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WITH THE NEW AMERICAN PRESIDENT COME GREAT CHALLENGES

The entire civilised world, with the possible exception of a Mr. Donald Trump, has now acknowledged that Joe Biden is the rightful President-elect of the USA. And for the allies of the USA in Europe, it was surely a great relief when it became clear that the controversial President was failing in his bid for re-election. The presidency of Donald Trump has been notable for a type of rhetoric that has been simply unheard of from any democratically elected leader in modern history. But as the world has been dejectedly shaking its head at the verbal outbursts from the POTUS, the unpredictability of the US politics has been what has caused grave concern on the part of the country's allies.

The announcement of impending withdrawal of American forces from several conflict areas around the world, Syria and Afghanistan among them, has really placed the European allied nations in a demanding situation. Particularly with regard to Afghanistan, this is a virtual punch in the face of the US allies in NATO. The backdrop for the NATO countries' entry into Afghanistan, was the Al-Qaeda attack on the USA on September 11th, 2001. In the wake of this attack, the NATO Treaty's Article 5 was invoked. This article holds that "an armed attack against one of the NATO nations, shall be considered an attack against them all", and every single NATO country followed up loyally together with the USA when NATO entered Afghanistan. When the USA now, suddenly and on short notice, is pulling major parts of its forces out of Afghanistan, this does not only put the allied forces in Afghanistan in a difficult situation. Politically, the allied nations, who stood up together with the USA in 2001, are now feeling a sharp stab in the back.

Military experts in the USA and Europe alike have been cautioning against too rapid a withdrawal of forces, from Afghanistan as well as from Iraq. The result could easily end up with a return of Islamicist organisations to power, opening these regions up again as a foothold and base for international terror.

There is little or no understanding why the USA, after almost 20 years in Afghanistan and some 6 years in Iraq, should now be in some desperate hurry to withdraw from these countries. It could seem as if Trump in the course of these final weeks of his presidency is pushing these withdrawals through, not so much because it is important for the USA, as it is because of a wish to create problems for the President-elect. As if the new President did not have enough on his plate with the Corona crisis, the Iranian crisis, the climate crisis, the black-lives-matter crisis, the immigration crisis and the US economy in general, the Biden administration may also be forced into dealing with an increased amount of international terror, some of which terror may very well be directed against the USA.

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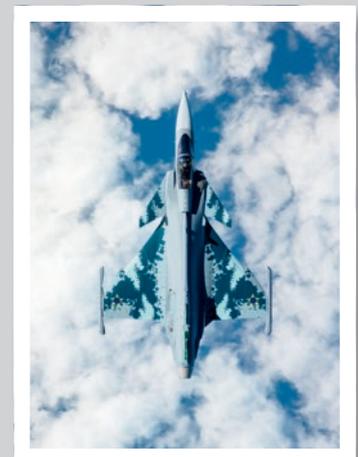
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COVERPHOTO:

Flight test with the first
Gripen E fighter aircraft
for Brazil.

Photo:
Linus Svensson / Saab



GRIPEN IN BRAZIL, SAAB'S LARGEST TECHNOLOGY TRANSFER PROGRAM EVER



Brazilian Gripen during trials.

In 2015, the contract signed between the Brazilian Government and Sweden came into force to equip the Brazilian Air Force (FAB) with a fighter to maintain the defence of its air space. In all, 36 Saab Gripen E and Gripen F were purchased, including logistical support, armaments and simulators. It was not about buying an on-the-shelf product, already available on the market. Together with Sweden, Brazil became a protagonist in the development of the Gripen E/F fighter.

The Brazilian acquisition of Gripen generated one of the largest technology transfer programmes ever carried out for FAB, and the largest ever made by Saab to another country, says Mikael Franzén, Vice President & Head of Marketing & Sales, Saab Aeronautics. -We expect that until 2025, more than 350 Brazilian engineers and technicians from partner companies will participate in theoretical and on-the-job training at Saab in Linköping, Sweden. As of today, more than 230 engineers have been

trained in Sweden. These engineers are now back in Brazil, most of them working at the Gripen Design and Development Network (GDDN) located at the Embraer plant in Gavião Peixoto.

- The programme will impact the national defence industry, involved in the process of developing structures, systems, avionics, production, flight tests and training to support, maintain and modernize this fleet for the next decades, Franzén continues and adds that Embraer is our main partner and beneficiary in Brazil.

More than 36 fighters?

- As of today we have contracted 36 fighters (28 Gripen E single seaters, 8 Gripen F twin seaters). -It is however public information that the Brazilian Air Force has an operational need for more than 36 aircraft and of course, Saab would be very interested in providing the Brazilian Air Force with more Gripen fighters in the future. But as of today, we are focused on delivering the 36 Gripen fighters to the customer, Franzén emphasizes.



Photo: Saab

13 of the Brazilian fighters will be built entirely in Sweden. Further on, eight fighters will be partly built in Sweden and finalized in Brazil. And starting in 2021 the last 15 aircraft will be entirely assembled at the at Embraer's plant in Gavião Peixoto, São Paulo State, Brazil.

Test program

Saab's Brazilian partner will also play a major role in testing the aircraft. The flight test programme will be expanded to include the Gripen Flight Test Center at Embraer in Gavião Peixoto, which will be fully integrated with the test programme already running at full phase at Saab in Linköping since 2017. Activities in Brazil will include testing of flight control system, environmental control system as well as tests of the aircraft in tropical climate conditions.

A NUMBER OF NEW GRIPEN CONTRACTS IN THE NEAR FUTURE?

Besides Brazil, Gripen is operated by the Air Force of five nations; Sweden, South Africa, Czech Republic, Hungary and Thailand. In addition Empire Test Pilots' School (ETPS) in the United Kingdom has used the Gripen for their Test Pilot training program. But the Gripen team is currently working on several possible sales, both for the new E/F version, and of the older C/D version.

Sweden

Sweden ordered a total of 204 Gripens and the Swedish Air Force received its first Gripen in December 1996. As of today the Swedish Air Force operates 95 Gripens, 23 Gripen D (twin seat) and 72 Gripen C's (Single seat).

In the future it is expected that the Swedish Air Force will be operating 60 Gripen E/F. In addition there are also plans to keep some of the Gripen C/D active after 2026.

The E/F versions will be assembled at the Saab facilities at Linköping in Sweden. As Brazilian industry now have a huge footprint in the Gripen production line, several components in the Swedish Gripen fighters will be made by Brazilian industry.

South Africa

In 1999, South Africa signed a contract with BAE/Saab for the procurement of 26 Gripens (17C and 9D) and deliveries commenced from 2008 to 2013. These were newly built Gripens.

Hungary

In 2003 Hungary signed a 10 year lease contract for a total of 14 Gripen fighters (12 C and 2 D versions), and in 2012 the lease was extended until 2026. With the fleet of 14 Gripen fighters, Hungary protects its own air-space but is able at the same time to perform air-policing over Slovenia and on regular basis to participate in NATO Baltic Air Policing.

Czech Republic

In 2004, it was announced that the Czech Republic was to sign a 10 year lease contract for 14 fighters (12 Gripen C and two Gripen D). The CzAF Gripen fleet was newly produced in Linköping, Sweden, and the deliveries started just one year after contract signature with the first CzAF Gripen landing at Čáslav AB in April 2005. In 2013 the

lease contract was extended by another 14 years, until 2027 with a two years option for the CzAF. Czech Air Force participates on regular basis in NATO Air Policing missions over Baltics or Iceland. Recently, the fleet of CzAF Gripen fighters reached an impressive milestone of 30.000 Flight Hours.

Thailand

In February 2008, the Thai Air Force ordered six Gripens (2 single-seat C-models and 4 two-seat D-models) from Saab; deliveries began in 2011 and in 2010 Thailand ordered six more Gripen C's, deliveries began in 2013.

Croatia

Croatia is in process of purchasing 12 fighters, and the Swedish Government (via FMV) is offering 12 newly built Gripen fighters in the C/D version for Croatia. The other contenders are the US with Lockheed Martin's with new F-16 Block 70 and the French government offering used Dassault Rafale fighters.

Gripen for Finland?

– We can confirm, that we are offering Gripen E/F and GlobalEye to Finland, says Magnus Skogberg, Gripen for Finland Campaign Director. -However, due to customer restrictions, we are not allowed to comment on the details of our offering and hence not reveal the number of aircraft included.

The Finnish HX program is a functional procurement, aiming to maximize the operational capability of the air force and the whole Finnish defence forces. Finland is not replacing fighters, it is replacing the capability. Within the budget of 10 billion Euro, each contender is to define an offering that in the best possible way handles and meets the challenging scenarios and operational needs defined by Finland.

– Our offer includes Gripen and GlobalEye aircraft with all related support systems and other necessary equipment and associated services, including training, needed for operating Gripen and GlobalEye in Finland, says Skogberg. -We are also offering our new Lightweight Air-Launched Decoy Missile (LADM) as well as Saab's advanced Electronic Attack Jammer Pod (EAJP). The offer comes with an extensive industrial participation programme, full in-service



Gripen being tested during Finland's HX Challenge flight evaluations in Pirkkala airbase, Finland. Any fighter for Finland must cope with winter conditions. Photo: Miikka Hult / Saab

support until 2030 as well as a significant package of weapons, pylons and sensor systems. We will now, together with the customer, optimize our offer in order to maximize the offered operational capability for the allocated budget. According to the customer's planning, "Best and Final offer" is to be submitted in spring 2021.

– We are confident in our offer, Skogberg concludes. Gripen has been designed for the challenging operations and threat scenarios very similar to those in Finland. It is built for road-base operations, harsh climate and easy maintenance by conscript mechanics.

Other contenders for the HX competition are Boeing F/A-18 Super Hornet, the

Dassault Rafale, Eurofighter Typhoon and the Lockheed Martin F-35.

Gripen for Canada?

Canada will purchase 88 advanced fighter aircraft. The new fighter will replace the Royal Canadian Air Force's fleet of aging CF-18s. Besides Saab's Gripen the other contenders are F-35 from Lockheed Martin and Boeing's F/A-18E/F Super Hornet. The competing companies must submit proposals that offer economic benefits to Canadian defence contractors and other businesses, as industrial incentives and offsets make up 20 percent of the criteria under evaluation. The proposals will also be evaluated on each aircraft's capability and cost, which will be weighed at 60 percent and 20 percent respectively.

Canadian Gripens built in Canada

Saab is planning on building a number of Gripens in Canada if they win the contract. Canada has not requested a two seat configuration so all 88 will be Gripen E single seat version.

– The number of Canadian built Gripen fighters is yet not determined, but we are

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committed to maximizing the number as much as possible given the Government of Canada's requirement and delivery timelines. The Canadian Gripen production line will be set up at IMP Aerospace & Defence site in Halifax, Nova Scotia, and is a key part of our solution, Patrick Palmer, Executive President and Head of Marketing & Sales Canada emphasizes.

Austria

In July 2017, as a result of the ongoing controversy, the Austrian Ministry of Defence announced the phasing out of the Eurofighter starting in 2020, and its replacement by a "militarily more effective and more cost-efficient" air surveillance system. Austria signed in 2003 a EUR 2 billion contract and received 15 Eurofighters plus required support. In 2017, the Austrian prosecutors launched investigations into Airbus and the Eurofighter consortium after the Defence Ministry said it believed they had misled the state about the price, deliverability and equipment of the 2003 deal. In April this year a lower court however ordered an end to the investigation on the grounds that Austria had



Saab is also offering to Finland their Electronic Attack Jammer Pod (EAJP), here seen as the outermost underwing pylon, next to the missile on the wingtip. *Photo: Miikka Hult / Saab*

not provided enough evidence. The court order was appealed, but in November the Austrian appeals court confirmed the court order to end the investigation. Still the Austrian MoD is in the process of replacing its 15 Eurofighters, and in September the Austrian Defense Minister Klaudia Tanner stated that Austria had officially responded

to Indonesia's request to buy the 15 Eurofighters from the Austrian Air Force.

Tanner said she had directed the General Staff to prepare for negotiations with their Indonesian counterpart, and added that the "exit from the Eurofighter system" is the declared goal and the sale is in the best interest of taxpayers. Two options are available for

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the sale to proceed. First, the Eurofighter consortium will have to issue an end user certificate to Indonesia and Austria will sell the jets directly to Indonesia. Alternatively, Airbus will buy back the planes, upgrade them and then Airbus will sell them to Indonesia instead.

– Gripen is the perfect solution for Austria. Gripen meets all requirements and is cost effective from day one. The low operating costs, combined with a very robust and powerful aircraft, make the jet a very attractive solution for any modern air force, including Austria's. From a military perspective, the protection of its own airspace is one of the most important tasks of a country. This can only be fulfilled with a supersonic jet, Per Alriksson, Managing Director Saab Aeronautics Austria GmbH explains.

According to the Swedish MoD different business models for the active Airspace Surveillance have been offered. In 2017, the Swedish Defence Materiel Administration submitted a response to a request for information (RFI) from Austria, offering a total of 18 Gripen aircraft, 15 single-seaters and 3 two-seaters. If Austria decides to replace its current fleet with Gripen, brand-new aircraft would be delivered within 24 months. ■■

FACTS AND FIGURES

Gripen C/D and E/F

Compared to the Gripen C/D, the Gripen E/F is a new platform enhanced with new capabilities, such as extended range (new engine, additional internal fuel tanks etc), new modern sensors including a comprehensive electronic warfare system and an increased load capacity. Gripen E/F also has a new avionics system. The avionics architecture allows it to be upgraded and updated in very short time frames. It is designed in such a way that it fully separates flight-critical functions from tactical functions which means that changes to the software and hardware will not necessitate new, time-consuming flight safety tests and associated qualifications.

KEY DATA	Gripen C/D	Gripen E/F
Length overall	14.9 m	15.2 m
Width overall	8.4 m	8.6 m
Basic mass empty	6800 kg	8000 kg
Internal fuel	> 2400 kg	3400 kg
Max takeoff weight	14000 kg	16500 kg
Max thrust	80.5 kN	98 kN
Min takeoff distance	400 m	500 m
Landing distance	500 m	600 m
Max speed at sea level	> 1400 km/h	> 1400 km/h
Max speed at high altitude	Mach 2	Mach 2
Max service altitude	> 52.500 ft	> 52.500 ft
Ferry range	3000 km	4000 km
Combat range	800 km	1,500 km
Hardpoints	8	10
Combat turnaround air-to-air	10 min	10 min
Full engine replacement	1 hour	1 hour

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NORWEGIAN DEFENCE AND SECURITY INDUSTRIES ASSOCIATION (FSi)

THE LEADING ASSOCIATION IN NORWAY ADVOCATING THE INTERESTS OF ITS SECTOR, AND THE PRIMARY INTERLOCUTOR FOR THE GOVERNMENT IN MATTERS OF IMPORTANCE TO THE INDUSTRY. AFFILIATED WITH THE CONFEDERATION OF NORWEGIAN ENTERPRISE (NHO) AND REPRESENTING MORE THAN 100 COMPANIES

NORSK FORSVARSINDUSTRI FORTSETTER FREMGANGEN

Omsetningsvekst og solid ordresreserve styrker forsvarsevenen, sikrer verdiskapning og arbeidsplasser i en krevende tid og skaper handlingsrom for fremtiden.

Forsvarets forskningsinstitutt publiserte nylig rapporten om Forsvarsindustrien i Norge for 2019. Den viser at omsetningen ble rekordhøy med en økning på mer enn 10% til 17,7 milliarder kroner. Eksporten er fortsatt også høy, og de norske forsvarsbedriftene i utlandet viser en positiv utvikling. Det er også positivt at de små og mellomstore forsvarsbedriftene kan vise til en betydelig omsetningsvekst i 2019. SMBene i forsvarsindustrien hadde en vekst på over 10% og står nå for mer enn 30% av den samlede omsetningen i bransjen. SMBene lykkes også på eksportmarkedet. De står for over 30% av den totale eksporten av forsvarsmateriell fra Norge.

Et annet nøkkeltall som fortjener oppmerksomhet, er rapportert ordresreserve. Ved inngangen til 2020 hadde norsk forsvarsindustri en ordresreserve på om lag 27 milliarder kroner. Dette er en økning på over 90 prosent fra årsskiftet 2018/2019. I en tid da mange bransjer har store utfordringer som følge av koronapandemien har forsvarsindustrien en ordresreserve som er "all time high". Fra media er kjent at det også i inneværende år er inngått flere omfattende strategiske samarbeidsavtaler med Forsvaret og store eksportkontrakter i 2020. Det er derfor grunn til å anta at ordreserven ytterligere har økt gjennom året.

Dette innebærer at aktivitetensnivået i norsk forsvarsindustri, på tross av de utfordringene koronapandemien innebærer, er økende. Det gjør at mange bedrifter nå bemanner opp og at mange norske SMBer får langsiktige underleverandørkontrakter. Dette er viktig, særlig

for virksomheter som også er eksponert i bransjer der koronapandemien har ført til oppbremsing og markedssvikt.

Utviklingen de siste årene viser med all tydelighet hvor viktig det er at rammebetingelsene legges til rette for utvikling og vekst i forsvarsindustrien. At norsk forsvarsindustri i en krevende tid er en bransje som bidrar til å holde verdiskapningen oppe og hjulene i gang, er et synlig bevis på at den satsningen som myndighetene og industrien i fellesskap har gjort de siste 20 årene er svært vellykket. Særlig gledelig er det at denne utviklingen bygger på at det norske forsvaret har særlige behov som ikke løses ved å anskaffe såkalt hyllevarer i det åpne markedet. Suksessen er en konsekvens av at Forsvaret, akademia og industrien i fellesskap har tatt frem kosteffektive fremtidsrettede løsninger med stort utviklingspotensial som også er attraktiv for allierte og andre nærstående lands Forsvar.

Langtidsplanen som akkurat er behandlet i Stortinget innebærer en betydelig opptrapping av satsningen på Forsvaret. Det innebærer også at det kommer mange nye muligheter for å videreføre den positive utviklingen i industrien og sikre at norsk forsvarsindustri forblir en viktig del av Totalforsvaret, en strategisk partner for Forsvaret og en attraktiv leverandør og samarbeidspartner i det internasjonale forsvarsmarkedet. Det forutsetter at norsk forsvarsindustri får levere når Forsvaret har behov der forholdene ligger til rette for det, økt satsning på forsvarsteknologisk FOU, at det konsekvent og målrettet benyttes industrisamarbeidsavtaler som sikrer Forsvarets og forsvarsindustriens interesser ved anskaffelser fra utlandet og at det tette samarbeidet med norske myndigheter for å legge til rette for markedsadgang og internasjonalt samarbeid videreføres.



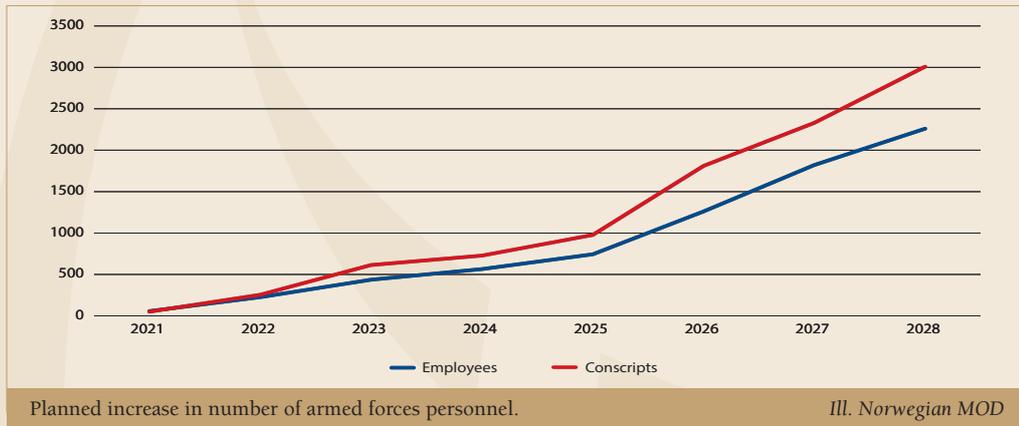
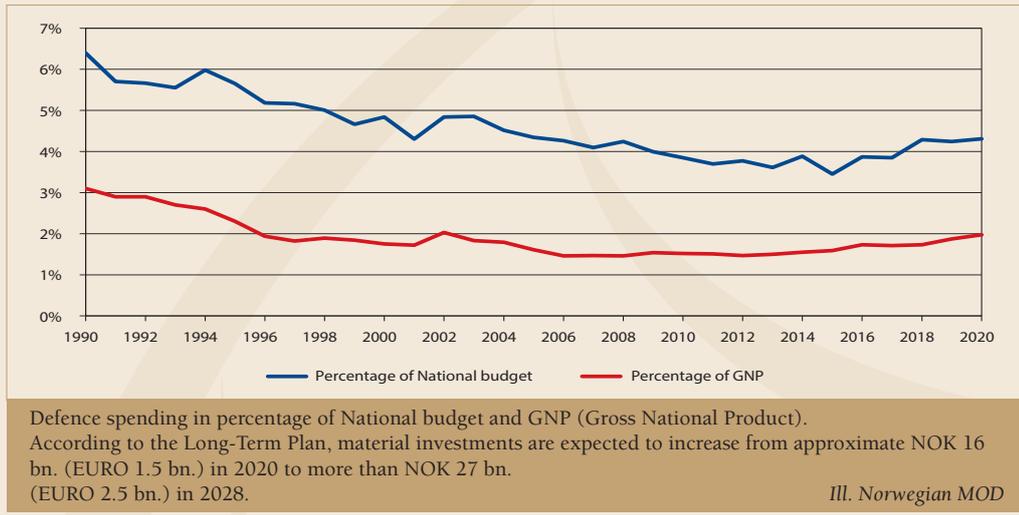
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DIGITAL PROGRAMME CONFERENCES

The world has certainly changed a lot during the year, and the programme conferences, originally planned as physical conferences earlier this year, were held as digital conferences during the first half of November.



The conferences were introduced with a general part, and Torbjørn Svensgård, CEO of the FSi, opened the conference by underscoring that while the current climate precludes the arranging of physical conferences today, it remains as important as ever to keep up the flow of information between the Armed Forces and the defence industries. And with approximately 150 attendees signed up, the need for information updates is clearly present.

Svensgård also noted that work is currently ongoing on a new Parliament Report on the Defence Industry, to replace the

current Parliament Report no. 9 (2015-16) about the National Defence Industrial Strategy.

– There can be no doubt that the Parliament Report no. 9 has been a success. Just look at the successes achieved by Norwegian defence industry on the export markets during recent years. – We within the FSi are now working actively to convey the industry’s input to the new Parliament report, Svensgård explained, and concluded that the new report looks to be even better than the previous one.

In the spring, the Government presented a new Long Term Plan for the Armed Forces, but

after consideration in the Parliament, the Long-Term Plan was sent back to the Government. On 16 October, the Government presented a new, revised Long Term Defence plan.

The Standing Committee on Foreign Affairs and Defence asked for elaboration and detailing within eight specific topics. There was a consensus on the main topics of the plan, but the new plan gave more information and details to Parliament.

– The background for a new Long Term plan for the Armed Forces, is the global security environment which is more unstable. We see a greater complexity of

threats challenge our security, explains Specialist Director, Gro Kolstad Mortvedt from the Ministry of Defence. Increasing threats, challenges and vulnerabilities must be met by active policies, priorities and measures. Investment in defence and security remains a key priority for the Norwegian Government.

The challenges to our national security are becoming more complex. Great power competition and the increased strategic importance of the High North has implications for Norwegian security. The most significant change in the Norwegian security environment is Russia’s growing military capability and its use of force. The military reform in Russia has resulted in a modernisation of Russia’s conventional forces as well as a strengthening of its nuclear capabilities.

– The new Long Term Plan entails a significant financial lift for the Armed Forces, Mortvedt further explains, and points among other things to a significant escalation in the next few years of both the number of employees in the Armed Forces and the number of conscripts. For the years towards 2028, the number of employees will increase by 2200, and the number of conscripts will go up by about 3000.

The Government proposes an increase of the Defence budget to a level in 2028 that is NOK 16.5 Billion above the agreed 2020 budget level. The plan will improve the national capability and enhance the ability to receive allied reinforcements and to deploy forces to operations abroad. For 2020, the Norwegian defence budget will be just under 2% of the GDP, and we expect it to be kept at the same percentage level also for 2021. ■■

PROGRAMME CONFERENCE LAND FORCES

The program conference Forces Land Forces was also held as a webinar conference. More than 150 participants confirm the interest for information.

During the Programme Conference Land Forces, the presentations included a brief on the development of Program Mime. In the Mime programme, a series of investment projects within combat-proximate ICT has been gathered.

The vision for the Mime programme is “Optimal operational effect in the Armed Forces through comprehensive implementation of relevant digital services”, explains Morten Gjellerud, Programme Director Mime for FMA ICT capacities. Today, the Armed Forces are operators of a large number of different ICT systems on the various platforms, systems that can communicate with each other only to a greater or lesser degree. We want to achieve more comprehensive solutions, not just to connect the systems, but also to improve the interconnection of the systems that are connected to each other today.

As dictated by our vision, Mime should provide an increased operational effect for the Armed Forces. This means that we will improve the ICT deliveries to the Armed Forces, not for the sake of ICT, but to increase the Armed Forces’ ability to resolve their objectives. But even if comprehensive and improved digital services facilitate increased operational effect, it will be up to the Armed Forces themselves to take advantage of the opportunities that Mime provides for increased effect. The Chief of Defence pointed this out in his digital strategy, where it is stated that: “Digitalization is just as much about the way we work and organize ourselves, as it is about the development of new technology.”

HG 2030

Colonel Asbjørn Lysgård of the HG (Home Guard = Heimevernet) presented the opportunities and



Home Guard soldier driving snowmobile.

Some of the Home Guard soldiers are, due to their civilian jobs, very experienced snowmobile drivers.

Photo: Marte Brohaug/ FMS

challenges that the Home Guard is working on today.

The Home Guard consists of 11 districts, 207 home guard regions, 12 action forces and a total number of some 40,000 soldiers, spread evenly all over the country. The Home Guard’s top command is located at Elverum, about 170 kms north east of Oslo.

– The Home Guard is a reserve capacity in many situations, and we aim to be this in the future as well. As an example of this reserve capacity, I can mention that in connection with the corona epidemic and the closure of the borders, the Home Guard has since March, at the request of the police, carried out more than 15,000 guard days on the border with Sweden.

– On the equipment side, we are working on several challenges. First and foremost, the processes for materiel procurement to the HG are both extensive and cumbersome. We want to renew the materiel and take part in the technological development. This is important, not only to

increase the operational effect, but also for the individual soldiers and commanders in the HG, to perceive that the Home Guard is more than just “a guy with a backpack and a gun”. We recently had the occasion to test out the micro UAV Black Hornet 3, and we see right away that a small investment like this will give us substantial effect.

– The FFI is working on a three-year study on the HG towards 2030, and the sub-reports in this study have concluded that the HG needs to become more future-oriented and technological. And in the work of self-development, we would appreciate more contact with the industry, even though the FMA is the formal point of contact, says Lysgård, while he adds that equipment for 40,000 soldiers can involve significant deliveries.

– On the materiel side, we also have challenges in getting what we have today to function, and not least, in furnishing all HG departments with standardized materiel and equipment. We want

the departments to have the same equipment all round, and in addition to have as much system similarity as possible with the Army and the Armed Forces in general. – The Army introduced the HK416 from 2008, but not until next year will the entire HG be equipped with this weapon. Because most of our HG soldiers have their background from the Army, we have for over 10 years received soldiers fully trained on HK416, and we have wasted time and resources on additional training on the AG3 when they come to us.

– We also see that regulations and bureaucracy impose unnecessary expenses on us. We have for example HG soldiers in Finnmark, who work in the reindeer husbandry industry, and who have ridden snowmobiles daily almost all their lives. But when they report to us, we are required to put them through a 14-day training course to be certified for driving the Home Guard’s snowmobiles. ■■

PROGRAMME CONFERENCE SEA

This year's Programme Conference Sea was conducted as a 2-hour session with streaming. The Ministry of Defence and the FSi stood together as organizers, and even this conference had more than 100 participants.

Harald Andersen launched the conference part by presenting the most important projects under way on the naval side, and mentioned among other things that three new coast guard vessels are under construction, as replacements for the Nordkapp class. The hulls and the heavier elements of these vessels are constructed and assembled in Romania before being towed to Vard Langsten shipyard in Tomrefjorden in Møre og Romsdal where the vessels are to be finished.

– Further to this, work is of course also being carried out on the Submarine project. Here, an agreement has been entered into with Germany for the deliveries of 6 identical submarines, four for the Norwegian Navy and two for the German Navy.

Among the other projects, work is ongoing to renew the counter-measure capacity against sea mines. Here, Norway currently has mine-clearing vessels of the Oksoy class and the Alta class,

but the future lies in autonomous systems.

The Navy has also taken delivery of the replenishment vessel KNM Maud, which is the Navy's largest vessel by far, about 50 meters longer and 5 times heavier than the frigates.

Next to the fighter aircraft procurement, the project portfolio for the navy is by far the largest. We have had a small dip in investments now in 2020, but we estimate that over the next few years, investments will be between NOK 5 and 6 billion each year.

Commander Øystein Storebø, head of the project department Marine Capabilities (FMA MARKAP), went into some more detail on some of the most important projects.

The FMA is currently conducting approximately 55 projects with up to multiple program milestones within each project. In addition, FMA MARKAP supports projects carried out under the auspices of the Norwegian Navy.

We also have challenges on the resource side, and in short, we must ask ourselves the question of how to accomplish more without an increase in staffing. An obvious solution to this question is to develop better contact with the industry.

– In addition to the major new acquisitions, we also have a number of maintenance and update projects on existing equipment. It was recently clarified that the Skjold class of coastal corvettes will undergo major maintenance / upgrades at the UMOE Mandal shipyard in the far south of Norway. This work includes both the ship technology and the combat systems. The maintenance / upgrade comes because it has now been decided that the service life span of the Corvettes will be extended from 2025 to 2030, partly as a result of the loss of the frigate "Helge Ingstad".

– Even though we are in a process of acquiring new submarines, it is important that we maintain the submarine capacity

until the new submarines are operational. This means that we will have to continue to carry out maintenance and updates on the existing ULA-class submarines for a number of years to come.

Unit vessel?

Although it is emphasized that no decision has yet been made, the Navy is looking into the possibility of a future standard vessel concept. It is considered that such a standard vessel class will be able to replace the coast guard vessels of the Reine class, the Barentshav class, and possibly also the Nornen class as well as the KV "Harstad". In addition, the class of such a standard vessel can be used as a mothership in a future autonomous mine-clearing concept. The standard vessels are envisioned to be equipped with different modules for the various assignments. And even though the unit vessel concept has not been decided in any way, the Norwegian Navy is receptive to creative thoughts and ideas. ■■



KNM Skjold.

The service life span of the Skjold class of coastal corvettes will be extended from 2025 to 2030, partly as a result of the loss of the frigate "Helge Ingstad".

Photo: Torgeir Haugaard / Forsvaret

PROGRAMME CONFERENCE INI

This year's Programme Conference INI was also held digitally, in the middle of November. Some 100 participants attended, and feedback from participants at earlier conferences was that the digital format worked quite well.



Communication unit on a BV206 Tracked Vehicle during exercise Joint Viking 2017.

Through the Mime program the Norwegian Armed forces will invest a significant amount of money to modernize its combat-proximate information and communication systems at a tactical level.

Photo: Jens Svendsen / Forsvaret

Lieutenant Colonel Truls Bjerkestuen, head of the INI sub-portfolio, presented the challenges that the Armed Forces are facing in this area.

According to the new long-term plan, investments in the INI area will run to some 1.5 to 2 billion NOK per year over the next few years. This entails a significant investment in the period 2020 to 2026, Bjerkestuen explains. We currently have more than 70 ongoing projects in the INI area, and there is a great degree of inter-dependence between several of these projects. Most of these projects will be continued, and in addition we expect that there will be some new projects.

Among other things, we are expecting a significant strengthening in the area of C2IS (Command, Control, Information Systems), and we also see that we will have projects in combat management related to air sta-

tions, which is completely new. In addition, we will have projects to improve the national situation, as well as some space-related projects.

On the whole, we are experiencing a significant focus on improvement and efficiency through digitization.

The two major programmes within the INI area are program Mast and program Mime.

Mast stands for "military use of cloud services" and will among other things ensure a robust communication infrastructure, renew ICT platforms including command and control, management, logistics, office support, collaboration and digitization. In addition to investments, the programme also deals with the way the Armed Forces works today and how to improve this.

Mime sets out to modernize the combat-proximate information and communication systems at a tactical level.

Through strategic cooperation, the Armed Forces will involve the industry in both programmes, in order to gain access to expertise that the Armed Forces do not possess on their own.

Cyber Defence, Major Challenges

Major General Inge Kampenes, Chief of the Cyber Defence, presented the challenges facing the cyber defence.

– We are standing in the middle of the fourth industrial revolution, and we have problems keeping up, Kampenes began.

– Digital intelligence is the biggest intelligence threat we are facing at this time, but this is not recognized to any great extent today. At the same time, we see that the Total Defence has gone through a renaissance. But the merging of the Armed Forces and the civilian society creates significant challenges.

Today we have marginal ability for defensive operations in the cyber domain, i.e. defending against cyber-attacks from the outside. We lack competence and consequently the workload will weigh heavily on the remaining personnel base.

Nevertheless, we also see several great opportunities; we have a significant investment portfolio, and we also need to improve education.

– We currently have collaboration with both academia and the business community, but if we are to be able to resolve our tasks in the future, we are depending on this collaboration to be expanded. It is our vision that when we come to 2022, the cyber activities in the Armed Forces are recognized as a driving force in the cyber area, quick to resolve tasks and adopt new technology, as well as being leaders in cyber security, Kampenes states in conclusion. ■■

PROGRAMME CONFERENCE AIR

Originally, the Programme Conference AIR was scheduled for the Spring of 2021, but with the decision to run all the other programme conferences for land, sea and INI this autumn, it was natural to hold the air conference in the same section. More than 70 participants had signed up for the conference, which is a good indication of the need for information and dialogue.

For the air defence, previous long-term plans have centred upon the base structure of the Air Force, focusing on tactical bases at the air stations of Ørland and Evenes. This has highlighted the need for protection of the bases, in terms of both air defence and base defence.

The new long-term plan continues a strategic effort on air defence. Cruise missiles constitute the most demanding air threat to Norway, and mass attacks with cruise missiles are considered the dimensioning threat.

NASAMS (Norwegian Advanced Surface-to-Air Missile System) is the cornerstone in the ground-based air defence in Norway. To keep NASAMS relevant the long-term plan states that the current NASAMS systems will be upgraded from 2023 to 2029. This upgrade involves modern sensors, as well as that short-range missiles will be entering the NASAMS system, in addition to current medium-range missiles.

This upgrade of NASAMS is considered a necessary prioritization to be able to combat incoming cruise missiles. It also means that investment funds for a possible long-range air defence will be postponed until after 2028. The long-term plan states that purchasing long-range air defence systems is a significant investment, and to maintain a long-range air defence system operational, demands notable resources and competence.

As of today, the Norwegian Air Force is in the process of completing the NASAMS 3 upgrades. NASAMS 4 will be the upgrades in the period of 2023 up to 2029 where the plan is among other things to add short-range missiles into the NASAMS system. If there is a further development with long-range missiles after 2028, it will probably be named NASAMS 5.

Besides the NASAMS 4 upgrade, the long-term plan also express the importance of modern

base defence (force protection) on the airbases. The base defence is designated to the protection of the airbase, so the airbase operational functions can be maintained in crisis and armed conflict. The development, procurement and implementation of modern base defence are prioritized within the 2023 up to 2029 time period.

Helicopter for the Special Forces and new helicopters for the Army?

In its proposal for a long-term plan, the Government recommended that the helicopter capacity should be further developed by replacing the Bell 412 in the period of 2024-2029 with a new capacity that is better suited to the needs of the special forces.

But recently, the Storting (Norwegian Parliament) in its resolution (proposal 87 S) asks that the government in connection with the planned helicopter procurement for the special forces

es from 2024 should also procure new helicopters for dedicated helicopter support to the Army. The Storting further states that the new helicopters will be organized in one squadron at Rygge about 60 kms south of Oslo, and one squadron at Bardufoss in northern Norway. The Storting is asking the Government to revert with a separate case on the acquisition of helicopters, including numbers.

In the Storting resolution no details have been clarified about the possibly army helicopter.

Where numbers of helicopters are concerned, the Storting is saying two squadrons. How many helicopters there are in a squadron remains a quite open question. Within NATO, the number of units in a squadron varies from down to three aircraft in the olden days, right up to the Americans, who are today dealing with squadrons operating 18 or more flying units. If, on the other hand, the basic premise is that a squadron should be able to lift an army company, and that each helicopter can take 12 fully equipped soldiers in one lift, and that one must have some spare helicopters to cover maintenance time etc, then one will quickly arrive at 10 to 15 helicopters to one squadron. But this is merely speculations, and the number is by no means settled yet. The Storting request the Government to come back to the Storting with a separate white paper on helicopter procurement, including number of units. In this report, one can also hope that the government will preset cost and funding alternatives for a possible new helicopters purchase.

As of today, it is however certain that getting helicopters in place for the Special Forces and also possibly for the Army by the timeframe 2024-2029, is a very short time. ■■



Bell 412 during Cold Response 2014

The Bell 412 helicopters have been a faithful workhorse in the Norwegian Army for almost 40 years, but now the Storting (Norwegian Parliament) suggest purchasing new helicopters.

Photo: FMS

FINNISH-NORWEGIAN DEFENCE INDUSTRY WEBINAR

On 16 November this year, the FSI with its Finnish sister organization AFDA (Association of Finnish Defence and Aerospace Industries) held a Finnish-Norwegian defence industry seminar. The seminar was conducted on the Web due to the Corona situation, and Ms Tuija Karanko, Secretary General of AFDA, started her introduction by recalling the last time such a seminar was conducted, in 2016 in Helsinki, in the presence of King Harald of Norway.

Torbjorn Svensgård of the Norwegian emphasized that Finnish-Norwegian defence co-operation has increased significantly in a very short time, and there is potential for more.

The first speaker, Mr Jukka Juusti, Permanent Secretary with the Finnish Ministry of Defence, emphasized in his address that Finnish industry is important for the Finnish defence, and that Finnish industry largely carries out maintenance, repairs and supplies to the Finnish armed forces. Juusti also emphasized that the Finnish HX program, for the replacement for today's F/A-18 fighter aircraft, grabs a lot of focus in the Finnish defence at the moment, and added that even if the program due to COVID-19 is about 6 months delayed, Finland will be flying the new planes for 30 years, and a few months' delay is does not make a lot of difference in that context.

The Norwegian Keynote speaker was State Secretary Ms Tone Skogen of the Norwegian Ministry of Defence, who in her speech emphasized the similarities in security policy between Norway and Finland. Both nations have a huge neighbour whose actions cause instability in our "neighbourhood", while at the same time more and more countries are turning their attention to the Arctic areas.

– Materiel co-operation has an intrinsic value, in addition to providing cost-effective solutions, increased military and political effect while also providing opportunities for a common industrial base, Skogen explained, and added that when we have common requirements, we will see more



Finnish F/A-18 Hornet.

F/A-18 Hornet was introduced into service in 1995-2000. Finnish F/A-18 Hornets had an estimated lifespan of 30 years, meaning that last Hornets is planned to be decommissioned by 2030.

Finland is currently working on the HX program for the replacement for today's F/A-18 fighter aircraft.

Photo: Gerard van der Schaaf /wiki

material co-operation and more joint procurement.

– We are optimistic in the matter of armament co-operations between our nations. We have achieved a lot, but there is more to come, Skogen said in conclusion.

The Finnish keynote speaker, Mr Raimo Jyväsjarvi, Director of National Armaments at the Finnish Ministry of Defence, began by emphasizing that Norwegian and Finnish co-operation is very pragmatic.

The Norwegian and Finnish militaries operate largely in the same arctic environment, and both countries are looking for the best capabilities for their forces. This means that we very often arrive at quite similar requirement specifications for the materiel, which in turn can form the basis for joint procurement.

But memoranda and agreements are not enough, the people in the process are most important and here the pragmatic approach that I experience in both countries is important, Jyväsjarvi concluded, before adding that the Finnish side sees several promising areas for collaboration.

"Finland is an island"

Finland has a long border with Russia, but 80% of our trade goes by sea through the Baltic Sea and out through the Danish Strait. In this respect, in terms of supplies, Finland can almost be regarded as an island, pointedly observed MS Tarja Jaakkola, Deputy NAD, Finnish Ministry of Defence, and added that in winter this sea route is frozen, which places special demands on our navy.

– Not least now during the COVID-19 crisis, when national borders have been closed, it has become evident that Finland is an island that gets its supplies by sea. For this reason, the Finnish Armed Forces has always had a great deal of focus on security of supplies.

Jaakkola also presented the main figures in the Finnish defence budget. This year, the budget is EUR 3.172 billion, which is 1.27% of GDP. For next year, however, the budget will be about 4.8 billion Euros, mostly due to the HX fighter programme, and we will then reach the benchmark of 2% of GDP, Jaakkola explained, before noting in conclusion that Finland is obviously not a NATO member, so the 2% target does not have the same significance as it does for NATO member nations. ■■

EXPORT CONTROL SEMINAR

After having been postponed, at first from March to June, this year's export control seminar was finally held in the form of a Webinar in late November. Some 70 delegates had signed up for the webinar, as a clear indication of the considerable interest the topic holds in the Norwegian defence industry. The conference was organized by the FSi in co-operation with FSi Eku (FSi Eksportkontrollutvalget, or the FSi export control committee), which is one of the FSi's professional committees.

About 75% of the revenues in the defence industry in Norway comes from exports, and if we are to preserve our defence industry, then exports must be boosted further, explained Torbjørn Svensgård, CEO for FSi, in his opening remarks.

The defence industry is dependent on the Norwegian people and the Storting having the confidence that the export of Norwegian defence materiel is conducted in full accordance with laws and regulations. If only one incident of illegal or irregular export of Norwegian defence material should occur, the entire defence industry suffers a loss of political and public confidence. Therefore, it is important that the entire industry is conscious of its responsibility when we export our goods, Svensgård emphasized, and added that we receive feedback that the laws and regulations that we do have are working well. And not least, the industry receives quick feedback on its applications for export licences, which gives Norwegian industry a competitive advantage compared to several other countries.

FSi Eku has recently launched the "FSi Export Control Compliance Guide" as a tool for member companies to act in accordance with the regulations. This guide can be obtained by the member companies by visiting the FSi member pages.

Gunn Margit Strand-Utne from Kongsberg Defense & Aerospace reviewed the most important elements for companies that want to build a compliance program.

– Many small companies have limited resources for developing

and implementing good compliance programs, and then it is important to clarify the organization, roles and responsibilities for the various parts of the program, and that personnel is given the necessary training to be able to carry out the tasks that the compliance program entails. The company must also have a communication plan so that necessary information, such as error reports, changes in laws and regulations, etc. is communicated to the responsible parties.

– Secondly, the company must develop clear and unambiguous procedures for the implementation of the various parts of the compliance program, Strand-Utne explained and mentioned, among other things, procedures for checking that materials do not come from prohibited sources, screening of business contacts, whether customers come from a prohibited country, assessment of end users, etc.

In addition, the company must also document what is being done, and store the documentation in line with the regulations. The Americans say it a bit pointedly: "If it cannot be documented, then it did not happen".

Strand-Utne concluded by emphasizing that introducing a compliance system is not something that will be done once and for all. The system must be continuously improved, further developed and adapted to changes that take place inside and outside the company.

Thomas Brandi and Kine Bjelke Christophersen from the law firm Selmer have extensive experience from assisting Norwegian

exporters navigating sanctions and export control legislation.

The Nordic money laundering scandals have represented a paradigm shift in terms of focus on AML (Anti-Money Laundering) and sanctions risk by the banks and the export industry, said Brandi in opening, and added that exporters may have trouble getting paid for an item that has been delivered, if the bank identifies sanctions risk related to the counterparty or the product. Brandi pointed out that there is an overlap both across risk factors and mitigating measures relating to sanctions, AML and anti-corruption and that Norwegian exporters could benefit from adopting a holistic approach and using available toolkits across various compliance disciplines when navigating sanctions risk.

The focus of regulators on third party screening and due diligence is a real game changer, Christophersen said. We see that regulators increasingly are holding companies accountable for getting their screening and due diligence processes right. However, regulatory expectations for sanctions compliance program remain formally undocumented in many jurisdictions, including Norway. Christophersen recommended to look for direction in the OFAC (Office of Foreign Assets Control) Framework for Compliance Commitments and the EU guidance on internal compliance program. She also pointed out that having performed robust and proportionate due diligence may be a defence should a sanctions enforcement matter arise.

Øyvind Aarø and Johan Teigland from DNB could report

that the banks today are keenly aware of both money laundering and sanction rules.

The consequences for a bank that contributes to money laundering or the execution of transactions to sanctioned countries, can be blacklisting in US banks or, in the worst case, the bank can be barred from making transactions in US dollars. Such an event would spell disaster for any bank.

However, it is up to each bank to make its own risk assessment in a transaction, and the banks can assess the risk differently.

– An international transaction often goes through several correspondent banks before it reaches the recipient's bank. This means that even if we in DNB approve the transaction, one of the banks in the next stages may block the transaction and refuse to carry it out. In such cases, we receive the transaction in return, and no explanation is given, other than usually only that the transaction has been stopped "due to Compliance reasons".

Our recommendation is that companies that are unsure whether a transaction can be completed should contact their bank before starting. We have several examples of customers who have sent the goods, and who do not receive their payment because the transaction has been stopped.

– If your payment transaction has been stopped, do not try to resend it again. Contact your bank immediately.

– We can assist and advise our customers, but we can never guarantee that a transaction can be carried out, said Aarø and Teigland in conclusion. ■■

hiddn HIDDEN TECHNOLOGY AS

Hiddn Technology is dedicated to research, development, manufacturing and sale of hardware-based encryption and authentication solutions primary to military and government agencies. Hiddn's patented hardware-based encryption platform is currently utilized to secure data at rest on laptops, hard disks, USB flash drives, and other storage media.



History:

Hiddn Technology was established in 2019 based on assets acquired from Hiddn Security. Through the transaction the company secured full ownership of products, patents, trademarks, and technology for unique solutions protecting Data at Rest. The company leverages 22 years of investments in research and development in the encryption area.

Technology products and services today

The uniqueness of the solutions is delivered through a complete value chain starting with a card management system – CMS - to register, configure, initialize, and prepare keys for encryption/decryption to all devices. Initialization and keys is delivered through secure smartcards, which is also used for to authenticate the user.

Hiddn Technology's current product portfolio consists of the following encryption products:

- Internal hard drives for use in laptops PCs and servers, based on HDD or SSD technology
- USB flash drives
- USB connected hard drives, based on SSD technology

- A management system managing devices, cards, and encryption keys

All products can be delivered as a managed system, or as independent devices delivered with a standard set of cards.

The company is scaling-up production together with Technology partner Axxe AS in Halden, which also adds substantial value through their production quality and world class approved processes.

The ambition is to increase the number of projects towards key customer segments, extending existing solutions and delivering on new use-cases.

Integration of our value chain into Key Management Infrastructures, provide secure transfer methods between our devices and extending our interfaces into next generation like PCIe, NVMe and NVMe-oF is areas we are currently working on.

Governance

Hiddn Technology is a private Norwegian company owned by a group of technology innovators and more recently our working chairman - Harald Lome, with a long track-record from the IT industry.

The company has secured a strong team of specialists covering

the spectrum from hardware, embedded programming, database, software development and smart card technology. In addition, we have partnerships with several international software and technology suppliers to continuously improve our products and value to the market.

Processes to comply with stringent security requirements, necessary support functions and logistics is in place and will be developed continuously.

Involvement in the defence industry

During the past year Hiddn Technology has managed to secure new contracts with two NATO countries. Hiddn Technology is also engaged with R&D activities together with defence and governmental organisations.

Membership in FSI

Hiddn Technology has been a member of FSI since it started, and it was never discussed any other alternatives.

Why FSI

FSI was the obvious choice for Hiddn technology to get access to the structured agenda and the established governance FSI has within the defence industry. We feel FSI is welcoming new players in a good manner. FSI and SME is likely a response to the defence customers wish to use smaller companies to help the established large players to Innovate.

How is the membership used?

We use FSI as a discussion partner related to our plans and participate in FSI agenda and work. The pandemic with lockdowns of meeting points and conferences has limited the interaction in

some ways. But being digital also creates new ideas for communication and products which can be used in our development.

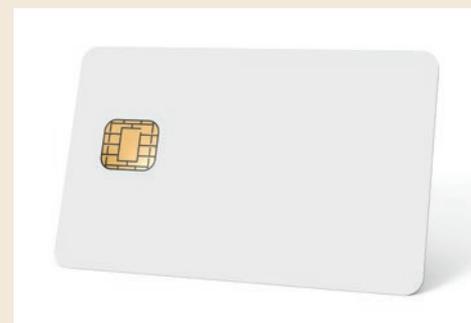
The community we were introduced into has given us a lot of value in the form of industry knowledge and opening for co-operation with small and large companies. We really look forward to work more in the organisation.

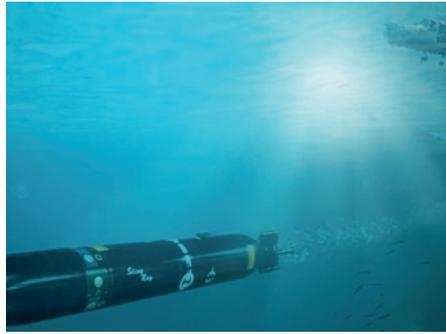
Suggestions for the FSI SME agenda

SMEs are often characterized by a pragmatic corporate culture that is very resultoriented. This often provides basic preconditions for the development of an innovation culture. We believe that SMEs can contribute to competitiveness in the industry through collaboration with larger companies. And we have seen defence customers who encourage smaller companies to the ecosystem as a catalyst for innovation.

FSI should continue to stimulate a collaborative platform for small and large companies working together. Working towards the defence and the government on important common positions can provide added value for future market opportunities.

Seminars and industry meet-ups, physical or digital could energize the interaction between all members of FSI to and drive the industries agenda forward. ■■





CV90 will stay relevant and capable through incremental upgrades.



GOOD RELATIONS ARE KEY TO LONG-TERM COOPERATION

The global defence and security company BAE Systems has a long-standing cooperation with industries in Norway. Advanced and technologically leading solutions for defence, aerospace and security are delivered in cooperation with subcontractors.

Trusted, innovative and bold. These are the keywords of BAE Systems that pervade both company culture and decision-making. These characteristics are hallmarks also to the cooperation with Norwegian customers and Norwegian industries. Together with local partners, BAE Systems develops, constructs and manufactures products and systems to protect people, maintain national security and keep critical information and infrastructure safe.

At the forefront

BAE Systems is one of the world's largest corporate groups within the defence industry, with operations in 40 countries. The companies in the group deliver high-tech, sustainable and efficient services and products. Intense efforts

within BAE Systems aim to develop new technology to support future product strategies.

For many years, BAE Systems has been in close cooperation with Norwegian defence industry, like Kongsberg, Nammo and Thales. The Norwegian armed forces have invested in a number of BAE Systems' products, for example weapon systems, combat vehicles, electronics as well as services and maintenance.

To strengthen its defence capability, Norway is making large and long-term investments in ships, submarines, land-based equipment and aircraft. For example, the Norwegian fleet of F-16 fighter jets is replaced by 52 new F-35, which is described as a technologically superior fighter jet, developed by BAE Systems, Lockheed Martin and Northrop Grumman. The Norwegian marine forces, Sjøforsvaret,

use the BAE Systems the Sting Ray acoustic homing torpedo, and BAE Systems is sub-contractor to the Vertical Launching System (VLS) MK41.

Long-term operations

In the mid-1980's, BAE Systems began development of the CV90. The combat vehicle has since been subject to internal research and development. In June 2012, the Norwegian armed forces commissioned an upgrade as well as 144 new CV90. The first new CV90 were supplied three years later, and deliveries continued until April 2019 with support by Norwegian Industry, where Kongsberg, Thales and Nammo had an important role.

A new phase now follows, where incremental and continuous upgrades will be made to every vehicle. Initially 20 CV90 will be upgraded by Norwegian contractors in close cooperation with BAE Systems.

According to the Norwegian long-term plan, investments and upgrades to defence material will increase, to strengthen the overall Norwegian defence. BAE Systems are happy to contribute with cutting edge technology. Years of partnership with Norwegian corporations will considerably facilitate this journey. ■

"A JOURNEY IN KNOWLEDGE AND TECHNOLOGY"

While many companies bet for oil and gas, Tamek AS chose the defence industry.

– A unique and adventurous journey! I'm very proud of our knowledge leap, says Patrik Berggren, CEO at parent company Morekgruppen.

The past eight years at Tamek AS have been a period of growth and development that many companies can only dream of. In 2014, the company that specializes in technical production sought new ways to go. At this crossroad, Tamek AS chose to pursue a new venture: the defence industry.

– We saw an opportunity to do something that was not a first-hand choice for others, says Patrik Berggren, director at Morekgruppen that comprises the two companies Morek AS and Tamek AS, both of which now work with BAE Systems.

Berggren became CEO at Morekgruppen in 2016, and at the same time, Marcus Ek was hired as CEO at Tamek AS.

It all began with a phone call to BAE Systems, and the die was cast.

– A lot of it was coincidence, but we landed just right in this first call. In five or six weeks, a strategic purchaser visited us.

After that, things really moved fast.

– How can we manage this? A lot

of things had to happen in a really short time, but we have a big heart and were willing to go the extra mile.

In six months, Tamek received its first order from BAE Systems, worth 30 million NOK.

The cooperation made it possible to move and expand the business from 900 to 3,500 square meters. It also meant big investments in machinery and a great number of new employees.

In 2020, the Norwegian government increased its funding of companies within the defence industry, to secure jobs threatened by the ongoing Covid-19 pandemic. The CV90 upgrade has been advanced and is already underway.

– Thanks to BAE Systems, we have reached a strong position. We are a player to count on, and we have experienced a tremendous knowledge leap and technology transfer, which all of us in the group are extremely proud of, Patrik Berggren concludes. ■

AN OPEN DOOR TO THE INTERNATIONAL MARKET

Investments, improved skills and new employees. For T&G Elektro, cooperation with BAE Systems has had a lot of positive effects.

– Our cooperation has opened doors to the international market, says Martin Grimsgaard, CEO at T&G Elektro.

The cooperation goes back to the 1990's, when the original CV90 was delivered to the Norwegian army.

– We have worked together for almost 30 years, and we have had a very good and close dialogue. Long-term work is both important and good, Martin Grimsgaard says.

Over the years, the family business has developed into an important partner to BAE Systems. As supplier of cabling, T&G Elektro has shown its versatility, flexibility and knowledge.

– It is very important to strive for the same goal. And that is what we have done.

In 2013, T&G Elektro received a big commission for the upgrade

of CV90. This called for new employees and new investments.

– At top capacity, 29 workers have worked full time on the project and we have expanded our plant in Nes in Ådal, thereby increasing production by 50 percent.

The long-term cooperation has brought a continuous skills development to a number of areas. Like ripples on the water, this development has also been useful for other Norwegian and international companies with whom T&G Elektro has shared its competence.

– Thanks to BAE Systems, we have got new customers and new doors have opened. To work with a well-known corporation gives us very good credentials. ■



RITEK TAKES LEAD WITH NEW CONTRACT

The new contract with the Norwegian armed forces for a CV90 upgrade means growth and development for Ritek in the coming years. The contract also benefits many small and mid-size companies.

– The contract requires increased Norwegian involvement, and Ritek will be a hub for a large number of Norwegian companies in this project, says Hilmar Olsen, CEO at Ritek.

In July 2020, Ritek and FMA signed a contract for the preparation of surplus CV90 chassis prior to upgrade. A complementary contract with BAE will cover the full scope upgrade program as a follow on production of existing configuration.

– This means that we can continue to develop our skills and our capacity for the CV90 system, and it strengthens us as a partner to BAE Systems, in Norway and internationally. This contract consolidates our position as a trustworthy partner to the big main contractors, who will vie for the coming procurements in Norway, says Hilmar Olsen.

Ritek and BAE Systems have had a close and trusting relation since 2010, a well working cooperation even when faced with major tasks and challenges.

– We had experience from demanding technical maintenance work from before 2010, but the CV90 project and the cooperation with BAE Systems has been a big step forward for Ritek as a company. Industrial cooperation has led to

considerable development in a number of areas, like purchase, supply chain, logistics, configuration and integration.

– Without the security that this partnership has meant to us, regarding tech transfer and BAE Systems' experience as system integrator, we would hardly have had the possibility to take on such demanding projects.

So far, Ritek increased its production capacity with 50 percent. A big part of the growth can be attributed to the CV90. New employees have been recruited as the company grows.

– We have recruited technically and mechanically skilled personnel from our region, as well as specialists with a background in the Norwegian Defence.

The new contract runs until 2023. Hilmar Olsson welcomes a continued partnership, and hopes for a future together with BAE Systems.

– We believe that BAE Systems solutions will continue their success in the future, and we would love to be a part of that success. ■

BAE Systems works closely with local partners to support economic growth through the transfer of knowledge, skills and technology.

CONTRACT FOR UPGRADING OF AIRSPACE CONTROL IN NORWAY

Forsvarsmateriell has entered into contracts with Thales Norway and Eidsvoll Electronics to upgrade SISAM, a communication system used by the Armed Forces to maintain airspace control in Norway.

The system is used for communication with aircraft and between civilian and military units that exercise airspace control in the total defence.

Today's SISAM has already been in use since the late 1990's. Forsvarsmateriell is now signing contracts with Thales Norway and Eidsvoll Electronics, respectively, for the upgrade of SISAM.

In total, the contracts have an estimated value of at least NOK 250 million, or 23 MEUR.

Digital off-the-shelf product

SISAM was at the time cutting-edge pioneering, with the possibility of open as well as highly graded communication in the same headset, along with high usability from touch screens. Today's system was originally delivered by Thales Norway AS and Eidsvoll Electronics AS (Eidel) jointly, and formed the basis for a major sales success in NATO.

The development contracts that the project has given rise to, have been negotiated as direct procurements in accordance with the Procurement Regulations for the Defence Sector (ARF). What is notable for this delivery is the early involvement of the industry, as both suppliers have contributed constructively to the project as early as in connection with the preparation of the Procurement Solution (FL). The materiel delivery is mainly off-the-shelf digital goods, but the software will be developed. The development is based on the current solution and prototype that was already funded through R&D (Research and Development).

Two separate agreements have been entered into with the suppliers, but they have committed to a close collaboration, in order to be able to deliver the upgrade of SISAM jointly.

– Through a fantastic collaboration with FFI, the Armed Forces and the FMA, we have developed a prototype of secure voice services. The technology will be industrial-

ized, and systems put into operative action at several of the Armed Forces' airspace monitoring locations through this contract. The technology has the potential for increased operational effect also in other usage scenarios, where there is a need to handle speech and interaction at different gradation levels, says CEO Tom Tuhus of Thales Norway AS.

– This is the largest single contract in EIDEI's history and lays the foundation for a good collaboration with the Armed Forces for many years to come, says Truls O. Andersen, CEO for Eidsvoll Electronics.

Combat-proximate ICT – program Mime

The project is part of the program Mime – combat proximate ICT. The defence sector is investing heavily in combat-close ICT to meet existing and future needs for information exchange and interaction between aircraft, vessels and soldiers on the ground, and with allied forces. In total, discussions revolve around several billion kroner for investments into combat-proximate ICT over the next ten years.

Mime joins together delivery packages for the Armed Forces from several related projects. The packages are referred to as delivery waves. Delivery wave 1 is the first comprehensive delivery from the program to the Armed Forces and will be carried out in the period 2021-2022.

Mime coordinates deliveries from as many as 17 investment projects in four capacities through Forsvarsmateriell. SISAM is an important part of delivery wave 1. In total, there will be 5 comprehensive delivery packages or waves to the Armed Forces up until 2030.

Three locations will have the new SISAM: Sørreisa, Ørland and the Armed Forces' headquarters at Reitan. Deliveries are scheduled for completion in 2023. ■■



SISAM (SIkkert SAMband) is a communications system being used by the Armed Forces to take care of controlling the Norwegian air space. *Ill. Thales*

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Brazilian Missiles for Gripen

The Brazilian Air Force (FAB) and AVIBRAS Indústria Aeroespacial signed a Memorandum of Understanding in order to formalize AVIBRAS' intention to develop long-range cruise missiles, with the contribution of the FAB, with regard to sharing of global military expertise and requirements for missiles of this class.

The MICLA-BR, so named in the Military Strategic Plan for Aeronautics (PEMAER), is a national project for the development of a long-range cruise missile, with propulsion based on a jet engine, to be launched from aerial platforms.

With the knowledge to be acquired during the development of the MICLA, it will be possible to design a family of similar missiles for application in various scenarios of armed conflict by the Brazilian Armed Forces.

The benefits to be generated with this initiative go beyond the increase in the defense capacity of Brazil, as it will contribute to the promotion of the Industrial Defense Base, generating jobs, technological evolution, and even foreign exchange through the possibility of exporting technological products of high added value.



A poster of the MICLA-BR long-range cruise missile that Avibras will develop to arm the Brazilian Air Force's F-39E Gripen fighters.

Photo: FAB photo

UAV's to the Norwegian Armed Forces

Norwegian company Nordic Unmanned has been awarded contract as system integrator including training and life cycle support for the Norwegian Defence Materiel Agency for VTOL (Vertical Take Off and Landing) UAS.

The framework contract, under the name "VTOL UAS", is one of the most valuable mini VTOL UAV defense contracts of 2020 in Europe.

The contract is a non-exclusive framework contract available for the Norwegian Ministry of Defence and Justice with all subordinate agencies. The duration of the contract is 3 years, with options to extend the du-

ration of the contract up to a total of 7 years. The initial call-off is expected to be done within the following months.

Details of the framework contract:

- Nordic Unmanned is the system integrator and oversees all quality systems and project management according to client requirements.
- Nordic Unmanned will deliver training and MRO services.
- Nordic Unmanned will provide system integration of radios from the Norwegian producer Radionor Communications AS.
- Lockheed Martin is the OEM of the Indago products



This test firing of the MdCN naval cruise missile is the last milestone in a series of tests designed to verify the correct functioning of the Suffren's armaments and of its combat system in general.

Exocet firings from Submarine

On October 20, 2020, the French submarine Suffren, the first-in-series of the six new nuclear-powered attack submarines (SSNs) in the Barracuda programme, successfully

completed the test firing of an MdCN (Missile de Croisière Naval) naval cruise missile from the sea near the DGA missile test centre at Biscarrosse.

F-35s to UAE

The US State Department has notified US Congress of its desire to sell the United Arab Emirates (UAE) 50 F-35s in a \$10.4bn deal.

The proposed sale would make the UAE the second country in the Middle East after Israel to operate the Lockheed Martin stealth fighter.

Israel has to date ordered 50 F-35s, the same number of

fighters as the White House is proposing would be sold to the UAE. Israel could increase its fleet to 75 jets in future.

Any deal to sell the jets must win the approval of Congress, where the sale could face stiff opposition. Discussion around the sale has stepped up in recent months following a deal to normalise relations between the UAE and Israel.



An Australian F-35A Lightning II at Luke Air Force Base.

Photo: U.S. Air /Jensen Stidham

Tempest future fighter worth £25bn to UK economy



Mockup of the Tempest future fighter.

Photo: Leonardo

A Analysis report commissioned by BAE Systems on behalf of Team Tempest, the has concluded that the project to develop a future fighter will contribute at least £25bn to the UK's economy and support an average of 20,000 jobs a year between 2026 and 2050.

Team Tempest is a partnership between BAE Systems, Leonardo, Rolls-Royce, MBDA and the Royal Air Force's (RAF) Rapid Capabilities Office, as well as a host of small-medium enterprises and academia.

The report added that for every 100 people directly employed by Team Tempest, a fur-

ther 270 would be employed across the UK.

Tempest is expected to come into service in the mid-2030s and is set to replace the Eurofighter Typhoon within the RAF. The aircraft is set to form part of a broader combat air system that will likely include 'wingman' uncrewed aerial systems (UAS).

Team Tempest today also unveiled several insights into the programme including that Leonardo, the programme's electronics lead, was developing new radar systems capable of providing over 10,000 times more data than existing systems.

China's 2nd Aircraft Carrier to be Combat-Ready by Year-End

China's first domestically made aircraft carrier, the Shandong, has completed regular testing and training missions at sea.

The testing and training included aviation support, dam-

age control and emergency response.

It set out for military exercises on September 1, and experts hoped it would be combat-ready by the end of 2020.



Chinese Navy's second aircraft carrier, Shandong, will be declared operational by the end of the year, according to Chinese media.

China MoD photo

EU to allow Britain, U.S. and Norway on future joint defence projects

The European Union will allow non-members such as Britain and the United States to take part in future joint EU defence projects, but only on an exceptional basis.

The decision resolves a long saga over whether Britain could take part in a new EU defence pact, known as Permanent Structured Cooperation (PESCO), which aims to help the EU fund, develop and deploy armed forces together. It will not amount to an EU military.

The breakthrough of an impasse which dates back to June 2018 also helps to revive EU defence integration efforts launched with great fanfare in December 2017, in part to show unity after Brexit, but which ran into bureaucratic hurdles.

In May this year, the European Commission made a

long-awaited proposal to earmark 8 billion euros (\$9.5 billion) of its next budget on a new, complementary EU defence fund, keeping alive a Franco-German desire to deepen military cooperation among EU nations that have long pursued independent projects.

While the United States, the world's biggest military power, has 30 weapons systems, the EU has 178. The bloc has 17 types of battle tank, compared to just one in the United States.

A senior EU diplomat said in late October that the rules on Participation of non-members will allow Britain and others, such as Norway and the United States, to take part in future projects to develop aircraft, helicopters and weapons.



Patria's 6x6 armored vehicle will serve as the basis for the new armored vehicle to be jointly developed by Finland and Latvia.

Photo: Henri Patrikoski/Patria

Development of a 6x6 Armored Vehicle System

In October, Finland, Latvia and Patria land signed an agreement on research and development of a common 6x6 armored vehicle system based on a Patria vehicle.

The purpose of the armored vehicle development agreement is to develop Patria Land Oy's 6x6 vehicles on a single platform, which will perform the functions of soldier transport and command. The agreement will allow other possible vehicle variants to be de-

veloped at a later stage.

It is planned that the research phase of the new vehicles will end at the end of 2021, after which the partner countries will be able to start negotiations on the purchase of the new 6x6 armored vehicles. The first deliveries of 6x6 vehicles could take place already in 2021.

The total value of the vehicle development contract is approximately 7.3 million Euros, and its costs will be covered equally by Latvia and Finland.

Russia Test-Fires New ABM Interceptor Missile

Russia's Aerospace Force has successfully test-fired a new missile of the country's anti-



Test launch of a new missile for the Russian missile defense system. Photo: Russian MoD

ti-ballistic missile (ABM) defense system at the Sary-Shagan proving ground in Kazakhstan, the Defense Ministry of Russia announced.

Last time, Russia's Defense Ministry reported about the test-launch of a new interceptor missile from the Sary-Shagan proving ground on July 2, 2019. The interceptor missile also successfully coped with its task, striking the notional target with the required accuracy.

Russia's ABM system operational in the Aerospace Force is designed to defend the country against strikes by a potential enemy's aerospace attack weapons.

F135 Engine Maintenance Depot

Kongsberg Aviation Maintenance Services AS (KAMS) announced that it has signed a contract with Pratt & Whitney, officially starting operations at Rygge, one of the five planned F135 Maintenance, Repair, Overhaul & Upgrade (MRO&U) facilities, or depots, worldwide. Together, the depots will be responsible for sustaining the global engine fleet that powers the F-35 Lightning II fighter aircraft.

This contract marks the transition of the KAMS MRO&U facility to qualification and operations from activation and training in support of achieving Initial Depot Capability by the end of 2021. The contract is the first in a series to span decades providing MRO&U and logis-

tics support to the global F135 motor user community.

The KAMS F135 engine depot has the capacity to support multiple repairs, overhauls and logistic services including handling spare parts.

KAMS will employ and educate mechanics, technicians and logistics personnel that will incrementally take on more complex repairs and an increased work scope of the F135 engine. The depot facility is designed with expansion in mind to accommodate future work and other business opportunities.

Kongsberg Aviation Maintenance Services AS (KAMS) is majority owned by Kongsberg Defence & Aerospace with 50.1% of the shares and Patria of Finland owning 49.9%.

Dutch CV90s to get composite rubber tracks



The reduction in noise and vibration helps to minimise crew fatigue. The CV90s will receive rubber tracks jointly developed by Soucy International and BAE Systems Hägglunds. Photo: BAE System Hägglunds

BAE Systems will equip Dutch CV90s with composite rubber tracks as part of a €500m upgrade programme to the Infantry Fighting Vehicle (IFV).

The Royal Netherlands Army will follow the Norwegian Army, which has already equipped its vehicles with the rubber tracks and used them in Afghanistan.

Switching from steel to the composite rubber track has the benefit of reducing the vehicle's weight and noise in the crew compartment by as much as 65%.

The weight reduction increases the efficiency and running costs of the vehicle as well as freeing up payload for the addition of future systems.

Soucy designs and manufactures the tracks and BAE Systems Hägglunds has qualified them in full-scale trials.

The Royal Netherlands Army is also set to start equipping its CV90s with Elbit Systems' Iron Fist Active Protection system, following an agreement to integrate the system in 2019. BAE Systems Hägglunds is leading the integration of Iron Fist on the Dutch IFVs.

CV90 is currently also in-service with Denmark, Estonia, Finland, Norway, Sweden and Switzerland – with the operating countries a part of what Hägglunds calls the 'CV90 Club'.

Italian-Polish-Spanish Tank?

Italy is looking for partners to jointly develop the successor Ariete main battle tank, and has to date offered Poland and Spain to form a partnership to develop it.

The Italian initiative stems from its failure to win a role in the French-German Main Ground Combat System (MGCS), as after two years of discussions those two countries want to get the project up and running before opening it

to additional members.

- The alternative with Poland and Spain, which have also been excluded from the Franco-German MGCS program, is on the table, while a pan-European program, as well as the alternative idea of proceeding with a bilateral program with Israel, is more remote, Italian Deputy Defense Minister Angelo Tofalo told Italian parliamentarians in early October.



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Avinor Air Traffic Control work station.

Ill.Kongsberg

Spain's Menorca Airport to operate with KONGSBERG's Remote Tower System

Together with Gesnaer Consulting and Avinor Air Navigation Services, KONGSBERG has been selected to provide the KONGSBERG advanced Remote Tower System for Air Traffic Control at Menorca Airport. Instead of a traditional view of the airspace and runways, the system includes a 360° panorama high resolution camera system for a live out the window view and a pan-tilt zoom camera for the controller's binocular functions.

The design of the Electro-Optical Sensor Suite includes a rotating platform housing a visual and infrared 360° daylight and infrared cameras and a pan-tilt camera platform with a visual zoom camera, an infrared camera, a laser range finder and a signalling light. The digital out the window view

is displayed for the controllers on high resolution monitors.

The system can be extended to control multiple airports from the same control centre. Remotely controlling several airports from the same location is what Norway is currently setting into operation. KONGSBERG and Avinor Air Navigation Services are working together on the Ninox program that includes 15 different airports that will all be operated from a new control centre in Bodø, Norway. Two of which are operational and controlled by Bodø today, and the next thirteen are lined up to be connected into the control centre.

The system will be delivered in 2021. Gesnaer Consulting is responsible for implementing and executing the project for AENA.

UK seeks to reduce wind farm impact on air defence radar system

The UK Ministry of Defence's (MoD) Defence and Security Accelerator (DASA) has awarded contracts to five companies to develop technologies that will eliminate offshore wind farms' interference on air defence radar system.

The contracts follow an investment worth £2m by the UK Government. The companies are Thales, QinetiQ, Saab, TWI and Plextek DTS.

Defence Minister Jeremy Quin said: "We want more offshore wind farms to help deliver our ambitious environmental agenda while retaining the protection that radar provides.

Thales will partner with the University of Birmingham and

SMEs to develop surveillance to reduce the wind farm 'clutter', while Saab will use artificial intelligence and doppler filtering to develop a radar mitigation system.

QinetiQ will develop two proposals. In the first method, it will use new materials to prevent the distortion of the radar, while the second method will develop radar-absorbing materials that can be installed on offshore wind turbines.

TWI will be responsible for the development of new methods to create conductive coating that will absorb radar for turbine blades, in collaboration with the Centre for Metamaterial Research and Innovation of University of Exeter.



The UK MoD wants to reduce windfarms' impact on UK air defence radar system. The photo displays Wind turbines overlooking Ardrossan, Scotland.

Photo: Vincent van Zeijst

Electrical driven fiber optical drum



Photo: Micropol

Sweden based company Micropol Fiberoptic AB announces the introduction of an electrical driven fiber optical drum for harsh environments. The cable drum fills an important gap in the market for distance-controlled robots. Distance control is required when there is a risk for the operator's health and safety. In traditional cases, communication between robot and operator is utilized by radio, but in situations where radio control cannot be used, due to e.g. radiation disturbance or radio shadow, fiber is required, especially when utilizing sophisticated sensors requiring high speed communication. The possibility to operate under radio silence is also important

for military customers, to avoid detection.

The cable drum communicates with the robot to either deploy or retract the cable harness, adjusting speed and direction of the drum. Cables and connectors used are based on the Swedish Armed Forces' specifications and are utilizing Micropol's FALCON expanded beam connectors.

Micropol Fiberoptic is located outside Halmstad on the Swedish south west coast and have been in business for more than 30 years. Micropol's products are used in a whole range of technologies, from complex fiber optic networks for telecom and data communication, to advanced sensor systems for industrial, medical and military applications.

France to Develop New Aircraft Carrier and Next-Gen SSBN

France will develop and build a new aircraft carrier to enter service in 2038 to replace the Charles de Gaulle now in service, French Armed Forces Minister Florence Parly announced in October.

In a video speech marking the opening of the Euronaval online exhibition, Parly said “Regarding the new generation aircraft carrier, I can confirm that this program will be launched to give a successor to the Charles de Gaulle in 2038,” adding that “it will offer an op-

erational framework that will be perfectly adapted, from the outset, to our future combat aircraft, known under the name of SCAF.”

Parly also announced that, “in the coming months, I will launch construction work on third-generation ballistic missile submarines.”

This confirms the long-term modernization of France’s fleet of four Le Triomphant-class ballistic missile submarines, presently armed with the M51 nuclear warhead ballistic missile.



TRML-3D radar.

Photo: Hensoldt



Aircraft Carrier Charles de Gaulle.

Photo: USMC/J. Smith

Third TRML-3D to Royal Thai Army

The sensor solutions provider HENSOLDT will equip the Royal Thai Army with its TRML-3D.

This is the third TRML-3D ordered by the Royal Thai Army. The radar will be delivered in 2022.

The mobile systems TRML-3D is used in surveillance and air defence missions supporting short-range air defence weapon systems. It is a fully coherent multi-mode phased array sur-

veillance and target acquisition radar system designed for detection and air defence.

The 3D radar is capable of detecting, tracking, and classifying various types of targets with a particular emphasis on small, fast and low-flying aircraft, missiles and hovering helicopters. TRML-3D has been in service since 2004 and is in operational use with different armed forces worldwide.



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Spanish Eurofighter.

Photo: T. Felce / wiki

New Eurofighters to Spain?

Eurofighter has submitted proposals for the replacement of the Spanish Air Force's F-18s which are based on the Canary Islands.

Spain is looking to secure 20 new Eurofighter Typhoon aircraft to boost its existing fleet under what is called Project Halcon.

Airbus is in the process of negotiations with the Spanish

government to mature the proposal and a contract for the 20 aircraft is expected to be signed in 2021.

The 20 latest-standard Eurofighter Typhoon aircraft would feature the E-Scan radar, which is currently under development.

The Spanish Air Force Eurofighter fleet is 73-strong.

31 NH90 helicopters for shipborne operations

Replacement of German Sea Lynx fleet with an evolution of the Sea Lion.

The German Bundeswehr has ordered 31 NH90 NFH helicopters, to be known as Sea Tiger, for the German Navy's shipborne operations. The helicopters will replace the German Navy's Sea Lynx Mk88A fleet which entered into service in 1981. The Bundeswehr has already ordered 18 NH90 Sea Lion naval transport helicopters, seven of which have already been delivered.

The widespread use of the NH90 TTH by the German Army and the NH90 NFH by

the German Navy enables considerable synergies in terms of logistics and training. Naval flight crews and technical staff have already been undergoing basic NH90 training together with Army's NH90 crews since the introduction of the Sea Lion.

100 naval NH90 helicopters have already been delivered to six nations and have completed over 70,000 flight hours in search and rescue, humanitarian, and military operations. There are currently 430 NH90 helicopters in service worldwide that have accumulated over 270,000 flight hours.



German NH90 Sea Lion.

Photo: Airbus

Vestdavit wins contract to supply six French Navy vessels

Marine-davit manufacturer Vestdavit has secured a contract with shipbuilder Socarenam to supply fast rescue boat davit systems for six patrouilleurs d'outre-mer (POM) vessels for the French Navy. The 80-metre-long ships will serve as part of the Navy's POM programme, providing surveillance and protection for France's extensive exclusive economic zone (EEZ), which includes parts of the Caribbean and the Indian Ocean.

Currently under construction at the Socarenam yard on in Saint Malo, the offshore patrol vessels are due for delivery between 2022 and 2025. Each of the six diesel-electric POM ships will deploy one PLD-5000 fast rescue boat davit system to enable fast launch and rescue operations in waters surrounding French overseas territories.

"Because France's EEZ is so widely distributed, the Navy's POM vessels are built for varying and unpredictable conditions – and their davits need to match this level of flexibility," says Vestdavit Area Sales Man-

ager Redouane Lahsen. "The PLD-5000 fast-rescue davit comes equipped with an adjustable and detachable docking head, making it one of the most flexible boat-handling systems on the market."

Lahsen explains that the A-frame, single-point solution was specially designed to support the launch and recovery of larger boats weighing as much as five tonnes, and that its automated painter boom allows safe handling up to sea state 5. Its guiding arms, shock absorbers and wave-compensating winch system provide additional layers of safety and comfort for craft and crew, adds Lahsen, while its compact, simplified design facilitates installation and maintenance.

Vestdavit designs, supplies and supports tailor-made solutions for launching and recovering boats in difficult conditions at sea. Since 1975, Bergen-based Vestdavit has supplied over 2000 davits and side and stern launch systems.



French patrouilleurs d'outre-mer (POM) vessel.

Ill. French Navy

Boeing and US Navy to Demo Future Ramjet Missile Technology

Boeing has been awarded a \$30 million contract from the Navy to co-develop the Supersonic Propulsion Enabled Advanced Ramjet (SPEAR) flight demonstrator with the Navy's Air Warfare Center Weapons Division. The contract award comes after the Department of Defense requested information from the defense industry to help the Navy determine technical requirements of future carrier-based land and sea strike weapons systems.

Boeing and the Navy Air Warfare Center Weapons Division plan to fly the SPEAR demonstrator in late 2022. Prior successes by Boeing in developing supersonic and hypersonic technologies include the X-51 Waverider test vehicle in 2010 and the Variable Flow Ducted Rocket propulsion system under the Triple Target Terminator program in 2014.

Boat-handling systems to U.S. Navy

Vestdavit Inc., the US operation set up by davit supplier Vestdavit, has won a contract to deliver boat launch-and-recovery systems to two Expeditionary Fast Transport (EPF) vessels belonging to the United States Navy. Currently under construction by global shipbuilder Austal at its yard in Mobile, Alabama, the EPFs will assist the Navy's military and humanitarian efforts worldwide.

Vestdavit will supply a 2TDB-7000 davit system to each of EPF 13 and EPF 14, the latest vessels to be commissioned as part of the US Navy's EPF program. With EPF 13 due for delivery in late 2021, both ships will be deployed in the high-speed, intra-theatre transport of personnel and supplies as well as military vehicles and equipment.

The hydraulically operated 2TDB-7000 davit will enable the safe launch and recovery of

11-meter rigid-hull inflatable boats in conditions up to sea state 6 and at 10 knots. The system is specifically designed for flexibility, he says, and features a painter boom, a wire hauler, shock absorbers and dual independent winches with constant-tension, controlled by PLC. It is made of robust steel, with an aluminium foundation frame minimizing overall weight.

Vestdavit's selection to provide boat-handling systems for EPFs 13 and 14 reaffirms its standing as the preferred davit supplier of international navies and coast guards. In addition to signing agreements with the Royal Navy, the French Navy and the Royal Australian Navy in 2020, the Bergen-based company recently won a contract to supply davits to two Expeditionary Sea Base ships for the US Navy.



The RAPIDFire system.

Photo: Nexter

French Navy ships with a new generation of artillery

The RAPIDFire system developed by the consortium formed by Thales and Nexter has been chosen by the French defence procurement agency (DGA) to equip future French Navy vessels with new artillery.

This new weapon system will provide the Navy's surface vessels with an effective close-in defence capability against modern air and surface threats.

RAPIDFire is a gun system that offers high precision thanks to its optronic fire control system integrated onto the turret, its

advanced algorithms, powerful gun and automatic ammunition management system allowing the best reactivity and efficiency for the operator. RAPIDFire incorporates the new medium calibre 40 mm gun developed by CTAI, the international subsidiary of Nexter Systems and BAE Systems. The system is compatible with the full range of ammunitions developed for land forces programmes and is predisposed to the use of future ammunition as the smart Anti Aerial Airburst (A3B) round.

Carl-Gustaf for US Army

The US Army has signed a multi-year framework contract worth up to \$87m with Swedish firm Saab to procure Carl-Gustaf multi-role, man-portable shoulder-fired weapon systems.

The indefinite-delivery, indefinite-quantity (IDIQ) contract will allow the US Army to place orders for the latest version of the weapon system, designated as M3E1 in the US, during a seven-year period.

The latest version of M3E1 weighs 14.8lb, around 8% lighter than its preceding variant M3. Carl-Gustaf is used by the ground forces as an anti-tank weapon system and to neutralise other challenges.

Saab has already received an initial order of \$9.2m, with deliveries slated next year.

As agreed, the weapon systems to be delivered under this contract will be used by the US Army, US Marine Corps and Special Operations Command.



The US Army will procure the latest version of the Carl-Gustaf multi-role, man-portable shoulder-fired weapon. Photo: SAAB

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New Mission Master – Armed Reconnaissance system

Rheinmetall's Mission Master - Unmanned Ground Vehicle (A-UGV) family has just gained a new member: the Mission Master – Armed Reconnaissance. Equipped with intelligence-gathering technology and a Rheinmetall Fieldranger remote-controlled weapon station (RCWS), the new Armed Reconnaissance module is designed to collect tactical intelligence in the area of operations while providing frontline fire support whenever necessary.

The Mission Master – Armed Reconnaissance is de-

signed to execute high-risk scouting missions and deliver a real-time common operating picture without putting soldiers in danger. Its payload consists of long-range EO/IR sensors, a surveillance radar, a 360° full ring camera, a laser rangefinder and a laser designator to identify potential threats. To further enhance the line of sight for the sensors while keeping a concealed posture, the reconnaissance payload is installed on a 3.5-metre expandable mast with a tilting mechanism.

Propeller systems for five F110 frigates

Kongsberg Maritime has secured a contract worth NOK 200 million with Spanish shipbuilder Navantia to supply propeller systems for five F110 frigates, currently in construction for the Spanish Navy. These next-generation vessels are designed to follow on from Navantia's F100 frigate.

KONGSBERG is well placed to deliver propulsion systems to meet the most stringent specifications thanks to the Kongsberg Maritime Research Centre (KHRC) in Kristinehamn, Sweden, which is known for its work in hydrodynamics and advanced designs.



Art impression of a F110 frigate, currently in construction for the Spanish Navy. III. NAVANTIA

Finnish Army tests multiple launch rocket system GMLRS ammunition

The Finnish Army has carried out test firing of the multiple launch rocket system ammunition to test its long-range fires readiness. The test firing was conducted to check the precision and effectiveness of the multiple launch rocket system Guided Multiple Launch Rocket System (GMLRS) Unitary rockets for point effects precision fire.

It also involved the validation of the GMLRS Alternative Warhead (AW) rockets for area effects.

The GMLRS Unitary rocket has a range of around 80km and explodes on target. However, the GMLRS AW is developed to service area targets and explode above the target without the unexploded ordinance effects.



The test firing was carried out in Rovajärvi Live Fire and exercise range from 16 to 17 November.

Photo: The Finnish Defence Forces

Follow-on JSM contract with Japan

Kongsberg Defence & Aerospace AS has entered into a second follow-on contract with Japan to supply the JSM (Joint Strike Missile) for their fleet of F-35 fighter aircraft. The contract is valued 820 MNOK.

The JSM is a 5th generation stealth air-to surface missile developed to fill F-35A anti-sur-

face warfare and land attack capability gaps. JSM can be carried internally in the F-35 thus ensuring the aircraft's low-signature capabilities. The JSM has superior performance against well-defended sea- and land targets across long distances.

W5 Solutions Wins Ground Power Unit Procurement

To satisfy the Swedish Armed Forces need for electric power supply to its Sikorsky Black Hawk and NHIndustries NH90 helicopters, W5 Solutions has been awarded a contract for the delivery of Ground Power Units (GPU). The GPU output rating is 50kVA and the system is adapted to the helicopter specific needs. In addition to fulfilling tough requirements on electromagnetic compatibility (EMC), power quality and operational environment, the GPU is also completely mobile. Delivered on a trailer it can easily be towed and the design en-

sure easy loading onto a transport aircraft, such as Lockheed C-130. With its built-in diesel engine, the GPU is completely self-supplying.

W5 Solutions is a Swedish company with extensive experience in providing products, systems and services to the defence and security sector. The company has a long experience in development, production and delivery of simulators, power supply equipment, live fire targetry and communication systems. The products are fielded in approximately 50 countries globally.



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Testfiring of Patria Nemo.

Photo: Patria

U.S. Army testing Patria Nemo 120 mm mortar system

Patria has entered into an agreement with the U.S. Army to conduct a turreted mortar feasibility study in the form of Foreign Comparative Testing (FCT). The testing complements ongoing cooperation between Patria and the U.S. Army on a Cooperative Research and Development Agreement (CRA-DA) announced in May.

The study consists of several tests and demonstrations in the U.S. and Finland. Through these events Patria and the Army are testing Patria Nemo 120 mm turreted mortar system performance with U.S. ammu-

munition and against U.S. requirements.

This agreement is a continuation of the U.S. Army's effort to provide Armored and Stryker Brigade Combat Teams with rapid, precise indirect and direct fire capability where the operating crew is well protected, and their physical burden is significantly reduced. In 2018 and 2020 the Army published market surveys to identify capable sources to develop and produce the 120 mm Modular Turreted Mortar System (MTMS). Patria answered the market surveys based on Patria Nemo mortar system.

20,000th Remote Weapon Station (RWS)

Kongsberg Defence & Aerospace AS (KONGSBERG) is pleased to announce that it has delivered its 20,000th Remote Weapon Station (RWS) from its PROTECTOR family of products.

The system has been in use from 1999 by The Norwegian Armed Forces, and has developed into a family of versatile systems with capability to integrate weapons from 5.56 mm rifles to 30 mm cannons, anti-tank and air defence missiles,

mission oriented sensor packages and flexible control solutions. The PROTECTOR RWS has been sold to 23 nations including Norway, United States, United Kingdom, France, Germany, Canada, Australia, the Netherlands and Switzerland.

More than 17,000 stations are delivered to United States alone, where unit number 20,000 was a PROTECTOR Low Profile for the U.S. Army M1V3 Abrams Main Battle Tank.



RWS on top of armoured vehicle.

Photo: Kongsberg

NASAMS for Hungary

Longtime partners Kongsberg and Raytheon Missiles & Defense were awarded a Euro 410 million contract by Hungary for the National Advanced Surface-to-Air Missile System, also known as NASAMS. Hungary becomes the 6th NATO nation and the 12th country in the world to acquire NASAMS, a highly adaptable medium-range solution for a variety of operational air defense requirements.

The program enables long term industrial cooperation between Hungarian and Norwe-

gian industry.

The NASAMS air defense solution is comprised of Raytheon Missiles & Defense's AMRAAM and AMRAAM-ER missiles and Sentinel radar, and Kongsberg's Fire Distribution Center (FDC) and canister launcher. NASAMS offers air defenders the proven effectiveness of the AMRAAM missile which is in the inventory of 39 countries. Sentinel is a proven air defense radar deployed by more than 18 countries and has been evolved to address the C-UAS threat.

Air-to-air refuelling of P-8A Poseidon

The Australian Department of Defence has announced that one of the surveillance aircraft of the P-8A Poseidon fleet of the Royal Australian Air Force (RAAF) completed the first air-to-air refuelling with a KC-30A multi-role tanker transport.

The KC-30A multi-role tanker transport from the RAAF

Amberley home base refuelled P-8A Poseidon from RAAF Base Edinburgh's No 92 Wing.

Seven refuelling flights between 22 September and 1 October occurred between the two aircraft.

The refuelling was carried out at designated training airspace off the Queensland coast.



In a first, a RAAF KC-30A refuels a P-8A Poseidon. Photo: B. Sherriff

Australian sensors for Joint Strike Missile

Kongsberg Defence and Aerospace has placed a Purchase Order with BAE Systems Australia for an initial batch of Passive Radio Frequency Sensors for the Joint Strike Missile (JSM).

The order is the first Full Rate Production order of the sensors and is part of a broader co-operation agreement that KONGSBERG and BAE Systems Australia have been successfully operating under for the past five years.

Following initial funding by the Australian Government, KONGSBERG and BAE Systems Australia have continued

to invest in the qualification and integration of the Australian sensor into the JSM, providing additional capability to the fifth-generation, long-range, precision-guided, stand-off missile system.

The order follows a set of flight trials that demonstrated the successful integration of the electronic systems into the missile.

JSM is highly effective against maritime and land targets, and is the only anti-ship cruise missile that can be carried internally within the F-35 Joint Strike Fighter. ■

HENSOLDT - EXCELLENCE IN SENSORS ACROSS ALL DOMAINS

HENSOLDT is a pioneer of technology and innovation in the field of defence and security electronics. We develop innovative, integrated and customer-specific solutions in the fields of radar, electronic warfare, avionics and optronics.

Our company's know-how is based on the pioneering spirit of our renowned predecessor companies such as AEG, Aerospatiale-Matra, Daimler, Dornier, EADS, Siemens, Telefunken, as well as Carl Zeiss and Airbus.

Formally established in 2017, HENSOLDT now has 5,500 employees worldwide and achieved revenues of 1.11 billion euros in 2019. In 2020 HENSOLDT became a publically traded company on the Frankfurt stock exchange.

RADAR & IFF - THREAT DETECTION IN THE AIR, AT LAND AND AT SEA

HENSOLDT's radar systems are in operational use in surveillance, reconnaissance, air defence and air traffic control, combined with in-house manufactured and certified IFF systems. To name a few:

TRML/TRS-4D, our latest generation of naval and land radar systems uses

state-of-the-art AESA technology, allowing for fastest response time and high hit probability in a complex environment with a high target density and both, agile and asymmetric threats. These radars are used especially in MRAD and frigate applications for air and surface surveillance.

The **Spexer 2000 3D** radar product family can be used for sea, land, and air surveillance in fixed, deployable and mobile configurations. It represents high-performance surveillance at short ranges for ground, sea and air targets, such as persons, vehicles, helicopters and jets down to very small drones.

The **TwInvis passive radar** uses existing electromagnetic energy from analogue and digital radio- and TV-broadcast transmitters. Being completely passive, TwInvis can detect and track targets in a wide range without being seen. The technology also enables detection of very low RCS targets and high resistance against jamming.

OPTRONICS - FOR A CLEAR VIEW, DAY AND NIGHT

HENSOLDT's optronics solutions are deployed on various platforms, including submarines, armoured vehicles, manned and unmanned aircraft and satellites, for land, air, sea and space missions.

HENSOLDT is a trusted partner to the armed forces of the Nordic countries with products ranging from rifle scopes to submarine periscopes. The periscopes SERO14 and SERO15 are used in the Norwegian ULA class submarines, as the first customer with this combination already in 1989. Leopard Main Battle Tank optics and optronics also come from HENSOLDT; we are the LEOBEN approved solution provider for these MBTs.

HENSOLDT optronics products are utilizing short to long wave thermal imaging, low-light level technology. Coupled with effective SW image enhancement and AI, we are providing cutting edge performance. Combined with our laser range finders and designators, we can provide a complete suite of surveillance, observation and targeting optronics.

In the spirit of innovation, **SETAS**, the so called "see through armoured system" was developed by HENSOLDT. The system provides the crews of armoured vehicles an exceptional 360° live visibility of their surroundings, thus providing a constant situational awareness without having to leave the safety of their vehicle.

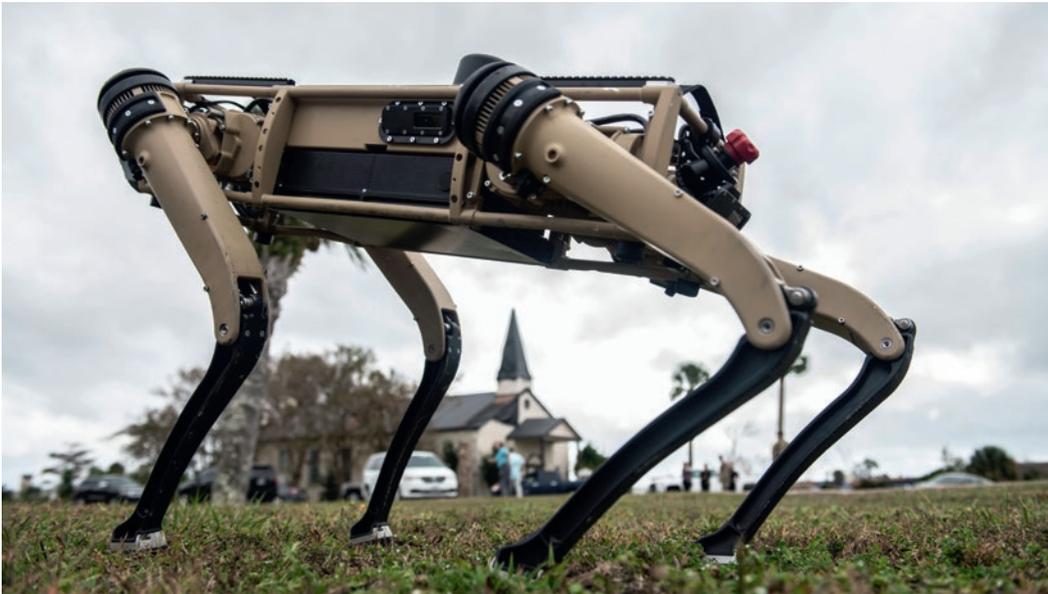
HENSOLDT - MUCH MORE

In addition, our solutions range from Electronic Warfare, Counter-UAS to Cyber and from Avionics to Space.

Contact us at www.hensoldt.net



US AIR FORCE DEPLOYS SEMI-AUTONOMOUS ROBOT DOGS



By February 2021, the squadron expects to have four of the robo-dogs in place around the base's perimeter, where they can either roam on their own or be manually operated for up to seven hours before they'll need to hit a charging station. The robot dogs are weatherproof, four-legged, unmanned patrolling drones that have two-way communication abilities and high-tech sensors that cost about \$100,000 per unit.

Photo: USAF/ Tiffany Price



Airman with a Ghost Robotics Vision 60 robot dog.
Photo: US Air Force

The US Air Force (USAF) has announced that the Tyndall Air Force Base in Florida will deploy semi-autonomous robot dogs into their patrolling regiment.

Tyndall Air Force base Security Forces Squadron had partnered with Ghost Robotics for the development of a system to increase security and safety for the base population.

The robots resemble a dog but will not replace the military working dogs. The robot dogs will be used as a force multiplier for enhanced situational awareness by patrolling areas that are not desirable for human beings and vehicles.

The dogs will be given a specific patrol path overseen by security personnel, whom will be able to see exactly what the robot dog is detecting through its mobile camera and sensor platform if desired. The personnel we will also be able to issue verbal commands to a person or people through a radio attached to the dogs. The dogs are not there to hurt anybody but if someone attempts to steal or otherwise "harm" the robot, a defense mechanism is triggered that will hurt the predator. ■

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