-Iranian relationship is important, as Turkey and Iran are the main regional powers in the Middle East. It is impossible to influence regional policy without the participation of both countries.

Due to the historical and cultural ties in the region, they have established multifaceted relations with neighbouring countries, which makes them competitors. The

According to the treaty, Mesopotamia fell to the Ottomans and Yerevan to the Safavids in the South Caucasus. Diplomatic relations were intensively expanded from

that expanded into a proxy war. The so-called Islamic State (IS) used the unstable situation in Syria and Iraq to proclaim a "Caliphate State", which was the beginning of a long reign in the Middle East. As if all this was not enough, Kurdish nationalism reached its peak in Northern Syria and Northern Iraq. The terror organisation PKK with its offshoots PJAK in Iran and PYD in Syria ruthlessly tried to establish a Marxist-Leninist Kurdistan. Due to the unstable political situation in Lebanon and the assistance of Iran and Syria, Hezbollah is strongly represented throughout the Levant, but could also cause violence in Israel. In Yemen, the Houthi rebels, supported by Iran, are fighting their arch-enemy Saudi Arabia and turning the situation in the southern Gulf region into a witch's cauldron. Iran is a deeply divided country with a very conflict-ridden political landscape with revolutionary ideology that emphasizes self-sufficiency and resistance to the "imperial" West.

In contrast to Iran's strategy, Turkey is trying to undermine Iran's ambitions by restoring political and economic stability in the region. Unfortunately, little attention is paid to Iranian water policy in geopolitics. Isa Kalantari, former minister of agriculture and now minister of the environment of the Rohani government, recently said in an interview: "Iran with its 7,000-year history will no longer be habitable in 20 years if water resources continue to be destroyed so quickly. Iran must fear water scarcity more than nuclear war, Israel or the United States."

### Iraq and the Kurds

Wars have been raging in the Middle East for decades for various reasons. Iran and Iraq fought each other between 1980 and 1988, resulting in millions of deaths. The Second Gulf War followed in 1991, caused by the occupation of Kuwait by Iraq; the USA and its partners liberated Kuwait from Saddam Hussein. Finally, Iraqi President Saddam Hussein was overthrown by the US in the third Gulf War (Iraq War) in 2003. The end of the US occupation was announced by former US President Barack Obama, and troop withdrawal was completed on 18 December 2011. Unfortunately, the American withdrawal from Iraq has created a power vacuum and plunged the country into chaos. Iran

Graphic: Amir Ebrahimi



**The Kurdish population is distributed between Iran, Iraq, Syria, Turkey and Armenia.**

two countries pursue different approaches in international politics, but are not only politically but also economically interdependent, especially in energy and water security.

### Historical Background

Relations between Iran and Turkey date back to the Ottoman Empire (Turkish, Sunni) and the Safavid Empire (Persian, Shiite). From 1514, both empires were continuously involved in wars for over a century and fought for supremacy in the Caucasus and Mesopotamia; the confessional differences, in particular, reinforced the conflicts. The treaty of Qasr-e Shirin ended the sporadic wars between the Ottomans and the Safavids in 1639.

1835 onwards through the international deployment of the first Ottoman ambassador Esad Efendi. Despite all this, the tension between the empires continued into the 19th century, but the Qasr-e Shirin Treaty resolved all conflicts. It is worth noting that today the borders between Turkey and Iran and Iran and Iraq are designed in accordance with the Qasr-e Shirin Treaty.

### The Crisis-Ridden Middle East

After the end of the Cold War, dynamic changes took place in Turkey and Iran, prompting both Ankara and Tehran to redefine their strategies of influence. In 2011, a small spark in Syria triggered a civil war



has used this to its advantage and influenced the Iraqi government with the help of machinations. There are no longer any Sunni members of the government as before; the members of the government are mainly Shiites. This has led to tensions between Turkey and Iran with far-reaching consequences in the Arab world. The former Iraqi government under Nouri al-Maliki and the present government under Haider al-Abadi are also constantly trying to consolidate their control over Iran's political institutions and security services in order to curb the freedom of the Sunni Arabs and Kurds in Iraq.

Turkey has a strong interest in a politically stable, independent and economically prosperous Iraq, but classifies Iran's ambitions as very dangerous. Iraq's ties with Iran should be prevented by a close relationship between Ankara and the Kurdish regional government in Northern Iraq. Not only has the economic development of the Kurdish areas led to prosperity in Northern Iraq, but the Kurds have also become politically more self-confident.

As a result, the Iraqi Kurds, led by Masud Barzani, held an independence referendum on 25 September 2017, despite the ban by the Supreme Court. Despite the



Photo: Free Gaza Movement

***The Israeli attack on the Turkish ship MAVI MARMARA in 2010, in which ten Turkish citizens were killed and several dozen injured, strained Israeli relations with Turkey.***

large participation of the Kurdish people, the Iraqi government declared the referendum unconstitutional. The result was that the two competitors Iran and Turkey were in agreement this time, because both countries have large Kurdish minorities in their own country and are strictly against

an independent Kurdish state. This development must not obscure the fact that the political supporters of the Kurds were Israel and the USA at the time. Apart from the Kurdish question, Ankara and Tehran have recently become good friends in the Qatar crisis. Both countries were on Qatar's side



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Photo: US State Department



**The representatives of the UN Security Council's five permanent members, China, France, Russia, the UK and the US, together with Germany and the EU negotiated with Iran about its nuclear programme.**

when an alliance of several states such as Saudi Arabia, the UAE, Egypt and Bahrain accused the Gulf state of terrorist support and politically isolated it in June 2017.

Turkey is fighting more intensively against the Kurdish terror organisations PKK, PJAK (Iran) and PYD (Syria) than Iran, because Tehran sees the Kurdish terror organisations as an important instrument against Turkey and wants to keep them as leverage. These developments could profoundly change relations between the two countries. Obviously, Tehran has recently come to the conclusion that a cooperative Turkey brings more advantages than disadvantages.

Turkey has three objectives in Iraq: firstly, the elimination of the terrorist organisations IS, PKK, PJAK and PYD in the Qandil and Sinjar mountains. Secondly, Turkey wants to maintain Iraq's sovereignty and, thirdly, to prevent a "Shiite Crescent" uniting Iran, Iraq, Syria and Lebanon. Iran wants a weak Iraq to maintain its supply routes to Syria and Lebanon on the one hand, and a controllable Iraq capable of facing the resurgence of the IS groups on the other. The "Shiite Crescent" would allow Iran to influence the region from the Caspian Sea to the Mediterranean and Persian Gulf and impose its geopolitical will on the world.

### "Arab Spring"

"Arab Spring" is an allusion to the Prague Spring of 1968 and has its origins in Tunisia. On 17 December 2010, protests began against the head of state Zine el-Abidine Ben Ali, which, until his escape from Tunisia, caused uprisings with hun-

dreds of deaths and also engulfed other Arab countries. The damage was devastating and caused the deaths of thousands of people. From a Turkish perspective, the Arab Spring was a "democratisation process", but from an Iranian perspective it was an "Islamic revolution". In the initial phase, many Arab countries saw Turkey's position positively, but when the protests in Egypt were bloodily suppressed by the armed forces and democratically elected Egyptian President Mohammed Morsi was overthrown and sentenced to death, the Turkish government sided with the Egyptian people. Since then, Turkey's attitude towards Egypt and some Gulf states has been viewed with suspicion; political relations with Egypt have come to a standstill and many military exercises and projects have been suspended until further notice.

### Proxy War in Syria

As part of the Arab Spring in early 2011, the protests against Assad's authoritarian regime in Syria began. As the protests turned into a civil war, foreign influence and participation grew and, as a result, the Syrian civil war evolved into a bloody proxy war. In Syria in particular, the differences between Turkey and Iran are clearly visible. Turkey calls on Syrian President Bashar Al-Assad to take clear steps towards democratisation and refrain from repressive measures against his people, but Assad has not yet complied. The partnership between Damascus and Tehran dates back to the Iranian Revolution, when both countries showed solidarity against Iraq. At the same time, the two countries are supporters of

the Hezbollah militia, which is seen as a bulwark against Israel. Allegedly Iran is fighting in Syria with its Revolutionary Guard and Shiite mercenaries with more than 250,000 fighters.

Things became even more complicated when Russia gave Bashar Al-Assad political and military support to expand its sphere of influence in the Mediterranean region. This was also one of the reasons why the US chose the Syrian branch of the terrorist organisation PKK, the PYD, as a partner in Syria instead of its long-standing NATO partner Turkey. When IS and PYD gained a lot of ground, Ankara took the initiative to drive the PYD and IS from the Turkish-Syrian border through Operation Euphrates Shield and Operation Olive Branch, which aroused US opposition. The Syrian border towns Afrin and Manbij, former PYD strongholds, are now under the control of the Turkish armed forces. The main purpose of the operations is to address Turkey's security concerns. Russia, Turkey and Iran are currently trying to end the proxy war in Syria and have therefore started the Astana process without the participation of the USA and the West.

### The Palestinian Question and Israel's Policies

For centuries, Turkey has been good friends with the Jewish citizens and for decades with the State of Israel. This attitude has been translated excellently into economic and military relationships. The relationship between Ankara and Tel Aviv was actually so good that Israeli fighter pilots were trained in Turkish airspace for a long time.



The Turkish–Israeli friendship was for a long time observed with great concern by Tehran, because Iran feared that Israel could use Turkey for its military attacks against Iranian installations. It is no secret that Iran has used the PKK terrorist organisation in order to destabilise Turkey from within.

But Israel's aggressive attitude towards the Palestinian people, especially in Gaza, has weighed on relations between Ankara and Tel Aviv. A tragedy, which marked the lowest point in Israel and Turkey's relationship, occurred in May 2010 as part of the peaceful protests to lift the Gaza blockade. Israeli commandos attacked the ship "Mavi Marmara" in international waters, killing ten Turkish citizens and seriously injuring several dozen. Ankara broke off all relations with Israel. Although Israeli Prime Minister Benjamin Netanyahu apologised a few years later for the deaths of several Turkish civilians, his aggressive attitude towards the Palestinians caused relations with Ankara to stall. As long as relations between Turkey and Israel remain reserved, Iran will benefit, but if the Palestine question were to be resolved, this would be detrimental to Iran. Turkey would not only strengthen its relations with Israel, but the peace process would give Ankara an enormous reputation in the Arab world. In other words, not only Tehran, but also Cairo and Riyadh do not want a peaceful solution to this issue.

### Turkish Dominance in the Caucasus and Central Asia

Thanks to former President Turgut Özal, Turkey has cleverly exploited the collapse of the Soviet Union and expanded its sphere of influence in the Caucasus and Central Asia. Turkey benefitted in particular from its strong cultural ties with Azerbaijan, Kazakhstan, Kyrgyzstan and Turkmenistan. In addition to Turkey's reputation, this has also benefitted the Turkish economy, particularly the Turkish defence industry. In the Caucasus, Iran is supported only by Armenia and in Central Asia only by Tajikistan. Iran's relations with the Tajiks are good, as 85% of the Tajiks are of Iranian origin. Good relations with Armenia are important for Iran, because Tehran needs a counterweight against the strategic alliance of Turkey and Azerbaijan in the Caucasus. In the explosive conflict in Nagorno-Karabakh between Azerbaijan and Armenia, Iran is supporting Armenia instead of the Shiite Azerbaijan. In doing so, Iran wants to keep Azerbaijan weak in international politics and prevent Armenia's geographical isolation. Furthermore, Azerbaijan and Iran have unresolved conflicts such as Iran's claim to the energy resources of the Caspian Sea. The

hostile attitude of Iran and Armenia has prompted Azerbaijan to intensify cooperation with Turkey and Israel in military and defence matters. Azerbaijan supplies most of its natural gas and oil to the international markets through Turkey, and recently the main section of the TANAP Trans-Anatolian Natural Gas Pipeline was completed. Turkey and Azerbaijan call themselves "one nation, two countries", the economic development of both countries has not yet reached its peak and also holds enormous potential for foreign investors.

### The Iranian Nuclear Programme

Iran has its own uranium deposits in Anarak, Gchine and Yazd; uranium ore is currently being mined in Saghand. The military facility in Parchin is considered a pos-

sible site for nuclear experiments alongside the research reactors in Tehran, Bonab and Ramsar. According to US reports, Iran carried out a nuclear programme under Shah Mohammad Reza Pahlavi until the end of the 1970s and is suspected of developing nuclear weapons.

It is an open secret that the Islamic Republic regards nuclear capability as a deterrent against the threat emanating from the USA and its partners, in particular Israel and Saudi Arabia. It is worth mentioning that Saudi Arabia is considered a great threat, because Saudi Arabia and Iran claim to be the rightful leaders of the Muslim world. Turkey is very concerned about Iran's nuclear programme, as an Iranian nuclear power would destabilise the Middle East and trigger a regional arms race. The consequences would first affect Saudi Arabia and then Egypt. Moreover, Ankara does

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Photo: Wikipedia



**A demonstration against President Assad's authoritarian regime in Douma near Damascus, Syria, during the "Arab Spring"**

Photo: Kremlin



**Russia's President Putin met with President of Iran Hassan Rouhani and President of Turkey Recep Tayyip Erdoğan on 22 November 2017 to discuss a peace settlement in Syria. Turkey and Iran are the main regional powers in the Middle East.**

not want Iran to be cornered by sanctions and economic embargoes, because that is what makes Tehran erratic and aggressive. Turkey has cooperated with Iran twice in the past, first in May 2010, when Turkey and Brazil signed a uranium enrichment agreement with Iran, and later, as Erdoğan mediated between Iran and the P5+1. The Joint Comprehensive Plan of Action (JCPOA) between Iran and the P5+1 (Chi-

na, France, Great Britain, Russia, the USA + Germany) has been successful until very recently. Iran was allowed to buy Western aircraft and consumer goods, but with the US withdrawal from the Iran agreement under the Trump government, the positive developments were brought to a halt. This strengthened the hardliners in Tehran, who now claim that good relations with the West would be impossible. The developments in

Tehran should be watched carefully, especially the conservative camp. But Turkey will continue to have a lot to do in the future, because Ankara has recently begun constructive talks with Tehran, which would help the West.

## Conclusion

As a NATO partner, Turkey holds a unique position in the Middle East and stands on multiple sides in regional conflicts, frequently in opposition to Iran. The government in Ankara wants to safeguard the sovereignty of its territory and therefore has begun to construct a 688 km wall along the Iranian border in 2017. The first section with a length of 144 km will be completed this year. Turkey is cracking down on the Kurdish terrorist organisation PKK and its Iranian branch PJAK. In addition, the wall will cut off the logistical routes, but Ankara also wants to stop or curb the smuggling of people from Iran and Afghanistan. In August 2017, Turkey, Iran and Russia signed a trilateral agreement to establish a consortium of three partners: In the near future, the Turkish energy company Unit International, the Russian energy company Zarubejneft and the Iranian investment company Ghadir will exploit and distribute Iranian oil and gas reserves.

In addition, the three countries have two important objectives. Firstly, the Astana process under Russian leadership should restore peace in Syria. There is still a discrepancy in the common strategy; Turkey wants a sovereign, stable Syria without Bashar Al-Assad, but Russia and Iran want a controllable Syria under the leadership of Bashar Al-Assad. Time will tell us how it will turn out. Secondly, the three countries want to extend their scope for action on and around the Silk Road through cooperation.

It is in the nature of things that countries gear their geopolitics to their own interests. As a result of Iranian-Turkish rivalries tensions will continue to arise, but there will also be some constructive developments; for instance, Iran and Turkey will continue economic cooperation in defiance of the American policies. But it is inappropriate to speak of a "Turkish-Iranian axis". In the future, the USA will be more supportive of Turkish interests than those of Kurdish organisations, because if it were not for Turkey, US foreign policy in the Middle East would come to a standstill. Moreover, neither Israel nor Saudi Arabia can replace Turkey in the Middle East. Furthermore, Turkey is fully aware and is also expected to adapt to a changing security environment as NATO's most important partner. ■

# NATO Assurance Measures in the Baltics

**Tomáš Čížik**

**Russia's aggressive actions against Ukraine and the annexation of the Crimean peninsula in March 2014 have changed the European security architecture. These measures have surprised every state and disturbed relative security in Europe.**

Russia's aggression, however, has been increasing gradually since 2008, as many events showed: Vladimir Putin's speech at the Munich Security Conference in 2007, the suspension of the implementation of the Treaty on Conventional Armed Forces in Europe in 2007, the Russian "peace mission" in Abkhazia, followed by Russian intervention in Abkhazia and South Ossetia in 2008, major military exercises on Russia's western borders near Georgia and Ukraine, or several attacks on the air sovereignty of many NATO member states. Moreover, since NATO's enlargement to include Central European and Baltic states in 1999 and 2004, there has been little investment in the development of NATO infrastructure in these states. The main reason is that nobody (except Poland and the Baltic states) perceived Russia as a direct security threat. In fact, it was Poland and the Baltic States that demanded an increased presence of the Alliance on their territory. During this period, NATO member states tried to build a "strategic partnership" with Russia, but Russia's use of military hardware and equipment was not conducive to this initiative. But everything has changed with the annexation of the Crimean peninsula by the Russian Federation. Relative security in Europe and the "strategic partnership" with Russia disappeared, and NATO had to face the new security challenge in the immediate vicinity of its borders. In the summer and spring of 2015, RAND Corporation investigated the form and probable outcome of a short-term Russian invasion of the Baltic States. They noted that NATO

was unable to successfully defend the territory of its most exposed members during this period and that NATO had very limited opportunities to take countermeasures. Further simulations by RAND Corporation have shown that approximately seven brigades, including three heavy tank brigades, can successfully prevent the rapid flooding of the Baltic states. Of course, it would require adequate support from air forces, land fires and other ground-based facilitators who are prepared to fight at the start of hostilities. In addition, such an initiative would require the commitment of all NATO member states and increased defence spending.

## Russian Federation and Baltic Countries

Russia is using hybrid warfare to change the European security architecture and the entire world order. Russia's involvement in Syria, the attempted coup in Montenegro in 2016, interference in the US presidential elections or the use of chemical nerve gas in the UK are clear insults. However, Russia behaves differently in the Baltic States. Russia has about

100,000 deployable soldiers near NATO's eastern border (in the western military district); it carries out massive "offensive" military exercises, often involving the use of nuclear weapons. The number of Russian air force flights into NATO airspace has also increased significantly in recent years. The most difficult one was the "successful" simulation of a nuclear attack on Stockholm in March 2013, and in recent years Russia's military capabilities have improved significantly both qualitatively and quantitatively. As Kaarel Kaas argued in his 2014 article, "one of the strategic goals of Russia's political elites is to create forces that can, firstly, guarantee Russia's military superiority over the entire territory of the former Soviet Union and in neighbouring areas; and secondly, to project limited military force on a strategic, global level. The

## Author

**Tomáš Čížik** is director of the Bratislava based think tank Centre for European and North Atlantic Affairs (CENAA).



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**NATO's 2018 Summit at the level of Heads of State and Government with Georgia and Ukraine at NATO's new headquarters in Brussels, Belgium. NATO is pursuing a dual-track approach towards Russia: meaningful dialogue on the basis of a strong deterrence and defence posture.**

strengthening of Russia's military capabilities last year was made possible above all by the higher defence spending and military reforms announced by Russian Defence Minister Anatoly Serdyukov in October 2008. Russia has significantly increased investment in its military since 2013, and the Russian military budget has risen by 26%. In addition, Russia's modernisation efforts have focused primarily on the Western military district, the Baltic Sea and the Northern Fleet. Since the beginning of moderni-

sation there have been two main trends that have shaped the Russian armed forces in the Baltic Sea region – the strengthening of existing units and the formation of new units and military bases. Since 2009, the staff of the main manoeuvring units has been doubled and three new units have been created and stationed near the Baltic States: First, the 25th Motorised Rifle Brigade, which was set up as a completely new unit at the Vladimir Lager military base near the Estonian border. Secondly, Ostrov

Air Base near the Latvian border was reopened and staffed with a full-fledged Army Air Brigade (home of 50 of the latest attack and transport helicopters). Thirdly, in 2013 an air base was opened on the territory of Belarus, hosting 24 Su-27M3 fighters. Since 2007, Russia has been significantly strengthening its Baltic Fleet, which was hit hard by the dissolution of the Soviet Union. Currently, Russia's Baltic Fleet consists of two attack submarines and 55 warships (including destroyers, frigates, corvettes, guided missile corvettes, base minesweepers, landing ships and landing crafts). Moreover, Russia is strengthening its military presence in the Arctic region. As proof, we can mention numerous military exercises, the modernisation of military equipment or the reopening of old Soviet-era military bases. In addition, Russia has already deployed a brigade with special training for an operation in the Arctic in Alakurtti near the Finnish border (60 kilometres away). The second brigade is to be deployed in the Yamalo-Nenets Autonomous Region behind the Urals by the end of 2016. Russia also conducted numerous military exercises in the Nordic-Baltic region. In 2009, Russia and Belarus conducted a military exercise called Zapad 09, which included the defence scenario against an attack by Baltic "nationalists"; Russia tried to invade and occupy the Baltic region, with a corridor of about 100 kilometres west of the Russian border. Another large military exercise called Zapad 2013 took place in 2013, once again a joint military exercise of Belarus and Russia. The aim of the exercise was to fend off an attack on Belarus. However, the Zapad 2013 scenario was couched



**Aurora 2017 was a three-week exercise in September 2017, in which 19,500 soldiers from Estonia, Lithuania, Denmark, France, Norway, the USA and Finland simulated defence against a fictitious invasion. It was the biggest military exercise since the end of the Cold War. At the same time, Russian armed forces were holding the Zapad 2017 exercise in Belarus with (reportedly) 12,700 soldiers from both countries.**



in an “anti-terror narrative”. In August 2015, Russia launched an Arctic military exercise involving more than 1,000 soldiers, 14 aircraft and 34 special forces. As one commander of the Northern Russian naval fleet said, “the drills aim to increase the security of the Russian Arctic, to secure the economic freedom of our state in this region and to protect our territory from possible military threats.” The last, largest military exercise was Zapad 2017, which took place along the entire western border of Russia. In addition, this exercise exceeded the officially stated 12,700 personnel. Rather, based on observations, more than 100,000 servicemembers participated in Zapad 2017. It is necessary to mention that NATO is also conducting military exercises in the region. However, NATO’s military exercises always have a defensive character.

### Defence Spending and NATO Assurance Measures

At the NATO Summit in Wales in 2014, member states pledged to increase defence spending to 2 percent of GDP. As the data show, NATO Europe and Canada’s defence spending increased 3.08 percent in 2016 and 4.87 percent in 2017 (in terms of

prices and exchange rates from 2010). The cumulative increase in spending for the period 2015 to 2017 is more than US\$46Bn. However, there are only 5 NATO member states that spend 2 percent or more on defence: the United States, Greece, the United Kingdom, Estonia and Poland. Increased defence spending is the most important countermeasure taken by the Alliance to improve its deterrence and improve its territorial defence. By March 2014, most defence budgets of NATO member states were in decline. In 2009, defence spending by all NATO states reached a peak of 3.28 percent of GDP, in 2017 it will be only 2.42 percent of GDP. Increasing defence spending was the absolutely necessary step towards improving security in the Baltic Sea region. In 2014, NATO implemented Assurance Measures consisting of land, sea and air activities in, on and around the eastern part of the Alliance territory.

Assurance measures include AWACS employment to preserve airspace integrity, increased intelligence, surveillance and reconnaissance activities along the eastern borders, enhanced Air Policing to supplement national air policing capabilities, assistance to nations to refine their Special Operations Forces capabilities, employment

of Maritime Patrol Aircraft and Standing Naval Forces to provide maritime situational awareness and the execution of training and exercises across the eastern border to improve interoperability.

One of NATO’s first security measures for the Baltic states was air policing, which began immediately after the Baltic states joined NATO in 2004. Air policing aims to maintain the airspace integrity of the Baltic States. It is carried out as a collective 24/7 task on a four-month rotational basis. Air Policing is currently led by Portugal, which has sent four F-16AM FIGHTING FALCONS to Lithuania. Other participants are France, with four MIRAGE 2000-5Fs in Estonia, and Spain, with six Eurofighter TYPHOONS in Lithuania.

The second Assurance Measure in the Baltic States is the NATO Response Force (NRF). Founded in 2002, the NATO Response Force is a highly ready and technologically advanced multinational force composed of land, air, sea and special operations forces (SOF) components that can be deployed quickly and on demand. The NRF is based on a rotational system in which allied nations deploy forces for a period of 12 months. NRF can respond quickly to all security challenges from crisis management



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to collective defence. The NATO Summit in Wales in 2014 approved the creation of Very High Readiness Joint Task Forces, the main goal of which is to enhance NATO Response Forces and allow them to move rapidly and respond to potential challenges and threats. VJTF will be able to deploy within a few days to respond to challenges that arise particularly on NATO's periphery. VJTF consists of about 20,000 personnel and includes a multinational land brigade of around 5,000 troops and air, maritime and SOF components. Leading elements

AWACS surveillance aircraft as well as a wide variety of national JISR assets from the space, air, land and maritime domains. One of the most important of NATO's Assurance Measures is Enhanced Forward Presence (EFP). After the annexation of Crimea, NATO has enhanced its presence in the eastern flank of the Alliance. NATO's Enhanced Forward Presence represents four multinational battlegroups situated in Estonia, Latvia, Lithuania and Poland. These battlegroups are led by the UK, Canada, Germany and the US. Their

is a good thing". Nevertheless, the same studies have shown that 21 percent of Slovaks believe "NATO is a bad thing" and that 31 percent of Slovaks would vote to leave NATO. Strengthening the resilience of NATO member states against Russia's interference in their domestic policies should not stop with the Baltic states. Therefore, NATO member states should also engage in campaigns to improve public knowledge of NATO and its importance, but also to improve their internal resistance to disinformation campaigns and conspiracy theories. The public should be aware that it is directly or through proxies influenced by the Kremlin and what instruments the Kremlin uses. NATO member states should also improve their national cyber-security systems to further improve their security and the security of all Allies.

## Conclusion

Its aggressive actions against Ukraine and its interference in the domestic policies of NATO member states make Russia the biggest security threat to the Alliance. These measures have also changed the European security architecture. As shown above, Russian behaviour is clearly offensive and has the long-term goal of dissolving NATO from within through hybrid warfare and tactics. The most vulnerable members of NATO are the Baltic states most exposed to the Russian threat. To meet the Russian challenge, NATO decided to improve the security of the Baltic states through NATO assurance measures. These measures send a strong political message to the Kremlin: NATO stands behind all its members and each Member State is determined to defend its allies. Collective defence is NATO's most important role and one of the reasons for its creation. NATO's security measures in the Baltic States are not offensive and their main objective is to improve the Alliance's readiness for future Russian measures that could target the Baltic States. The NATO Summit in Brussels in July 2018 is a crucial moment for the future of the North Atlantic Treaty, which will determine the Alliance's future path. The summit will focus on six main areas: strengthening deterrence and defence, promoting stability and the fight against terrorism, enhanced cooperation with the European Union, modernising NATO, a fairer distribution of the burden and an alliance of common values and transatlantic unity. NATO is a unique project that has brought peace to Europe and its importance remains. However, NATO cannot stand still and must adapt to new security threats and challenges. ■

Photo: US Army



**Estonia opened the new NATO Force Integration Unit (NFIU HQ) building in Tallinn on 12 June 2016.**

will be ready to move within two to three days. NRF also consists of the Initial Follow-On Forces Group (IFFG), which is another high-readiness force that can be deployed quickly following the VJTF. IFFG are made up of two multinational brigades. Both VJTF and IFFG forces are based in their home countries, but they are able to be deployed to wherever needed. NRF also fulfil another important role – cooperation in education and training, increased exercises and better use of technology, which is crucial for interoperability of Allied forces. Finland and Sweden are also participating in NATO exercises; both countries are not NATO member states but perceive Russia as a security threat.

In February 2016, the defence ministers declared initial operational capability (IOC) for NATO's Joint Intelligence, Surveillance and Reconnaissance (JISR) initiative. This initiative should enhance the situational awareness of the NATO Response Force through heightened proficiency in collecting, processing and exchanging intelligence. JISR assembles data and information gathered through projects such as NATO's Alliance Ground Surveillance (AGS) system of NATO

presence sends a message that an attack on one ally will be considered an attack on the entire Alliance. EFP demonstrates the strength of the transatlantic bond, and it is the biggest reinforcement of NATO's collective defence. Based on data from February 2018, the total number of all troops in all four battlegroups is around 4,600. As mentioned above, all NATO Assurance Measures have a defensive character, and they are designed to improve the security of the NATO's eastern flank.

However, such measures are perceived differently by Russia. The Kremlin portrays NATO as an aggressor threatening Russia by moving ever closer to its territory. Such a story also appears in pro-Russian disinformation media throughout Europe. Many disinformation campaigns spread information that NATO is moving troops to the Russian border to trigger a new conflict. These campaigns are often supported by local politicians and extreme right-wing political parties who use this story to win the support of their constituents and create chaos in the minds of citizens. The Globsec investigations in 2018 showed that only 37 percent of Slovaks believe that "NATO




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# Mind the Gap

## Amphibious Bridging in NATO

**Tim Guest**

**Amphibious bridging capabilities among NATO members have taken a back seat for many years, but the Alliance is now at a critical point where its river-crossing assets must be addressed as a priority.**

**N**ATO has some big rivers to cross if ever a major conflict breaks out in Europe. Whether advancing eastwards, or withdrawing westwards, the same water obstacles that faced both sides in WWII will face any future armies at war in the European theatre. And with current political tensions and uncertainties across the continent, not least caused by Mr Putin's curiously aggressive Russia, that is no longer as farfetched an idea as it was just a handful of years ago. So,

### Yes and No

NATO's armies certainly have various means and capabilities to cross rivers should the need arise. From individual vehicle capabilities such as snorkelling, to assault craft, pontoon bridging systems all the way up to state-of-the-art amphibious 'bridging and ferry' systems. So, yes, we can cross a river, but the "no" is that we currently do not have enough bridging systems to face every eventuality and those we do have will

and the Turkish AAAB from FNSS are in use predominantly by their national armies. The fact is, there is an urgent need for new thinking, standards and decisions to ensure a future where NATO can deploy the right number of bridging systems capable of carrying not only the loads of today, but also the vehicle variants that are in the pipeline and likely to be fielded in the years to come.

### A Voice of Authority

This state of affairs has been repeatedly highlighted in recent years by Lieutenant General Ben Hodges, Commanding General of the US Army in Europe until December last year. Before, during and after the major NATO exercise "Operation Anaconda" in 2016, he voiced his concerns about the effectiveness of the Alliance's bridging capabilities in the face of the threat from the east. He said that heavy military equipment such as SP artillery and main battle tanks could not be moved fast enough from Western Europe to the eastern flank of NATO due to limitations that included insufficient rail transport and bridging. On the Baltics, Hodges said that NATO would be unable to defend those three nations from Russian attack due to the time it would take to get materiel in place, adding all three countries would likely be overrun within a matter of 36 hours.

It is worth noting that during Anaconda a combined engineer unit consisting of the German Army's 130th Engineer Battalion (PzPiBtl 130) and the British Army's 23 Engineer Regiment, operated the longest M3 floating bridge ever built to allow NATO forces to cross a 350 m span of the Vistula river near Chelmno, Poland. The bridging operation connected 34 UK and German M3 Amphibious Rigs together, (8 British and 22 German) in only 35 minutes, and vehicles that crossed included some 200 US Army vehicles such as STRYKER AFVs and others. General Hodges was reported as saying at the time of the Vistula record-breaking crossing that it was the best bridge he'd ever seen and that it was a wonderful example of interoperability with two allies providing the capability that everybody else in the Alliance needed. Neither the FNSS AAAB, nor the EFA system from CEFA were deployed during Anaconda. The kind of interoperability demonstrated by the M3 during Anaconda is key, not

Photo: UK MoD



**GDELS' M3 amphibious bridging and ferry system is widely used in NATO.**

if 27 allied nations did find themselves in need of delivering troops, armour and supplies to positions that require major river crossings, could they do it? Well, the answer is both yes and no, and the following article tries to address that question in more detail by looking at current thinking, capabilities and equipment, as well as imminent requirements.

### Author

**Tim Guest** is a defence and aerospace journalist and former Royal Artillery officer.

not be able to support future and current vehicles. Investment is one of the factors behind this state of affairs. Engineering capabilities like amphibious bridging have taken a serious budgetary back seat for many years. As a result, all too few Alliance members have amphibious bridging capabilities, or sufficient floating bridge capabilities and the organisation would be hard pressed to deploy successful bridges in every location needed in a Europe-wide conflict. The M3 amphibious bridging and ferry system from General Dynamics European Land Systems (GDELS) is currently the most widely adopted solution in NATO, while the French EFA system from CEFA

only according to General Hodges but also according to leading industry players who see interoperability as crucial to any future system. Equipment from different countries must be able to be combined in the field so it work together easily; during Anaconda three countries, the US, the Netherlands and Germany interoperated effectively with their respective pontoon bridge capabilities, and the British and German engineer capabilities also combined and interoperated effectively together to deploy the longest ever M3 bridge. Effective interoperability was demonstrated more recently in the M3's latest outing during the June 2018 "Sabre Strike" exercise in Estonia, Latvia, Lithuania and Poland. This involved 19 NATO nations during which British and German engineers once again deployed the M3, this time in a 200 m crossing scenario of the Neman river on the outskirts of the Lithuanian city of Kaunas. Some 150 vehicles and 700 troops made the crossing assisted by more than 40 British Royal Engineers and their German counterparts, who jointly deployed the M3. Once again, neither the FNSS AAAB, nor the EFA system from CEFA were deployed during Sabre Strike and, indeed, EFA and AAAB have not been deployed during NATO exercises so far.



Photo: UK MoD

**The longest M3 floating bridge ever built spanned 350 m across the Vistula river.**



Photo: French MoD

**The army of France relies on the EFA system from CEFA.**

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## Rigs in Use

The M3 is the most widely used of three amphibious bridging systems in NATO, the other two being the Turkish Armoured Amphibious Assault Bridge (AAAB), and the French EFA system, both latter systems used predominantly in isolation by their own national forces.

can carry loads of up to MLC 85T/132W and can be crossed by all types of Main Battle Tank (MBT) including the LEOPARD 2, M1A2 ABRAMS or the CHALLENGER 2. The M3 offers interoperability with other bridging solutions such as the SRB (Standard Ribbon Bridge)/FSB (Floating Support Bridge) and IRB (Improved Ribbon Bridge). GDELS also offers coupling devices to en-

to erect by eight men. In the ferry mode it can carry one heavy tank, two medium tanks, or four infantry combat vehicles. The Armoured Amphibious Assault Bridge (AAAB) from Turkish manufacturer FNSS, which is very similar to M3, though much heavier with two more axles and a lower MLC carrying capacity, is another bridge and ferry system designed specifically for the Turkish Armed Forces. In its capacity as a ferry the AAAB can carry MLC70 T vehicles when in a two-bay configuration. By deploying ramps, which are carried by the AAAB's hydraulic crane, three AAABs can be coupled together and from ramp to ramp MLC100 W vehicles can be transported on inland waterways. When 12 AAAB systems are coupled together from ramp to ramp, a 150 metre bridge can be created, capable of supporting the crossing of MLC100 W and MLC70 T vehicles. Wider spans can be crossed using more AAABs.

## Industry Thoughts for NATO

Most countries have two lines of thinking regarding bridge-crossing capabilities. One is to have an asset that is easy to store and procure and that sways users towards a pontoon bridge preference. The second is a need for a fast deployable solution, in which case an amphibious answer is preferred; this is also the preferred solution for modern armies, which want the least manpower-intensive system possible. And while, in the procurement phase, amphibious bridges are more expensive than pontoon options, in the end, after their operational lifetime, amphibious solutions like the M3 will end up cheaper. Pontoon solutions are more manpower intensive and will also need additional equipment to aid their deployment, including trucks and logistics vehicles are needed to transport, deliver and deploy them, all adding to their overall lifetime cost. So a system like the amphibious M3 will be more cost effective in the long run.

It seems, however, that NATO's needs are not all black and white. The results of various NATO exercises and comments from the likes of General Ben Hodges make it very clear that NATO does not, at this time, have enough floating bridge capabilities available. But decisions as to which to procure between pontoon or amphibious are really for each country to decide. European countries to the east are still pontoon oriented, while western nations lean more towards amphibious solutions. That said, NATO forces including the Germans and British, are currently looking for a follow-on system to the M3, as the M3's intended end life will be reached around 2030. The choice, however, is still not clear



*The CNIM Motorised Floating Bridge is also in service with the French Army.*



*The Turkish Armoured Amphibious Assault Bridge produced by FNSS*

The M3 offers high mobility, availability and seamless land to water transition. The rig can be driven directly into a river without preparation and used as a ferry or, when a number are joined together from bank to bank, as a bridge. The M3 can carry MLC85 tracked vehicles, (in bridge or ferry configurations), and eight M3 units and 24 soldiers can build a 100 m bridge in 10 minutes. The system can deploy on the move, in or out of water, with no on-site preparation to enter the water needed. It can be controlled from inside the cab when 'swimming'. It can be operated by a crew of two. Used as either a bridge, or as a multi-bay raft, the M3

sure a correct interface at any time with different types of equipment used among the Alliance members. The M3 was combat proven in Iraq by UK forces.

The EFA amphibious bridging and ferry system from French defence manufacturer CEFA is a 45-tonne system that can enter a water obstacle once it has inflated rubber floats; it has high mobility on land and in the water. It can act as either as a ferry, raft, or bridge, with an MLC-70 loading capacity. It can be used for wet and dry gap crossings and is operated by a two-man crew. A 100-metre bridge requires 4 EFA vehicles and will take around 15 minutes



### British Presence Confirmed

Lt Gen Patrick Sanders UK Commander Field Army in Germany was reported in August last year as saying that the British were now looking to maintain and extend their amphibious engineering/M3 capability, reviewing the issue until the start of 2018. He said that the "partnership between the German First Panzer Division and the British 3UK Division remains very close with the two working on a lot of division capabilities including interoperability, in parallel to the fact that they are serving alongside each other in the Baltics."

It now seems the review of the matter has borne positive results. In the middle of July 2018 the British Army announced that it is committed to supporting critical NATO assets in Germany, including a combined river crossing capability and facilities to allow for joint training. In a statement it said that "there is a requirement to enhance support to NATO and to strengthen ties with our European allies. We are committing to a combined river crossing capability with the German Army (Bundeswehr), known as the M3 wide-wet gap crossing capability, and associated shared facilities in Minden. We will also use the Training Area at Sennelager and supporting infrastructure in Germany to enable live fire training by UK and NATO forces." Good news for all concerned.

as to whether an amphibious, or pontoon system will be chosen as the next solution. The decision may be for a mix. What is clear, while this whole matter is still in the investigation phase, is that NATO countries are aware they have to do something to increase their floating bridge capability. That said, the M3 remains state-of-the-art at this time and can carry the heaviest vehicles currently in the NATO ORBAT. The

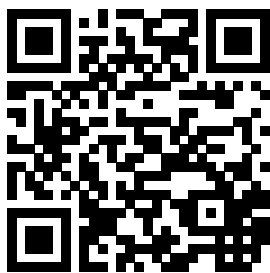
main problem is that all the leading NATO countries are increasing the MLC classes of their tanks. How far vehicle upgrades can go is something manufacturers are looking at carefully. They have to watch which way the countries develop MLC classes. These issues make it critical for the standards groups to come up with new standards for the next 25 to 30 years, and with countries now considering the building of MLC120

vehicles, or above, new and clearer standards are crucial. NATO countries must all be able to carry not only their own vehicles but also the vehicles of all their NATO allies.

### Conclusion

NATO must address its floating bridge capabilities as a matter of urgency. While MLC classes have evolved steadily since WWII, we are now entering a next-generation phase of new 'standard loads' at a time when NATO forces do not have enough floating bridges available to fulfil their tasks. These are what need to be defined by NATO to ensure manufacturers know which way they have to go; should they look to MLC100/110/120 and then to a general MLC class, or to a specific product-oriented MLC class? What new vehicle variants and weights/widths/deck pressures will need to be carried by a next-generation amphibious solution? And will NATO opt for purely an amphibious solution, or a pontoon system, something completely new? Industry can only respond with the right system when it knows what the Alliance wants and these requirements need to be identified urgently. Meanwhile, over in the east...

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# Military Capabilities of the Baltic States

**Giulia Tilenni**

In ESD 5/2017 we discussed why and how the Baltic States were planning to upgrade their military capabilities to better respond to geopolitical threats. One year later, what progress has been made?

Photo: US Air Force



*The BALTOPS exercise has gained in importance as a signal of the Alliance's commitment to the countries on the eastern flank. During BALTOPS 2016, a US Air Force B-52 STRATOFORTRESS leads a formation of aircraft, including two Polish F-16 FIGHTING FALCONS, four US Air Force F-16 FIGHTING FALCONS, two German Eurofighter TYPHOONS and four Swedish GRIPENS over the Baltic Sea on 9 June 2016.*

After the crisis in Ukraine, Estonian, Latvian and Lithuanian political leaders took a closer look at the defence of their countries.

Although NATO has been responsible for their defence since 2014, the Baltic states wondered whether NATO allies would actually provide them with military assistance in the event of an attack. In theory, this right is granted to all NATO members by Article V. In practice, it is difficult to judge how long a NATO response could take and

whether the Portuguese, Greek or Belgian governments (to give a few examples) would accept human losses to protect Tallinn, Riga or Vilnius. The EU could provide similar military assistance under Article 42.7. The fact that European defence capabilities are limited and the different interpretations of what the activation of this article really means could prevent any form of military support. All this considered, the three Baltic states have been struggling to achieve at least some form of autonomous military capabilities to be able to put in place limited military operations in case of need. Although these military capacities would not be sufficiently strong to neutralise eventual threats, they could help to provide more time while waiting for support from the Allies.

The Baltic states' new defence plans for the 2020 timeframe have been built around three key predicates: raising the defence budget to 2% of GDP (according to the NATO request formulated in 2016), bolstering national security strategies to make them respond to current threats, and procuring new military systems to boost armed forces' efficiency.

## Spending More, and More Efficiently

Riga, Tallinn and Vilnius consider it necessary to increase the defence budget not only to better adapt their defence systems to current security threats, but also to strengthen their many negotiating positions in NATO. Part of the defence budgets

## Author

**Giulia Tilenni** is an analyst for international affairs based in Paris, France.

of the Baltic States will be used in particular to improve military infrastructure and facilities, increase interoperability with NATO soldiers and increase the contribution to NATO activities (such as by pledging soldiers and funds for joint operations in areas such as landmines and cyber). Estonia was one of the first NATO countries to meet the 2% objective (along with the US, the UK, Greece, Romania and Poland). In fact, its level of military spending has been above the 2% threshold since 2015. In 2018, the Estonian defence budget accounts for approximately 2.14% of GDP, reaching €523.6M compared to €479.2M of the previous year. In details, Tallin will spend 30% for personnel, 27% for procurement and investment, and the remaining 43% to cover other defence-related costs. Procurement will mainly concern the support of armoured manoeuvring capabilities, and the modernisation of training conditions and facilities (including shelters for armoured combat support vehicles, maintenance and training garages, barracks for Estonian and NATO troops, and communications associated with this infrastructure, to be built in Tapa). Furthermore, as Estonia is a NATO Security Investment Programme recipient, extra funds will be available in addition to the €538M base budget for 2018.

In 2016, Riga spent 1.4% of its GDP on defence. Two years later, Latvia reached the 2% objective by raising its defence spending to €576.4M, a significant increase compared to 2017 – when the budget was €449.6M, 1.7% of GDP. The largest part of the Latvian defence budget will fund investments (43%), while 24% and 33% of the budget will be used, respectively, to fund maintenance and personnel. According to the Latvian ministry of defence, investments will fund infrastructure, air control and defence capabilities, additional mechanisation of their Land Force Mechanised Infantry brigade, and the upgrade of armed forces and the National Guard's combat and response capabilities. Estonia and Latvia, Lithuania has joined the exclusive club of NATO countries spending more than 2% of their GDP for defence. In 2018, Lithuanian defence expenditure has will reach €873M, about 2.01% of its GDP. This means a €149.2M or 20.6% increase compared to 2017. In detail, 41.6% of the Lithuanian defence budget will be spent on personnel and 13.5% on weapon and military equipment, 20.2% on investments and 15.3% on maintenance and other ex-

penses. Lithuanian leaders are confident that the country's military spending could reach 2.5% of GDP by 2030.

## An Overview of Defence Investments

Each of the three states has defined the programmes to be financed according to its military planning for the near future. According to the geopolitical scenario of the Baltic Sea region, the three states have a special focus on the procurement of new equipment in order to increase the efficiency of their armed forces. In Estonia, most of the 2018 defence investments will be dedicated to the mechanisation of the Scout battalion. They will include the procurement of ammunition and weapons, as well as communications, clothing and different forms of equipment (IT, personnel special equipment and personal protective

acquisitions. About €40M of the total defence expenditure will be spent on equipping the Army and the National Guard.

Lithuanian defence expenditure will focus on enhancing mobility and intelligence capabilities, developing and upgrading infrastructure, and technological capabilities (such as C2 structures, cybersecurity and information systems).

## The Estonian Example

Estonia is probably the Baltic state with the most advanced military industry. In fact, the country has developed highly relevant capabilities in the ITC domain and, consequently, remarkable technical capacities in the cyber domain. In theory, Estonian niche capabilities are so technologically advanced that they have no rivals within the EU. However, Estonia is still struggling to find its place within the European defence market, in which a limited number of countries control more than 80% of the whole marketplace. Initiatives such as PESCO and the growing NATO-EU cooperative efforts in the cyber domain could

serve as basis for consolidating Estonian position among its allies and, consequently, within the European market. For instance, the Estonian defence minister has recently declared that the country will propose, with Finland and Latvia, a joint project for the development of an autonomous land vehicle. This will be included in the second wave of PESCO projects, expected in November 2018. Such a project will allow

Estonia to demonstrate its will to expand its defence industrial capabilities beyond the cyber domain, with a particular interest for robotics. A growing number of Estonian firms have been already using the know-how developed in the ITC domain to implement robotics solutions. Unmanned vehicles are the core of this process, as demonstrated by the Estonian company Milrem (awarded the CV90 maintenance contract with BAE systems in April 2018). When the Milrem UGV TheMIS was presented at DSEI in 2015, the firm was a newcomer in the defence domain. In three years, the company has not only been able to further develop TheMIS' modularity (one of the most relevant features of the system), but has also established several partnerships with international firms (including ST

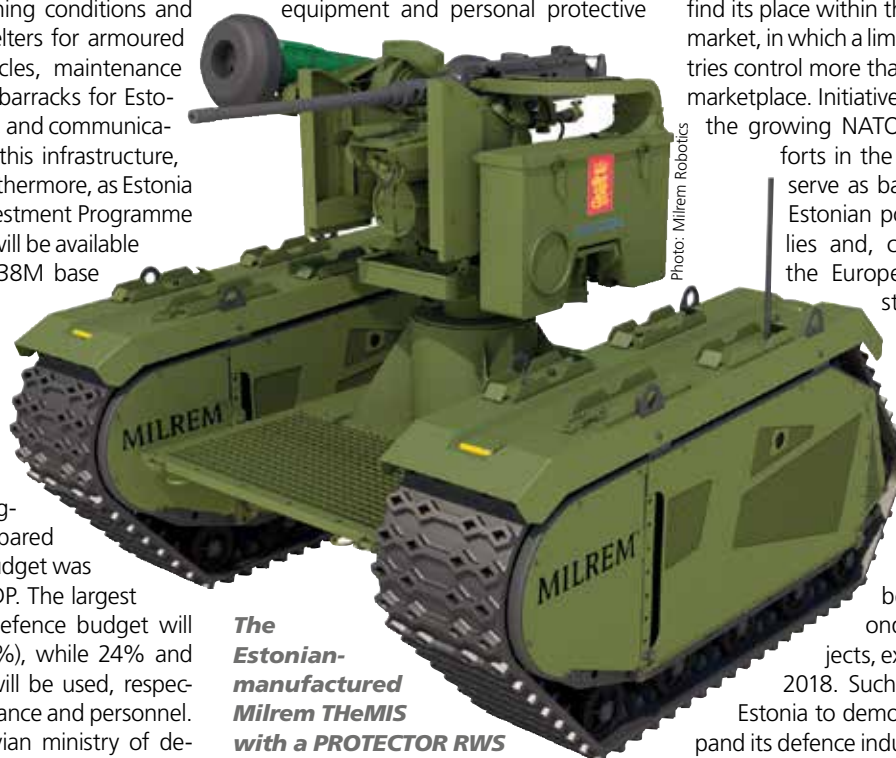


Photo: Milrem Robotics

**The Estonian-manufactured Milrem TheMIS with a PROTECTOR RWS**

equipment). The National defence League (the part of the Defence forces consisting of reservists) will receive defence funding as well, with a particular focus on ameliorating land forces' protection, rapid reaction and management capabilities. Other investments will fund equipment for intelligence and special operations, and naval minehunters' life-cycle maintenance. Latvia is expected to invest in military transport (28% of the total amount), ammunition (15%), weapons (13%) and individual equipment (8%). Seventy percent of the total procurement budget will be dedicated to supporting existing programmes, while the remaining part will be used for new





**On 15 December 2017, the Lithuanian Armed Forces received their first two VILKAS/BOXER training IFVs.**

Kinetics, Raytheon, FN Herstal, MBDA) for evaluating the integration of different weapon systems on its platform. Numerous armed forces are currently conducting tests to evaluate possible purchases of the systems. Should Estonian firms be able to affirm their technical capabilities in robotics, Estonia could increase its heft within the EU defence market, thus multiplying its chances of wielding influence in it. Estonia is also trying to gain the confidence of its allies through political measures. In particular, Tallinn is working to reaffirm its cooperative attitude in the defence field. Some 50 Estonian soldiers were sent to Mali to participate in the French military mission in the country. Estonia is well aware that this small contingent will have no significant military impact on the mission. However, Tallinn sees this presence as a kind of compensation for the allies' efforts to protect the Baltic States. Estonia recently signed the Letter of Intent to launch the European intervention initiative promoted by French President Macron to facilitate joint planning and establish a rapid reaction force to neutralise threats to European security. This initiative welcomes the participation of non-EU countries, in particular the United Kingdom after Brexit.

### **Estonia: Constant Spending Means Better Military Planning**

Estonia has been extensively working on raising its defence forces' readiness. According to Estonia's "National Plan for 2022", the country plans to enhance its defence capabilities by establishing "two fully manned, armed and equipped infantry brigades that are capable of quick re-

sponse." The 1st Infantry Brigade, located in Tapa, will be equipped with a mix of existing and new materiel. The ones already in Estonian armed forces' inventories include JAVELIN anti-tank missiles and PASI XA-180 EST armoured personnel carriers. New equipment will include self-propelled artillery systems and new personnel equipment, weapons and ammunition, as well as 44 BAE Systems HÄGGLUNDS AB CV9035 infantry combat vehicles and auxiliary vehicles, purchased from the Netherlands in 2014, with deliveries between 2016 and 2019. These systems will be joined by another 37 in the next years. Bought from Norway, they need to be refitted before use. A bid is open to decide which firm will be in charge of this modernisation, and the contract could be awarded later this year. The 2nd Infantry Brigade, expected to reach its full readiness by 2022, will be based in Luunja. Its equipment will include JAVELIN anti-tank missiles, 155mm howitzers, and the equipment and weapons needed to reach combat readiness.

The year 2018 is an important one for the Estonian armed forces, as the country has concluded three main deals for the modernisation of its defence capabilities – SHORAD (Short Range Air Defence), automatic rifles and howitzers.

In March 2018, Estonia launched a €54M tender to purchase M107 howitzer projectiles, as well as propellant charges and others. The country is also expected to procure new ammunition for the JAVELINs thanks to US funds granted to Baltic States to ameliorate their defence capabilities (\$170M in total).

In June, Estonia signed a €50M contract with MBDA to procure additional MISTRAL short-range air defence missiles/man port-

able surface-to-air missiles, to be delivered by 2020. The contract includes an option for the purchase of up to €100M in additional missiles. Thanks to this contract – the third between the two parties, as Estonian forces have been using MISTRAL since 2009 – Estonia will be one of the first countries to deploy MISTRAL 3 missiles. The agreement also includes the procurement of training missiles, simulators and testing equipment.

In the same month, Tallinn signed an agreement with South Korea for the purchase of Samsung Techwin K9 THUNDER self-propelled 155mm howitzers, to be delivered between 2020-2021 and 2026. This €46M contract includes 12 artillery systems, training, maintenance and spare parts.

The "National Plan for 2022" focuses mainly on land capabilities, as this operational environment is the most crucial for the country. However, Estonia is planning to further develop its mine warfare capabilities as well as its aerial capabilities, especially in regard to the ability to perform surveillance missions autonomously.

### **The Most Relevant Procurement Programmes in Latvia**

In Latvia, too, the increase in the defence budget will have a positive impact on procurement programmes, in particular on improving the Mechanised Infantry Brigade and, more generally, on strengthening the combat capabilities of the land forces and the National Guard.

On 12 February 2018, Riga signed a €108M contract with EuroSpike (a Rafael joint venture company) for the purchase of SPIKE anti-tank missiles, to be gradually integrated by 2023. SPIKE will equip the 123 Combat Vehicle Reconnaissance (Tracked) SCIMITARs bought in 2014 from the United Kingdom (€48.1M) and in delivery until 2020.

Tactical mobility, communication and personnel equipment are considered important assets to enhance Latvian armed forces' capabilities. In order to make its Armed forces and the National Guard more efficient, Latvia procured different types of off-road vehicles in 2018. These include three different models of 62 Polaris all-terrain vehicles (about €428M, co-financed by the US), procured in January, and the military version of BPR OUTLANDER MAX 650XT, procured in June (€11M contract) with deliveries to be completed by next year.

In terms of personnel equipment, the armed forces, National Guard and Border Guard will progressively be provided with new Heckler & Koch G-36 assault rifles,

purchased in 2018 under a €13M seven-year-long contract which also includes other types of weapons (undisclosed).

Moreover, the Latvian armed forces and National Guard are progressively receiving their new military tactical radio as a result of the two contracts (one in 2016, the other in 2017) signed with the US producer Harris. The aim is to reinforce command capabilities within the Latvian army and to ameliorate interoperability with NATO allies.

Latvia is also working to modernise its aerial capabilities, thanks to US funds. While the small air force, 250 regular servicemen, relies on two transport aircraft and fewer than ten transport helicopters, the Army does not have any aerial capability. Thus, Riga procured two AeroVironment RQ-20A PUMA UAS units for about €733,000, with deliveries expected in 2019. The first unmanned assets in Latvian armed forces' inventories will provide the country with persistent Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), over-the-hill and force protection capabilities. Riga is also working on enhancing its airspace security and the efficiency of air traffic surveillance, considered crucial capabilities for Latvia, which is already using three Lockheed Martin radars – the AN/TPS-777 model. In March 2018, the country received the first (of three) Scania-based Lockheed Martin TPS-77 Multi-Role Radar, bought in 2015.

### Lithuania: Procurement Programmes, Urban Warfare and Conscription

In 2018, Lithuanian investments in defence materiel slightly declined compared to 2017 (from €156.7M to €117.8M). However, Vilnius plans to spend €2.2Bn on modernising its armed forces in the 2017-2022 period. The three main modernisation projects will concern the procurement of BOXER (to be renamed VILKAS) armoured infantry vehicles (to provide the two infantry battalions with greater mobility, force protection, and firepower), self-propelled PZH2000 howitzers (to make the artillery battalion's fire support capabilities more efficient), and NASAMS (which will enhance the robustness of air defence systems). Lithuania received its first two BOXER prototypes in June 2018. The two vehicles will remain in Germany for qualification and test campaign for the whole year. During this time, Lithuania and ARTEC (the KMW-Rheinmetall consortium responsible for the vehicle) will finalise the last modifications before the start of serial production. Vilnius procured 89 IFV-configured BOXERS in four different variants. Deliveries are expected between 2019 and 2021.

Moreover, Vilnius signed a €109M contract with Kongsberg in October 2017 for the supply of NASAMS medium- to long-range air defence missile systems.

Lithuania is also trying to modernise its defence system according to the "total defence" approach, which focuses on enhancing Lithuanians' resilience. Thus, the country is multiplying its pedagogic efforts to raise awareness about how Lithuanians should

to improve its military infrastructure. The country has also launched (May 2018) the second stage of negotiations for the procurement of 4x4 light and medium-sized tactical vehicles. The Estonian MoD plans to invest more than €2.4Bn between 2019 and 2022. Investments will likely fund ammunition, communications, brigades' pioneer capabilities, as well as airborne and naval capacities. Moreover, Estonia is ex-



Photo: US Army

**Latvia just bought two RQ-20 UAS units to increase its surveillance capabilities.**

handle an eventual crisis or conflict, and is implementing the 2015 decision (unique in Europe) to reintroduce conscription. Vilnius is also at the forefront of urban warfare training thanks to two dedicated centres, used by both national and NATO armed forces. In the next years, Lithuania plans to double the size of these training facilities. The Pabrade training area will become able to host a battalion-sized group (up to 1,200 soldiers), while the Gaiziunai area will be able to train servicemen up to battalion level.

### Final Remarks

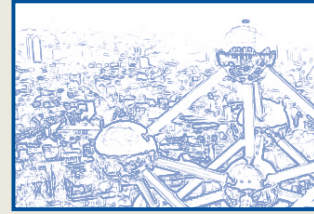
Estonia, Latvia and Lithuania are struggling to reaffirm some autonomous defence capabilities to better adapt them to the regional geopolitical scenario, as well as to the current political evolutions within NATO, the most effective military alliance they are part of.

In the immediate future, the three countries will continue the modernisation of their armed forces and territorial defence units through increased investments and new programmes. For example, Latvia plans to invest about €50M per year until 2021

pected to create its first cyber command by 2022. Lithuania plans to spend more than €2.5Bn in modernising its armed forces by 2022.

In addition, all three are working to improve the relationship between the military and the civilian population in order to strengthen the idea of "total defence". These include investments in psychological defence and domestic security to better support the population when necessary. However, the approach with which the three countries are improving their defence capabilities differs when it comes to the national defence industry. Latvia and Lithuania are highly dependent on foreign procurement, due to the limited size of their domestic defence industry, and Latvia is struggling for its place in the European defence market. The fact that the remarkable skills acquired in the cyber field could soon be complemented by highly relevant robotic capacities could serve as an important driver in strengthening Estonia's role in the European defence market. Indeed, remarkable robotic capabilities will be a first in the EU and could make an important contribution to the EU's efforts towards strategic independence. ■

# The Brussels Backdrop



## NATO Summit Marked By Disputes

Joris Verbeurgt

On Wednesday 11 and Thursday 12 July 2018, the 29th formal meeting of NATO Heads of State and Government took place at the new NATO Headquarters in Brussels. After a short opening ceremony, during which NATO Secretary General Stoltenberg outlined the Alliance's

cussion and discord between the Allies, no effort was spared to prevent a repetition of the harsh words between the US on the one hand and the European allies on the other. However, the Secretary-General's passionate plea, the symbolic signs of good will and the demonstration of good inten-

resilience to chemical, biological, radiological and nuclear-related risks, and the promotion of the 'women, peace and security agenda'. The two organisations already intensified cooperation in the field of maritime security, countering hybrid threats and fighting terrorism. The exchange of real-time warnings on cyber attacks is already taking place and NATO and the EU participate in each other's exercises and cooperate in the refugee and migrant crisis.

### Burden Sharing and the Fight against Terrorism

Fair burden sharing has been a burning issue for the USA for many years. Under the Trump administration, however, it has become an obsession. In May 2017, President Trump openly scolded European allies for not spending 2% of their GDP on defence, as they should do, according to the NATO rules. Speaking ahead of the Brussels Summit, it was Secretary-General Stoltenberg who brought up the subject by saying that the Allies will deliver on fairer burden sharing and that the European Allies and Canada are expected to spend an extra US\$266Bn on defence between now and 2024. Stoltenberg's démarche did not prevent President Trump from insulting one of NATO's most important allies on the first day of the meeting when he scolded Germany for participating in the North Stream pipeline project, paying billions of dollars a year for the supply of natural gas from Russia. Chancellor Angela Merkel countered that Germany is an independent country that takes its own decisions.

To step up NATO's role in the fight against terrorism, the leaders agreed to launch a new training mission in Iraq, with hundreds of NATO trainers. The professionalism of the Iraqi forces will be increased by the establishment of military schools, while key partners in the Middle East and North Africa, including Tunisia and Jordan, will receive more support from NATO.

Photo: Presidential Office of Ukraine



NATO's 29<sup>th</sup> Summit took place in Belgium on 11-12 July 2018.

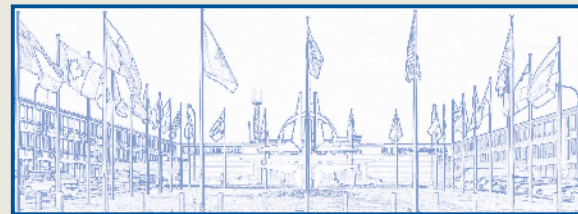
achievements in building peace and security and praised the professionalism and dedication of the Alliance's armed forces, the leaders of the 29 NATO member states and 20 partner nations discussed pressing NATO matters. Also present were representatives from the United Nations, the European Union, the World Bank and the NATO Parliamentary Assembly. The aim of the meeting was to strengthen NATO's attitude of deterrence and defence, to intensify the fight against terrorism and to achieve a fairer distribution of the burden - in other words, the traditional issues that have been recurring at every NATO meeting for two decades. In view of the painful experiences of the Warsaw Summit (July 2016) and the Brussels Summit (May 2017), when the world witnessed criticism, dis-

tensions could not conceal the deep dissension within NATO between US President Trump and European heavyweights Jean-Claude Juncker and Angela Merkel.

### NATO and EU Leaders Sign a New Joint Declaration

On 10 July, before the official beginning of the meeting, NATO Secretary General Stoltenberg, European Council President Donald Tusk and European Commission President Jean-Claude Juncker signed a new Joint Declaration on Cooperation between NATO and the EU. The new Declaration, two years after the initial agreement made in Warsaw, states that NATO and the European Union will strengthen cooperation in a number of areas, including military mobility, counter-terrorism,





## The Four Thirties

To strengthen NATO's deterrence and defence, the Heads of State and Government adopted the "Readiness Initiative". Commonly known as the "Four Thirties," this is a commitment to have 30 mechanised battalions, 30 air squadrons and 30 combat ships operational within 30 days or fewer by 2020. Furthermore, the Allies agreed on a new NATO Command Structure, including a new command for the Atlantic in Norfolk, Virginia, and a command for military mobility in Europe in Ulm, Germany. Staffing levels of these new commands are set at 1,200 personnel. They will ensure that NATO has the right forces in the right place at the right time. In addition, the Allies discussed NATO's response to hybrid threats and agreed to set up a Cyber Operations Centre and new counter-hybrid support teams to help NATO members at risk. These actions fit in the overall plan of protecting the Alliance and its members against "any potential threat", according to Stoltenberg, and to bolster combat readiness by easing the transport of troops across Europe in the event of a crisis. Although Stoltenberg stressed the fact that the new structure does not involve an increase in the number of NATO troops, it is no secret that the new measures are in response to perceived increased threats from Russia.

## Key Security Challenges

NATO also addressed key security challenges with leaders from Finland and Sweden, as well as with the Presidents of the European Council and the European Commission. Sweden and Finland are already very important NATO partners. Both countries are enhanced opportunity partners (EOP), participate in the NATO response force (NRF) and in exercises with the Alliance on a regular basis. As liberal democracies and advanced industrial economies with high-tech expertise and capabilities that have military significance, both countries are well integrated in the EU and share the core political values on which NATO has been founded. Could the renewed threat from a self-confident Russia encourage Sweden and Finland to become full members of NATO like the other Nordic countries of Norway, Denmark and Iceland?

The door has been opened for Skopje to open accession negotiations. Once the historic agreement on the name issue has been concluded and implemented, NATO may invite the former Yugoslav Republic of Macedonia to become the 30th NATO member under its new name, the Republic of Northern Macedonia.

The Heads of State and Government also met with close partners Georgia and the Ukraine to discuss regional challenges, defence reform and NATO's continuing support. Both countries are keen to join the Western military alliance, but have seen their chances of joining hampered by Russian territorial incursions. Under NATO rules, countries with territorial conflicts cannot join NATO.

The summit ended with a discussion on Afghanistan, during which the NATO partners decided to support the Allies. "Our presence in Afghanistan is crucial to ensure that the country never again becomes a safe haven for international terrorism," said the Secretary General. Heads of State and Government are expected to extend the financing of the Afghan armed forces beyond 2020 and to express their support for President Ghani's peace initiative and reform efforts.

At the end of the meeting there was a somewhat wrong tone when EU Commission President Jean-Claude Juncker was filmed at the gala dinner with wobbly feet. Assisted by the Dutch and Portuguese Prime Ministers, Juncker struggled to keep his balance among the other world leaders. The media immediately insinuated that he was drunk as this was not the first time that the EU leader had tripped at a summit. However, his spokesman categorically denied that Juncker was drunk. According to the spokesman, he suffered "a particularly painful sciatica attack accompanied by convulsions". Thus began and ended the 29th NATO summit with controversies.

## Aftermath: Trump and the Future of NATO

On 16 July, four days after the NATO meeting, Presidents Trump and Putin met in Helsinki to discuss relations between NATO and the Ukraine and Georgia. On 19 July, Putin warned NATO against maintaining closer relations with these former Soviet republics bordering Russia, saying such a policy was irresponsible and would have "unspecified consequences for the Alliance". Later, in an interview with Fox News, Trump (once again) questioned NATO's purpose and the common defence obligations of Article 5. Trump wondered why America should risk the Third World War with Russia for a country like Montenegro (NATO member since June 5, 2017). In his election campaign, Trump was already very critical of NATO and America's commitments to allies who contribute little or nothing to the Alliance,



**NATO's heads of state walk through the agora of NATO's new Brussels headquarters on 11 July 2018.**

to American security or to the defence of American interests. President Trump has been repeatedly irritated by NATO and the way in which the burden is shared among the Member States. Although Trump was immediately refuted by high-ranking members of his own Republican Party and the Democratic Party, this is a very dangerous development for Europe, because the US can do without NATO in a multipolar world but the EU cannot.

# Modernisation of the Russian Armed Forces

## Achievements, Plans, Objectives

**Stephen Blank**

One of Vladimir Putin's most important legacies is his reform of the Russian military, but many Western experts do not understand what military reform in Russia means, to where it could lead and how Russia's future defence policy could look.

Therefore Western observers cannot come to terms with Putin's defence legacy or the threats that it poses. Without such an understanding of context, content and direction, they complacently argue that Russia's problems, which are real, will negate any threat.

Photos: MoD Russia



**Putin's youth organisation "Young Army" (Junarmija) is a resumption of the pioneer organisations of the Soviet era, with an emphasis on military patriotic education and Russian Orthodox values.**

### The Defence Establishment

By situating Putin's reform of the entire defence establishment in the context of Russian history, this essay aims to alleviate commonplace misreading of Putin's accomplishments. Defence reform, as understood in Russia, entails the accompanying or preceding overhaul of the state administration and economy to support the new army that emerges out of a period of major change, either through revolution or "great reforms". Defence reform therefore goes beyond the Ministry of Defence and the armed forces; it aims to clarify relations between that Ministry and the General Staff, revise the military-industrial complex (OPK, Oboronno-Promyshlennyyi Kompleks) that supports those forces and transform the state administration that provides the money, manpower and resources needed to support a large defence establishment. In other words, and as happened with all

of his predecessors, Putin's reform of the armed forces entailed a systematic overhaul of the entire state administration and the national economy to support a new kind of armed forces suitable for contemporary challenges. This comprehensive reform also includes a fundamental reassessment of the nature of contemporary warfare and world politics, as the armed forces are structured in response to the perception of current and future warfare and international relations.

Seen in the light of Russian history, the defence reform that began in 2008 is the culmination of reforms begun by Gorbachev. Gorbachev's reforms led to the crisis of the 1990s, and because of the economic downturn there were no major reforms in the state structure. The current arms build-up also suggests a repetition of what the

Russian historian S.F. Platonov described as the pattern of Russian history, namely that the collapse of a system of rule is ultimately followed by the restoration of a new form of state power, culminating a few years later with a transformed army as the true incarnation of that state power.

### Author

**Dr. Stephen Blank** is a Senior Fellow at the American Foreign Policy Council. He is the author of numerous foreign policy-related articles, white papers and monographs, specifically focused on the geopolitics and geostrategy of the former Soviet Union, Russia and Eurasia. He is a former MacArthur Fellow at the US Army War College.

### Tsar Alexander II and Lenin-Stalin

Putin apparently abandoned this pattern; by putting economic reconstruction above other considerations, he apparently transcended the fundamental historical tendencies of Russian statecraft, which repeatedly sacrificed the economy to the military and to great power aspirations. But actually he was emulating his Tsarist and Soviet predecessors, particularly Tsar Alexander II and Lenin—



Stalin after 1921, all of whom had reorganised the economy and the state first before transforming their respective militaries.

Therefore Putin too had to achieve those tasks before even contemplating defence sector reform, because the scope of the latter obliges Russia's leader to have suitable instruments at his disposal to execute and support reforms, and before 2008 these instruments were not available to Putin. Although they were first administrative and economic, Putin's reforms may well have been intended, or at least set the stage, for the comprehensive defence reform that has occurred in the decade since 2008.

But he also initiated a process in which economic development should not only serve growth itself, but be the basis for an ambitious global policy to maintain Russia's supposedly inherent superpower status and be independent of foreign constraints. This policy logically means a significant increase in military expenditure and a stronger emphasis on defence issues that are characteristic of Russian history. Worse still, it inevitably contributes to the spread of great power tensions along military lines, some of which are already surfacing; the US European Command's call for more troops in Europe is at least partly due to an unforeseeable situation in Russia and there is growing willingness in some sectors of the US military to see Russia as a potential threat, particularly with regard to nuclear weapons.

Thus the reform of the Russian defence-industrial sector appears to have been deliberately planned in 2001-02 as a long-term process that entailed a comprehensive reform of the sector and of the state administration as a precondition to support the overall transformation of the economy and the state as a whole to support that long-term process. Thanks to those processes, we are now witnessing an ongoing surge in Russian defence production. The surge in Russian weapons cannot be explained by revving up idled production lines for fourth-generation equipment; instead it reflects modernisation of weapon characteristics, updating old production lines, building modern production facilities and switching from managerial regimes rewarding executives for mass production rather than military R&D.

However, unlike Soviet arrangements, state ownership doesn't bar OPK enterprises or public-private partnerships (PPP) from competing among each other. Military industrial firms (including holding companies) are permitted to operate on a for-profit basis. They compete for state orders and export sales (contracts) and can outsource. Shareholders and/or managers are variously incentivised to profit-seek and incompletely profit-max-



**Russia's army and military industry have shown innovative capabilities. Here, Nikolai Pankov, Deputy Minister of Defence of the Russian Federation, is opening the "Start in Science" festival at the Orenburg Presidential Cadet School.**

imise rather than comply with MoD commands and/or rent-seek. They have fewer degrees of freedom than private Western defence corporations like Boeing, but are self-motivated to efficiently produce in accordance with Herbert Simon's bounded rationality framework and William Baumol's satisficing concept. This bolstered OPK initiative when the MoD stopped prioritising military R&D. Putin beat the odds by imposing firm discipline and containing rent seeking, buttressed with competitive reforms and sufficient material incentives. These policies, which went largely unnoticed in Western literature, provided the basis for the surge we have seen in this decade and will also provide the foundation for the targets for current and 2018-27 defence programmes. Indeed, not only are the current and future defence programmes ambitious, even if they are being slightly moderated, Moscow also has comparably ambitious plans for the overall development of the OPK. In 2016, the government approved a new programme for the development of this sector. This programme incorporates some earlier federally targeted programmes and is largely classified. But we can discern from published data the scope of the transformation Moscow wants to see. From the published sub-programme, we see the government urging an increase in this sector's output by 75% in 2020 compared to 2014, labour productivity is supposed to increase by 137.5% and average monthly wages by 77%. Civilian output of the defence industry was forecast to grow by 28% by 2020 compared to 2015. And since the defence industry, as in Soviet times, continues to be

a major part of civilian industrial production, this figure hints at a return to some Soviet ways of thinking and doing business. Overall responsibility for the programme is vested in the Ministry of Industry and Trade and total funding through 2020 would be RUB1,067Bn – that is, over RUB200Bn annually.

These attributes of the programme underscore the ambitious targets for the renovation of the defence industry. While this programme was being formulated, announced, and in the early stages of its implementation, Russia was also formulating the state armaments programme (SAP) or defence programme for 2018-2027. Although the SAP naturally was the object of a lot of bureaucratic contention, by 2016 Putin made it clear that at some point in the next decade (if not earlier) defence spending would peak and then decline due to the economic crises of 2014-16: collapsing energy prices, the devaluation of the ruble, and Western sanctions on top of the structural impediments to growth. This commitment to make a retreat in defence spending at the end of this decade or beginning of the next one remains embedded in policy. But even though Russian officials believe Russia is now (2018) coming out of recession, its economic prospects are hardly rosy. Moreover, starting in 2016 high-ranking officials, possibly perceiving a deteriorating international situation that has only worsened since 2016, started advocating even more mobilisation of the state and economy towards a wartime footing.

Thus the new SAP or defence plan for 2018-27 carries within it an unresolved ambivalence if not contradiction. Reduced defence



spending denotes the leadership's satisfaction that the basic international situation and Russian defence capabilities do not warrant alarm and can therefore decline. But this spending fell by much less than Western analysts imagine, because they are unable to fathom Russia's highly opaque ad-

a mass-mobilisation army to meet 21st century security threats. "There was only one way out," Putin emphasised, "we had to build a new army." Moreover, in midsummer 2000, the disaster of the Kursk submarine confirmed that the rot also engulfed the navy and that the generals would not tell



**The gradual militarisation of Russian society is exemplified by the Yekaterinburg Suvorov Military School.**

ministrative procedures. On the other hand, published budgetary figures show that due to the rise in energy prices and despite statements to the contrary, spending in 2018 has actually grown from what was originally envisaged. The upshot of all this is that – despite too much fatuous analysis that the defence sector is hopelessly corrupt, that the economy is failing and that NATO is so much stronger – Moscow can field the armed forces it needs not only to deter NATO but to sustain its superiority in the theatre from the Arctic to the Black Sea against NATO and enhance its conventional and nuclear capabilities for some time to come.

## Defence Reform to 2008

Upon entering office and confronting the Chechen insurgency, Putin found that he could barely cobble together 65,000 men from disparate units stationed all over Russia. As he subsequently stated, "In order to effectively respond to the terrorists, we needed to assemble a force of at least 65,000 people. And in the entire army, in the combat-ready units, there were 55,000 people, and they were scattered across the country. The army had 1.4 million people, and no one to fight. And here they sent unseasoned boys out under fire." In his article in Rossiiskaya Gazeta (2012), Putin became even clearer. Describing the military legacy he inherited, Putin depicted the inability of

the truth about their situation. Indeed, he long since knew that the military could not reform itself before he became president. The high command was torn by personality and procurement rivalries between Igor Sergeev and Anatoly Kvashnin, the Defence Minister and Chief of the General Staff respectively.

Moreover, Putin also quickly understood that neither the inherited economy nor the state structure permitted Russia to maintain any viable military forces in an era of accelerating change in warfare and of multiplying risks to Russia's great power status. Thus his military moves had to proceed against this backdrop of weakness, incompetence, obstruction, and resistance, not to mention endemic corruption. And since Putin came to power through the military and plans for war in Chechnya, the military took this opportunity to demand access to state funds that would have destroyed the economy. So Putin had to take real control over the military and then rebuild the state and national economy in order to restore a credible military instrument that was truly subordinate to centralised authority and not an independent bureaucratic player.

In February 2000, he ordered the FSB to monitor military units' allegiance and become once again a centralised agency unifying counter-intelligence and the political police within the army. Likewise, the strategic plan to rebuild Russia's armed forces

and the defence industrial sector dates back to 2001. The government decisively determined then that, before moving to "a new generation" of weapons, it would have to undertake a general modernisation of the overall economy and, in this context, the means of production of new weapons based on new technologies. The government would first create the new technologies needed to produce the new weapons required by its assessment of contemporary war. Only then could mass production of new weapons begin. Before comprehensively overhauling the armed forces, the state economy had to be transformed to the point where it could support the huge expense of defence reform and begin introducing a new generation of weapons to overcome the procurement holiday that had been forced on the armed forces due to the collapse of the Soviet Union.

Concurrently, something few foreign analysts had noted but that was vital, the administrative reform of the state after 2000 also preceded defence reform. In that context and in tandem with the defence reform that began in 2008, Putin and then President Dmitry Medvedev postulated the need for further reform of the state structure to make it ready for mobilisation for strategic purposes already in the national security strategy of 2009 and the defence doctrine of 2010. Those documents summed up and launched discussions and projects that had begun earlier and that have led to the creation of a state structure that can mobilise resources from the private sector or beyond the formal defence structures for defence of the realm at home, still perhaps the greatest security threat, and also create private as well as paramilitary forces like the Wagner force we have seen in Syria and now in Africa. But it also entailed the creation of a vast number of other forces attached to the Ministry of Interior or local governments or funded by plutocrats, all of whom aimed to defend the regime, and many of which were consolidated into the heavily armed National Guard of 2016.

## Nuclear Issues and the Nature of Contemporary War

The reform of the defence sector began in 2008 and preceded the war with Georgia, but the military performance during that war confirmed the need for reforms. Reform also entailed new nuclear weapons and procurements that probably began around 2005–06 because the nuclear weapons and defence reforms were part of a new perception of contemporary war. Already in 2003–04, the the government concluded that it was fighting a new kind of political warfare with

the West; on 18 January 2005, Defence Minister Sergei Ivanov told the Academy of Military Sciences: "Let's face it, there is a war against Russia under way, and it has been going on for quite a few years. No one declared war on us. There is not one country that would be in a state of war with Russia. But there are people and organisations in various countries, who take part in hostilities against the Russian Federation."

More recently, Dmitri Trenin, Director of the Moscow office of the Carnegie Endowment, observed that, for some time, "the Kremlin has been de facto operating in a war mode." One sign of this war is that by 2007-08, that is, a decade ago, European Security services were reporting across the board an enormous expansion in Russian espionage, both traditional and economic, across Europe. That war is manifested in current military Russian thought as the promotion of "colour revolutions", which the Russian military regards as any insurgency against authoritarian regimes. In 2006, Ivanov publicly stated that the greatest threat perceived by Russia was alleged foreign efforts (and since domestic ones are also invariably special operations fomented by the West all such revolutions are inherently foreign) to alter the constitutional order in any of the CIS states, including Russia.

These perceptions drove an asymmetric strategy that we now see, for instance, the heavy reliance on a Russian concept of information and cyber warfare. Thus Ivanov observed in 2007 that, "the development of information technology has resulted in information itself turning into a certain kind of weapon. It is a weapon that allows us to carry out would-be military actions in practically any theatre of war and, most importantly, without using military power. That is why we have to take all the necessary steps to develop, improve, and, if necessary – and it already seems to be necessary – develop new multipurpose automatic control systems, so that in the future we do not find ourselves left with nothing."

Ivanov's statement strongly suggests that Russia sees its cyber capabilities as giving it asymmetric or alternative ways to counter Western challenges and threats by what are clearly militarily superior adversaries.

Accordingly, the 2008 defence reform aimed at creating an asymmetric force that could deter the West through nuclear parity and information war (IW), while at the same time creating sufficient conventional post-Soviet power to ward off and quickly overcome NATO-backed challenges or other threats on former Soviet territory. The bloated Soviet establishment was jettisoned, brigades replaced divisions and armies and new military districts, organised

around joint missions and command, while the entire command and control structure was reorganised culminating in the National Defence Management Centre (NDMC), opened in 2014. Meanwhile, existing nuclear weapons were modernised and new ones created. Both types of nuclear weapon were integral parts of the strategy and essential to the continuation of reform.

Indeed, as Sir Richard Shirreff, NATO's Deputy SACEUR from 2011-2014, stated, "Russia hardwires nuclear thinking and capability to every aspect of their defence capability." Dmitry Adamsky likewise observes that, "The nuclear component is an inseparable part of Russian operational art that cannot be analysed as a stand-alone issue," because it abets Russian conventional threats and aggression through the deterrence of adversaries' counteraction to that aggression. Similarly, Major Amos C. Fox (USA) writes that the strategic defence provided by Russian nuclear weapons and the IADS facilitate the attainment of all of Russia's conventional warfare objectives: deterring NATO expansion into Russia's historic sphere of influence, retaining regional hegemony in Eurasia, and demonstrating improvements to Russian military capabilities.



***Putin has succeeded in reconnecting Russia's military to modern technological developments.***

That much is obvious. But beyond that, the presence of nuclear weapons is perhaps the first critical component for modern hybrid warfare. Nuclear weapons provide protection against a massive ground response to an incremental war; the offensive nation that possesses nuclear weapons knows that the adversary is unlikely to commit large forces to a conflict for fear of the aggressor employing those weapons against those ground or naval forces. This dynamic emboldens the aggressor nation. In the case of Russia, possession of nuclear weapons

encourages leaders to take offensive measures, because they know that the threat of nuclear weapons brings potential opponents to a standstill.

We see this coming true in Moscow's behaviour and apparent nuclear strategy. Russian doctrine says that nuclear weapons deter local wars, namely, campaigns like those in Georgia, Ukraine, and now Syria. This is because the document detailing that strategy and conditions for nuclear use is classified and its doctrinal statements are hardly revealing. It is hardly revealing to say that nuclear weapons could be used in a first strike if the survival of the state is at risk, especially if it is haunted by the spectre of state disintegration and cannot afford to lose a war it is waging. But Russia's "nuclear behaviour" is sufficient grounds for real anxiety.

## Nuclear Escalation Dominance

Hans Kristensen and Robert Norris observe that, "Whatever the correct interpretation of Russia's nuclear strategy is, Moscow seems to be administering that strategy more dynamically and offensively than it did a decade ago. Russian officials have made many statements about nu-

clear weapons that appear to go beyond the published doctrine, threatening to potentially use them in situations that do not meet the conditions described. For example, officials explicitly threatened to use nuclear weapons against ballistic missile defence facilities, and in regional scenarios that do not threaten Russia's survival or involve attacks with weapons of mass destruction. Moreover, the fact that Russian military planners are pursuing a broad range of existing and new versions of nuclear weapons suggests that the real





***"Honour – Duty – Motherland": A military aviation parade at Migalovo air base near Tver on 5 June 2018***

doctrine goes beyond basic deterrence and towards regional war-fighting strategies or even weapons aimed at bluntly causing terror."

As Colin Gray observes, although there is no sign of Russian discourse coming true concerning the use of a nuclear weapon to defeat NATO in limited nuclear scenarios, Moscow talks as if it can achieve this outcome. He writes that Putin and others have decided to explicitly introduce ruthless threats, including nuclear ones, into Russia's argumentation about acute international crises. They hypothesize about the high political value that would accrue as a result of nuclear use on a limited scale. The hoop, apparently, is that the NATO enemy, certainly the less robust members, at least, would be outgunned either by the actuality, or more likely only by the credible threat of nuclear use, especially in a first-strike mode.

Not surprisingly, and in conformity with our argument above, Gray concludes that Russia seeks escalation dominance. Gray continues: "In the language of now-classic strategic theory from a past generation of theorists, the Russians currently are talking with apparent seriousness about nuclear escalation dominance. Russian theorists claim, perhaps expect, they could win a war wherein Russia employs nuclear weapons on a very modest scale. This expectation follows from a Russian belief that Moscow's employment of a few nuclear weapons would give them a decisive coercive edge in the diplomacy that should follow. Russian authors have advised us ironically that the use of these weapons would prove to be a decisive de-escalatory move – de-escalatory because NATO would be expected to capitulate. The high determination shown unmistakably by the fact of Russian nuclear use would surprise, even shock, audiences politically around the world. Thus with unmatched boldness Russia should achieve a considerable political, perhaps even military, victory."

While such a scenario has not yet occurred and is not immediately likely, the Russian nuclear threats show not only brazenness, but more importantly, how nuclear scenarios are intertwined with conventional wars. Indeed, escalation dominance is attainable only if Moscow can also obtain sufficient conventional superiority in the theatre to win in the initial phase of the war before NATO or anyone can react. Arguably a seamless web leads from conventional scenarios up to and including these supposedly limited nuclear war scenarios, perhaps using tactical nuclear weapons for which the West as yet has found no response.

Thus Jacob Kipp and Matthew Kroenig observe that, "In the past decade and a half, Russia has come to rely more on nuclear weapons as a means of deterrence and for war fighting to manage local wars. The possibility of a local war against NATO remains Moscow's highest priority security threat. Russia relies on the early resort to nuclear use in part to offset its aggregate conventional inferiority vis-à-vis NATO. Moscow's concept of "de-escalatory" nuclear strikes

envisions limited nuclear strikes on NATO targets early in a conflict in a bid to frighten Western leaders into suing for peace on terms favourable to Moscow. Even if such strikes are never employed, the possibility enhances Russia's coercive leverage in a crisis and to blackmail threats in peacetime."

Given steadily deteriorating perceptions of the external security order and growing apprehensions about the threat, and in view of Russia's continuing conventional inferiority to a fully mobilised NATO and US, this perception and strategy for nuclear weapons creates strong pressures for first strike use. As Kipp and Kroenig observe, "Russia's nuclear forces and strategy also present a number of weaknesses, however, that could be subject to Western exploitation. Russia does not prefer dependence on nuclear weapons, but is forced to rely on them largely in order to offset conventional disadvantages. This creates a number of problems, including imposing demands for rapid escalation in the case of successful initial operations by opposing forces. In addition, leaders in Moscow must confront the prospect that limited nuclear warfare might be conducted across the depths of Russia's homeland if NATO honours commitments to the Baltic States and the conflict escalates to the nuclear level."

Or, as Finnish LTC Pertti Forsstrom argues, "In this way the content of the concept of traditional strategic deterrence is broadened to cover both Russian nuclear and conventional assets. On the other hand, the abolishment of the restrictions for the use of nuclear weapons means that the dividing line between waging war with conventional or with nuclear weapons is vanishing. When the principle of surprise is connected to this idea, it seems that Russia wants to indicate that non-strategic nuclear weapons could be



***Russia's military moves back into the middle of society.***



regarded as “normal” assets on a conventional battlefield. This is the basis upon which Russia regulates the level of deterrence for example in the Kaliningrad exclave. By introducing the concept of pre-emptive strike to its military means, Russia is trying to enhance its non-nuclear deterrence even further.”

### A New Stavka?

And if one looks at Russia's nuclear procurement plan until 2025, then the fusion of nuclear weapons with Russia's war strategy becomes even clearer. Thus, current trends after a decade of reform and consolidation indicate a heightened readiness and war psychosis orchestrated by the government across the media as well as in the state administration. For example, Russian analysts told Asia Times Online that a new Stavka – the central operational command organ under Stalin in World War II – that would mobilise the entire country in wartime is now in the making. This follows a decade of organisational reform. Already, the 2009 National Security Strategy insisted upon an overhaul of the state administration to make it more effective and usable in wartime. Since then, defence reform abolished most army divisions and corps, replacing them with brigades that are increasingly capable of complex joint operations, and it introduced new military districts congruent with civilian administrative structures, such as the joint Arctic Strategic command in 2014 and the 1st Guards Tank Army, which augmented some brigades facing Ukraine where the danger of war is most acute, and defence reform also created the NDMC.

The NDMC will presumably function as that Stavka, given its ability to monitor developments across the entire country, coordinate regional and civilian administrations with the military and mobilise the state and civil institutions. Putin has also created dozens of private military forces, including the Wagner force, paramilitaries of all sorts, and then – in 2016 – the National Guard, whose two main functions are the suppression of civil unrest and the conduct of military operations that the Army would prefer not to handle or that would slow down its operations, or drain the state budget, or complicate strategic interests and decision-making. The creation of the National Guard and the use of such formations, including Cossacks, to suppress unrest as the latter did in May 2018 is also a process that began over a decade ago and continues to evolve.

We also see preparations for mobilisations in Russian exercises, many of which, if not all, also have a nuclear component or accompanying exercise. In the Kavkaz 2016 exercises, Russia not only once again (having done so

before) mobilised the civil administration, it even mobilised banks to pay soldiers in the field and hospitals to establish field hospitals during those exercises, a true sign of mobilising the entire state structure on behalf of a large war where the survival of the state is obviously at some risk. Likewise, the Zapad 2017 exercise highlighted a concept of operations that correlates nuclear drills and exercises with the mobilisation of civilian administrative authorities and institutions as in Zapad 2017 and in Kavkaz 2016. Zapad 2017 also pointed to an anticipation of actual nuclear war fighting. Therefore controversies over the role of nuclear weapons in Russian strategy and the question of wheth-

at home by the threat of force and the invocation of the maxim that the fatherland or motherland is in danger. This, of course, is hardly a uniquely Russian phenomenon, but it does mean the systematic generation of a war psychosis replete with demands for military action and readiness along with high spending and allocational priority as under Soviet power.

Nevertheless the Russian defence establishment has developed a coherent, evolving, and adaptable theory of contemporary and future war as it moves towards hypersonics, additive printing, robotics and artificial intelligence. It has reformed and greatly improved its defence admin-



**Putin is emulating his Tsarist predecessors, particularly Tsar Alexander II: Festive Easter Liturgy at a joint exercise of Russian and Belarusian Airborne Forces in Brest on 13 April 2018**

er or not Russia has a high or low threshold for nuclear use remain unresolved. But the reform of conventional forces that has created a formidable Anti-Access Area Denial (A2AD) combined naval and air defence capability and great striking power, along with heightened exercises, and unmistakable superiority in electronic warfare – even if surface ships are inferior – has given Russia a truly formidable military force. There is little doubt that such a force can achieve rapid strategic objectives along its frontiers in the initial stages of conflict, although protracted conflicts are another matter entirely.

The Russian government and media have clearly highlighted moves that suggest the likelihood of a major war with the West and the return of this contingency to centre stage in military planning. While there is no discernible serious Western military threat – notwithstanding blaring Russian propaganda to that effect – it is also possible that this lurch towards structural militarisation – a term coined by the late Vitaly Shlykov – denotes as well a comprehensive movement directed towards stifling any public protest

istration and force quality as well as the ability of its defence industry to service those forces. Its capacity for sustained force projection has been validated, and may be expanding through the innovative use of “private” forces, like Wagner or those raised by oligarchs in conjunction with Ukraine and Russia's campaign for naval bases throughout the Middle East and the Mediterranean. It is building, despite punishing sanctions, truly formidable conventional, nuclear and unconventional informational – and possibly biological and chemical – weapons for future conflicts. Meanwhile it has also greatly strengthened its administrative control over the entire country, should mass mobilisation become necessary. Indeed, to date Russia has won all of its wars since 2000, while the US record is hardly brilliant in this regard. Therefore the complacency that too many Western “experts” and observers still express concerning Russia's military prospects is therefore not only unwarranted and misguided, but also exceedingly dangerous. ■

# “The Navy is on the right course”

## Interview with Vice Admiral Andreas Krause, Chief of the German Navy

**ESD:** In the past three years the Navy has been stretched to its limits in terms of personnel and materiel by the large number of deployments, running in parallel, in response to crises and conflicts. Has this situation eased, or is it still going on?

**Krause:** In the past we have been severely stressed with regard to personnel and materiel in respect of capacity for deployment. But, despite that, we, the German Navy, have been in a position to fulfil the orders and tasks assigned to us, every time and any time. This is thanks not least to the high commitment of the men and women who serve in the Navy, at every level. In this context, I adopt the principle that anything which does not directly contribute to effectiveness in or for deployment, or to the defence of the Alliance and the country, is consistently to be regarded as of secondary concern. Things will definitely ease in the middle term with regard to the readiness for action, both for personnel and materiel. A precondition for the course which has been set does however entail all the planning being backed financially, and that we have our sights set jointly on our targets.

**ESD:** The state with regard to materiel (readiness for action of weapons systems) of the Federal Armed Forces is at the present time inadequate. This also relates to the Navy, for example, with regard to submarines. What are the causes of this,

and how should the inadequate state be overcome?

**Krause:** I am now glad to say, with regard to the situation involving submarines, that by the end of the year we will be able to use three submarines again, and perhaps actually four. U31 has in the interim successfully passed its performance trials, and is regularly going to sea. This is where the economies necessarily incurred from the peace dividend have at last caught up with us. Because for reasons of costs we have been obliged, among other things, to do without spare parts packages on the scale required, we are faced today with the situation that we rapidly reach the limits of our capacities, especially with unforeseen events arising. Every spare

part needs to be produced in an elaborate and time-intensive manner. But here too the right steps are being taken. With the second set of submarines, we have also initiated the procurement of a spare parts package for all the boats, and we have also concluded a framework maintenance and repair contract with the industry concerned. Both measures are aimed at cutting down dockyard times, and making things easier to plan. That is in any event what I am anticipating, and expecting. A particular focus of attention for me, as well as this challenge, is the issue of the Navy addressing the certification of our submarine crews as a top priority, so as to get this weapons system back in full operational readiness once again.

**ESD:** The process of shrinking the fleet has come to an end. The time has come for it to start to grow again, and for new vessels to be laid down. What shape is the Navy procurements programme taking, and which units and weapons systems need to be replaced or produced as new?

**Krause:** The shrinking of the fleet, which went on for years, is happily now behind us. Even if this is still in the planning, over the next 10 years the Navy should be receiving every year at least one seaborne or airborne weapons system. One special project in this respect is without doubt the MKS180 multipurpose warship. This is a vessel which will be equipped with a unique range of capabilities, such as the Navy has never seen before. The MKS 180 cannot be replaced by a K130 corvette, or indeed any other seagoing combat resource. This applies, incidentally, to all the ships, boats, and aircraft of the Fleet: Every seagoing weapons platform is unique, with its specific capabilities, and it is only as a composite, in joint effect, that the Fleet is in a position, as a whole or in appropriate mixed formations, to conduct war at sea in three dimensions. This is why I always speak of the “balanced” Fleet, which we need to direct with its full range of capabilities to achieve high intensity of effect. Only then can we, with one and the same Fleet, be confident of the defence of the nation and of the Alliance



**Vice Admiral Andreas Krause,  
Chief of the German Navy**

Photo: Bundeswehr



Graphic: MTG

**In late 2025, the German Navy will receive its first MKS 180 multirole frigate.**



and equally of responding to international crises and resolving of conflict. It does not work the other way round. But back to the MKS 180. For the first time, and as a direct consequence of the armaments agenda, we are already pursuing new courses even with the invitation to tender. This is not only Europe-wide, but also conjectured as an iterative process. The aim is minimisation of risk. Better that the invitation to tender takes more time, but leads to a satisfactory construction contract, with realisation risks which can be overcome at the same time, rather than suddenly being confronted in the construction phase with problems which cost us not only time but money too. There can be no question, then, of the present invitation to tender process being interrupted. On the contrary, everything is going to plan, and is going to continue to do so. The executive of the BMVg is holding to the previous course. I am anticipating the launch of the first MKS 180 by the end of 2025 or the beginning of 2026.

As well as the MKS180 project, we are also working intensively on the German-Norwegian submarine cooperation undertaking, the successor to the Sea-Lynx, the extending of amphibious capabilities, and a UAV for the K130 corvette. Double-hulled tankers, and successors to the units of sea mine defence capacity, are all intended to build up the German Navy of the future. The bilateral agreement which I signed in December last year with my Norwegian counterpart will among other things result in the procurement of two further submarines as from the middle of the next decade. As well as that, the contract for the second set of five corvettes was already signed in September 2017, before the Bundestag elections.

To round off this question, I would like to make one further point. Despite an essentially positive assessment for the years ahead, I must say that the procurement process needs to be overall faster, more flexible, and more committed to its aims. In many areas procurement is still simply taking too long.

**ESD:** In view of the resurgence of defence for the country and for the Alliance, the Baltic has once again become a geostrategic focus for NATO. What stance is the German Navy adopting to the situation, as the largest navy in the Baltic region?

**Krause:** If we consider the geostrategic location of Germany on its own and within NATO, the German areas of maritime interests extend from the northern flank to the Mediterranean. But they also extend into the Indopacific region. In this situation, the paramount focus is on the defence of the

Photo: PZM



*The Class 130 corvettes will receive a UAV capability.*

country and the Alliance. This defence of the country and Alliance in context is what dictates the structure and capability. For this reason, it is correct and important that the entire spectrum of possible tasks is incorporated in the development of capabilities, with concentration on high-end capabilities. We need the flexibility and stamina to be able to be deployed on anything from police actions in the crisis management context through to high-intensive, three-dimensional warfare.

This position is being constantly broadened in response to the wishes of the partner nations to intensify the cooperation, in order to master together the challenges of our times. What is clear is that no nation can achieve this alone. If we take a look at our partners in the EU, this has manifestly been recognised, and is reflected in the Permanent structured Cooperation, PESCO for short. PESCO is strengthening military cooperation in Europe.

We, as the German Navy, can justly and rightly contend that we are already ahead of our time. The German-Norwegian cooperation in the submarine sector is also to be seen as a beacon project in line with PESCO, even without Norway being a member of the EU.

But also close-knit cooperation and integration with the Dutch Navy, and the interaction in the context of the "Baltic Commanders Conference", are ongoing proof that the Navy is very well placed to face the future. With the building up of

the future Baltic Maritime Component Command in Rostock, the strong position of the German Navy in international interaction will be emphasised still further. All in all, the Navy is on the right course to sustain its success in the future.

**ESD:** What are the greatest challenges facing the Navy in the years to come?

**Krause:** The greatest challenges lie in the realisation of planned new units, and in upholding the availability of existing vessels, at a high level. In this context, the effort must also be sustained to have the right men and women on board. To do this, it will also be necessary to achieve the inner positive attitude, the "mind-set", of every single member of personnel, men and women, to embark on new courses as well. Thanks to the winds of change in personnel, materiel, and finances, we are at the start of the upswing, and the most comprehensive modernisation of the Navy since it was founded. This will be a campaign involving everyone. It will be a challenge for all of us. We may perhaps also have to consider taking a step back, and then making another run-up. Achieving all this will demand a lot from us, one way or another. But it will be worth it. We are in the process of creating a Navy which will be even more ready for action, and more attractive to serve in as well.

**The questions were posed by Dieter Stockfisch.**



# Deadly US Navy Accidents Reveal Need to Reform Training

**Sidney E. Dean**

Between June and August last year, two destroyers of the 7th Fleet of the US Navy were rammed laterally by merchant ships, with seventeen servicemembers killed. Both warships were severely damaged. There was no personal injury or significant damage to property on the merchant ships, whose displacement was three to four times greater than that of the destroyers.

The US Navy's Japan-based 7th Fleet experienced four major ship accidents in 2017, including two deadly collisions in June and August, with a total of 17 servicemembers killed. The two latter collisions also caused hundreds of millions of dollars in damage to the two destroyers, while the commercial vessels (each of which had three to four times the destroyers' displacement) experienced no casualties and only superficial damage.

Navy investigations determined that, in three of the four incidents, faulty shiphandling by the military crew was to blame. A report released on 1 November 2017 following the review of the two fatal collisions cited failures and violation of operational rules by watchstanders, as well as leadership inattention to crew compliance with standard operating procedures, to be the primary cause of the accidents. "Both of these accidents were preventable," said Chief of Naval Operations (CNO) Admiral John Richardson following release of the report. "We must do better."

## Report Faults Watchstanders

Specifically regarding the 17 June collision between USS FITZGERALD (DDG 62) and the container ship ACX CRYSTAL 100 kilometres southwest of Yokosuka, Japan, the report found that the bridge watch's Officer of the Deck (OOD), responsible for the safe navigation of the vessel, repeatedly failed to notify the commanding officer when the FITZGERALD approached within 5,000 metres of other vessels (as required

Photos: US Navy



**Admiral Philip Davidson is currently Commander, US Pacific Command.**

by the CO's standing orders); maintained too high a speed in a sea lane with moderately heavy traffic; repeatedly failed to calculate course and speed of vessels within 5,000 metres proximity; repeatedly crossed the bow of ships (in one case within 600 metres proximity) rather than astern as prescribed by the international nautical rules of the road; attempted to calculate the course of the CRYSTAL by radar, but miscalculated by 1,400 metres (it is unclear whether the officer was even tracking the correct vessel); ignored warnings by the Junior Officer of the Deck that the CRYSTAL was on a potential collision course and ignored suggestions to alter speed and course until collision was imminent; made no attempt to communicate with the CRYSTAL by radio

or danger signal or to notify the CO even after the danger was recognised; became confused and issued contradictory orders; and failed to sound the collision alarm. The report also faulted personnel of the Combat Information Center (CIC) for "failing to comprehend the complexity of the operating environment" (by misinterpreting radar data) and not communicating effectively with the bridge regarding potential threats. With regard to the collision between USS JOHN S. MCCAIN (DDG 56) and the tanker ALNIC MC on 21 August in the heavily trafficked Straits of Singapore, the Navy cited two major contributory factors: "MCCAIN's commanding officer disregarded recommendations from his executive officer, navigator and senior watch officer to set sea and anchor watch teams in a timely fashion to ensure the safe and effective operation of the ship. With regard to procedures, no one on the bridge watch team, to include the commanding officer and executive officer, were properly trained on how to correctly operate the ship control console during a steering casualty." This was partially because several members of the bridge watch had only recently transferred from a cruiser; while these sailors were inadequately trained on the MCCAIN's bridge systems, they were entrusted with steering controls. The officer responsible for training standards was himself deficient in vital aspects of the control system.

In the minutes leading up to the collision, the MCCAIN's helmsman demonstrated difficulty handling both steering and thrust control. This prompted the captain to order thrust control transferred to the lee helm station (immediately to the right of the helm station). Inadvertently, steering control was also transferred, prompting the helmsman to declare emergency loss of steering. Secondary to this loss of control, the rudder had been automatically

## Author

**Sidney E. Dean** is President of Transatlantic Euro-American Multimedia LLC. and a regular contributor to ESD.

centred while the two propellers operated with different thrust settings, causing the MCCAIN to deviate from its course and cross into the ALNIC's path. The bridge watch, focused on trying to regain steering control, initially remained ignorant of this deviation. Full control of steering and thrust were regained within two minutes, but the distraction caused the bridge to lose situational awareness until seconds before being rammed by the tanker.

## Disciplinary Action and Courts Martial

Between the FITZGERALD and the MCCAIN, a total of 18 crew members of all ranks, including the commanding and executive officers of both ships, were disciplined over the collision. At this time, several officers still face courts martial on charges of negligent dereliction of duty resulting in death and hazarding a vessel, but charges of negligent homicide have been dropped.

Special attention has been paid to the actions of the junior officers of the deck (ensign through lieutenant). On the FITZGERALD in particular, junior officers were charged with the primary responsibility for the accident, as they were the ranking personnel on the bridge and in the CIC when the collision occurred. The disciplinary hearings for these junior officers confirmed the findings of the November report, namely that several lieutenants had demonstrated gross incompetence, ignorance of basic operating procedures and/or negligence during the incidents. Defence attorneys and witnesses presented mitigating circumstances. The Fitzgerald's OOD's inability to properly calculate the course of the oncoming CRYSTAL was due – at least in part – to the radar having been set to the wrong frequency (by whom remains unclear). Additionally, the radar and other vital equipment aboard the FITZGERALD was known to be in poor operating condition. A post-accident comparison found that the CRYSTAL's radar had registered 30 radar contacts in the same timeframe that the FITZGERALD registered five. While the prosecution faulted the junior officers for not taking initiative to correct these conditions, the FITZGERALD's former weapons officer testified that she had warned the commanding officer – only months before the accident – that the ship was not safe for sea duty. Fatigue was also presented as a mitigating circumstance. Already in early 2017, an internal Navy study found the average work week aboard 7th Fleet warships exceeded 100 hours, with junior officers citing an average of four hours'



*On the evening of the accident, the USS FITZGERALD bridge crew only looked out to port, although the radar showed several hits on starboard. The approaching container ship CRYSTAL was visually detected only three minutes before the collision.*



*Bridge simulator at the Surface Warfare Officers School in Newport, Rhode Island*

sleep daily; caffeine and energy drinks were reportedly consumed in high quantities. Fatigue was exacerbated by watch schedules which did not correspond to a normal circadian rhythm.

## 83% of Junior OODs Display Competency Gaps

Between January and March 2018 the Navy conducted random fleetwide evaluations of junior officers to determine whether the performance issues observed aboard the FITZGERALD and MCCAIN were aberrations or represented a widespread problem. A total of 164 junior officers – all of them rated qualified as OOD – were tested. The evaluation included an experience survey, a written test of their knowledge of the nautical rules of the road, and a 35-minute bridge simulation set in light to moderately heavy ship traffic. Vice Admiral Richard Brown, Commander of Naval Surface For-

es, shared the results with fleet and ship commanders on 4 June; the results were made public on 6 June.

Admiral Brown described the findings as "sobering". Only 17% of the tested OODs demonstrated a full mastery of navigational skills, bridge technology, and proper operating procedures. Eighteen percent significant deficits, while the majority demonstrated "some cause for concern" in a few areas. Two primary areas of concern were noted: operating and interpreting the navigation radar, and mastering the nautical rules of the road. With regard to the latter, 91% of evaluated officers passed the written test, but more than half had difficulty applying the rules of the road during the bridge simulation, especially when degraded visibility was added to the scenario. Finally, the survey noted inadequate preparation for dealing with near-miss and other emergency situations. "While most of the 164 officers assessed were able to





**Navigation watch on an ARLEIGH BURKE class destroyer**



**A total of seven crew members of the USS FITZGERALD were killed; among the injured was the captain, whose cabin was directly affected by the impact.**



**The VALIANT class harbour tugboat MENOMINEE (YT 807) assists the ARLEIGH BURKE class guided-missile destroyer USS FITZGERALD on 11 July 2017 as it moves to Dry Dock 4 at Fleet Activities Yokosuka to continue repairs and assess damage sustained from its collision with a merchant vessel.**

avoid near collision situations, those that found themselves in extremis were often ill-equipped to take immediate action to avoid collision," Admiral Brown stated in his 4 June message.

## Current Training System Inadequate

Many former officers fault training system "reforms" instituted over the past two decades in order to reduce costs and, purportedly, increase efficiency. Until 2003, junior officers went through a 12-14-month intensive training cycle at the Surface Weapons Officers School (SWOS) before reporting for their first sea duty. In 2003, as the US military began to concentrate its resources on counterinsurgency operations, this training was scrubbed completely; junior officers were given a set of training diskettes which they were expected to master on their own while at sea. When this approach proved disastrous, a shortened SWOS phase was reintroduced. However, this nine-week Basic Division Officer Course (BDOC) includes very little preparation in navigation and shiphandling and focuses primarily on introducing the various ship departments. Junior officers are still expected to receive most of their shiphandling training at sea from the ships' more experienced officers. This approach ignores the reality that an extremely high operational tempo, combined with a general reduction of crew size over the past two decades, leaves mid-grade and senior officers very little time for training and testing junior officers.

## Navy Introducing Training System Reforms

Navy leadership has been aware of this problem for some time. Following the FITZGERALD and MCCAIN tragedies, more than 100 proposals for improving readiness have been evaluated. Several measures to reform the junior officer training system are being implemented or are in the pipeline. As an immediate step, BDOC's navigational radar training was extended from a scant two hours to eleven hours. Admiral Brown proposes to increase this to a full two weeks and to elevate the navigational training standard to that of the US Coast Guard. Beginning in 2019, BDOC will be augmented by a six-week course dedicated to watchstanding procedures; the curriculum for this course will be guided by the international STCW convention (Standards of Training, Certification and Watchstanding). Since 2014, junior officers have been attending a three-week Advanced Division





**Damage to the port side is visible, as the destroyer USS JOHN S. MCCAIN steers towards Changi Naval Base, Singapore, on 21 August 2017 following a collision with the merchant vessel ALNIC MC. Significant damage to the hull resulted in flooding to nearby compartments, including crew berthing, machinery, and communications rooms. Damage control efforts by the crew halted further flooding.**



**The USS JOHN S. MCCAIN is loaded onto the heavy lift transport MV TREASURE at Changi, Singapore, on 11 October 2017. TREASURE transported JOHN S. MCCAIN to Yokosuka for repairs.**

Officers Course (ADOC) prior to beginning their second sea tour. ADOC will also be augmented by an additional three week course dedicated to leadership, team building, and operational planning. The course will prepare junior officers for the responsibilities of duty as senior Officer of the Deck on the bridge and in the CIC. Follow-up testing will be conducted one year after course completion. In addition, officers of all ranks will receive refresher training or testing before assuming new leadership

positions or transferring to a new ship class. Admiral Brown emphasised that simply extending training is not sufficient; quality and applicability must be improved as well. Subjects such as operational risk management are to be incorporated at every training milestone. Team building and effective communications will be given high priority. Hands-on training in yard patrol craft will augment theoretical and simulator training. Simulator scenarios will be made more realistic by varying environmental condi-

tions and adding high-density traffic. Near-collision scenarios and shipboard emergencies will be included in simulator training, so that OODs will not be psychologically overwhelmed during real-world navigational crises. Maritime skills training centres (MSTCs) will be established in Norfolk and San Diego to support high-fidelity individual and team training for fleet personnel. These shore-based facilities will be augmented by improved shipboard simulators for enhanced training of personnel at sea. Finally, it must be underscored that training deficits were not the sole reason for the tragic mistakes made aboard the FITZGERALD and MCCAIN. Vice Admiral Joseph Aucoin, who was forced to retire from his position as 7th Fleet commander because of the accidents, cites chronic understaffing aboard ships as a contributing factor. In combination with the high operational tempo which forced the fleet to defer individual and group training as well as vital maintenance, manpower problems led to overworked and fatigued crews. The Navy

has, in the meantime, acknowledged the fatigue factor, and it has mandated a revised duty plan that should provide all crew members six hours of sleep daily and return watch schedules to a standard 24-hour cycle to match the human circadian rhythm. A new oversight body has also been established within the 7th Fleet; it will exercise oversight of technical and crew readiness and prevent ships from deploying if major deficiencies are found, even if this means cancelling planned missions. ■

# UK Armoured Vehicle Programmes

David Saw

**For almost 44 years the primary mission of the British Army was to be prepared to fight a high-intensity mechanised conflict on the North German Plain. For some 40 of those years, that mission would be conducted under the auspices of NATO. Then the world changed.**

**T**he end of the Cold War and German reunification marked the end of the primacy of the British Army of the Rhine (BAOR) in British Army operational thought. The consequences of this massive change were that the British Army would need to reinvent itself to remain relevant in the face of new security realities.

In many respects, the British Army was in a good position as far as armour was concerned. At the start of the 1990s, the CHALLENGER 1 had proven itself to be a very effective tank in combat in the Middle East. Furthermore, as it had only been in service for some eight years by the early 1990s, it had plenty of potential for upgrade and ser-

vice life extension. Yet, the CHALLENGER 1 began to be withdrawn from service in 1996, with its replacement being the CHALLENGER 2. The first batch order consisted of 127 tanks and 13 Driver Training Tanks DTT. A second batch order in June 1994, covered 259 tanks and nine DTT. The first CHALLENGER 2 tanks were delivered in 1998, with deliveries completed in 2002.

The WARRIOR had also performed extremely well in Granby and would remain in production until 1995, with the British Army acquiring 789 vehicles, although the original requirement actually called for 1,053 vehicles. The CVR(T) vehicle family had continued to demonstrate how useful it was, while the FV432, although old, had demonstrated that, whilst it might not be the greatest armoured vehicle in the world, there were plenty of missions it could perform for the British Army.

The evolution of British armour after the end of Operation Granby in February 1991 has proven to be a saga of complexity, immense frustration and failure. Indeed, some 27 years after Granby, the British Army still operates the WARRIOR, the CVR(T) family and the FV432 along with its numerous variants. It must be noted that, as of 2018, the WARRIOR has been in service for 31 years, the CVR(T) first entered service 45 years ago and FV432 entered service 55 years ago. There are numerous factors that have contributed to the British failure to effectively modernise their armoured vehicle fleet. Obviously one of the primary factors was politics in the post-Cold War world; the British Government, like many other European governments, looked to reduce defence spending to obtain a 'peace dividend' that could be spent on more politically useful purposes. Consequently both military budgets and the size of the military shrank. With no clear national defence strategy having emerged to reflect conditions in the post-Cold War world, defence matters were left to drift.

Events in the Balkans in the 1990s would find the British Army involved. Operation Grapple saw major British deployments to Bosnia initially as part of the United Nations Protection Force (UNPROFOR) and later as part of the NATO Intervention Force (IFOR). Deployments to Bosnia commenced in October 1992 and continued throughout the 1990s. Later, in 1999, British troops deployed to Kosovo for peacekeeping missions as part of the NATO Kosovo Force (KFOR). Both Bosnia and Kosovo were major troop deployments and asset intensive.

The arrival of Tony Blair as Prime Minister in 1997 saw the British Government embrace a policy of liberal interventionism. Britain was committed to peacekeeping/peacemaking missions; Kosovo was an example of this, as was Operation Palliser in Sierra Leone in May 2000. The Sierra Leone military inter-

Photos: UK MoD



***The CHALLENGER 2 LEP aims to modernise the tank to provide a precision direct fire manoeuvre capability, but doubts exist that all tanks will go through the LEP.***

Although the Cold War might have ended, the British Army that was built to fight the Cold War found itself deploying to the Middle East in 1990/91 in what was known to the British as Operation Granby. This meant the deployment of two armoured brigades and the HQ of the 1st (UK) Armoured Division; 221 CHALLENGER 1 tanks and thousands of other vehicles were employed. Apart from the CHALLENGER 1, which entered service in 1983, in terms of armour there was the WARRIOR IFV in multiple variants, this had entered service in 1987, the CVR(T) family of vehicles, which entered service in 1973, and the FV432 family of vehicles that entered service in 1963.

The WARRIOR had also performed extremely well in Granby and would remain in production until 1995, with the British Army acquiring 789 vehicles, although the original requirement actually called for 1,053 vehicles. The CVR(T) vehicle family had continued to demonstrate how useful it was, while

vention was both rapid and decisive, which is what the British Government hoped to achieve in these missions. Unfortunately then came Afghanistan and Iraq, major missions that were neither rapid nor decisive. Major involvement in Iraq (Operation Telic) lasted from 2003 until 2009, while Operation Herrick in Afghanistan lasted from 2001 to December 2014. The negative impact of Afghanistan and Iraq on the British Army cannot be underestimated, and the effects are still being felt today.

### Politics and Personnel

Between 1990 and 2015 the British Government embarked on a number of defence reviews, the first of which was 'Options for Change' in 1990, followed by 'Front Line First' in 1994, both of which were force reduction and cost cutting exercises. The Labour government that came to power in 1997 had their first review, 'Strategic Defence Review (SDR)', in 1998, which continued the trend of force reduction, cuts and restructuring. Post 9/11, the security situation had changed and this led to an addition to the SDR known as 'SDR Next Chapter' in 2002. This was followed



*In 2010/2011, BAE Systems were awarded a contract to modernise CVR(T) armoured vehicles to the CVR(T) Mk 2 configuration, as illustrated by this SCIMITAR Mk 2 vehicle on operations in Afghanistan.*

by another review 'Delivering Security in a Changing World' in 2003, unsurprisingly more restructuring and more cuts were on the agenda.

After that came the 'Defence Industrial Strategy (DIS)' of 2005, the aim here was to come up with a strategy that would give the military the equipment that they needed,

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### Office address:

Mittler Report Verlag GmbH

Baunscheidtstraße 11, 53113 Bonn, Germany

Phone.: +49 228 3500870, Fax: +49 228 3500871

Email: info@mittler-report.de, www.mittler-report.de

### Director of Marketing

Jürgen Hensel (jh)

Baunscheidtstraße 11, 53113 Bonn, Germany

Phone: +49 228 3500876, Fax: +49 228 3500871

Email: juergen.hensel@mittler-report.de

### Advertising Representatives:

#### UK/Ireland/Eastern Europe/Israel/Turkey:

Stephen Barnard, c/o Mittler Report Verlag GmbH

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#### USA/Canada:

Susan Spilman-Gardner

Email: Susan.Gardner@mittler-report.de

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#### Russia & CIS:

Laguk Co., Yuri Laskin, General Director

Krasnokholmskaya Nab., 11/15, 132, RF-109172 Moskau, Russian Federation

Phone: 007-495-911-1340, Fax: 007-495-912-1260, Email: yalarm-lml@mtu-net.ru

### Subscription/Reader Service:

PressUp GmbH, Postfach 70 13 11,

22013 Hamburg, Germany

Phone: +49 40 38 66 66-319, Fax: +49 38 66 66-299

Email: mittler-report@pressup.de

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when they needed it and at best value for money. Key to this was the domestic defence industry that was to sustain capability in key technology areas. In 2010, a Conservative/Liberal Democrat coalition government came to power, and their first review, the 'Strategic Defence and Security Review (SDSR)', of 2010 contained more force reductions. By this point, an overspend of some £38Bn by the UK MoD had become a major political issue, further increasing the pressure for more cuts in defence expenditure. The most recent SDSR was in 2015 and called for the British Army to have a regular force of 82,000 trained troops and 35,000 reservists.

To provide some context, in 2015, the British Army had 87,060 regular troops, 2,870 Gurkhas, 25,880 volunteer reservists and 4,680 other personnel. By 1 April 2018, there were 81,120 regular troops, 3,150 Gurkhas, 29,100 reservists and 4,410 other personnel. However, according to the 'UK Armed Forces Quarterly Service Personnel Statistics' as of 1 April 2018, published by the MoD on 17 May 2018, British Army Full-Time Trained Strength (FTTS) personnel numbers as of 1 April 2017 were 82,650 and as of 1 April 2018 were 81,160, with these numbers including mobilised reservists and Gurkhas. This indicates that the British Army is under strength; the FTTS personnel numbers are the key measure of usable troop numbers. Furthermore, retention of trained personnel is proving difficult and recruiting is not providing the bodies necessary to meet requirements.

To summarise, the British Army has suffered from years of over-commitment and underinvestment, added to which the procurement system has proven to be unfit for the purpose on far too many occasions. On the positive side, there are now a number of procurement programmes in action that will see the acquisition of new armoured vehicle capabilities, either through the upgrade of existing systems or the acquisition of new equipment. However, these programmes are not without their problems, and there are doubts whether the army, in its current anaemic state, can absorb or even actually needs all of these promised new armour systems.

A recent report by the House of Commons Defence Committee 'Beyond 2%: A preliminary report on the Modernising Defence Programme (MDP)' issued on 12 June 2018, noted that: "there are serious deficiencies in the quantities of armour, armoured vehicles and artillery available to the British Army." The report stated that after the 2010 SDSR, the number of CHALLENGER 2 tanks was reduced by 40% and the number of heavy artillery systems by 35%. Currently, the British Army has 227 CHALLENGER 2 tanks; in 2010 they had 316.

The Defence Committee report mentioned the CHALLENGER 2 Life-Extension Programme (LEP) and also referenced the WARRIOR life-extension, a programme with an estimated cost of £1.3Bn. The report then stated that: "Reports emerging from the National Security Capability Review (NSCR) suggested that the number of WARRIORS due to be upgraded would be substantially reduced." In addition, it was noted that: "The army is procuring the next generation of Mechanised Infantry Vehicle (MIV), a procurement taking place outside of the MDP. We took evidence on this in April (2018) and, at that time, the MoD was not in a position to provide detailed figures on how much each vehicle would cost. A failure to manage costs could put further strain on an equipment programme already under enormous pressure." Rectifying the serious deficiencies in quantities of armour and armoured vehicles available to the British Army, as noted above, would appear to be a work in progress. Evidence includes the CHALLENGER 2 LEP, the WARRIOR Capability Sustainment Programme (CSP), the 589 AJAX armoured vehicles order from General Dynamics Land Systems-UK and, as explained in the

official MoD statement at the end of March, the decision to “re-join the BOXER programme and explore options to equip the army with the 8x8 troop carriers to modernise its vehicle fleet and meet the army's Mechanised Infantry Vehicle requirement.” The statement added that: “The MoD is now taking forward negotiations with the Organisation for Joint Armament Cooperation (OCCAR) and Artec. Looking forward to the Assessment Phase concluding in 2019, this will consider the comparable benefits of manufacturing locations and different supply chains for BOXER, as well as value-for-money. Any deal will be subject to commercial negotiation and assessment in 2019, and the aim is to have the first vehicles in service with the army in 2023.”

## Survival

As previously discussed, there are four major British Army armoured vehicle programmes: CHALLENGER 2 LEP, WARRIOR CSP, AJAX and MIV. All of which appear, at least on the surface, to be highly logical and just the sort of armour capabilities that the British Army needs. The downside is that the army is still under strength, retention and recruitment are still problematic and the procurement system is still plagued with issues. While there is talk in certain political circles of the need to increase defence expenditure, very few actually expect more money to be made available. Indeed the pressure is on to save money; programmes that are not going according to plan or are becoming difficult to justify for other reasons will become increasingly vulnerable to cancellation. Of the four armour programmes, only two can be regarded as safe and secure at this point. The first of these is the AJAX, this is a family of vehicles with 589 being acquired under a £4.5Bn contract and the vehicle entering service in 2020. The AJAX contract covers six variants: 245 AJAX reconnaissance vehicles, 93 ARES reconnaissance support vehicles, 112 ATHENA command vehicles, 50 APOLLO support repair vehicles, 51 ARGUS engineer reconnaissance vehicles and 38 ATLAS recovery vehicles. Even if the MoD wanted to, it would prove very difficult to modify the AJAX contract in any significant way at this point.

The other secure programme is MIV, the decision to rejoin the BOXER programme to meet the MIV requirement is somewhat ironic. Back in March 1998, Britain had its Multi-Role Armoured Vehicle (MRV) requirement; it was participating in the multinational BOXER programme to meet that requirement and intended to purchase 775 vehicles. Then, in July 2003 Britain cancelled MRV, after spending some £57M on the programme. Now, some 15 years later, Britain is back into the BOXER programme and intends to order some 800 vehicles initially and perhaps more subsequently. Admittedly, there is still much work to be done on the BOXER programme in terms of both costs and contracts, but at this point, unless something absolutely calamitous emerges, this should be a guaranteed programme.

## Uncertainty

The WARRIOR CSP programme got underway in June 2009, at which point the aim was to upgrade in excess of 550 vehicles. Originally, Britain acquired 489 Infantry Section Vehicles (FV510), 84 Command Vehicles (FV511), 52 Artillery Observation Vehicles (FV514), 19 Battery Command Vehicles (FV515), 39 Recovery Vehicles (FV513) and 105 Repair Vehicles (FV512). The current declared fleet is 336 FV510/511, 44 FV514, 20 FV513 and 56 FV512. The WARRIOR CSP was awarded to Lockheed Martin in 2011 and up to 380 vehicles (in five variants) are to be upgraded. The problem with the WARRIOR CSP is that the programme has been running late and over budget. Added to which, structural de-

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**The AJAX armoured vehicle prototype on display near the future vehicle assembly site in Merthyr Tydfil, Wales. AJAX will replace the CVR(T).**



**WARRIOR (FV510) Infantry Section Vehicles with additional protection provided by the TES(H) configuration in Helmand Province, Afghanistan, in 2013.**

ficiencies are reportedly being identified in some WARRIOR vehicles, and this will cause further problems. All of this makes the programme vulnerable. WARRIOR CSP is one of a number of British programmes whose size and cost were predicated on the British Army adopting a particular operational/organisational structure. The problem is that structure is changeable and not set in stone. As a result, the number of systems that are necessary also changes and usually the number goes down. In the context of WARRIOR CSP, you have a delayed programme that still has risk, and the possibility of the

unit cost per vehicle rising as numbers are reduced. As of November 2017 the MoD had spent £381M on WARRIOR CSP, the possibility of the MoD deciding to cut its losses on this programme cannot be ruled out.

The other major armour programme is the CHALLENGER 2 LEP, and this is also potentially vulnerable on a number of different fronts; there are those who feel that a tank is too big and too heavy, and that the British Army should be a medium-weight and therefore more easily deployable force. The opposing view is that, if the British Army is to confront a 'peer' competitor, it is go-

ing to need the firepower and protection provided by a tank and for that reason the LEP programme is vital. It should also be noted that the CHALLENGER 2 LEP will only be an interim capability and that a new tank system will be needed from the mid-2030s. This explains British interest in the Franco-German Main Ground Combat System (MGCS), but here politics comes into play: attempting to join a European tank programme might not be an astute political move in domestic British terms at this point. Equally, there has been little enthusiasm in Paris and Berlin for British participation in the major Franco-German defence programmes that have emerged recently. Potentially, this could mean that Britain has to look for other partners to meet a future tank requirement.

Prior to the CHALLENGER 2 LEP, there had been numerous failed tank upgrade programmes in Britain, including the CHALLENGER Lethality Improvement Programme (CLIP) and the CHALLENGER 2 Capability Sustainment Programme (C2 CSP). However, the LEP became a reality, with five teams bidding for the programme that was aimed at providing what the MoD called a "precision direct fire manoeuvre capability across a broad spectrum of operations."

In December 2016, competitive Assessment Phase (AP) contracts for the CHALLENGER 2 LEP were awarded to BAE Systems and Rheinmetall Landsysteme GmbH. Each competitor was provided with two tanks; one of which was in operational condition, while the other was to be used for subsystem integration and testing. The plan is that the two teams will complete the AP contracts in December 2018. By that time, industry will have responded to the invitation to tender for the Demonstration, Manufacture and In-service support (DMI) contract, with the DMI proposals to be evaluated after the AP offerings have been received. After which, by mid-2019, the CHALLENGER 2 LEP contract should have been awarded.

Original planning for the CHALLENGER 2 LEP called for the programme to cover all 227 remaining CHALLENGER 2 tanks. Whether all of these tanks will actually go through the LEP process is becoming increasingly doubtful. Potentially only 170 or even fewer tanks could be upgraded. What the current, accident-prone British Government will be keen to avoid is another procurement-related scandal, and this is something that should preserve the LEP programme, although it cannot protect the number of tanks to be upgraded. Outside of these armour programmes, there are a number of studies taking place within Active Protection Systems (APS), in

both soft-kill and hard-kill formats in the UK for both tanks and other armoured vehicles. In the MEDUSA Technical Assessment Programme (TAP), the Defence Science and Technology Laboratory (Dstl), is investigating a number of APS options. As a part of this, Dstl has awarded QinetiQ a contract to evaluate an APS for armoured vehicles; this will use the Hensoldt MUSS (Multifunctional Self-Protection System), a soft-kill APS system as used on the German Army PUMA IFV. Other industrial partners in this assessment programme include Textron and Frazer-Nash.

Dstl also acquired the Rheinmetall ROSY rapid obscuring system and have tested it on a CHALLENGER 2. They have also acquired elements of the IMI IRON FIST hard-kill APS for testing on CHALLENGER 2 as well. In September 2017, Dstl placed a contract with Leonardo to participate in the Icarus Technical Demonstration Programme (TDP) to develop a Modular Integrated Protection System (MIPS). Leonardo will be responsible for the development of an MIPS Electronic Architecture (EA). According to Dstl, the MIPS EA will: "provide a common infrastructure that will deliver UK operational sovereignty and enable 'best of



**A German Army BOXER armoured vehicle participating in an anti-tank exercise in Lithuania**

breed' commercial off-the-shelf APS sensors and countermeasures to be selected, integrated and deployed to defeat a wide range of current and future battlefield threats." Leonardo has listed their industrial team for Icarus as: BAE Systems, Lockheed

Martin UK, Ultra Electronics, Frazer-Nash, Vetronics Research Centre, Abstract Solutions, Roke Manor Research and SCISYS. Dstl is also working on a number of other APS developments with both domestic and foreign partners. ■

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# Eurofighter TYPHOON – Who is Next to Join?

**Esteban Villarejo Ceballos**

**With campaigns in Belgium, Malaysia, Poland and Colombia ongoing and with Qatar (2017) and Kuwait (2016) having joined Europe's largest defence programme, Eurofighter may expect additional customers or new procurement efforts in Germany, Spain and/or Saudi Arabia.**

After a confident year in 2017 with the announcement of a new contract with Qatar and the delivery of the first aircraft to the Royal Air Force of Oman, more positive news for the Eurofighter TYPHOON consortium, whose order backlog has grown to 623 aircraft in nine countries, may come

UK (33%), and Leonardo in Italy (21%) also rely on old customers. These include the Royal Saudi Air Force, which recently placed a new order, while opportunities to update the fleets of German PANAVIA TORNADO and Spanish F-18 aircraft at short notice also presented themselves.



Photo: Bundeswehr

**EUROFIGHTER pilots of Tactical Air Force Wing 31 "Boelcke" test the Guided Bomb Unit 48 (GBU-48) at the military training area in Vidsel, Sweden on 6 September 2017.**

this year. According to sources close to Eurofighter's export campaigns, there are five or six countries in which the TYPHOON could be successful in the coming years and there is a real possibility of adding a new customer in 2018. Belgium, Poland, Malaysia, Canada, Colombia or even Switzerland are the main "battlefields" where the Eurofighter TYPHOON jet will have to face old (F-18, F-16 and RAFALE) and not-so-old competitors (F-35).

In addition to these new markets, Eurofighter partner companies Airbus DS in Germany (33%) and Spain (13%), BAE Systems in the

Here are the main market opportunities for Eurofighter TYPHOON to sell more aircraft in 2018:

## Belgium: the Mother of All Battles

If there is one country where the combat-proven Eurofighter TYPHOON is fighting hard for a deal, it is Belgium. It is a country in which the European defence and aviation sector is risking its reputation, while the Trumpist "Make America great again" is betting on making the

F-35 LIGHTNING II the "new European fighter".

On 14 February, the UK submitted its final offer to Belgium, in a proposal comprising 34 Eurofighter TYPHOON aircraft and support services, the British Ministry of Defence (MoD) announced. The aim of the competition announced by the Belgian Ministry of Defence is to replace its fleet of 54 F-16AM/F-16BM in the mid-2020s. Belgium wants deliveries of successor aircraft to begin by the end of 2022 and to be fully operational by 2029. The cost of the Belgian programme is estimated at around €3.7Bn.

"It's an offer that is all about Europe first rather than America first. We recognise that it is a straightforward competition between ourselves and F-35 - a European versus US solution - and we believe our advantage lies in being the European solution," said Anthony Gregory, campaign director for Belgium at BAE Systems.

In a way, it is paradoxical that the British BAE system defends the "Euro solution" in the uncertain times of the Brexit negotiations. For this reason, the British statement underlined: "The proposal has the full support of the governments of the four Eurofighter nations Germany, Italy, Spain and the UK as partners in Europe's largest joint military aircraft programme. The new aircraft - whether the Eurofighter TYPHOON or the F-35 - will be purchased under an intergovernmental agreement and the Belgian government might announce its decision in July, possibly during the NATO summit in Brussels, Eurofighter sources told ESD.

Along the way, the Boeing F/A-18 SUPER HORNET and SAAB GRIPEN decided to retire from the tender, while Dassault's RAFALE was not mentioned in the last statement of the Belgian MoD.

The proposal from BAE Systems includes 34 Eurofighter TYPHOON aircraft and the associated weapons package, underpinned by the offer of a comprehensive strategic, defence and industrial partnership between the governments of Belgium and the UK.

The UK also offers Belgium the possibility of establishing a National Network Cyber Centre, a Cyber Innovation Centre



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Eurofighter also believes that its proposal will create between 6,000 and 8,000 new and highly skilled jobs in Belgium over the life of a 30-year programme. "Over 25 years, the Eurofighter proposal could deliver €19Bn into the Belgian economy, with an additional €6.2Bn from wider economic multipliers," said Eurofighter. On the other hand, Lockheed Martin is offering 35 F-35s for US\$6.5Bn: "Lockheed Martin and the Belgian military and industry have a long-standing working relationship, partnering on programmes such as the C-130 HERCULES and F-16 FIGHTING FALCON since the 1970s," said Lockheed Martin.

The UK, Germany, Italy, Spain and Austria are already customers of the Eurofighter TYPHOON jet in Europe. At the same time, the UK, Italy, The Netherlands, Denmark and Norway are the F-35 customers on the old continent. Interoperability with allies will be another key factor in the final decision of the Belgian Ministry of Defence.

### Poland: 50 Soviet-Era Aircraft to be Replaced

The Eurofighter consortium declared last September that Poland should consider the Eurofighter TYPHOON to replace its fleet of 32 MiG-29 FULCRUM (air-to-air role) and 18 Su-22 FITTER (air-to-ground missions) aircraft, which have been in service for 30 years. "Eurofighter TYPHOON augments existing capabilities and further complements a powerful deterrence against any potential threat to Poland's borders. The TYPHOON with the F-16 Block 52+ will be a perfect combination," Raffael Klaschka, head of marketing at Eurofighter GmbH, commented at the MSPO defence exhibition in Kielce, Poland. The Polish Ministry of Defence announced two months later the launch of the "Harpia programme" to procure a new multirole combat aircraft.

The operational requirement for this programme is defined as "enhancing the capability to carry out missions within the framework of offensive and defensive combat against the enemy air power, as well as missions to support land, naval and special operations Multi-Role Combat Aircraft and Airborne Electronic Jamming Capabilities". Still in a primary phase of "market analysis", the Polish MoD sees three main options to replace its Soviet-era aircrafts: the F-16V (Lockheed Martin) which includes an active electronically scanned array (AESA) radar; the F-35 LIGHTNING II although the cost of



Photo: Crown Copyright

**A Royal Air Force TYPHOON performing an air display at RAF Coningsby. The TYPHOON provides the RAF with a multirole combat aircraft, capable of being deployed across the full spectrum of air operations, from air policing and to peace support, through to high-intensity conflict.**

€94,3M per unit may be prohibitive for the Polish MoD; and the Eurofighter TYPHOON, with Italian Leonardo leading the bid.

Other contenders could be Boeing's F/A-18 SUPER HORNET, SAAB's GRIPEN or the cheaper solution of second-hand F-16s. And finally, there is the possibility that the "Harpia Programme" may be postponed, taking into account other priorities of the Polish Ministry of Defence, such as new submarines, missile artillery systems or multi-purpose helicopters. "Joining the Eurofighter programme would bring new and additional opportunities to Poland – both from a military and economic perspective, with a number of possible options in scope, from assembly and manufacturing to support and maintenance. And, of course, Poland would play a role in the definition of any future development of the aircraft, which will continue to be in service well beyond 2050. We take Polish needs seriously, and would make it a guideline for our engagement," the head of marketing at Eurofighter said.

### Malaysia: a Great Opportunity in Asia-Pacific

After setbacks in India and South Korea, the Eurofighter lacks a customer base in the Asia-Pacific region, but Malaysia offers a great opportunity to win back customers.

The Ministry of Defence of Malaysia wants to replace its 18 MiG-29N – nearly half of which are grounded. Dassault's RAFALE and the Eurofighter TYPHOON offered by BAE Systems are considered the only options when the Malaysian government finally decides to purchase the new fighter aircraft.

BAE Systems will give Malaysia a UK government-backed financing deal if Malaysia decides to replace its fleet of combat jets with the Eurofighter TYPHOON, a senior company official told Reuters last month.

The competition, worth over US\$2Bn, is one of the largest fighter aircraft bids in Asia, although a decision has been delayed due to the forthcoming national elections in June and a shift in focus on improving air surveillance capacity in Malaysia. "We have an offer on the table. It's competitively priced and we have offered UK government financing so the Malaysian government can spread the payment over a longer period," said Alan Garwood, the Group Business Development Director for BAE Systems, in an interview with Reuters in Kuala Lumpur. "We can offer training, local partnership and lots of jobs," he added.

Financing would be provided via the UK Export Finance export credit agency.

Malaysia is also a customer of the European aeronautic industry, with four Airbus A400M transport aircraft already delivered.



## Canada: a Last Movement from Airbus

The Royal Canadian Air Force seeks to replace its fleet of 77 CF-18 aircraft delivered between 1982 and 1988. Canada has a strong partnership with the Lockheed Martin F-35 programme taking part in the Concept Demonstration Phase (US\$10M) and the System Development Phase (US\$150M). Eventually, however, it did not acquire any F-35 LIGHTNING II aircraft to replace its version of the F-18.

A recent change in the aerospace industry has brought the Eurofighter consortium back to the table: Airbus and the Canadian manufacturer Bombardier Aerospace have joined forces to build C-Series civil aircraft. Some military experts see this as an opportunity for Airbus to sell the jet fighter. Boeing could also participate in the programme with the new F-18: The American company has informed the Canadian government that it is interested in a new order to supply 88 new fighters.

## Colombia: a Buy or a Second Hand Option?

The Colombian Air Force needs to replace its 19 Israeli-built multirole combat aircraft KFIR C-10/C-12/TC-12 in service since 1989. Bogota has studied different options, including the GRIPEN NG and the F-16 Block 50.

The Eurofighter TYPHOON consortium has also offered its aircraft in a campaign led by Airbus in Spain. led by Airbus in Spain. Fernando Alonso, head of military aircraft at Airbus DS, said in a recent meeting with specialised journalists, ESD included, that Colombia was a potential export customer for the Eurofighter. At the last Expodefensa 2017 in December, Airbus displayed the flight simulator for the Eurofighter TYPHOON in Bogota.

The choice of a new fighter aircraft was one of the main subjects of debate.

"However there is an intermediate option," a Colombian military source told ESD, "the second-hand Eurofighter option." This deal would involve the Spanish Air Force, which could sell Eurofighter Tranche 2 to their Colombian colleagues in a government-to-government agreement.

"The deal could include logistic and training support, some weapons and the integration of the METEOR air-to-air missile," the same sources said.

This deal would allow the Spanish government to order new Eurofighter aircraft (Tranche 3). A package of 14 units was cancelled by the Spanish government in 2013 due to budgetary constraints. Perhaps it would be an opportunity to resume this initiative.

## Switzerland: the Return of an Old Opportunity for Airbus

In a press talk last December, Fernando Alonso (Airbus DS) also mentioned Switzerland as a novel prospective customer for the Eurofighter TYPHOON. In May 2014, Swiss voters had rejected in a referendum a CHF3.1Bn (€2.8Bn) order for 22

the innovative CAPTOR-E E-SCAN radar.

**Oman:** In June 2017, the Sultanate received its first Eurofighter TYPHOON. The contract was signed in 2012 for BAE Systems to supply 12 TYPHOON for £2.5Bn.

**Saudi Arabia:** In June 2017, BAE Systems delivered the 72nd and last Eurofighter TYPHOON to Saudi Arabia. An additional procurement from the Saudi Air Force is

Photo: U.S.M.C.



**A Eurofighter TYPHOON with the Spanish Air Force based out of Morón Air Base, Spain, refuels from a KC-130J HERCULES on 13 August 2016.**

GRIPEN fighter jets; 53.4% of the voters opposed the contract. Still, the Swiss government intends to replace the 30 F/A-18 fighter jets; Swiss Defence Minister Guy Parmelin said he would see no alternative to buying new jets. Airbus (Eurofighter TYPHOON), Boeing (F-18), Dassault (RAFALE), Lockheed Martin (F-35) and SAAB (GRIPEN) are again the known options. The decision should be taken in 2020 and the new fleet of fighters should be fully operational in 2030.

## Brief Comments on ...

**Qatar:** Last December, Qatar and BAE Systems signed a contract for the supply of 24 Eurofighter TYPHOON aircraft in a £6Bn deal, making Qatar the ninth customer. Deliveries are expected to begin in late 2022.

**Kuwait:** Last year, production started on the Eurofighter TYPHOON for Kuwait. The contract for €8Bn between Leonardo and Kuwait was signed in 2016 to supply 28 Eurofighter TYPHOONS; this version will have

always on the table. But nothing is for certain in the Kingdom, especially after the recent political changes.

**Austria:** The new government will reconsider the previous government's decision to terminate a €2Bn Eurofighter Jet programme prematurely, said new Defence Minister Mario Kunasek recently. His predecessor Hans Peter Doskozil started an unprecedented legal dispute with Airbus and the consortium a year ago, accusing them of fraud and malicious deception in connection with a US\$2Bn Eurofighter order in 2003. It seems that Airbus and Austria are approaching an understanding of the matter.

**Spain and Germany:** Airbus CEO Tom Enders said on 15 February that further Eurofighter orders, both from new export customers and "repeat orders" may be available soon. It is known that the German and Spanish air forces will have to replace their 88 Panavia TORNADO and 85 F-18s in the next 3-5 years. "The Eurofighter (Tranche 3) is the most likely choice to replace these old fighters," the Spanish Ministry of Defense disclosed to ESD. ■

# Combat Aircraft Cockpit Developments Gain Momentum

Luca Peruzzi

The amount of information and situational awareness needed in today's air combat operations, as well as the energy requirements and data processing capabilities imposed by the new generation of sensors and mission systems, require new cockpit architectures and core mission subsystems.

To improve the human-machine interface (HMI) and reduce pilot workload while facilitating target search and engagement cycle, both upgrades and new production combat aircraft programmes

are looking into new cockpit architectures, including large area displays (LAD) and helmet displays (HMD) with or without new low-profile head-up displays (HUDs), which further improve flight safety.

## US Platforms

The US Navy's latest Block III F/A-18 E/F SUPER HORNET and upgrade programme for Boeing aircraft currently in service will incorporate new sensors and networks to operate together with the Lockheed Martin F-35 LIGHTNING II stealth platform. Working in unison with the E-2D ADVANCED HAWKEYE early warning, command and control and Boeing EA-18G GROWLER EW aircraft platforms, the latest Block III version will be able to engage both airborne and ground targets spotted by stealthy F-35Cs scouting ahead into hostile airspace. In addition to structural improvements to extend its service life to 9,000 hours, conformal fuel tanks to increase its range, speed and available wing hardpoints (for additional ordnance), as well as a reduced aircraft radar signature, the Block III version will feature a new mission system centred on the Distributed Targeting Processor-Network (DTP-N) computer, the Rockwell Collins-provided Tactical Targeting Network Technology (TTNT) and the Advanced Cockpit System (ACS), in addition to new sensors and updated satellite communications. Together with Raytheon's APG-79 AESA radar and an improved defensive countermeasures system based on Raytheon's ALR-67(V)3 RWR and BAE Systems' ALQ-214(V)3 Integrated Defensive Electronic Countermeasures suite, the Block III will be equipped with Lockheed Martin's Infra-Red Search and Tracking Block II, enabling passive triangulated airborne engagement through the new onboard mission system. By boosting the computing capability of the current SUPER HORNET mission computer (Block II) seventeenfold and processing all data on board the aircraft using an open architecture that is amenable to future upgrades, the DTP-N receives, processes and distributes data over the TTNT network, which is also used on the EA-18G and E-2D platforms. The TTNT enables the fast transmission of large amounts of data, even in

Photo: UK MoD



*Panoramic display in the cockpit of an F-35 II LIGHTNING*

Photo: RC/VES



*The F-35 Gen III HMD system allows the pilot to "see through the plane" by providing a 360° view.*



the event of hostile jamming, and is part of the NIFC-CA (Naval Integrated Fire Control – Counter-Air) system. All data provided by different sensors and networks are pooled together, presented, managed and distributed by the crew through the highly integrated Advanced Cockpit System (ACS). Developed by Boeing, the completely redesigned cockpit architecture is based on a new Elbit Systems of America 10x19-inch touchscreen high-definition large area display (LAD), which replaces the existing multifunction displays alongside a new low-profile HUD and the Joint Helmet Mounted Cueing System (JHMCS) supplied by Rockwell Collins ESA Vision Systems (RCEVS), a joint venture between Rockwell Collins and Elbit Systems of America. The ACS provides increased situational awareness, 3D target tracking for the effective coordination of long-range attacks, fault tolerance/built-in redundancy and scope for future growth. The first version of the Block III will go into series production delivery in early 2021, while the modernisation of in-service Block II will begin in 2022. The deployment of Block III aircraft is planned for 2022, and production will run until 2025. The Boeing F-15 is approaching its 50th



Photos: Saab

**Cockpits of a Saab GRIPEN E (left) and the new GRIPEN EIF.**

maiden flight birthday and will receive new capabilities. US and foreign customers of the EAGLE and STRIKE EAGLE versions have sought to improve the capabilities and extend the service life of these platforms. Boeing has worked in both directions to introduce new onboard systems to meet

the latest mission requirements as the US is upgrading its USAF and Air National F-15C and F-15E fleets to keep the platform in service until 2040 and beyond. The latest mission system update is based on the advanced Suite 9 hardware and software package including the new Advanced Dis-



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**The new RAFALE has a well-thought-through cockpit with a modern HMI and larger side touchscreens.**

play Core Processor (ADCP) II computer, which is claimed to be the fastest flight mission system available; it is capable of processing up to 87 billion instructions per second. The new suite opens up advanced capabilities that will be common to both EAGLE versions, including the EAGLE Passive/Active Warning and Survivability System (EPAWSS) upgrade, which will allow the platform to cooperate closely with the F-22 and the F-35. The upgrade package also includes AESA radars, conformal fuel tanks (National Guard), Lockheed Martin's IRST21-equipped LEGION pod to operate in radar-denied environments and potentially a new gateway system (Talon HATE) for communications between the EAGLE and 5th-generation aircraft, in addition to new weapons systems, such as the Small Diameter Bomb II. The ADVANCED EAGLE programme for the export market, which is based on the US upgrade but also introduc-

es a completely new Advanced Crew Station (ACS), features even more advanced innovations, such as a Digital EW System (DEWS), Lockheed Martin's SNIPER pod, IRST, the digital Joint Helmet Mounted Cueing System (JHMCS), a digital fly-by-wire and two additional hardpoints. A key option for the ADVANCED EAGLE is the new ACS with a Large Area Display (LAD), a low-profile HUD and the ADCP II. Centred on a decoupled LAD for the front and rear cockpits and developed by Elbit Systems as part of what was previously known as CockpitNG (Next Generation), the LAD replaces the previous multifunction displays with a single, large, touchscreen, high-definition, colour display, which provides the crew with the primary flight information and sensor data. According to Boeing, the LAD uses latest-generation smartphone technology and allows the pilot to select and expand the display information to cope

with operational needs. Qatar is the first customer for this option; Qatar will receive its F-15QAs (QATAR ADVANCED) together with an extended weapon package.

The 5th-generation F-35 LIGHTNING II became the first combat aircraft to feature a cockpit layout centred on a 20x8-inch LAD produced by L3 Aviation Products and a Helmet Mounted Display (HMD) system produced by RCEVS. These two systems provide all the mission and flight information, which is a huge advantage compared to previous generation cockpits based on multiple multifunction displays and HUDs. By using Northrop Grumman's electro-optical Distributed Aperture System (DAS) integrated into the skin of the stealth platform, the RCEVS F-35 Gen III HMD system allows the pilot to "see through the plane" by providing a 360° view. This advanced interface features a biocular 40x30° field-of-view, high-brightness and high-resolution display, with integrated night digital vision, providing the pilot with accurate and readable information in the virtual HUD and significantly expanding situational awareness. Combined with low latency, the F-35 Gen III HMDS delivers mission critical information through its intelligent pilot interface. However, the development of threats to be faced by 2025 and beyond requires the US MoD and Lockheed Martin to introduce capability improvements, including the integration of additional weapons and upgrades to the electronic warfare system, datalink systems, radar and other sensors. An essential element of the F-35 avionics upgrade is the Technical Refresh 3 (TR3) hardware upgrade programme. Being developed to fully support Block 3F functionality and to allow incorporation of all Block 4 capabilities documented in the System Requirements Document (SRD), TR3 hardware redesign is required to support the required fourfold increase in processing power, based on current estimates for all 3F capabilities. It features an improved integrated core processor, an improved panoramic cockpit display, and a more capable aircraft memory system. In June 2017, Lockheed Martin Aeronautics contracted Elbit Systems of America to develop a panoramic cockpit display unit to replace the fighter's current L3 Aviation Products cockpit display. In the same month, Lockheed Martin contracted Harris to improve the F-35's data storage, display processing and throughput capabilities. The TR3 avionics upgrade is part of the F-35 Block 4 enhancing package. It will be added during the Block 4.2 increment in order to incorporate a number of upgraded sensors and other capabilities. The



new panoramic cockpit display will have the same dimensions as the current Large Area Avionics Display (LAAD) provided by L3; the display will have a size of 20x18 inches overall, divided electronically into two 10x8-inch side-by-side screen elements, said Lockheed Martin, which plans to finalise the display design in late 2018. Harris will provide the new Aircraft Memory System (AMS) and Panoramic Cockpit Display Electronic Unit (PCD EU), which are based on an open architecture and commercial-off-the-shelf (COTS) technology. The solid-state mass storage AMS is an essential element of the F-35 avionics suite, as it is the repository for avionics operational flight programmes, mission and theatre data, prognostics and health data, audio, display video, and aircraft parametric data. The PCD EU provides processing for the new panoramic head-down display in the cockpit. The current technology development phase will be followed by a system qualification phase in early 2019 and a subsequent 5-year production contract phase.

## European Platforms

Sweden and Brazil have contracted Saab to develop and deliver the latest version of the GRIPEN multirole fighter (GRIPEN E/F), the airframe, systems and avionics suite of which are completely new. The next generation GRIPEN programme aims to build a long-term strategic relationship between the two nations, industries and air forces, with technology transfer agreements, local co-design, development and assembly, which includes the Brazilian avionics specialists AEL Sistemas to supply the cockpit's main interaction technologies. The latter are centred on LAD and have become cockpit options for potential customers of the Gripen E/F. The new aircraft's avionics suite is based on an innovative, scalable and hardware-independent architecture concept known as DIMA (Distributed Integrated Modular Avionics) which segregates flight-critical functions from non-critical applications. The new architecture, certified to commercial standards, not only enables Saab to speed up the pace of initial development, but also shortens the time required for new capabilities and weapon integration.

The GRIPEN E introduced a new generation cockpit architecture which, together with a new set of state-of-the-art sensors and weapon systems, significantly enhances the situational awareness and net-centric and combat capabilities of the new multirole fighter. The Swedish company has selected

Photo: BAE Systems



**BAE Systems' wide-field-of-view LiteHUD in a TYPHOON cockpit**

Elbit Systems' Brazilian subsidiary, the avionics specialist AEL Sistemas, as partner in the technology transfer agreement to provide the Wide Area Display (WAD), Head-Up Display (HUD) and the TARGO HMD, which will be integrated into the GRIPEN NG (as Brazil calls the new platform) as part of the Brazilian F-X2 programme. Being the core element of the cockpit arrangement, the Wide Area Display is a single intelligent and fully redundant, full-colour, large (19x8 inches) multipurpose display system, with continuous image presentation and cutting-edge touch-screen controls. It is the primary source of all flight and mission information in the cockpit. While the WAD and its HMI represent a huge enhancement in cockpit and mission management, with all the relevant information provided in a single large screen, the HUD and HMD are contributing to achieving safety, immediate situational awareness and combat capabilities. The new TARGO HMD will provide night cueing and display capabilities. The Swedish Air Force's future GRIPEN E aircraft are currently configured for a three-screen display system while having selected AEL Sistemas, TARGO HMD. The GRIPEN E is equipped with Leonardo's sensors suite including the Raven ES AESA radar, which features an innovative roll-repositionable AESA antenna offering superior situational awareness, a SKYWARD-G IRST passive sensor and a phased array IFF system, integrated with Saab's new-generation MFS-EW (Multi Functional System) suite, which is based on the AREXIS EW product family and a communication package. The latter includes both Link 16 or a customer-specified data link and Saab's intra-formation data exchange system. With the renewed commitment of the

partner nations, a rash of sales in the Middle East to Oman, Kuwait and Qatar, and Saudi Arabia's commitment for additional aircraft, the Eurofighter TYPHOON programme is regaining momentum. Among the consortium's partner customers, the UK is today leading the aircraft's evolution with the national "Project Centurion" which is based on the four partners' platform evolution roadmap and on incrementally phased enhancements (PE) to which the aircraft is subjected and which respond to customer and potential user requirements. The UK's "Project Centurion" will allow the retirement of the TORNADO in 2018, and it provides the TYPHOON with a number of enhancements including the integration of MBDA's STORM SHADOW stand-off cruise missile and the METEOR beyond-visual-range air-to-air missile (BVRAAM) (under P2E international efforts), in addition to MBDA's Dual-Mode Seeker (DMS) BRIMSTONE (under the follow-on international phase 3E). The UK MoD and other TYPHOON operators are also working to ensure that the TYPHOON can operate in conjunction with the F-35 to maximise the benefits of both platforms. Both the Eurofighter and the Euro radar consortiums are committed to provide TYPHOON with the E-Scan or the Captor-E active-electronically scanned array (AESA) radar, which will see initial capability phase-in on Kuwait's TYPHOONs manufactured on Leonardo's assembly line from 2020 on. All these enhancements require new software and HMI developments. According to Eurofighter, the TYPHOON is at the forefront of sensor fusion and decision-making technology, with the cockpit centred around large,

colour multifunction displays, wide field-of-view HUDs, BAE Systems' STRIKER integrated helmet-mounted display, HOTAS and direct voice input (DVI). The current cockpit configuration has so far proven itself under combat and operational conditions and can handle the current and planned short-term enhancements with further refinements. Over time, however, the existing cockpit configuration will reach its limits in terms of the amount of information a pilot can handle.



Photo: UK MoD

**Cockpit of an RAF TYPHOON**

The Eurofighter consortium is working with the partner nations to complete a Phase 4 Enhancement (P4E) and to prepare the subsequent P5E packages. Potential candidates are new weapons and dual-carriage common weapon launchers, conformal fuel tanks, a new laser targeting pod, an E-Scan radar, satellite communications, enhanced data links suite and BAE Systems' new-generation STRIKER II digital day/night HMD. The latter builds on the success of the original STRIKER helmet, which is in service in eight nations with decades of proven combat experience. The fully digital colour day/night binocular STRIKER II HMD system provides enhanced situational awareness, target tracking and 3D audio, in addition to flexible weapons cueing night and day, thanks to an integrated night vision camera which removes performance and pilot ejection limitations with existing night vision goggles. What is more, Eurofighter is looking beyond the P5E with the long-term evolution (LTE) initiative study,

investigating potential enhancements such as a new cockpit layout and an enhanced avionics structure. At DSEI 2017, BAE Systems declared that they are studying a series of TYPHOON cockpit upgrade concepts centred on a large-area touchscreen display and exploring the potential of augmented reality using its STRIKER II HMD. Replacing the current three-multifunction-display (MFD) cockpit with a single large touchscreen would greatly facilitate the necessary sensor fusion with the new sensor such as the AESA radar and the new generation of targeting pods that will be introduced on the aircraft and whose additional data will be available to the pilot.

Moreover, the LADs are significantly cheaper to produce, maintain and lighter than current MFDs. BAE Systems has already set up a TYPHOON cockpit demonstrator with a LAD, and Airbus is pursuing a similar effort. In the cockpit configuration envisaged by BAE Systems, the company's STRIKER II HMD system would augment the LAD. BAE Systems is also developing a portable cockpit technology based on the STRIKER II HMD, which projects augmented and virtual reality interactive cockpit displays and controls directly in front of the pilot's eye, replacing the current physical cockpit layouts. BAE Systems has also successfully developed a new HUD family, which has been already selected for the Turkish HURKUS B trainer, the SCORPION light attack aircraft, the AC-130J gunship and BAE Systems' ADVANCED HAWK concept demonstrator, in addition to three other undisclosed platforms. The LiteHUD is a small and compact HUD that offers space and weight advantages combined with the latest digital display technology, revolutionary waveguide optics and highly reliable electronics.

In March 2017, the French MoD approved the start of development of the new Dassault Aviation RAFALE F4 standard. Continuous development processes are to draft standards to adapt the aircraft to new requirements; the F4 standard series RAFALES are to enter into service from 2025, but some standard equipment or capabilities are expected to be added to the inventory in advance thanks to a building block approach based on software upgrades. The F4 standard is based on new-generation networking equipment and capabilities, sensors and weapon system enhancement or new versions, cockpit evolution and predictive support/availability.

The F4 standard provides for the integration of new Thales CONTACT software-defined radios, which are to be tested for RAFALE as early as in 2020, as well as a new point-to-point, directional, discrete data link for communication and data connection only between RAFALES, which will

supplement the current Link 16 in addition to a modified avionics system, and civilian and SYRACUSE IV military SATCOM.

The RBE2 AESA radar will benefit from new air-to-ground modes and the Thales/MBDA SPECTRA EW suite will feature extended frequency band coverage and improved emitter geolocation capabilities. Both systems will also be equipped with gallium nitride (GaN) technology, while the RAFALE Front Sector Optronics (FSO) will receive a new generation ofIRST optimised for air-to-air engagements. Due to the well thought-out and balanced environment and the modern HMI, the cockpit is expected to receive new, larger side touchscreens and see various other adjustments.

The innovation is to close an operational gap by introducing HMD. It has been reported that the specifications for the new devices are compatible with the systems of various providers. In January 2017, routes were flown with an HMD on export aircraft, similar to the Elbit Systems TARGO II system, but no official explanation was published. Meanwhile, in March 2018, the French MoD officially launched the "Man-Machine-Teaming" preliminary advanced study programme (PEA MMT) for the development of artificial intelligence technologies for combat aircraft after 2025.

The PEA MMT was awarded in December 2017 to Dassault Aviation as the leading company for the air combat system and Thales as a co-contractor with regard to the man-machine interface and sensor and aims, among other things, to develop artificial intelligence technologies in the following areas: definition of an intelligent cockpit and HMI, introduction of a "virtual assistant", application of innovative technologies in the field of human/machine teaming within the cognitive air system, in particular with regard to decision autonomy and machine learning, and the development of technologies for smart/learning sensors in addition to maintenance and logistical support.

With a budget of €30M, around 30% of these funds will be earmarked for the creation of an ecosystem of some 200 French start-ups, SMEs and research centres specialising in artificial intelligence, robotics and human-machine interfaces. Dassault and Thales have already defined the research topics and will award R&D contracts for 12–18 months until about October, which will be repeated over the same period in 2019 as part of a three-year overall programme. It is expected that the PEA MMT will influence the successor of RAFALE to F4 standards and may be retrofitted for the fighter aircraft, in addition to new combat aviation programmes. ■



# “Our goal is clear: To protect our territories, people and forces.”



Photo: MoD Turkey

## Interview with Yunus Emre Karaosmanoğlu, Deputy Undersecretary of the Ministry of National Defense, Republic of Turkey

**ESD:** In many Western countries, the changed security situation in Europe has prompted governments to provide additional resources for defence and armaments. To what extent and in what way has this trend affected things in your country?

**Karaosmanoğlu:** We are located in a unique geographical region which is full of difficult challenges. These challenges are not only limited to various terrorist threats originating from Syria and Iraq but also include other challenges such as irregular mass migration, foreign terrorist fighters, drug trafficking and a great number of internally displaced people who are in need of humanitarian assistance.

I would like to stress the undisputable fact that these terrorist organisations, against which Turkey has been fighting for several decades, also pose a clear and significant threat to the security of many other countries in Europe.

As such and unlike any other European country, Turkey is a NATO ally that shares land and sea borders with the crisis regions. The Turkish Armed Forces are responsible for securing and controlling the borders in this volatile region which affects the security of Europe as well.

Against this backdrop, Turkey has been increasing funds devoted to defence and armaments in order to tackle the aforementioned challenges. In this regard, some taxes and levies have already been increased. Additional spending is planned to be allocated for major equipment systems, including modernisation and ammunition. The international security environment has

gone through important changes in recent years. Particularly since 2014, we have been facing unprecedented challenges from many directions. These challenges emerge in different forms and sometimes reach the level of risk or threat. Whether conventional, asymmetric or hybrid, these risks and threats need to be properly addressed. Our goal is clear: To protect our territories, people and forces.

Therefore, improved readiness and responsiveness, both at national level as well as in NATO, are key to overcome the current challenges. We are now working nationally and with our Allies to bolster our defences to deter potential aggressors and protect our people from the threats emanating from multiple sources and directions.

All these factors necessitate increased defence expenditure and sufficient capabilities. Back in 2014, Allied leaders committed themselves to the Defence Investment Pledge at NATO's Wales Summit, and work is now underway to fulfil the commitments.

In fact, the security environment around Turkey had already compelled us to take necessary measures at the national level. Instability and conflicts in Syria and Iraq have had direct implications for our security and prosperity, in the form of increased terrorist threat as well as more than 3.5 million refugees. In fact, Turkey is the Ally who has suffered most from the scourge of terrorism. In response, last year we successfully conducted the Operation Euphrates Shield (OES) against Daesh and cleared an area of over 2,000 square kilometres from Daesh terrorists. More than 2,600 terrorists were neutralised. Unfortunately, Daesh is not the only terrorist organisation along NATO's southeastern borders. PKK/PYD/YPG terrorist elements were also intensifying their attacks against Turkey. Therefore, in January 2018, Turkey launched Operation Olive Branch (OOB) against both PKK/PYD/YPG and Daesh in Syria in accordance with international law and our right to self-defence. With the liberation of Afrin city on 18 March

2018, a key phase was completed. As a consequence, another 2,000 square kilometres were cleared of these terrorists. Both operations created a 500-kilometre-long terror-free border line between Turkey and Syria.

Despite these national operational engagements, Turkey spares no effort to contribute to various NATO, UN, and EU operations and missions. In this regard, to name but a few, Turkey takes part in NATO's missions in Afghanistan and Kosovo (RSM and KFOR), maritime operations (NATO's Operation Sea Guardian and Counterpiracy Operation CTF-151), EU's operation in Bosnia and Herzegovina (Operation ALTHEA), and the UN's UNIFIL Mission in Lebanon.

Due to the unstable international and regional security environment briefly depicted above, Turkey had already increased its defence spending in recent years. Turkey allocated 1.46% and 1.56% of its GDP to defence expenditures, respectively in 2016 and 2017. In comparison to 2017, the 2018 Budget of the Ministry of National Defence increased at a rate of around 40%. Consequently, the expected share of defence expenditures in GDP for 2018 has risen to 1.77%. These figures reaffirm Turkey's determination to meet the 2% criterion by 2024. In the meantime, Turkey has already been well above the 20% threshold of spending in the major equipment systems at a ratio of 31.55% in 2018.

Turkey's determination to protect her people and territories remains firm. Thus, we will continue to invest more in our defences to accomplish this clearly stated goal.

**ESD:** What are the most important armament programmes in your country, both current and forthcoming?

**Karaosmanoğlu:** We attach great importance to the design, development and manufacture of indigenous defence systems. Through a strong defence industry, Turkey has embarked upon a number of projects and programmes. Here below are some examples:

- ATAK Helicopter Gunship,
- ALTAY Main Battle Tank,
- Heavy Lift Helicopter,
- MPT-76 indigenous modern infantry rifle,
- SAMUR mobile amphibious assault bridge,
- Multi-Purpose Amphibious Assault Ship (LHD),
- "İ" class Frigate,
- TF-2000 class Anti Air Warfare Destroyer,
- F-35 JSF,
- TFX Fighter Jet,
- A-400M,
- Stand-Off Munitions (SOM),
- ANKA MALE Class UAV,
- Tactical and mini UAVs.

**ESD:** Which of these are carried out in international partnerships, and who are your partners?

**Karaosmanoğlu:** We are cooperating with our Allies in many projects. To name just a few, on air and missile defence systems we are working with France and Italy. Discussions are underway with the US for the PATRIOT system. On the Multi-Purpose Amphibious Assault Ship Project cooperation continues with Spain. On the TFX Fighter Jet Project many important steps have been

taken with the UK. Furthermore, Turkey is taking part in multinational initiatives with our Allies, such as A400M and F-35 JSF projects as well. Hence our Allies are playing a key role in our capability development efforts. Taking this opportunity, I would like to express our gratitude to all Allies that are in close and effective cooperation with Turkey in supporting our capability development efforts.

**ESD:** In what way do you intend to consider the PESCO concept?

**Karaosmanoğlu:** Turkey's defence and security is directly linked to that of Europe. Our support to the EU's Common Security and Defence Policy from the very outset is an expression of this reality. Whether some EU members deny it or not, Turkey is an integral part of Europe's security and defence both by virtue of our geostrategic position and our advanced capabilities.

Turkey's efforts to combat terrorism, our efforts to prevent foreign terrorists, our role as a country that prevents the additional influx of migrants into Europe, and our flanking position in the face of the many challenges posed by state and non-state actors need no further explanation

of Turkey's critical role. Turkey's role in Europe, therefore, cannot be overstated. This reality needs to be recognised, including in the context of the EU's efforts to contribute to European security and defence.

The EU should engage Turkey as a non-EU NATO Ally in its security and defence-related efforts, including EDF and PESCO. So far, the EU's efforts have been carried forward in a largely closed manner that excludes non-EU Allies. Some of these initiatives are still at an early stage, but they must not become new barriers to us. An inclusive and transparent approach is needed. Pursuing such an approach would also be consistent with and underpin the large-scale defence cooperation projects underway between Turkey and several allies which are also EU-member countries.

We would like to see that the EU's efforts are carried forward in a complementary manner with NATO. The EU should avoid duplicating the efforts of NATO, which are essential for overall security and defence in the whole Euro-Atlantic region.

**The interview was conducted by  
Peter Boßdorf**



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# After India's Withdrawal: What is Happening with the Su-57?

**Georg Mader**

Alongside the US and China, only post-Soviet Russia has succeeded in developing a stealth-optimised fifth-generation fighter aircraft. However, the T-50 project launched in 2010 – now called Su-57 – has recently suffered a major setback.

For the time being, India is obviously withdrawing from the programme, including its billions of programme share. In ten years, India fears, the aircraft will not yet be technically mature and there will be too many unfinished subsystems, excessive costs for too few "Made in India" products and – in view of 12 missing squadrons – probably too low a sales volume. But Su-57 is far from being completed and the programme needs Indian resources to get there. The question now arises as to whether Russia will be able to carry out such a large programme on its own, both technologically and financially, and thus be prepared for significant series production, even if only at a frozen standard.

In April, the local Indian IHS Jane's correspondent R. Behdi wrote that India as a long-term programme partner will withdraw from the FGFA (Fifth Generation Fighter Aircraft) programme, as the National Security Advisor Ajit Doval and Defence Secretary Sanjay Mitra already communicated in February to a Russian delegation. After 11 years of cooperation, India, which has a development share of €330M, does not want to invest more money in the unfinished system, even if Russia provides another billion dollars. Russia has been refusing to share blueprints and source codes indispensable for the production in India. With these resources, India would be better off developing its own stealth jet AM-CA. This may be the case, but this is where the question has to be asked: By when? After all, Indian development or procurement processes can certainly be called 'Byzantine', and they may take decades. Here are just two examples: The recently

Photo: Sukhoi



*Fourth prototype of the Su-57*

launched LCA TEJAS Mk.1A whose carrier version was rejected as inadequate by the Indian Navy has been under development for about 30 years. The same holds true for the BAE HAWK: 22 years passed before the beginning of local production.

## Technically Unfeasible

Nevertheless, Indian sources claim that the production version of the 'supercruise' (supersonic without afterburner) engine AGGREGATE 30 had not made its maiden flight until last December, or that the three-part AESA radar located in the aircraft nose (X-band) and leading edge structures (L-band) is not expected before 2020. Over the years, India cut the number of jets ordered from 214 down to 127, as the IAF's repeated demand of a two-seater for complex missions was "more or less ignored by the Russians", an Indian Navy test pilot said. India does not need a PAK FA (Перспективный авиационный комплекс фронтовой авиации) nor the F-22 and F-35. What is worse, the radar

cross-section (RCS) or the degree of camouflage in the general design of the Su-57 no longer meets current requirements. New findings in the areas of materials, design, manufacturing techniques, tracking technologies and computing power are creating new solutions that must be constantly integrated, because otherwise the formerly intended effect would be greatly diminished, as history has shown for all weapons. In view of all this, it would be surprising if the Russians could manage the development on their own. Conceptually, the Indians had no say in the basic design anyway, since their 40 or 50 changes from T-50 to FGFA would have mostly affected subsystems, communication/data link, software or weapons. At least that was the state of knowledge at the end of 2016, when the press releases conveyed considerably more optimism. For example, Mikhail Pogosjan, the former head of Sukhoi and OAK, stated publicly that 800 aircraft would be a realistic production number for both countries plus exports. Meanwhile, there are also enough new reasons, such

## Author

**Georg Mader** is a defence correspondent and freelance aerospace journalist based in Vienna, Austria, and a regular contributor to ESD.

as concerns about the US Government's sanctions against Russian arms suppliers, which have convinced decision-makers at several levels.

## India's Loophole

In regard to the FGFA programme, India wants to keep a loophole, at least for the foreseeable future. In order to save both sides' faces, the Indian partner confirmed in its announcement that India would reconsider its withdrawal if the Russian industry could prove that it has overcome all technical difficulties and can deliver a ready-built 5th generation fighter in a reasonable time. India's ambassador in Moscow, Pankaj Saran, confirmed this statement in early June: "Discussions on the FGFA continue, which

With regard to the achievable RCS, it was rumoured early on in India that the Russian side – similar to the Chinese J-20, whose relatively rapid development is closely observed by India – prefers a low detectability to high-frequency radars (3 to 30 GHz) at the front.

The defence doctrine for own airspace or bases against air attackers – especially the F-22 with the BVR dual K-77/AIM-120D missile – considers the low detectability in front as a priority, because in this way – with calculated loss – the opponent is forced to the classical fight within sight. In this way, the German EUROFIGHTERS have already defeated the F-22. But the super manoeuvrability through thrust vector control, which the Russians always hold so dear, would then take effect, said IIL-Gromov's

The Indians obviously agree. A few years ago, the author was a keynote speaker at the Aero India Seminar in Bangalore, attended by HAL and the IAF. In the course of this seminar, he realised that the Indians much prefer a stealth approach that covers the entire plane, since the Indians want to carry out an offensive attack within defended enemy (mostly Chinese or Pakistani) airspace in order to destroy priority targets on the ground. At least at this point, there is a difference between the Indian and Russian basic orientation for the FGFA aircraft, which is already reflected in the plans. Among other things, this different orientation has led to the decision to withdraw.

## Made in India?

Another point of contention was the prevailing industrial philosophy "Made in India", proclaimed by the government of the Indian Prime Minister Modi. Under this dogma, it was the Indians' wish that the FGFA be produced as far as possible in India and partly assembled at HAL. But to implement the 40 to 50 national changes mentioned, it would have been necessary for Suchoj or OAK – that is, ultimately the Russian Government – to hand all drafts, CAD drawings and, above all, the software source codes of the flight control and mission systems to India.

For a long time this was not an issue, neither when India contributed around US\$300M to the launch of the programme, nor when the two sides agreed years later on an equivalent financing of around US\$3.7Bn for production readiness. These figures are, of course, given without procurement costs, which have been estimated at up to US\$30Bn for the 250 Russian and 144 Indian aircraft planned to date. In view of these amounts, the Indians were dissatisfied with Russian secrecy.

There was also no agreement on the use of Indian test pilots in flights, which was confirmed to the author by the Su-57 main programme test pilot Sergei Bogdan. Indian technicians also had no access to the 6th prototype damaged in an engine fire in 2014. And finally, the Russian partner has demanded up to US\$7Bn for the complete technology transfer, which was considered too much by the Indian side, taking into account all the difficulties and problems.

## An F-35 for India?

For decades, Russia was the main supplier of weapon systems for India's Air Force. The 272 Indian Su-30MKIs (220 delivered up to the present) may have even saved the Rus-



**First image of the SATURN (ИЗделие) 30 turbofan nozzle engine for the Su-57. According to the Indian authorities, the ИЗделие 30 integrated in the second prototype made its maiden flight last December.**

will help to better understand each other's priorities and plans for the future." And indeed, the Russian side has not officially commented on or confirmed the Indian withdrawal. Only some bloggers and forum users are happy to "finally get rid of the annoying Indians", but now that Su-57 has to make progress without Indian money, they also have no solution as to how to proceed.

## What Kind of Stealth?

Even before the contract for the joint development of the then PMF (Perspective Multirole Fighter) as a Stealth Fighter was signed in 2010 by HAL (Hindustan Aeronautics Ltd.) and Sukhoi, joint working groups discussed the design in great detail.

boss and hero test pilot P. Vlasov during a MiG-29M2 flight, and he continued: "This would empty the American's stealth purse quickly – and then he will die. Especially the F-35."

No wonder the Americans and British disagree on this point. Any Lockheed manager or F-35 test pilot will tell you how unlikely this result would be in view of the immense sensory overview of Western "network warriors". Something would have gone fundamentally wrong if you had been forced into a visual battle with Su-57s or J-20s. This question would require a separate article on eastern cyber warfare against western networks. But Western experts swear that it is impossible to compromise the air force's networks and that pilots are fully trained in this philosophy.



sian fighter industry in the 1990s. Today, it is obvious that India is buying its weapon systems increasingly in the US, as indicated by India's recent purchase of the C-17, P-8, AH-64 or C-130J. However, India's withdrawal from the FGFA programme does not automatically mean that the only alternative would be an Indian F-35 JSF. When it comes to combat aircraft, India's MoD and the IAF want full-scale modernisation and adaptation authority over the entire lifespan of the product, and this would mean getting access to the F-35's EW systems and their threat libraries. And this is where it all ends: The US Government or Lockheed Martin would never grant India access to the F-35's key IT systems, even if India were to pay US\$7Bn. In addition, India would have to share sensitive data with the US. Moreover, as already reported from Dubai with respect to the Emirates, the US military leadership would not allow F-35 technology to operate next to opponent (Russian) systems. As the two nations might fight each other in cases of conflict, they certainly will not exchange data packages. This is a similar situation to Turkey, which bought the Russian S-400 air defence system and then wanted to buy 100 American F-35s. So far only Israel is allowed to modify the architecture of the F-35I ("ADIR") to adapt, modify and fill its onboard systems nationally.

This is why the AMCA is once again in demand in India; the Advanced Medium Combat Aircraft is to become a stealth twin engine in the 20- to 25-tonne class. The design definition phase is completed, and a prototype will be exhibited at HAL in 2019, possibly with the help of Saab, since Ulf Nilsson is the head of their aviation division.

## Will Russia Carry on with the Project?

To avoid misunderstandings: PAK FA / T-50 or Su-57 is a remarkable design, with an RCS about 30 times smaller than a standard Su-27. Despite popular comparisons drawn between the RCS of the F-35 and that of a bird, it should be noted that these are only laboratory values from so-called anechoic chambers that have never been tested during a real operation.

Last December, the second prototype "No. 52" with the Cyrillic letters LL for "Letajushaya Laboratoriya" made a first flight with the promising SATURN engine *Изделие 30* ("Unit 30"). Compared to the AL-41F1 engine (resp. 117S) in the Su-35, the maximum thrust once again increased from 147 kN to its current 186 kN and will provide enough power for supercruising, in contrast to the Chinese J-20. It has fewer

mobile parts and a fully electronic FADEC control. Furthermore, Sergei Bogdan mentioned very innovative solutions, like the new modular avionics network *ИМА БК* with a code of four million lines, multi-core multiprocessors and fibre-optic capacities of 8 Gbps versus 100 Mbps of its predecessor BAGAT launched in 2004 and developed for the Su-35. Last year, an intelligent monitoring system was launched, which, like a 'living organism', is designed by the structure-connecting fibre-optic mycelium to govern neuronal dynamics and to react in real time to mechanical influences and changed statuses.

In light of such remarkable achievements, crude propaganda coups like the two Su-57 prototypes deployed to Syria for a few days in February are not really necessary. But perhaps the Indian withdrawal was already known at that time, and those videos in which one or two Kh-59 air-to-ground cruise missiles were "successfully launched against Islamists" were shown as a publicity stunt. But the weapons in the video were completely red, as is usual for new Russian ordnance, which rather indicates a first regular test within the two internal weapon bays. Some weapons associated with the Su-57 on posters and brochures have so far only been known as mock-ups exhibited at the Russian MAKES Air Show at the stand of Russian missile manufacturer TMC. As the author has observed, there has been a similar situation with the AESA fire control radar developed by Tikhomirov and its suppliers, which was exhibited at several MAKES shows. In general, as far as the high-tech sector of the Russian defence industry is concerned, grand designs do not always lead to big production. This also has to do with the availability of key parts and machines. For semiconductors, Russian industry is still dependent on microchips from Taiwan and South Korea, which are not always reliable.

The continuing weakness of modern manufacturing capacity for real mass production coincides with another crucial aspect: Over the next two years, Russia's defence budget will continue to decline as a percentage of GDP (RUB83Tr or €119Bn in 2017), due to slow economic growth and Western sanctions due to the Ukraine/Crimea crisis. The Duma Defence Committee estimates that security spending will fall by 0.1% of GDP to 2.7% in 2019 and by a further 0.1% to 2.5% in 2020. The defence budget for 2017 has been estimated at RUB2.84Tr. That would have been about 10% less than in 2016. Moreover, the military budget had already fallen slightly from RUB3.16Tr to RUB3.15Tr, after spending had steadily increased since the beginning of Vladimir Putin's era.

## No Unlimited Funds

Unlike China, Russia has limited funding opportunities for several simultaneous armaments programmes (submarines, battle tanks, nuclear weapons, space travel). The question therefore arises as to what priorities the Russian Air Force VKS sets and what proportion of the funding the project will receive. It is worth mentioning once again that the Su-57 was not designed to stay above enemy airspace for hours, as the Western air forces have done for years in mostly unprotected airspaces of developing nations. Even in a system like today's Russia, there are additional factors, such as the influence of important persons in the Russian power structure. As long as former Sukhoi boss Michajl Pogosyan was managing director of the OAK consortium, the Su-57 seemed to have absolute priority. ROSTEC managers may see things differently. At the beginning of the programme in 2010, it was said that the first 10 test aircraft would be available in 2012 and 150 aircraft would enter service in 2016.

At the end of 2014, there were only 55, and these were to be delivered from 2020. And in 2015, Deputy Defence Minister Yuri Borisov said that production planning would initially be reduced to 12 examples to buy more 4.5 generation Su-30SM, Su-34 and Su-35. In the same year, VKS Commander Viktor Bondarew said that production would start in 2017 after completion of all tests. In this context, we are now waiting for the integration and verification of the new 'Unit 30' engines. VKS acceptance tests will now begin in Aktyubinsk in 2019. Mr. Borisov confirmed in the spring that "Su-57 is part of the state armament programme 2018–2025. An exact number cannot be given today." This shows that the Su-57's obvious descent on Russia's priority list could also have influenced the Indians. The descent coincides with the advent of Russia's new hypersonic weapon recently praised by President Putin, ISKANDER's sibling Kh-47M2 KINZHAL which flew over Red Square attached to two MiG-31Ks on 9 May. It offers increased attack potential of up to 2,000 km without risking valuable aircraft. Although two of the nine existing Su-57 prototypes were also shown, stealth takes significantly lower priority in Russia, as the country has excellent Su-35, Su-30SM2/3 and soon MiG-35 aircraft immediately available in large numbers. When looking at these figures, the following can be predicted: If the remarkable Su-57 survives as a flagship project, it will barely reach the 300 units sold on the F-35 that Lockheed Martin recently announced as delivered. ■

# Military CBRN Decontamination

## Problems and Issues

**Dan Kaszeta**

The threat of use of chemical, biological, radiological, and/or nuclear (CBRN) weapons poses many tactical, strategic, and technical problems. By any realistic measure, one of the most serious aspects of CBRN defence is the prospect of short-term or long-term contamination of people, equipment of every size and shape, and terrain.

Indeed, given that technology allows for protection of military personnel from injuries due to chemical attack, on the modern battlefield it is the prospect of serious contamination that can sometimes pose a greater risk to military operations than immediate casualties. Contamination of ports and airfields can slow the deployment of military forces. Contamination of armoured vehicles and artillery pieces will force soldiers to operate in a protected posture, degrading their performance and increasing stress. Contamination of roads, bridges, and other key terrain features can reduce the mobility of military forces and constrain a commander's courses of action.

### Neutralising Contamination

Decontamination, which is the art and science of removing or neutralising contamination, is often the least glamorous aspect of the CBRN defence disciplines. It is also, from a products and technologies standpoint, a relatively static element of the market space, particularly compared to some of the more high-tech disciplines like computer modelling and detection/identification. This correspondent surveyed products, procurement programmes, and major manufacturers in the decontamination space for this journal in 2016. Radical changes and major breakthroughs have not occurred since that issue was published, so the overview provided in 2016 is still largely valid today. However, there are a number of vital technical and doctrinal issues in decontamination that anyone who is seriously interested in CBRN

Photo: Dan Kaszeta



**An Italian decontamination suite for military vehicle and personnel decontamination**

defence needs to understand, and this article attempts to highlight these areas of concern.

### Decontamination is a Burdensome Task

CBRN decontamination is a thoroughly unpleasant and intensive business that has tremendous operational and logistical impacts on military personnel and units. Decontamination operations, whether formal or improvised, impose a number of important burdens, which need to be understood by commanders and planners. The first burden is operational displacement. Soldiers, equipment, and units that are undergoing decontamination are out of the battle until they are decontaminated. The second burden is geography. Decon-

tamination needs to occur at some defined place on the map, preferably where it poses no threat to others, but close enough that it can be supplied by logistical channels and that contaminated platoons or companies do not need to travel far. The third burden is time; decontamination is time consuming. A single aircraft or tank may take hours to decontaminate, depending on the type and extent of contamination and the method of decontamination.

The fourth burden is labour. Decontamination of military vehicles can require a lot of personnel. Since the personnel conducting the decontamination operate while wearing protective clothing, they cannot work non-stop, particularly in warm climates. It can, therefore, take a large group of soldiers to decontaminate a company of tanks or mechanised infantry. Nor is decontamina-

### Author

**Dan Kaszeta** is Managing Director at Strongpoint Security Ltd. and a regular contributor to ESD.



tion the unskilled labour it might appear to be to outsiders. This poses the issue to militaries of who actually will do all of the required decontamination operations. Even at the height of the Cold War, few armies adequately staffed decontamination units, preferring to rely on mobilisation of reservists or conscripts. In many modern NATO armies, for example, there is an absolute deficit of decontamination force structure and, if, for example, the British Army had to decontaminate a tank battalion, there is some question as to where the forces to do it exist in the table of organisation.

The fifth burden is resources, both generic and specific. Decontamination needs equipment. It also needs raw materials, usually decontamination solutions and often lots of water. As a young CBRN officer in the US Army, I quickly learned that the greatest problem in planning decontamination operations in arid climates was supply of water. During the first Gulf War (Operation Desert Shield/Desert Storm) the water logistics behind decontamination planning were daunting, given the dry environment and lack of suitable local water supplies. Any kind of large-scale decontamination operation requires a complex supply chain to keep operating. These resources cost money. All five of

these burdens mean that military planning for decontamination is difficult. Although decontamination in a civil setting, after acts of terrorism, poses some interesting challenges as well, these 5 burdens are generally applicable as well. An important point to make here is that technology and new products may help address these burdens, none of them are problems that are amenable to easy technical solutions. For example, the finest decontamination equipment is great, but if there are no soldiers to operate it and the tanks that need to be decontaminated cannot be pulled out of battle, then the technology has not solved the problem. As well as, and perhaps because of, these five burdens, decontamination has competitors.

### **“Contamination Avoidance” is a Valid CBRN Discipline**

The colossal difficulties posed by large decontamination operations have long been understood by military staffs. It is not surprising that an entire strain of military thought that roughly says “if decontamination is such an operational pain, then we need to do whatever we can to avoid having to do it” has evolved. This is the CBRN defence discipline called “Contamination Avoidance.”

Some militaries place great reliance on Contamination Avoidance in order to have to place less emphasis on post-attack decontamination, in particular the British Army. Contamination Avoidance can basically be described as a collection of measures and technologies to improve situational awareness so that military forces avoid becoming contaminated in the first place. Detection and identification instruments detect the presence of hazards. Reconnaissance vehicles and teams conduct surveys to identify areas affected by contamination. Modelling, whether by manual or computerised means, predicts the extent of hazard areas. Warning and reporting systems spread this information throughout deployed forces, so that everyone knows which areas should be avoided. However, even if everything works properly, the best contamination avoidance measures will only reduce, not eliminate, the need for decontamination. Contamination Avoidance is, in many ways, cheaper than decontamination. But it cannot and should not be a substitute for the adequate provision of equipment and personnel decontamination.

Incidentally, from a market and products perspective, Contamination Avoidance causes an interesting internal conflict

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Photo: US Air Force

**A US airman processes through a decontamination area while two other airmen wash contaminants off his level-A hazmat suit during hazmat decontamination training. All three airmen are with the 380th Expeditionary Civil Engineer Squadron Readiness and Emergency Management Flight. The flight performs chemical, biological, radiological, and nuclear (CBRN) detection and decontamination operations.**

within the CBRN industry. One segment of the industry is devoted to making sure that you do not need so much of another segment. Because detection and identification is an area where much new innovation has occurred and the products are more interesting and dramatic, it is possible that decontamination producers have lost out a bit to companies who sell Contamination Avoidance solutions. My own direct experience is that this is more theoretical than actual. However, it does explain a lack of integration in the industry.

## Is it Needed?

A different philosophy to Contamination Avoidance bears no discrete name, but can be summed up as “we are not going to let contamination stop us from fighting the war.” Advances in both individual and collective protection systems mean that modern fighting forces can prevent injury and death and continue to operate for increasingly longer periods of time in contaminated environments. Furthermore, many CBRN threats go away over time anyway. Some radioactive isotopes are short-lived. Some chemicals are non-persistent. Most biological pathogens do not survive lengthy exposure to direct sunlight. This intellectual approach also has the great tactical value of negating much of the alleged offensive value of persistent chemical weapons, thus possibly reducing their likelihood of use. This is the “well, why should we bother with chemical weapons because they aren’t going to stop the enemy from attacking or make them retreat; they’ll still fight us hard so we might as well use weapons that destroy tanks and not just make them dirty” approach, and it is a valid one. Although one of the alleged axioms of military decontamination is to decontaminate as soon as possible, there is a great deal of

credibility to a “fight through it, continue the battle, and some of the problem will go away on its own” approach. Obviously, the details are scenario-specific. However, companies seeking to develop solutions and sell products in this sector need to understand the mindsets they might encounter. In effect, decontamination competes with individual and protective collection technology for expenditure of scarce budgetary resources.

## Generic Alternatives

An inherent feature of the CBRN decontamination market is that expensive decontamination equipment and specialty decontamination chemicals have always

competed with generic alternatives. Many types of decontamination chemicals are commercially available, but few of them are cheap. Some are prohibitively expensive, if a country were to want to use them for extensive operations and maintain a viable stockpile.

For all the sophistication of the CBRN threat, one fundamental truth continues to surface through all kinds of trials and testing. For the large majority of threats, soapy water is actually not a bad way to decontaminate things, whether it be exposed skin or the side of a tank. Decontamination is about both removal and neutralisation. Soapy water, or even in absence of soap, just water, actually is not a bad decontaminating agent. For example, all of the nerve agents react with water. Anthrax spores, once they are wet, do not pose wide area respiratory hazards. Radioactive fallout is generally dust, and it reacts just as non-radioactive dust – it washes off.

Manufacturers of specialty decontamination equipment and specialised detergents and solutions have a much harder burden than makers of detection equipment or medical countermeasures. The generic equivalent to a nerve agent detector doesn’t really exist. The alternative to a protective mask is no protective mask. But the alternative to a bucket of specialty chemicals that might cost €100 could be a bucket of free water and 50 cents of soap. However, there is no bucket of specialty chemicals that a manufacturer can sell to a military that is 200 times more effective

Photo: Courtesy of Cristanini spa



**The SX 34 sensitive equipment decontamination kit, produced by Cristanini (Italy). It is one of the rare products on the market for dealing with contaminated electronic systems.**



than a bucket of water and some soap. It might be twice as effective in some circumstances, and 20% more effective in others. It might ease the logistical burdens and require less water. But it still costs 200 times the generic alternative. This is a conundrum for both militaries and industry.

### Sensitive Item Decontamination

One area where products and technologies can make a clear impact is the decontamination of sensitive and fragile items. The warm soapy water that may be fully adequate for the exterior of a tank is not going to be very pleasant for sensitive avionics, communications equipment, or computers. Neutralising or removing contaminants from expensive and highly useful pieces of equipment in a non-destructive manner is one of the few areas in CBRN decontamination that is moving forward at a reasonable pace. While this article is not a survey of manufacturers, this is an area where companies like Cristanini (Italy) and Steris (USA) are doing interesting work, particularly with decontamination processes that fumigate contaminated items and areas, or use specialty sorbents that are not harmful to electronics. While effective products and technologies are available here, they are not by any means cheap. For sensitive item decontamination to become a full component in military CBRN defence operations, it will need to become more economical.

### Wide Area Decontamination: Buildings and Terrain

The vast majority of decontamination doctrine, technology, and equipment involve cleansing things that are moveable, like tanks or people or aircraft. Buildings and land are not moveable. Persistent chemical agents or radiological particulates could be used to contaminate key terrain, like road junctions, bridges, ports, or runways. Likewise, buildings can be contaminated and rendered unfit for occupation. Cold war-era Soviet chemical warfare doctrine called for long-range systems such as SCUD missiles to use persistent agents to contaminate ports and airfields that the USA was likely to use to reinforce continental Europe, as well as contaminate large stockpiles of vehicles stored by the US Army for use in wartime scenarios. Contamination of runways with persistent agents like VX or so-called NOVICHOKs could place a runway out of service longer than attacks with conventional weapons.

Decontamination on a large scale is still widely treated as too hard to contemplate. In military CBRN training, it is often given only token consideration in publications and training. It is rarely exercised. While notional processes and procedures tend to exist in manuals, they call for amounts of time, labour, and materials that are stunning in their magnitude. If CBRN warfare threats are to be taken seriously, this gap in capability needs to be addressed. This is an area where industry, if sufficiently motivated by government requirements, could really do some interesting work if adequate resources were committed to it. Products and technologies are largely absent in this area. Furthermore, non-technical resources,

such a labour, are likely to be needed to conduct wide area decontamination, and countries serious about this as a requirement need to look into how to provide the necessary resources.

### Conclusions

It is clear that decontamination poses many complex issues, both in practical operational and logistical terms and in terms of technology. The CBRN segment of the defence industry has long sought to provide technology and products to solve the problems of CBRN defence. However, some of the intractable issues of decontamination are only mitigated, not solved, by current technologies. ■

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# Poland's Defence Industry Base

**Eugene Kogan**

**The country's defence sector is currently in a process of rapid structural change, facing major challenges from increased competition. Like other industrial sectors, the defence industry is required to deliver increased efficiency in order to provide value for money.**

In January 2017, it was reported that the Polish Armaments Group (known under its Polish acronym PGZ Group), which is under the authority of the MoND, would change its status. It was planned to change the management structure and procurement mechanisms. Not all of Poland's de-

panies are the WB Group based in Ozarów Mazowiecki, followed by Gdynia Shipyard Remontowa Shipbuilding. Decisions on what to do remain unclear. Even though a new Strategic Defence Review (SDR) was completed by the government in May 2017, a revised version has

2017, exports account for 15% of the Polish defence industry's turnover, with the Middle Eastern and developing countries being the main export hubs. In 2017 the PGZ achieved sales worth PLN798M (US\$228M). This was a 40% increase over 2016 sales worth about PLN560M (about US\$150M). Compared with the neighbouring Czech Republic, which in 2016 achieved sales worth CZK20Bn (or about US\$910M), Polish arms exports are not just too low but also lagging behind. Thus, something substantial needs to be done in order for the PGZ Group to achieve better results. The PGZ's Code, which is to be discussed later, may help the group to become better integrated, better coordinated and perhaps more successful on global markets. Whether or not the whole process of further integration, coordination and, as a result, achieving success on the arms market can be accomplished remains to be seen.

## PGZ Group as the Country's National Champion

PGZ consists of 60 companies with 17,500 employees and has three major shareholders: the MoND with 37.13%, PHD with 33.51% and ARP with 29.36%. PGZ President Jakub Skiba said on 20 May 2018 that "Huta Stalowa Wola (HSW) [in particular] is probably the best facility among PGZ Group's subsidiaries. All contracts assigned to this entity are being executed in a proper manner." Skiba's statement is supported by the HSW revenue achieved in 2017, which exceeded PLN500M (or about US\$140M) out of a total PLN798M. HSW informs that in 2018 planned consolidated revenues are expected to amount to PLN1Bn.

In addition to the 60 companies under its umbrella, PGZ took control of the Polish Naval Shipyard Company (Stocznia Marynarki Wojennej, SMW) headquartered in Gdynia on 20 December 2017. The SMW was bankrupt at the time and PGZ had to overhaul the shipyard's finances and restructure the company. According to an e-mail to the author from PGZ's Communication and Marketing Department, PGZ is currently in the process of restructuring the SMW. No further information on the issue was provided as of 2 July 2018. In spite of the Naval Shipyard's financial losses, Cezary Cierzan, the PGZ representative said at the Maritime Security Forum in January 2018 that: "No plans ex-



Photo: Kubson

**PGZ Group, headquartered in Radom, is Poland's largest defence company.**

fence industry is state-owned; there are also several large, privately owned defence companies or subsidiaries of foreign companies. The largest private defence compa-

not yet led to a restructuring of the defence industry. What is evident, however, is that the defence industry cannot expect to continue receiving state subsidies indefinitely. State support has made the industry less efficient; sluggish arms export results are a sign that the defence industry has become inward-looking and lost some of its competitive edge. According to a report prepared by the Polish Strategic Defence Intelligence (SDI) and published in March

## Author

**Eugene Kogan** is a defence and security expert based in Tbilisi, Georgia.



ist to radically lay-off shipyard employees. Nevertheless, certain personnel adjustments will be made." Cierzan did not elaborate any further on the company's human resources. The idea of uniting the Polish defence industry under one roof seems to have been abandoned. The management structure of the PGZ Group is therefore still subject to considerable changes. In November 2017, for example, PGZ introduced the so-called PGZ Code, which lays down the rules for cooperation between the group's companies. According to the code, the companies of the group are to complement each other in order to avoid internal competition and may involve external companies in potential tenders in order to make the customer a more attractive and cost-effective offer. If carried out correctly, the code can be a step towards consolidating the Polish defence industry within the PGZ Group, as the new rules can be an effective means of integrating the defence sector in Poland. The division of labour between the individual companies to create competences that complement each other in a system is the key to success. Otherwise, billions of Polish zloty to be spent on modernisation would not bring technological progress in the in-

dustry. A harmonised approach is also important in cooperation between PGZ and external partners from the EU and the US. The PGZ's code puts down several measures to enhance cooperation within the group: Seven domain bureaus are to be created within PGZ which are to coordinate the implementation of the major programmes in the areas assigned. For instance, Land Performs Directorate is to coordinate the MBT, IFV and APC programmes, as well as programmes concerning the vehicles for the special operations component. According to an e-mail to the author from PGZ's Communication and Marketing Department, in addition to the Land Performs Directorate, directorates for Naval Platforms, Aviation Platforms, Firearms and Ammo, Ground Based Air-Defence and Missile Defence and Barrel and Rocket Artillery are currently under construction. There are also directorates that are working on interdisciplinary projects such as C4ISR systems, EW, cyber security and R&D projects. The directorates will also distribute competencies among the companies and plan the further development of capabilities offered within the respective domain. The aim is to develop focused and purpose-oriented

companies within the group. The code would also introduce a coherent communications and exports strategy to promote the group on export markets and increase PGZ's share group in those markets. In the future, PGZ intends to present its offers uniformly within a coordinated and realistic strategy. It should also be noted that the agreements concluded between the PGZ Group and the individual companies should make it possible to define the rules for cooperation, as there is no holding law/regulation in Poland.

The Polish defence sector, although formally consolidated, needs more integration and cooperation. The gradual introduction of the PGZ Code is the opportunity to achieve integration. At the same time, if the country's defence spending successfully increases in the coming years, the defence industry would have to produce military products for the country's armed forces. To take advantage of this unique opportunity, the consolidation of the defence industry must be completed and PGZ must become a successful defence company. In addition to PGZ's WB Group and other companies listed below, the following companies are also part of the defence sector.

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**Engineers of WB Group, Poland's largest private company in the defence sector, observing the first military exercise with the company's WARMATE system on 31 May 2018.**

### WB Group – a Success Story of the Polish Private Sector

The private WB Group was founded in 1997 and currently employs 800 people. Of crucial importance for PGZ is the fact that WB Group has created a branch known to all customers and manufacturers of defence systems, which everyone knows is a brand from Poland. The Polish Development Fund (PFR) paid PLN128M in November 2017 for the acquisition of 24% of WB Group's shares, demonstrating confidence in the UAV technologies developed by the company and the possible opening of the domestic market for the company for further UAV orders.

Piotr Wojciechowski, President of WB Group's Management Board, said in September 2017 that "We at the WB Group deal with development of comprehensive UAV systems, creating operational concepts and concepts for conducting joint operations with other systems: command, reconnaissance, artillery or fire-mission systems. Within that scope the user is trained, and we gather knowledge provided by the customers, on the requirements that need to be met to enhance our systems [performance] and make them more universal. Our UAVs have been used in combat during the last 15 years. In Poland, we remain the sole exporter and manufacturer of UAV systems. We are also the sole Polish manufacturer of

unmanned systems, which have been and are accompanying the Polish forces during foreign deployments. Based on experience gathered during those missions and by our foreign customers, we know that these systems performed greatly in armed conflicts." In November 2017, the MoND signed a breakthrough agreement with WB Group to purchase 1,000 WARMATE UAVs manufactured by the company. Designed by the Military Institute of Armament Technology under the aegis of the MoND, WARMATE might be equipped with warheads manufactured by the PGZ subsidiary Belma; the cooperation could open up an area of collaboration between the WB Group and the PGZ Group.

Wojciechowski further clarified company relations with the PGZ Group by saying that: "We are a part of numerous consortia, enjoying equal rights with befriended entities of the PGZ Group. We are supporting our colleagues from PGZ companies with all of our expertise, to the best of our abilities. Our colleagues working at PGZ are working with us, within the scope of the process of the implementation of challenging and technically complex military projects. Cooperation in areas where joint effort takes place is very good, at all levels." In addition to its success on the domestic market, WB Group has also expanded its presence to Malaysia and the USA; its subsidiary WBE Technologies Sdn Bhd is based in Kuala Lumpur, Malaysia, and focuses on warranty services, spare parts supply and logistical support for WB Group programmes in Southeast Asia. On 18 April 2018, WB Group represented by WBE Technologies



**The Armour Factory Bumar-Łabędy (ZMBL), a subsidiary of PGZ Group, is cooperating with Rheinmetall to modernise Poland's fleet of LEOPARD II MBTs.**



Sdn Bhd officially signed the offset contract for technology transfer (ToT) with the Malaysian MoD and the Malaysian DRB-Hicom Deftech Sdn Bhd.

WB America was founded in January 2018 with the aim of marketing and distributing WB Group products in North and South America; the new company will offer a wide range of products in the areas of special electronics, communication systems and UAVs. One of Fonet's products has already been integrated into the US Army Stryker and Joint Light Tactical Vehicles

building, said in February 2018: "For many years the Remontowa Shipbuilding facility has been carrying out complex work. It not only provides jobs for its own staff, as the shipyard also creates jobs for more than 2,000 employees of its cooperation partners. Although Remontowa Shipbuilding is a private company, it maintains close cooperation with state industrial plants and research centres. This was proven by the construction of the KORMORAN II MCMV. When the first Polish minehunter was built, Remontowa Shipbuilding worked closely

commitment in Poland. Leonardo produces AW149 helicopters at its Polish subsidiary PZL Swidnik, while Lockheed Martin's Polish subsidiary PZL Mielec produces the S-70i export version of the BLACK HAWK helicopter. However, the additional workload for the subsidiaries depends on the international tenders in Poland and other countries.

Secondly, Rheinmetall Defence Polska is a subsidiary of Rheinmetall Landsysteme GmbH. The company was founded in Poland in August 2016. The company is a partner of the local defence industry and supports the Polish armed forces in technical and logistical support and in the development of logistics concepts with a focus on the modernisation programme for the Polish LEOPARD 2 MBT fleet. Rheinmetall Defence Polska is also the Polish hub for all Rheinmetall Defence companies and acts as a central contact point for the Polish government, the military and Polish companies.

Rheinmetall Defence Polska is represented at two locations: A liaison office was set up in Warsaw to be close to the authorities, and in order to optimally support Zakłady Mechaniczne Bumar-Labedy (ZMBL, member of the PGZ Group) in the modernisation of Polish LEOPARD 2 MBTs and to offer services around the LEOPARD 2, a second location was established in Gliwice.

The further consolidation of PGZ Group and the expansion of WB Group beyond Poland underline the current trend in the Polish defence industry. To be on safe ground, both the development of the armed forces' domestic procurement contracts and the expansion of foreign exports should go hand in hand. The export portfolio of the PGZ Group is still too small for such a large state-owned company. The future looks promising, but in the real world competition for market share is becoming tougher and ToT is a must. Whether PGZ Group is prepared to do this remains to be seen. WB Group has expanded its activities beyond Poland. Regarding the company's financial results, the author did not receive a response from the WB Group, although he had contacted the Group's Communications and Advertising Department. The cooperation between PGZ and WB Group and Remontowa Shipbuilding should be continued, as it leads to positive results and all parties involved benefit from the cooperation. The role of foreign subsidiaries in Poland is rather limited, but it gives foreign companies an advantage in the country and thus plays an important role in Poland's arms procurement and modernisation programmes for the next decade. ■

## Forcepol

(sb) **Forcepol sp. z o.o.** is a trading company headquartered in Warsaw, Poland, and with offices in Brno in the Czech Republic. Their mission is to deliver products for both defence and civil industries, according to specific requirements in Poland, the Czech Republic and throughout Europe.

Deliveries are mainly to the Armed Forces (Armies, Air Forces and Navies) of the region, with specific, highly-specialised demands from paramilitary and Special Forces, and also first Responder and Police forces, and other pro-security and pro-defence organisations, being met, reliably and regularly.

Within the complex and highly competitive Polish market Forcepol also represents a number of US, European and other companies: "Our reputation and highly ethical and effective support for both our industrial as well as our political and military customers ensure a strong, sustainable level of success for everyone involved" says Agnieszka Ułasiuk, CEO.

Forcepol generally works with acclaimed, established, world-class companies and organisations that operate around the world: the company cooperates with the defence and security industries, as well as with universities, laboratories and research centres.

New products are continually being introduced into their portfolio and the list of their suppliers and partners is both extensive and growing in order to provide access to specific products individually requested by their clients.

"Together with our clients and partners, we develop, refine, and deliver best-performing products and systems to meet the most exacting requirements with the highest level of precision and complete satisfaction", said Ułasiuk. "We are focussed on reliable and well-established business partners who share our totally ethical and professional approach to business cooperation."

A cross-selection of Forcepol partners includes: PROTOTYPA-ZM (Czech Republic), EDH Doppler (South Africa), Fireco (Italy), Scandinavian Avionics Group (Denmark), IKEY (USA), NSI (Germany), Vital Seating & Systems (UK), Coastal Environmental Systems (USA), NISSENS (Denmark), Avalex (USA), Scanfiber Composites (Denmark), VarTech Systems (USA), among many others.

(JLTVs). For the years 2016-17, no financial data were provided to the author.

In addition to the WB Group, the Polish shipyard Remontowa Shipbuilding, a subsidiary of Remontowa Holding Capital Group must be mentioned.

A contract for the delivery of two more modern minehunters was signed in Warsaw on 27 December, 2017. The new KORMORAN II MCMVs will be built by a consortium led by Remontowa Shipbuilding. The other two companies in the consortium are the Centre for Maritime Technology (CTM, also known as OBR CTM) and PGZ SMW, both based in Gdynia.

Bartłomiej Pomierski, Vice President of the Board of Directors of Remontowa Ship-

building, said in February 2018: "For many years the Remontowa Shipbuilding facility has been carrying out complex work. It not only provides jobs for its own staff, as the shipyard also creates jobs for more than 2,000 employees of its cooperation partners. Although Remontowa Shipbuilding is a private company, it maintains close cooperation with state industrial plants and research centres. This was proven by the construction of the KORMORAN II MCMV. When the first Polish minehunter was built, Remontowa Shipbuilding worked closely

## Foreign Subsidiaries

On the one hand, Leonardo's Augusta Westland and Lockheed Martin acquired local subsidiaries, making them the only foreign companies to establish a long-term

# ASCOD and PANDUR – Vienna Calling!

Jürgen Hensel

At the end of May 2018, General Dynamics European Land Systems (GDELS) invited a group of journalists to their GDELS-Steyr facilities in Vienna, Austria, to draw attention to a number of new developments to be presented first at this year's Eurosatory exhibition and with a focus on the new ASCOD IFV and MMBT (Medium Main Battle Tank) variants.

Thomas Kauffmann, GDELS' VP International Business and Services, was the first presenter with a briefing on the General Dynamics Group's portfolio and capabilities as well as GDELS' particular approach to industrial cooperation on export markets.

## Portfolio and Offset Strategy

With 98,600 employees and ten business units in four operating groups, GD generates a turnover of US\$31Bn (2017). Of that, the business unit European Land Systems (GDELS) has a share of US\$6Bn with 2,200 people and customers in 44 countries around the globe. In accordance with the group's decentralised company strategy GDELS has manufacturing facilities in Austria, the Czech Republic, Denmark, Germany, Romania, Spain (European HQ) and Switzerland. In essence, the company's capability portfolio comprises ground combat platforms (including light tactical vehicles), wheeled armoured vehicles, tracked vehicles, bridging systems, artillery systems and ammunition, and integrated logistic support (ILS). In the case of IFVs and APCs, the design philosophy centres on a common base platform – mainly the lower vehicle hull – for a variety of different vehicle variants.

In response to increasing offset and compensation requirements in the scope of export programmes, the company has developed an offset strategy for the involvement of local industries that is supported by four main pillars:

1. Direct participation in the programme as a partner, subcontractor or supplier;

2. "Membership" of GD's global supply chain;
3. New business development through technology partnerships between local SMEs and GD
4. GD's global leverage to obtain business from other industry partners in the country.

## ASCOD

José M. Lineros, GDELS' Vice President Engineering, briefed the group on the two combat vehicle variants to be presented first at Eurosatory, namely the ASCOD IFV and MMBT. Both versions are based on the common platform principle and designed with an open architecture to provide the optimal combination

With the latest development status implemented, the vehicle can handle slopes up to 60%, slide slopes (tilt) of 40%, can cross ditches and trenches up to 2.5 metres, ford in waters up to 1.5 metres deep and step-climb obstacles of up to 1.1 metres in height. Based on advanced suspension and driveline technology, the vehicle platform features reduced weight, noise, vibration and roll/swing characteristics and provides for optimum shoot-on-the-move capabilities due to improved vehicle stability. The vehicle's APC version can be airlifted with A400M, C-17 (2) or IL-76 respectively (turbo options to be confirmed).

A special contribution to crew survivability is made with the vehicle's floating floor, which has replaced the conventional footrests. The modular design of the vehicle allows for interchangeable mine protection and add-on armour, turret solutions range from 25 to 120mm calibres with an additional anti-tank guided missile as an option.

The IFV variant presented in Vienna was equipped with the UT30 MK2 unmanned turret from Elbit and the ATK MK 44 ABM 30mm gun. The turret, a downgraded version of the 120mm MERKAVA MK 4 turret, was subject to a separate briefing by Maimon Ifergan, Elbit's VP International Land Programs, who also used the opportunity to draw attention to the IRON VISION head-mounted display that provides 360° situational awareness even if used in a closed-hatched armoured vehicle. The turret, a co-development with the Israeli Defence Forces (IDF), allows for the integration of an ATGW – as currently is the plan with SPIKE in Croatia with tests ongoing in Spain – and can be upgraded to carry a 40mm gun.

The MMBT (Medium Main Battle Tank) version on display is based on the proven ASCOD running gear and was equipped with a HITFACT 120mm turret from Leonardo (formerly Oto Melara), which



of tactical mobility, manoeuvrability and fightability. Lineros emphasised that the two new vehicle variants were the result of consistent development efforts and investments in a common vehicle platform that was first implemented with the two early ASCOD (Austrian-Spanish Cooperative Development) variants, namely PIZARRO in Spain and ULAN in Austria, followed by the DONAR SP artillery system and the repair/recovery versions through to the British AJAX variants.



was also subject to a separate presentation by Alessandro Tognetti, Leonardo's Capture and Development Manager. Both vehicles were also the subjects of dynamic displays at the company's outdoor area.

### PANDUR 6x6 EVO (Evolution)

In the scope of an ongoing procurement effort, GDELS has been tasked to deliver 34 PANDUR vehicles in APC configuration (Austrian designation: MTPz - Mannschaftstransportpanzer) to the Austrian Army. The vehicle which – according to Florian Bernhard, GDELS-Steyr's Deputy Head of Engineering – has been designed "with tracked vehicle experience", features a 8.9 L Cummins engine with 6-speed ZFECOMAT automatic transmission, a power pack that is also in use with the 8x8 version of the vehicle. In response to a requirement from the Austrian military, the vehicle has a C-130 roll-on, roll-off (RoRo) capability and can accommodate up to 11 personnel. Deliveries are to commence in September, with 5 vehicles to be delivered in 2018, 21 in 2019 and the remaining 8 in 2020. Some 190 Austrian subcontractors and suppliers are participating in the programme. The con-



**ASCOD MMBT (left) and the new ASCOD IFV with the UT30MK2 turret on display at the outdoor area of GDELS-Steyr in Vienna, Austria**

tract with the Austrian MoD includes an option for a follow-on order to be exercised by the end of 2019.

### Perspectives

Obviously, the decision to invest money in the development of the ASCOD MMBT is based on the assumption that the changed European security environment with a new priority alignment on territorial defence will stimulate the international market for armoured combat vehicles. As such, the idea of offering a lighter-than-usual main battle tank (gross vehicle weight 42 t) will certainly find its way into the consideration of all those whose budgets do not allow for the acquisition of a latest-generation main

battle tank (heavy) fleet, particularly in such countries where defence procurement is also seen as a measure to strengthen the local defence industrial base.

The ASCOD IFV, on the other hand, is a contender in the scope of the BMP-2 replacement programme in the Czech Republic and thus facing competition with BAE Systems' CV90, PSM's PUMA, Rheinmetall's LYNX and possibly others. While all serious contenders will probably be in a position to offer vehicle designs that can respond to the requirements from a technical point of view, the level of industrialisation that can be offered as part of the respective proposals may become a decisive factor. In this context, GDELS' offset strategy as described above is certainly worth noting. ■

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# “We have been a supplier to the Bundeswehr and international customers for more than 60 years.”

After a change of name in October 2017, the Bremerhaven-based pyrotechnics company that was formerly known as Chemring and Drew Defense is today called WesCom Signal & Rescue Germany GmbH. ESD spoke with the company's Managing Director, Jan-Dirk Hellwege.



Photos: WesCom

**ESD:** What were the reasons for the name change? Who owns the company?

**Hellwege:** The name change had become obligatory for legal reasons. Our former parent company Drew Marine was sold. The new owner insisted on retaining the exclusive rights to the name, so there was no alternative to changing the name. The name WesCom is to be a reminiscence to our core brands Pains Wessex and Comet. WesCom Signal & Rescue Germany is still owned by The Jordan Company, L.P. in the United States.

**ESD:** What are the core capabilities of the company? Where are your markets?

**Hellwege:** WesCom develops, builds and sells pyrotechnics. In the area of civilian py-

rotechnic sea rescue means for professional shipping applications, WesCom is the world market leader with its brands Comet and Pains Wessex. Our defence business comprises the segments of Signal & Illumination, Training & Simulation, as well as portable minefield breaching devices. In essence, the Signal & Illumination segment includes sophisticated parachute signal cartridges as well as handheld signals in the white light and IR spectrum, several signal cartridges of different calibres, and ground signal devices.



*Smoke signature of the ManPADS M 176 simulator. The right-hand picture shows (left) the product and (right) the WESS*



The Training & Simulation segment is made up by both pyrotechnic products for the realistic presentation of weapon and battlefield effects, as well as electronic launchers for the secure handling of these devices in military training operations.

The mine breaching segment is characterised by ergonomic and low-weight applications for the quick engagement of mines, obstacles and IEDs. For both our civilian and military products we rely on an above-average level of automated production. This provides for comprehensive production safety, a high quality level and increased competitiveness. The technical expertise necessary for automation in an explosive-processing environment is maintained and preserved internally. For more than 60 years we have been supplying the Bundeswehr, several NATO states and international customers from Bremerhaven.

**ESD:** What is the ratio between your military and civilian business? What are your current programmes in the defence arena? What share of your total turnover is generated by exports?



**Applications of the Portable Explosive Minefield Breaching System (PEMBS) include the neutralisation of anti-personnel mines, IEDs and man-made obstacles.**

**Hellwege:** In FY2017 we generated around 20% of our sales in the defence business. This year, FY2018, we have noticed increasing interest in mine breaching systems, battlefield illumination and pyrotechnic simulation of ground-to-air missiles. We are currently developing tailor-made solutions for these programmes in particular. We make more than 90% of our turnover in export.

**ESD:** From our point of view there are two products that require special attention:

namely, the Portable Explosive Minefield Breaching System (PEMBS) and the ManPADS simulator. What is it that customers of these two products take particular advantage of?

**Hellwege:** Despite frequent condemnation the mine threat is still present. Besides, the neutralisation of IEDs is an imminent requirement. As a means that can be deployed quickly the PEMBS offers a sustainable response. In pilot training, the reaction to threats imposed by man-portable air defence systems (ManPADS) has again gained in importance. The pyrotechnic ManPADS M 176 simulator presents an extremely realistic signature of such a missile at launch. In addition, it has the advantage that it has a total self-consumption effect, which also contributes to the attractiveness of this training tool.

**The questions were asked by Jürgen Hensel.**

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# European Training Equipment Conference 2018

Readiness, Cyber and Training were the main topics at ITEC 2018.

**William Carter**

The 2018 European International Training Equipment Conference and Exhibition (ITEC) was held at the Messe Stuttgart Exhibition Centre, conveniently located on the north side of Stuttgart airport. Before the main exhibition opened, there was the usual day of presentations by members of the international Simulation Interoperability Standards Organisation, the so-called "SISO day". Subjects included NATO Standardisation of Modelling and Simulation by

out-of-the-box thinking is required, he said, particularly in the cyber area. He also mentioned an increase in the use of drones, for which more training is required to control, deter and counter them.

Rear Admiral Simon Williams of Clarion Defence recalled that ITEC started in 1990, the year that Saddam Hussein invaded Kuwait. Since then there has been constant change in the training world and the challenge is how to keep ahead.

and Instrumentation (STRI), headquartered in Orlando, Florida. His theme was "Readiness 2025", an integral part of the US "Force 25" concept, and the head of the US Army, General Mark Milley, had recently stated that "Readiness is our Number One priority". On Live, Virtual and Constructive (LVC) training, General Cole said that in exercises, we need to link the L, V and C domains. As well as Virtual simulation, the Constructive element is most valuable for battle staffs



*ITEC 2018 was held in Stuttgart, Germany.*

Agatino Mursia of Leonardo, Distributed Information Systems (DIS) by Patrice Leydour of Thales, Cross-domain Security by Wing Commander Colin Palmer and Squadron Leader Rebecca Collis of the Royal Air Force, and the latest version of the Real-time Platform Reference Federation Object Model (RPR FOM V3) by Bjorn Möller of Pitch Technologies. Other subjects included Medical Simulation, Metadata and Open Standards, M&S as a Service (MSaaS), and Urban Combat Training. These are significant subjects, and it was disappointing that there were only about 60 attendees – perhaps in future years the SISO event could be integrated more closely with the main conference so that more people have the opportunity to attend.

## Keynote Addresses

Introducing the keynote addresses on 15 May, conference chair Udo Keuter of Airbus Defence emphasised the theme of "Readiness". With current and future threats,

Defence capability, he said, is the sum of manpower, equipment and training. Looking at manpower, he used figures from World Mapper to show that world population in most regions is due to rise steadily, particularly in the Middle and Far East, but that of Russia is forecast to fall, with important implications for the future balance of power. High-tech warfare uses modern weapons and includes the cyber domain, he said, but we must also consider the use of "crude" weapons by insurgents. We therefore need to train for both the high- and low-tech areas. Strategy, he suggested, should take into account both intelligence and force which he characterised as "David and Goliath", and we need to allow for Artificial Intelligence (AI) and the so-called "Super Intelligent" systems of the future. The world is changing, and we must change with it, he concluded.

The next address was from US Army Brigadier General William Cole, Principal Executive Officer (PEO) for Simulation, Training

and commanders, and we still do "quite a bit" of live training. He quoted French General Foch as saying in 1917 that "it takes about 15,000 casualties to train a major general," but General Cole was pleased to be able to say that, today, these "casualties" are now in computer exercises. As an example of current training, at Fort Riley the "Big Red One" Division with some 4,500 soldiers, has one battalion in field training, another in simulators and another in constructive training. The significant point is that the colonel, who is coordinating the results, often cannot tell the difference between which of the LVC elements is being used. The L, V and C elements originally were different areas of operation, but we have now integrated them, he said. Larger LVC exercises take place up to army level, although some work is needed to standardise the interfaces between the three elements. In some exercises, Automated Forces (AF) are inserted, where a few operatives control thousands of automated personnel and vehicles in the exercise. He also pointed out that vehicle and



troop movements are recorded during exercises, plus the audio within each vehicle. At the moment these data are not kept – but in the future they should be, he said, to be able to show long-term trends. Turning to Cyber training, he mentioned the Persistent Cyber Training Environment (PCTE); this is a closed system, because live cyber training risks exposure of classified techniques and data.

On medical training, he mentioned the new Defence Health Agency (DHA) for which PEO STRI is the coordinator on behalf of the DoD. Training manikins are becoming more realistic, with simulated blood, body movements, sounds and even simulated death, and the so-called "Star Wars" training facility at Fort Polk now includes medical manikins as well as other training devices. A recent development is the Warrior Injury Assessment Manikin (WIAM), a specially-instrumented dummy for training in injuries from blast or mines.

Turning to multinational training, he mentioned standards for laser-based systems within NATO. Because many European nations have different laser coding systems compared to the US, so called "bilingual" laser systems have been developed and are being used in increasing numbers, for instance at the US Army European training complex at Grafenwoehr, NE of Nuremberg. Another recent example of a multinational exercise was in April at Fort Bragg, North Carolina, where the British Army participated in battle command exercises. This shows that pre-planned variable levels of security can be used, in which, he said "we are better but not perfect", and the key words are "pre-planned" for different security levels for multinational exercises. Finally, although there is an enormous number of Procurement Regulations, there is also an Other Transaction Authority (OTA) system for quick action for new and prototype systems.

The final keynoter was Jürgen Michel, head of international sales at Rheinmetall Defence Electronics (RDE), headquartered in Bremen. Training needs to be available where units are located rather than just on ranges, he said, and training for the overall mission should be recognised as more important than training for individual weapons. For mission training, modern systems such as Artificial Intelligence (AI) and "Big Data" should be used, and he noted that Commercial Off-The-Shelf (COTS) systems reduced both procurement time and cost. With threats varying from individual terrorists, through insurgency to full conflict, the future is unpredictable, he said, and Training and Simulation systems need to be designed to be flexible so that they can keep up with changes. Looking at the variety of training



Photos: Ian Carter

**Keynote address by US Army Brigadier General William Cole, Principal Executive Officer (PEO) for Simulation, Training and Instrumentation (STRI)**

systems, we need simple tablet-based systems for individual training, right up to high-fidelity systems with built-in Augmented and Virtual Reality (AR/VR). In training the young, we have to realise that they don't like reading manuals, he said, but they often have good knowledge of computing and IT systems, and future training systems should take this into account.

## Conference Presentations

In several conference rooms next to the exhibition there was a good programme of presentations. Subjects included, in alphabetical order, Blockchain Technology, the Cloud, Cyber Training, Disruptive Technologies, Distributed systems, Low-cost Simulation, Management of Training, Medical Training, Modelling & Simulation as-a-Service (MSaaS), Multi-domain Training, and Threat Simulation. This was in addition to the presentations mentioned earlier on SISO day. Presenters came from 14 countries, including the following from outside Europe: Australia, Canada, Ghana, Pakistan, and the USA.

## The Exhibition

The exhibition occupied about two-thirds of Halle 9, the number of halls illustrating the enormous size of the Stuttgart Airport Exhibition Centre. 93 companies were listed as exhibiting, led by the USA with 23, followed by the UK (19), Germany (17), France (10), Canada and Italy with 4 each, Sweden and Switzerland with 3, then 7 other countries. Overall attendance was about 2,500, similar to last year in Rotterdam, and people came from about 40 different countries.

Displays at the exhibition booths showed that simulator visuals continue to improve in fidelity and in real-world effects such as weapon, weather and special effects,

night imagery and so forth. Displays varied from domes, screens of various shapes, flat displays large and small, to Head Mounted systems in which the visual scene can be seen wherever you look. Some of the smaller simulator motion systems were on show, but the large hexapods used in Full Flight Simulators are too big and expensive to bring for just a few days.

## Summary and Conclusions

The exhibition gave a good feel for progress in modelling, simulation and training. The presentations covered a large range of activity from the general to the highly specialised, and that by US Army Brigadier General Cole was particularly significant because of the crucial role of his STRI organisation in US and NATO simulation and training.

The Stuttgart venue is very convenient, because the exhibition centre is on the north side of the airport. There are hotels at the airport and more in Echterdingen, one stop on the S-bahn towards the centre of Stuttgart and a half-hour walk to the Conference Centre. ITEC has also been to Amsterdam, Brussels, Cologne, Lausanne, Lille, London, Prague, Rome, Rotterdam and Stockholm. All have good exhibition facilities, but they are some distance from the airport, and some need a double journey, first to the city and then to the Exhibition Centre. The ITEC exhibition is small compared to the equivalent US event, in both numbers of attendees and company booths. In the US, numbers increased significantly once I/ITSEC stabilised its location in 1996 at the Orange County Exhibition Centre in Orlando, Florida, at which it will be from 26-29 November 2018. Looking to next year, ITEC is in Sweden from 14-16 May at the Stockholmsmässan at Älvsjö on the south side of Stockholm, last visited by ITEC in 2008. ■

# “Proven reliability and durability”

Photos: Geroh



**As a specialist in mobile telescopic masts, the German company GEROH has been an exhibitor at several MSPO exhibitions. To mark this year's MSPO in Kielce, Poland, ESD had the opportunity to speak to GEROH's new Managing Director Markus Kopp.**

**ESD:** How long have you been in your current position as Geroh's Managing Director? What is your personal background? Are you a shareholder of the company?

**Kopp:** My adventure started in July 2018 and I have known the company and some of the employees for many years. I am proud to be a member of this great team. GEROH is part of the WILLBURT group, the world's premier manufacturer of mobile telescopic mast and tower solutions and pan and tilt positioners. Before I started to work with GEROH, I was the General Manager of ECCO SAFETY GROUP GERMANY (ESG) located in Ulm. ESG produces beacons, light bars and backup alarms for vehicle-based applications.

**ESD:** What is GEROH's portfolio of capabilities? In which areas do you consider the company to be a market leader?

**Kopp:** We are specialised in mast systems and trailer solutions mainly for military applications and we constantly increase our market share in the commercial market. After 72 years, more than 40,000 GEROH masts and hundreds of special purpose trailers are in use all over the world – partly under extreme environmental conditions. GEROH MIL-STD masts with proven reliability and durability offer highest precision even under difficult wind conditions and payload capacities for heavy antennas, radars or optical systems with weights up to 300 kg and more, which clearly is the main criterion for a MIL-STD mast. Our most recent development is a spindle mast with a nested height of only 0.8 m which extends to a height of 3.3 m. The combination of precision, payload capacity and long service life makes a GEROH

mast such a great product. Our experienced and highly skilled design team customises our solutions to any specific requirement. In addition to that WILLBURT, ITS and MAD products allows us to always offer the perfect mast for any application, having the best price-performance ratio. The latest innovation in the 100-year history of the WILLBURT company is the patented Remote Locking System for pneumatic masts. It significantly increases the safety of the mast operator and is unique in the world. We can clearly say the WILLBURT group is the market leader in mobile telescopic masts.

**ESD:** How much of GEROH's business is generated from military programmes? What are your best practice references with the Bundeswehr and other forces?



**Geroh's brand new patented Remote Locking System for Pneumatic Masts allows safe operation from a distance.**

**Kopp:** Traditionally the majority of our business is done in the scope of military programmes, as we offer highest precision and longest possible lifetimes and a great



**The 4.5 m Spindle Mast is a fully integrated solution including an auto-stow and cable management.**

service and maintenance concept, COTS or if needed tailored to our customers' requirements. An excellent example is our first spindle mast series which has been in use in Thailand since the early '90s. We are also very proud to be a long-standing partner of Bundeswehr with projects like the FENNEK or the RMB system based on the FUCHS APC or YAK and many more.

**ESD:** We understand that GEROH is going to exhibit at this year's MSPO in Kielce. Is this the first time that you participate in this exhibition? What are the highlights of your exhibit?

**Kopp:** Together with our partner SUNDOOR we have been an exhibitor at MSPO for many years. On our joint stand we will present our bestsellers for commercial and military applications, i.e. the crank mast series KVR and a high precision spindle mast SPM as well as WILLBURT's lightweight carbon fibre composite STILETTO mast. SUNDOOR and GEROH have had a relationship for more than 20 years.

**The interview was conducted by Jürgen Hensel**



## Introducing New Capabilities on a Combat-Proven Fighter

(df) Aero, the biggest Czech aircraft manufacturer, and Israeli Aerospace Industries (IAI) introduced their cost-effective, combat proven fighter attack aircraft at Farnborough. The F/A-259 STRIKER is a multirole aircraft for close air support, counter-insurgency operations and border patrolling with interception capabilities. "The F/A-259 STRIKER combines the robustness and effectiveness of its successful predecessor, the L-159 ALCA, with the latest advances in avionics and aircraft systems technology," the companies announced. "Powered by the same 'best in its class' Honeywell F124 engine and using benefits of a wet wing, F/A-259 STRIKER provides superior performance, great manoeuvrability, and a high range." "The F/A-259 is able to operate from unpaved runways and has seven hard points for any combination of fuel, weapons, or mission



Photo: IAI

equipment, allowing smart weapons integration and standoff weapon capabilities. As an optional upgrade, the F/A-259 can be equipped by EASA radar and helmet mounted display. Another optional upgrade is air-to-air refuelling, increasing the aircraft's range and endurance," said Benjamin Cohen, General Manager of IAI's Lahav Division. "With advanced 4th generation avionics the F/A-259 STRIKER has an open architecture concept, allowing future updates based on customers' requirements and use of Real Time Data Link, supporting a high situational awareness capability. The advanced digital cockpit is equipped with two large multifunctional displays, electronic flight instrument system, and other features." Giuseppe Gioro, President and CEO of Aero, added: "Nowadays, national air forces are looking for a solution how to fulfill a great variety of missions in an affordable way, while keeping high survivability of the aircraft and its crew. Aero and IAI are introducing a multirole fighter, F/A-259 STRIKER, with a wide range of combat capabilities that meet those needs of air forces."

## New Team for NATO BMD Command and Control

(df) Lockheed Martin and ThalesRaytheonSystems are joining forces to provide NATO with a territorial Ballistic Missile Defence



Photo: US Navy

(BMD) command and control capability. This teaming agreement, signed in the presence of Raytheon and Thales, establishes a transatlantic team that combines the decades of expertise from Lockheed Martin and Raytheon with Thales' European air command and control capabilities. ThalesRaytheonSystems will be prime contractor and system integrator for the defence solution, which will combine operational experience and components coming from different partners. Lockheed Martin developed the ballistic missile defence planning capability through its Defence Design System. Additionally, both Lockheed Martin and Raytheon bring in expertise and experience as prime contractors for the United States' ballistic missile defence capability. The focus of the programme is the upgrade, test and integration of NATO's command and control (C2) systems and underlying communication network to enable effective information exchanges between various NATO and national missile defence systems. With the ever-increasing threat of proliferation of ballistic missile technology and weapons of mass destruction, NATO is redoubling its effort to deal with this threat and to protect European populations and territories, which, according to Western leaders, is a key element of NATO's collective defence. This integrated system-of-systems architecture will provide NATO forces with the capability to defend NATO territories.

## Safran Wins THIS Contract

(cl) The Defense Material Organization (DMO) of the Netherlands awarded Safran Vectronix AG, a subsidiary of Safran Electronics & Defense providing state-of-the-art optronic equipment, systems and sensors, a contract to deliver more than 1,000 units of the next-generation MOSKITO TI thermal imaging and targeting systems in the frame of the Thermal Handheld Imag-



Photo: Safran Vectronix AG

ing System (THIS) programme. MOSKITO TI is a lightweight combination of several high performance sensors and modules including uncooled thermal imager, high grade direct view optics (DVO), Low Light TV (LLTV) channel, a laser rangefinder (LRF), a digital magnetic compass (DMC) and a GPS receiver. These features can be used for day and night observation, target acquisition, artillery and fire correction, forward observer and Joint Tactical Air Controller. MOSKITO TI can work in all-weather environments. The delivered systems will be used by the Dutch Armed and Special Forces.

## MBDA's New Facility in Bolton

(df) MBDA's new high-tech manufacturing facility in Bolton has been officially opened by Gavin Williamson MP, UK Secretary of State for Defence. The new facility houses some 670 design, engineering and manufacturing employees and is to be used for the production of inert missile equipment and systems. An opening ceremony conducted by the Secretary of State marked



Photo: MBDA

the completion of five years of development and £50M of investment by MBDA. The new Bolton site is where a number of key missiles are being produced for the UK Armed Forces, delivering operational sovereignty and freedom of action to the UK. These systems include BRIMSTONE, ASRAAM, CAMM (SEA CEPTOR and LAND CEPTOR), SPEAR, and METEOR, for which final assembly for all six European partner nations is carried out at MBDA Bolton. The site will also play a key role in exports, underpinning the UK Government's Prosper-

ity Agenda. "This £50M factory supports 700 jobs in Bolton, showing how central a strong British defence industry is to our national prosperity," said Williamson at the ceremony. "MBDA's investment has created more than 100 new jobs, and this has been supported by a £400M contract from the Government, helping to create a further 100 roles within the company. You can't have prosperity without security. MBDA in Bolton is keeping Britain safe while creating highly-skilled jobs and opportunities, demonstrating our commitment to the people of Bolton and the North West."

## Raytheon Wins Laser Development Contract

(df) Raytheon has won a US\$10M US Army High Energy Laser Tactical Vehicle Demonstration (HEL TVD) programme contract. Within this contract the company will develop a 100kW class laser weapon system preliminary design, for integration onboard the family of medium tactical vehicles (FMTV). Upon HEL TVD Program Option Two completion, one supplier will be awarded a system development and demonstration contract by the Army to build and integrate a weapon system on the FMTV. A system, development and demonstration contract decision, valued at nearly \$130M, is expected in early 2019.

"The beauty of this system is that it's self-contained," said Roy Azevedo, Vice President of Intelligence, Reconnaissance and Surveillance Systems at Raytheon's Space and Airborne Systems business unit. "Multi-spectral targetting sensors, fibre-combined lasers, power and thermal sub-systems are incorporated in a single package. This system is being designed to knock out rockets, artillery or mortar fire, or small drones."

## Camcopter Successfully Demonstrated to the Belgian Navy

(df) Schiebel successfully demonstrated the search and rescue as well as maritime surveillance capabilities of the CAMCOPTER S-100 Unmanned Air System (UAS) from June 21 to July 1, 2018 to the Belgian Navy. "The trials with the S-100 have been very

successful and have taught us a lot about the possibilities of such systems and sensors; the ability to operate in Belgian's confined airspace; opportunities for the domain of coastal security; and prospects for further developments," said the officer in charge of the Belgian Navy's Maritime Tactical UAS (MTUAS) Project Team, LtCdr D. Biermans. "Given the complexity of introducing a MTUAS within the Navy and its impact on the concepts of operation and tactics, this was a first informative step and will be part of a series of tests and experiments with a variety of vehicles and sensors. "These flights were the first S-100 customer demonstrations with the recently integrated PT-8 OCEANWATCH payload. This wide-area maritime search capability offers a powerful naval patrol capacity and thus solves the challenge of searching for small objects over vast areas. The employed combination of two payloads proved to be an ideal solution for the tested scenarios.

"With its small footprint, exceptional capability and state-of-the-art payloads, the CAMCOPTER S-100 is the perfect platform for maritime and land-based SAR missions," said Hans Georg Schiebel, Chairman of the Schiebel Group.

## Fire Support for Danish Army's New Artillery Systems

(df) Systematic has been contracted by the Danish Defence Acquisition and Logistics Organisation (DALO) to deliver a new fire

observer and passed to the gun crew via a joint fires cell or similar element – to be digitally transferred into an artillery fire-control system (FCS), where the ballistic calculations are made. Even though it has a high level of automation there will always be operator verification before the mission is carried out, the company said. "The threat posed by counter-battery fire on the modern battlefield necessitates the ability for artillery systems to 'shoot-and-scoot' while maintaining accurate targetting," explained Hans Jørgen Bohlbro, Systematic's Vice President, Defence Product Management, "One of the benefits of the new function is the ability for artillery systems to quickly conduct fire missions and redeploy before they can be engaged by enemy fire."

## SANDCAT With Mission Management System

(ck) Israeli companies Plasan and BIRD Aerosystems have teamed up to offer a SANDCAT armoured vehicle equipped with a mission management system. The special intervention vehicle was displayed for the first time at Eurosatory 2018. The protected SANDCAT, Plasan's family of 4x4 armoured vehicles, offers flexibility and robustness

Photo: US Army



Photo: Plasan



while maintaining manoeuvrability and agility, even when equipped with surveillance and communications systems. The SANDCAT has been designed to support various missions including law enforcement, Special Forces, homeland security, border patrol and armed conflict. SANDCATs are also used to transport troops or as command posts. More than 600 vehicles have been sold worldwide. Equipped with BIRD Aerosystems' MSIS, the SANDCAT armoured vehicle can participate and lead task force ground missions while communicating in real time with the other task force segments, whether aircraft, helicopters, or ground sensors. BIRD's Multi-Sensor Integration System (MSIS) manages the mission profile and ensures that all operating teams share a unified, real-time situational awareness. The MSIS is part of BIRD's Airborne Surveillance, Intelligence and Observation (ASIO) solution. The system allows collecting and processing of large amounts of

Photo: Schiebel





information gathered from airborne platforms and automatically classifying and efficiently displaying them. The information is then shared in real-time with the ground segments of the Task Force such as the C2 centre and ground intervention vehicles, and enables all operating teams to share a unified situational awareness picture.

### Damen and SAAB to Cooperate on Brazilian Corvette

(ck) In order to meet the needs of the Brazilian Navy, Damen Schelde Naval Shipbuilding and Saab will cooperate to deliver the project that will supply four TAMANDARÉ class corvettes. The companies are world-leading references in the development of naval solutions: Damen will be responsible for supplying the SIGMA 10514, a proven platform that will be adapted to meet the demands of the client. SAAB will provide its 9LV combat management system, used by navies from several countries; the system is known for its flexibility and easy integration of third-party modules. In addition to supplying the corvettes, SAAB and Damen are proposing a technology transfer programme for much of the project, which will benefit Brazil's national defence industry.

### Cooperation in MKS 180 Tender

(ck) thyssenkrupp Marine Systems und German Naval Yards Kiel have entered into a cooperation agreement for the further bidding process in the MKS 180 multi-role combat ship procurement project for the German Navy. German Naval Yards Kiel is participating in the MKS 180 award procedure as a general contractor: if German Naval Yards were to win the contract thyssenkrupp Marine Systems would perform a substantial share of the required development and engineering work as a subcontractor. The German defence procurement agency BAAINBw will be sending the bidders in the MKS 180 award procedure a precise specification for the vessels and request a best and final offer (BAFO). On this basis thyssenkrupp Marine

Systems and German Naval Yards Kiel will cooperate to submit their BAFO. A final decision in the award procedure is not expected before 2019.

### Thailand Procures IRIS-T Missiles

(ck) Diehl Defence has signed a contract for the supply of short range air-to-air IRIS-T (Infra-Red Imaging System - Tail/Thrust Vector Controlled) missiles to Thailand. As early as 2011, the Royal Thai Air Force opted for the European short-range missile to arm

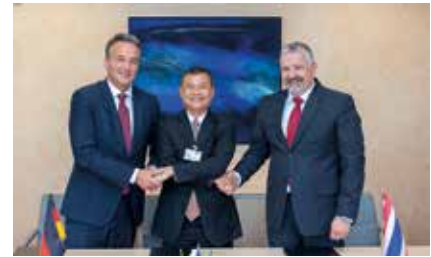


Photo: Diehl

their GRIPEN and later also their F-16 fighter aircraft. In addition, integration of the missile into the F-5 fleet is planned as part



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of the new procurement, so that IRIS-T will now also become the standard weapon in the Thai Air Force. IRIS-T is one of the world's most modern short-range air-to-air missiles. In addition to defeating enemy fighter aircraft, a self defence capability against attacking air-to-air or ground-to-air missiles is provided by IRIS-T. Even attacks from behind can be successfully fended off by the pilot with IRIS-T, without having to change the course of the aircraft. IRIS-T was developed and procured by Germany, Greece, Italy, Norway, Spain, and Sweden as the successor to ageing SIDEWINDER missiles. Series production began in 2005 and other user countries include Austria, Saudi Arabia, South Africa and Thailand. As a multi-purpose weapon, IRIS-T is also used as a surface-to-air missile in a ground-based air defense role.

## New CEO for IAI

(ck) Israel Aerospace Industries (IAI) has named Brigadier General (Res.) Nimrod Sheffer, IAI's VP of Strategy and R&D,

Photo: IAI



as IAI's new CEO. Sheffer will replace Joseph Weiss, who is stepping down on reaching retirement age. The nomination is now pending the approval of the State Com-

panies Authority and the Defence and Finance ministers. This is the first time that IAI has named a CEO who is not an IAI alumnus. Sheffer joined IAI recently from the highest ranks of military command; he retired from the Israel Defense Forces (IDF) two years ago. In his most recent role, he headed the planning division of the IDF's General Staff where he was responsible for drafting and executing the IDF's work plan, including the shaping of long term strategic processes and managing the army's resources. Among others, Sheffer has led the talks with the Israeli government on the defence budget, the IDF's streamlining processes, renewal and technological development projects and the external relations of the military. In his previous roles, Sheffer served as deputy commander of Israel's air force and headed an aerial division. Combat pilot by training, Sheffer holds a degree in geophysics from Tel Aviv University and a master's degree in Public Administration and Policy from Harvard University.

## Designed To Survive: Peli Launches Video Competition

(ck) Peli, a manufacturer of protective cases, has announced a video contest. Under the hashtag #DesignedToSurvive the company is looking for creative fans who want to show what their Peli Case can do. The company's marketing message reads: "We want fun, we want atypical, we want your best adventures in a video!" Professionals and amateurs are invited to send videos that show the challenges their Peli cases face. The best video will receive a prize of €1.000,- in Peli Products, the second prize is €750,- and the third prize is €500,- at Peli Products. Peli's video competition is open to submissions from Europe, the Middle East and Africa. Applicants are asked to shoot a video story of a Peli case in action and then upload the video to Instagram using the hashtag #DesignedToSurvive. The competition runs from 20 August to 20 September 2018 and the winning videos will be selected by an internal Peli jury and announced on Peli Facebook and Instagram by the end of September. Detailed information on the competition rules, the award ceremony and the evaluation procedure can be found at [www.peli.com/blog](http://www.peli.com/blog)



## Cybersecurity Training

(cl) In cooperation with the Carlos III University of Madrid, Minsait, Indra's digital transformation business unit, will provide personalised training programmes on its CYBER RANGE platform due to growing demand for cyber experts to protect advanced societies against cyber attacks. The platform has been designed to support individual and group training in techniques related to cyberdefence, cyber attacks and forensic analysis. The system will adapt to each student in an autonomous way and in real time. Instructor intervention is no longer needed, which minimises the required resources. The adversary's action, as defender as well as attacker, will be automated by the system, reacting to

the student's responses. The system is also able to evaluate the student's performance and provide aid proactively. In addition, it will have tools to automatically compose new exercises based on a catalogue of prior knowledge and the professional's personalised needs. As a consequence, it will be able to meet the specific needs of organisations and companies by taking into account the desired level of training, the type of organisation and the area of attack, without losing the practical aspect of mass training. Minsait offers security guarantees to protect classified content; it has a private cloud equipped with technical security measures. The platform has been tested by more than 1,000 cybersecurity professionals from fifty countries.

Photo: Indra



## Kongsberg to Acquire Rolls-Royce Commercial Marine

(cl) Kongsberg Gruppen ASA (Kongsberg), a company operating in automation, navigation and control systems, has signed an agreement worth GBP500M with Rolls-Royce to acquire the latter's Commercial Marine division, a technology business within maritime operations, providing pro-



pellers, propulsion systems, handling systems and ship design. Kongsberg thus takes over the marine products, systems and after-market services businesses supplied by Rolls-Royce's subsidiaries but not Bergen Engines nor Rolls-Royce's Naval Business. Thanks to the complementarity of the two firms this acquisition enables Kongsberg to improve its market position in the global maritime industry and especially enables the company to provide solutions for the industry's key drivers: technologisation and digitalisation. Even though the activity level of the Commercial Marine has seen some reductions, this fusion will strengthen the global position of Kongsberg as Rolls-Royce is represented in 34 countries. The companies, jointly, have equipment and deliveries associated with around 30,000 vessels. After clearance by regulatory authorities, the acquisition process is expected to be completed in the first quarter of 2019. The final purchase price depends on Commercial Marine's cash, debt and working capital at the time of completion of the transaction.

### MBDA and Milrem Robotics to Develop Anti-Tank Unmanned Ground Vehicle

(cl) The European missile systems designer and producer MBDA and the Estonian unmanned vehicles manufacturer Milrem Robotics decided to cooperate to develop the first unmanned ground vehicle (UGV), designed for anti-tank purposes. The new product will be a combination of MBDA's Integrated MMP Precision Attack Combat Turret (IMPACT) system and Milrem Robotics' TheMis unmanned ground vehicle. MMP is an anti-tank guided land combat missile, but may also be used against personnel and infrastructure. It has been developed for mounted and dismounted applications. As a "fire-and-forget" missile, it has a 4km+ range that reaches further than the enemy's

counter fire, and two firing modes: lock on before launch (LOBL) and lock on after launch (LOAL). MMP has a dual mode seeker (uncooled infrared and visible colour channels) and fibre-optic data link which minimises collateral damage. With its remote operation, it can be adapted to the UGV. It also provides an Intelligence, Surveillance, Target Acquisition & Reconnaissance (ISTAR) capability and, through direct integration with a C4I network delivers battlefield intelligence. IMPACT is a 250kg motorised turret carrying the day/night sensors of the MMP fire control, additionally to two read-to-fire missiles and a 7.62 mm self-protection machine gun and its ammunition. The commands are displayed in the vehicle cab to keep the crew out of danger. MMP will be combined with TheMis UGV, a fully modular diesel-electric UGV. It has a top speed of 22km/h and can carry a payload of 750kg. TheMis can be operated line of sight, via cameras and equipped with an autonomy kit even operates autonomously. The UGV aims to exchange humans whose heat signature can easily be detected for robots on the battlefield in order to assure soldier's safety.

### Peli Products Announces its Expansion in Turkey

(cl) Peli Products, a design and manufacturing company of high performance protective cases and advanced portable lighting systems, continues its expansion since its foundation in Barcelona in 1997 and opens new offices in Ankara. Since then, the enterprise has expanded in the European, Middle East & African (EMEA) region and is represented in 140 countries. Additionally to the increase of the production in Europe, Peli Products now strengthens its presence in Turkey which was built up since 2011. The central position in Ankara will enable the firm to establish new relationships to local customers and thereby facilitate the company's adapta-

tion to the Turkish customer's preferences and future business opportunities in Turkey. Peli Products operate on markets including fire fighters, police, defence, aerospace, entertainment, industrial and consumer.

### Terma and MASS to Deliver EWLS Solution

(cl) Terma and MASS will cooperate to provide a global Electronic Warfare Lifecycle Support (EWLS) solution which will be able to support any fleet. The two partners complement each other's capabilities: Terma Group is a Danish Aerospace, Defence & Security Group providing control and integration of any combination of sensors and countermeasure systems. MASS, a Cohort plc company, employs experts in Electronic Warfare data

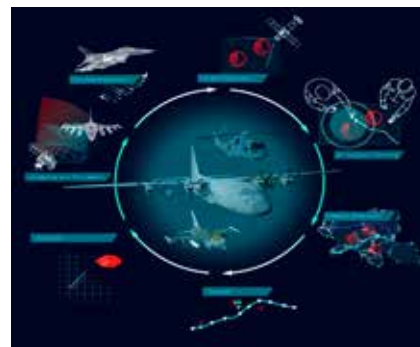


Photo: Terma Group

management. The company is experienced in threat vulnerability analysis and countermeasure development. The service of the future EWLS solution will comprise countermeasure development, mission data generation and flight data replay and debrief. It will also offer control and exploitation of proprietary Electronic Warfare data and information as well as expert advice and consultancy that supports the development, maintenance and full exploitation of EW equipment capability. Moreover, the EWLS solution shall be cost-effective and shall minimise the time taken in providing support.

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## TERRIFFIC Project to Counter CBRNe Incidents

(cl) To fight the increasing threat of radiological dispersal devices (RDD) combining radioactive components and conventional explosives, the TERRIFFIC project is a cooperation of ten European organisations which will develop Tools for early and Effective Reconnaissance in cbRne (Chemical, Biological Radiological or Nuclear explosives) Incidents providing First responders Faster Information and enabling better management of the Control



Photo: TERRIFFIC

zone (TERRIFFIC). The ten partners, especially SMEs and practitioners, are ARKTIS Radiation Detectors, NEXTER Robotics, AERACCESS, Bruhn NewTech, ARTTIC, ISEMI, TL & Associates, LIST, CEA and

ECL. R&D partners can supply leading edge technologies and SMEs already operating in military or first responder markets develop key innovative components. TERRIFFIC is a research and innovation project funded under the European Commission's Horizon 2020 programme. The research is based on results from prior European projects in this sector. It focuses on enhancing the effectiveness of first responders during the first hours of radiological or nuclear explosive events, but also treats the applicability on incidents with chemical and biological weapons, in order to minimise response times, health and safety risks for the response teams and human intervention in general by employing automated processes, mobile detection capabilities and technologies like detectors, algorithms, drones, robots, dispersion models, information management software and decision support systems. For example, mixed reality technology will provide continuously updated information during operations to first responders. Furthermore, the developed components will be standardised. Like this, they are adaptable to existing and future solutions.

## Thales and Microsoft Develop Defence Cloud

(cl) To accompany the digitalisation of armed forces, Thales and Microsoft announce to cooperate in the development of a common Defence Cloud solution for modern armed forces. This new cloud will be based on the Microsoft Azure Stack platform which will be cyber-secured by Thales by integrating its end-to-end cybersecurity and encryption solutions. The two companies combine their knowledge in IT and cybersecurity to meet the demand of armed forces to keep classified data inside their own infrastructures, but to use the capacities of clouds to store and communicate data. The combination of Microsoft's Azure Stack and Guavus Reflex analytics platform will enable soldiers to analyse big amount of data in real time, to use military Internet-of-things (IoT) applications or exchange data with mobile applications. This cloud will be useable in national command centres and individual theatres of operations; the interoperability will be reinforced. To ensure its operability even in remote locations and theatres of operations, each integrated system will have a level of autonomy and be capable of working without connection.

# Preview

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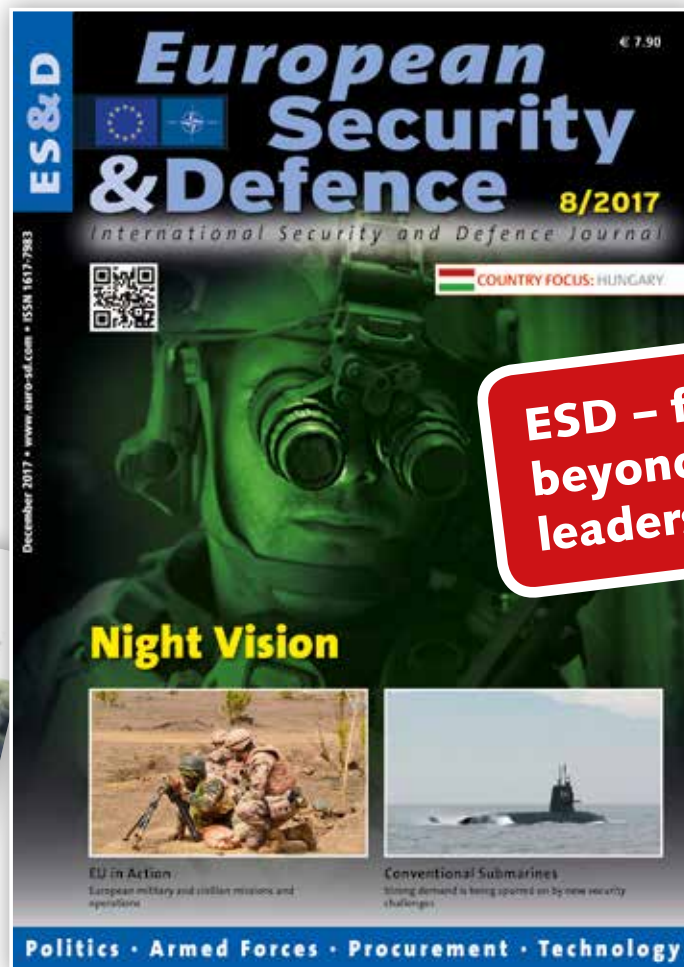
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