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NORWEGIAN DEFENCE AND  
SECURITY INDUSTRIES ASSOCIATION



**FSi**

# GIRAFFE 1X

FLEXIBLE PROTECTION  
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# ELECTRONIC WARFARE; A CRACK IN NATO'S DEFENCE

Last September, for more than a week, the GPS signals in the airspace above Eastern Finnmark were suddenly gone. Finnmark is the northern area of Norway, and the eastern part shares a common border with Russia.

According to open sources, civilian air traffic reported losing GPS signals when reaching an altitude of approximate 2000-3000 meters. Naturally the incident caused great concern within the Norwegian aviation authorities.

Recently, presenting his non-classified "Annual report on assessment of current security challenges", the chief of the Norwegian Intelligence Service admitted that the September incident in Eastern Finnmark was caused by Russian electronic warfare units.

For years, Russia has spent great amounts of resources developing equipment and competence on electronic warfare. Several incidents reported all over Europe confirms this capacity.

For NATO's armed forces, the use of electronic signals for positioning, mapping, weapon guidance, communications, etc, is crucial. The operational effect of highly advanced military systems will be significantly reduced without the ability to send and receive reliable electronic signals. In some cases, entire military capacities might even be completely cut off if electronic signals are lost.

Similar to the deployment of long range precision missiles, the Russian electronic warfare capacities again give proof of Russia's disturbing ability to allocate resources and funding to developing the exact weapon systems and technologies that cause the most headaches within NATO.

As a counter-move against the long-range precision missiles, a number of nations are looking into missile shields for protecting their most highly prioritized military installations. Missile shields, however, are expensive to purchase and costly to operate.

What counter measures to take against electronic warfare attacks are yet to be clarified. As of today, it seems like the NATO nations have a major job to do, developing technologies that can reduce the effect of an advanced and massive strike from electronic warfare systems. And let there be no mistake about this – any effective defence against electronic warfare solutions is bound to be expensive.

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### Coverphoto:

A K9 Thunder test firing the new Nammo base bleed artillery shell at a test range in Southern Sweden.

Both Norway and Finland has selected the South Korean K9 Thunder for their new artillery.

The new shell design Nammo is known as the 155 mm IM HE-ER (Insensitive Munitions, High Explosive, Extended Range).

Nammo's new artillery ammunition reaches a maximum height of 16 km, or more than 50,000 feet, when fired at its maximum range of more than 40 km

Photo: Nammo



# NEW ARTILLERY FOR NORWAY

In December, the Norwegian Ministry of Defence signed a contract with South Korea for the delivery of their K9 Thunder as the new artillery system for the Norwegian Defence. The K9 Thunder has been developed and is manufactured by the South Korean Hanwha Techwin (formerly Samsung Techwin), and counts the Finnish Defence among its earliest users.

The Korean artillery won ahead in the competition against the German Panzerhaubitze 2000 from Krauss-Maffei Wegmann and Rheinmetall; the French Caesar wheeled artillery from Nexter, and the M109 KRAIT developed and made by the Swiss Ruag. M109 KRAIT is an upgraded version of the American M109 artillery.

– Our main reason for choosing the Korean alternative is that the system was able to meet a convincing number of the requirement specifications we had set. A large number of K9 Thunder have

been operative in the Korean artillery over several years, from which it follows that the system is thoroughly tested in practice. To us, this means getting an artillery with a great degree of operational matureness, which is an important factor in reducing the technical risk inherent in the project, says senior advisor Asgeir Spange Brekke of Forsvarsmateriell.

We also considered the fact that the system is well adapted to operations under Norwegian conditions, continues Brekke, while adding that the purchase price was a significant factor as well.

The K9 artillery has been supplied in several varieties, and the Norwegian configuration consists of solutions picked from a number of these variations. What is unique for the Norwegian configuration, however, is the integration of Norwegian communications systems on the artillery vehicles.

The contract covers 24 units of the type K9 VIDAR as well as 6 units K10 VIDAR ammunition re-supply vehicles. Further to this, logistics and education materiel will be procured.

Norway also holds an option for six K10 VIDAR ammunition vehicles, as well as a further option for another 24 units of K9 VIDAR artillery and 12 units of K10 VIDAR ammunition vehicles.

## Possible co-operation with Finland and Estonia

In February of last year, the Finnish Ministry of Defence confirmed its intention to buy K9 Thunder artillery



from South Korea. Finland will buy a total of 48 second-hand units from the South Korean Army, at a total cost of some 155 million USD. (Finland also holds an option for another 48 units). The Korean artillery systems will likely replace elderly, Soviet-made artillery systems in the Finnish Army.

From the Norwegian Ministry of Defence comes the confirmation that Norway will be looking into the possibilities of a closer collaboration with Finland on the artillery side. With Norway and Finland now procuring materiel that is to all intents and purposes identical, there will be opportunities for co-operation within all the usual fields of training and exercise, logistics and spare parts, maintenance and whatever future upgrades may lie ahead.

### K9 Thunder for Estonia

The Estonian government has confirmed the receipt of an offer for 18 K9 Thunder howitzers from the government of South Korea. The 12 howitzers offered have seen some use, though little, in the South

Korean army. Estonia is planning to buy its K9s in collaboration with Finland, and the Estonians had the possibility to tap into the in-depth preparatory work done by Finland.

A spokesman for the Estonian Army points out that the use of similar artillery by several countries in the region creates good possibilities for using each other's maintenance and training capabilities, and also makes easier the manufacturing and certification of ammunition for weapons that are to be used under similar conditions.

If the purchase is made, the first units are expected to arrive in Estonia in 2021, the last ones by 2026. The Estonian Army expects to operate their K9s for at least 30 years to come.

In addition, the offer includes an option for the purchase of eight to 12 more K9 howitzers.

The price is confidential and will only be published once an agreement is signed. According to open sources, the agreement is expected to be signed in first half of 2018.

### K9 Thunder

The K9 Thunder is a South Korean self-propelled 155 mm howitzer developed by Samsung Techwin for the Republic of Korea Armed Forces. It was developed to supplement and then replace the K55 self-propelled howitzers in South Korean service.

K9 is an indigenous system of an all-welded steel armour construction which is rated to withstand 14.5 mm armour-piercing rounds, 155 mm shell fragments, and anti-personnel mines. The unit also supports full CBRN protection.

The main gun on the K9 has the ability to fire its shells in MRSI mode (Multiple Rounds Simultaneous Impact). In the MRSI mode, the K9 is able to fire three shells in under 15 seconds – 1 shell every 5 seconds – each in different trajectories so that all of the shells will arrive on their target at the same time.

The K9 has a unique hydro-pneumatic suspension system, a requirement for Korea's rugged mountainous terrain.

In June 2016, a new fully automatic projectile-and-charge loading system was revealed. The system will be retrofitted to the K9, essentially giving it a robotic turret. The purpose is to reduce the crew needed to operate the vehicle to two soldiers.

### K9 THUNDER SELF-PROPELLED ARTILLERY SPECIFICATIONS

- ▲ **Place of origin:** South Korea
- ▲ **Designer:** Samsung Techwin, Agency for Defence Development  
Designed 1989–1998
- ▲ **Unit cost:** Estimated: \$3.9 million
- ▲ **Produced:** 1999–present
- ▲ **Weight:** 47 tonnes
- ▲ **Length:** 12 m
- ▲ **Width:** 3.4 m
- ▲ **Height:** 2.73 m
- ▲ **Crew:** 5 (Commander, Driver, Gunner, 2 Loaders)
- ▲ **Main armament:** 155mm howitzer (Cal 52)
- ▲ **Secondary armament:** 12.7 mm (.50 calibre) K6 HMG
- ▲ **Engine:** MTU MT 881- diesel engine, 1000 hp
- ▲ **Power/weight:** 21 hp/ton
- ▲ **Operational range:** 480 km
- ▲ **Speed:** 67 km/h
- ▲ **Maximum climbing slope:** 60% (31 degree)
- ▲ **Maximum firing range:**  
30,000 m (HE)  
38,000 m (DP-ICM base-bleed)  
41,600 m (K307 Drag reduction  
Extended range full-bore base-bleed)  
52–56,000 m (K315 BB+RAP extended range)

### Export customers

Besides Norway, Finland and possibly Estonia, several other nations has acquired or shown interest in the K9 Thunder.

Samsung Techwin sold the K9 subsystems to Turkey. Turkey received its first batch of the K9 subsystems and the license to produce the subsystems domestically in 2004. The domestic Turkish self-propelled howitzer was named as T-155 Firtina. Turkey is expected to field a force of 300 Firtinas by 2011.

Samsung Techwin has also formed a venture in 2012 with Indian conglomerate Larsen and Toubro to supply the K9 for the Indian Army. The vehicle is named K9 VAJRA-T and is a variant of the K9 specially designed for operation in the desert areas on the Pakistani border. So far, India have signed contract for 100 units, of which first 12 units will be produced in Korea, the rest in India.

The K9 Thunder is one of contenders for supplying Egypt with new artillery systems, other howitzers competing with the K9 including those from Russia, South Africa and France, specifically the CAESAR self-propelled howitzer. Egypt is expected to sign contract within two years. ■■



The Norwegian version will be named K9 VIDAR (Versatile Indirect Artillery System). The Norwegian Fire Support System is named ODIN, after the ruler God in Norse mythology. VIDAR was one of ODIN's sons.

Photo: Finnish Army



The Korean K2 Black Panther main battle tank. The Korean Army operates the K2 with a crew of three, several of which are conscripts. Most of the competing tanks on the market today require a crew of four. Photo: Korean Army

## K2 BLACK PANTHER FOR NORWAY?

In the wake of Korean industry's success in securing the contract for new artillery for Norway, the Koreans have also been sniffing at the possibility to supply armoured vehicles for the Norwegian Defence. The K2 Black Panther from the Korean company Hyundai Rotem is a freshly developed battle tank, which is now being presented as a possible candidate for the replacement of the current Norwegian Leopard 2 battle tanks.

— **W**e are naturally fully aware of the strong Norwegian tradition for choosing German battle tanks. With this in mind, we would still like to see Norway conducting an open contest for the supply of these vehicles, and taking the time to test the various alternatives like it was done for artillery at Rena last winter, says Mogens Rasmus Mogensen of the Danish MED (Military Equipment Denmark), representatives for Hyundai Rotem to the Nordic countries. — We are confident that the Norwegian Defence will then find that there are viable alternatives to the German offering, capable of competing head-on in terms of both operative capacity and quality, not to mention purchase price and life cycle costs.

— In our view, the K2 tanks come with a number of advantages over the competition. First and foremost comes the weight of the battle wagons, at some 56 tons. In comparison, the latest version of competitor tanks weighs in at 65 to 70 tonnes or more. Further on, K2 as well as several tanks in the market today, is powered by a diesel engine rated at 1500 hp/1118 kW, providing the K2 with a far

superior power to weight ratio, Mogensen explains.

— In addition, I would like to point to the suspension system in the K2 wagons. These are hydraulic suspensions, and most easily comparable to the hydro-pneumatic suspensions of some advanced Citroën passenger car models. This suspension system offers huge advantages in a battle tank. When running across uneven terrain, the tanks are more stable, with less shaking and more controlled movement caused by the ground being covered.

The same suspension system also offers the possibility of raising or lowering the K2 wagon, Mogensen continues to explain. In the normal state, the ground clearance under the vehicle will be about 45 cm's, but this can be raised to over 55 cm, and not least significantly, lowered to 15 cm. This provides advantages, not just when driving across rough terrain, but also operational advantages in that the tank can be lowered for lesser exposure, such as when taking position behind a building or a protrusion on the ground. And this is not all; the front and rear parts of the vehicle can be raised and lowered independently of each other. This

### FACTS

- ▲ **Crew:** 3
- ▲ **Combat Weight:** 56 tonnes
- ▲ **Size (LxWxH):** 10.8 x 3.6 x 2.4 m
- ▲ **Engine:** 1500 hp (1118 kW) Diesel
- ▲ **Power / Weight ratio (hp/t):** 27.3
- ▲ **Ground clearance:** 0.45m (Adjustable: 0.15-0.55m)
- ▲ **Max speed:** 72 km/h
- ▲ **Max speed cross country:** 50 km/h
- ▲ **Water fording depth:** 4.1 m
- ▲ **Main gun:** 120mm 55 Calibre smooth bore
- ▲ **Ammo loading:** Autoloader
- ▲ **Ammunition:** 40 rounds
- ▲ **Secondary weapons:** 12.7 mm machine gun and 7.62 mm machine gun
- ▲ **Armour Protection:** Composite armour / ERA
- ▲ **Active protection system:** Soft kill or Hard-Kill (option)
- ▲ **Identification of Friend or Foe:** Yes

means that the lowest elevation angle of the cannon can be reduced another few degrees, by lowering the front and raising the back of the wagon, while conversely, the nose can be lifted while the rear squats. The latter configuration offers extra capacity for engaging higher targets, such as an infantry position up a hill side, or aircraft and helicopters flying at low altitude.

— I would also like to point out that the K2 Black Panther has been in operation in the Korean Army since 2014, and before this, prototypes underwent thorough testing by the Korean Defence through almost five years. Hence, the K2 is a solidly tested alternative, carrying minimal risk, states Mogensen in conclusion. ■■



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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

## FORSVARSSAMARBEID I EU – NORSK FORSVARSINDUSTRI PÅ UTSIDEN?

I For noen få dager siden fattet forsvarsministrene i 25 EU-land beslutning om oppstart av de 17 første samarbeidsprosjektene i EUs nye forsvarssamarbeid PESCO. Samtidig ble diskusjonen om tredjelands muligheter til å delta utsatt. Danmark, som har reservert seg mot forsvarssamarbeidet i EU generelt og Storbritannia, som er på vei ut, får dermed ikke anledning til å delta i PESCO-prosjekter inntil videre. Norge er selvfølgelig også utenfor så lenge modalitetene for eventuelt samarbeid med tredjeland ikke er avklart.

Dette føyer seg inn i et mønster som vanskelig kan tolkes annerledes enn at toneangivende EU-land har satt seg fore at Europas strategiske autonomi skal sikres gjennom samarbeidsmodeller der de selv utvikler rammene og stiller betingelsene, før eventuelle andre nasjoner får anledning til å delta i prosjektene.

Parallelt med utviklingen av PESCO arbeider EU ufortrødent videre med å etablere det europeiske forsvarsfondet (EDF), som skal legge til rette for en konkurransedyktig europeisk forsvarsindustri. Fondet er delt i to, forsvarsforskning (DR) og et

program for utvikling av europeisk forsvarsindustri (EDIDP). Kommisjonens ambisjon er at fondet, etter 2020, årlig skal sikre 500 mill. EUR til forsvarsforskning og 5 mrd. EUR til utvikling av teknologi, produkter og systemer. De første tre årene frem t.o.m. 2020 er en prøveperiode for å teste ut hvordan forsvarsprosjekter kan gjennomføres i EU. Fondet etableres innenfor rammen av det indre markedet, med styrket konkurransevne for europeisk forsvarsindustri som hovedbegrunnelse.

Norge har, som eneste tredjeland, fått anledning å delta i det forberedende programmet for forsvarsforskning (PADR) som ble startet opp i fjor. Utviklingsprogrammet for Europeisk forsvarsindustri (EDIDP) er inne i den siste og avgjørende behandlingen i Brussel i de såkalte «trilogue» forhandlingene mellom Kommisjonen, Medlemsstatene og EU-parlamentet. Her ligger det ikke an til at Norge vil få delta i EDIDP. Det gir grunn til bekymring.

EUs nye fremstøt på forsvarsområdet er langt mer ambisiøse enn noe vi tidligere har sett og det er all grunn til

å ta dette på alvor. Til forskjell fra tidligere forsøk på å regulere forsvarsmarkedet, har kommisjonen nå tatt initiativ til å legge betydelige summer på bordet for å støtte forsknings- og utviklingsprosjekter. Dersom det ender med at norsk forsvarsindustri holdes utenfor, vil det helt åpenbart være uheldig og svekke industriens muligheter til å vinne innpass i europeiske samarbeidsprosjekter på sikt. Blir konsekvensen at det store europeiske markedet blir enda mer lukket enn det allerede er, er det alvorlig for norsk forsvarsindustri.

Forsvarsfondet etableres innenfor rammen av det indre marked, der Norge gjennom EØS-avtalen har et avklart forhold til EU og medlemslandene. Norge har implementert EUs direktiver om forsvars- og sikkerhetsanskaffelser. Det sikrer at EUs forsvarsindustri kan konkurrere i det norske forsvarsmarkedet. Dersom vi i fremtiden får en situasjon der europeiske bedrifter skal konkurrere i det norske markedet med teknologi og produkter som er utviklet med betydelige subsidier fra EU, uten at norsk industri får anledning til delta i disse pros-

jektene og i tillegg med dårligere markedsadgang enn i dag, vil det bli sterkt konkurransevridende i norsk industris disfavør, både hjemme og ute. Dette kan ikke være i samsvar intensjonene i EØS-avtalen. Dersom det norske forsvarsmarkedet skal være åpent for europeiske leverandører, må det, med EØS-avtalen og europeisk industris markedsadgang i Norge som begrunnelse, forutsettes at Norge og norsk forsvarsindustri også får anledning til å være med i EU-subsidierte programmer som forsker frem ny teknologi og utvikler nye produkter i Europa. Det vil være bra også for Europeisk forsvarsindustri som norsk industri er en integrert del av.

Norske myndigheter arbeider for dette og det er viktig at dette arbeidet videreføres med en klar målsetting om at norsk industri skal kunne delta i EDIDP prosjekter etter 2020. I tillegg må det vurderes å iverksette tiltak for å kompensere for den åpenbare konkurransevridningen det vil innebære dersom europeisk industri skal kunne konkurrere i Norge og med norsk forsvarsindustri internasjonalt med produkter der utviklingen subsidieres av EU.



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# INNOVATION DAY AT THE NORWEGIAN MILITARY ACADEMY: CADETS MEET INDUSTRY

In collaboration with the Cadet Society, the FSi held its Innovation Day at the Norwegian Military Academy in Oslo in November last year. The purpose of this effort is amongst others to acquaint the officers of the future with industry, and to present the latest in technology and products.

The seminar part was particularly concerned with the Land Force Study and the manner in which this was conducted, including how games and simulations were used to evaluate different options for the future land forces.

Svein Erlend Martinussen from the Norwegian Military Academy provided insights into how simulations and games with different scenarios influenced the results of the Land Force Study. Several relations were uncovered, explained Martinussen, while emphasising



Several businesses presented their compact, portable radar solutions. Managing Director Richard Norland from the Moss-based company ISPAS explained that their radar among other features has the capability to make a distinction between drones and birds, which is becoming increasingly important under the current threat perception. ISPAS has sold a number of radars to the oil industry, but none to the Armed Forces as per this date. The company was originally a spin-off from the Norwegian Defence Research Establishment.

Photo: MilitærTeknikk



Rune Fleischer from Thales presented the company's portable radar systems.

Photo: MilitærTeknikk

that even observations of how Team Red, which is the enemy in the game, reacted to our army, proved very useful.

– We could also observe how the teams acted upon prerequisites of which the teams themselves were not fully aware, and that in some cases might actually be erroneous.

Col. Jan Fredrik Geiner of the Norwegian Army Weapons School drew up some main elements from the Land Force Study, and pointed to current deliberations on procuring more anti-air defence for the Army, and on the procurement of missile based long range precision weapons. The long term plan is also suggesting a stop to the upgrading of armoured vehicles, and a move towards the investment into a modern and future-proof combat vehicle, and that such a vehicle will be in need

of active protection, Geiner underscored.

The long term study also proposes for conscription to remain in force in the future, and we have also suggested the prolongation of conscription duties for relatively large groups of candidates. We had expected to meet with quite considerable resistance to this item, but to our surprise, it has sailed right through without much debate.

**Much interest in the technology fair**

In parallel with the seminar part, a technology fair was also arranged, with exhibitors from the industry making an appearance.

The cadets showed keen interest in the exhibits, where they were presented with the very latest and newest of what is available today, and with plans for future materiel. ☒



Cadet Petter Torud testing out the control unit for the Kongsberg weapons station, mounted on an Eagle armoured vehicle from the Swiss manufacturer Mowag.  
Photo: MilitærTeknikk



**INFO/ERFA 2018**

**ENDRINGSEVNE – VÅR STØRSTE UTFORDRING?**

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# TECHNOLOGY CONFERENCE WITH THE SPECIAL FORCES

Two years ago, the Technology Conference with the Special Forces was held in the city of Horten. This year's conference was located in Bergen, and for reasons of great interest, the conference was moved from the Commander's Residence (Kommandantboligen) to the more extensive facilities at the Royal Norwegian Naval Academy (RNONA).

The conference was opened by Col. Halvor Johansen giving an overview of the Special Forces, their future procurement plans, and their focal areas.

The Special Forces are highly prioritised in the Armed Forces, and even though we have been on tight budgets for the last four years, with the F-35 laying claim to huge portions of the defence budgets, we are intending to conduct materiel investments to the tune of hundreds of millions of NOK over the years to come. These are investments into materiel specific to the Special Forces. In addition to this, we will receive a share of the materiel procured by the armed forces in general, for example ammunition.

Many of the investments will naturally be concerning materiel that is re-purchased after it is used up, broken or worn out, but quite a few new materiel purchases are also to be conducted. For the industry, special interest may be attached

to solutions being developed jointly with us as projects, and which may later be procured in greater numbers by the armed forces in general.

The Special Forces are also undergoing a shift in focus, from the international arena in general to domestic areas, where the opponents will be significantly more high-tech oriented than what has been the case in the matter of international operations.

This poses new challenges on the materiel front, where we are looking at three main aspects.

In the first place, we need to develop more robust capabilities with enhanced endurance.

Secondly, we acknowledge that up against a technologically advanced adversary, requirements to our keeping a low signature will be more demanding. And this comprises not just camouflaging equipment and personnel, but also low-signature communications and sensors.



– Even though the Special Forces are now realigning focus towards Norway and the neighbouring areas, we will continue to maintain capabilities to take part in and conduct international operations. This means having to cover a large spectrum of operational arenas, from snow and ice to jungle and desert, says Col. Halvor Johansen of the Armed Special Forces. Photo: Marinejegerkommandoen

The last main challenge we face is the need of greater operational integration vs. other units of the Armed Forces, says Johansen, citing as an example long-range weapons and the facility for target advice for these.

Quite specifically, our greatest areas of effort will lie in command, control and information systems.

We are also looking at the possibilities inherent in the field of unmanned systems, and especially within small, light and mobile systems.

Mobility is also a keyword when taking a broader view of

our investment desires, both on land, at sea and in the air.

And even though airborne mobility for the Special Forces has been the subject of much debate, we hope that we will end up with a good solution here as well.

Further to the above, we are also aware that major parts of the personal weaponry portfolio will probably need replacing from 2020 and beyond, says Johansen in closing, adding that the Special Forces are enjoying excellent co-operation with the Armed Forces' materiel works. ■■

## PROJECT P6359: FUTURE MARITIME MINE COUNTER MEASURES CAPABILITY – CRITICAL CAPABILITY FOR NORWAY

**In a crisis or war-like situation, maritime mine counter measures capability (MCM = Mine Counter Measures) will be vital for Norway, both to guard the transport lines north to south along the coast, as well as with regard to keeping sea lanes open for our allies to be able to deploy reinforcements.**

Even though the Navy's mine clearing vessels in themselves are still in good shape, several of the on-board systems are close to reaching the end of their effective service life, while the access to spare parts for many of these systems is already showing signs of becoming a problem. This means the Navy is at a cross-roads, between getting replacements for major parts of the on-board systems currently in use, or having to look into the acquisition of all-new capabilities.

### Getting personnel out of the mine field

Among the most important aspects in the selection of future maritime mine counter measures capability is that of personnel safety. This is an area where all-new technology is likely to afford a much greater degree of personnel safety in mine clearing operations at sea than what has been the case with the current fleet of mine clearing vessels. Not least the advent of remote-control technology and the development of autonomous vessels mean that there will no longer be a need to send manned craft into waters that may be infested with sea mines. Furthermore, there is reason to believe that remotely controlled and autonomous vessels will come with somewhat lower life-time costs than manned units.

– A lot of countries are working on developing their MCM capabilities, and they

are all looking like moving towards unmanned systems, with a greater or lesser degree of autonomy, says Bjørn Schjerven of the Ministry of Defence, before emphasising that the concept for the future MCM capability of Norway has yet to be determined.

From the Norwegian side, we are keen to collaborate with other countries on developing the MCM capability of the future, and Germany has already indicated that they would be interested in co-operation. It is also said that this interest is not just owing to the ongoing

collaboration on submarines between Germany and Norway. It is our understanding that the Germans are interested in Norway because Norwegian industry and defence alike have highly developed underwater and submersible technologies.

### MCM capability: Vital for the national security interest

MCM is a capability that is of strategic importance to the security of Norway as a nation. Furthermore, the conditions along the Norwegian coast, regarding the coastal topography as well as the seabed, the climate situation and the water temperatures are in combination quite unique compared to all other countries. This could mean that Norway in the procurement of future MCM equipment will probably not be bound by the EU regulation on defence procurement and

competitiveness, but will be in a freer position to choose Norwegian businesses as co-operating partners.

The Ministry of Defence has assigned the Norwegian Defence Research Establishment the task of conducting a defence-industrial analysis, in the project P6359: Future maritime mine counter measures capability. This defence-industrial analysis will among other things chart the relevant competence in Norwegian industry, and examine the opportunities for Norwegian industry to participate in the various phases of the project. The analysis will also be looking into the possibilities of early co-operation, national development, direct procurement from the Norwegian defence industry, limited national competition, participation in multi-national development programmes or other kinds of international collaboration. ■



Working on the future Norwegian maritime mine counter measures capability: From the left; Morten Nakjem (FFI), Christina Brouwers (MOD), Bjørn Schjerven (MOD), Rune Fardal, FFI, and Bjarte Haugsvær (Norwegian Navy)

Photo: MilitærTeknikk

# PROGRAM CONFERENCE AIR SYSTEMS; FIFTH GENERATION FIGHTERS – FIFTH GENERATION AIR DEFENCE

The first program conference this year, the Program Conference on Air Systems, took place on February 15th. More than 80 delegated from the defence community and the industry had homed in on Lysaker in Bærum, near the old Fornebu Airport.



Lt. Col. Espen Gukild of the Air Force and Arne Gjennestad from Kongsberg Defence & Aerospace. Photo: MilitærTeknikk

For the Air Force, it goes without saying that the new F-35 fighters are by far the biggest and most demanding project in terms of resources. The implications of the F-35, however, go far beyond the procurement of new fighter aircraft by the Air Force.

– We are now getting a fifth-generation fighter system, which means that we need to progress ourselves into a fifth generation air defence, was the pointed opening remark of Lt. Col. Espen Gukild.

This means that for us to be able to fully exploit the capabilities of the F-35 fighter, we also need to develop our organisation, our routines, and not least – raise our competence levels.

Activities surrounding the F-35 aircraft will be concentrated to a few bases with high

combat capability. These bases are Ørland, Evenes and Rygge. To achieve high combat capability at the bases, a crucial factor is the protection of the bases.

In this base protection, ground-based air defence is one of the most important elements, Gukild continues. And this air defence, to be effective, needs a mix of missiles in order to counter all the currently perceived threats we are facing. Furthermore, great demands are made of the sensor part of the air defence.

And in addition to this, the F-35 bases will need base defences. The air stations and the grounds surrounding the air stations cover huge areas, far too great to cover with personnel alone. In order to mount a relevant base defence, the system must be based on

various sensors connected to a CCI system, where personnel to a greater extent function as a rapid deployment force.

Ground based air defence, challenges, and opportunities

The challenge in locating air defence on the ground lies in particular on the sensor side. The curvature of the earth as well as the uneven terrain with hills and mountains, valleys and cities et cetera, will obscure radars and other sensors, and to a long-range air defence system, this may limit the operational range, explains Arne Gjennestad of Kongsberg Defence & Aerospace. It is likely that a greater number of radars will be required to achieve adequate coverage, as well as air defence weapons with shorter range as a supplement to the long-range air defence. ■

## MAINTENANCE OF THE NH-90 HELICOPTERS

The status of the NH 90 delivery is that as per this date, seven of the total of 14 helicopters have been delivered, reports Harald Sveen of the Norwegian Defence Materiel Agency. Six of these helicopters are so-called IOC helicopters (“Initial Operational Capacity”) that are to be reverted to the manufacturer for upgrading, and the first of these IOC choppers will return to the factory in the course of summer this year. The first machine with FOC (“Full Operational Capacity”) was delivered in January this year.

On the maintenance side, the component maintenance including engines has been covered by the supplier up to June 2019, according to the contract. Beyond this, we have already entered into a contract with Patria for more extensive maintenance.

Regarding maintenance after the summer of 2019, we are looking into several possibilities, says Sveen in closing. Among other things, we are looking at possible co-operation with other NH 90 nations, as well as the possibility of working together with the industry or the supplier.



Harald Sveen of the Norwegian Defence Materiel Agency, section Air Capabilities.

Photo: MilitærTeknikk

# EXPORT CONTROLS AND SANCTIONS;

## - IMPORTANT REGULATORY MEASURES FOR NORWEGIAN DEFENCE INDUSTRY

Like most other countries, Norway's military industry operates under a strict regimen of controls and limitations for the export of weapons, ammunition and military materiel in general. For the defence industry, thorough knowledge about these regulations is essential, and when the FSi held a seminar on export controls and sanctions, the audience counted more than 80 delegates from the defence industry.

Export control and sanctions are enforced by the Ministry of Foreign Affairs, and basically there are two regulations that limit Norwegian exports: Export controls on one side, and sanctions on the other, said Erik Furu, deputy director of the Ministry of Foreign Affairs' Export Control Section.

### Export Control

The basis for export controls is what types of goods and services are to be exported.

– The backdrop for the export control regulations is that Norway wishes to make sure that any export of military materiel is done within the confines of Norwegian foreign policy and according to Norway's international obligations, said Furu. And even though weapons and military materiel are at the focus point of export control, there are also other goods and services that are subject to strict controls regarding their exports. The export control regulations are in three parts, starting with the "Act of 18 December 1987 relating to control of the export of strategic goods, services, technology, etc". This is supplemented with item lists, and with the "Guidelines of 28 February 1992 for the Ministry of Foreign Affairs".

### Item lists

Export of certain articles are subject to licence according to the regulations on export control.

Licensable items are described in two item lists.

List 1 (ML) contains military materiel, which includes weapons, ammunition and other military materiel and attendant technology.

List 2 is the so-called Dual Use list, which includes multi-purpose items that are primarily of a civilian type, but may carry a major military significance.

– The Norwegian lists are drawn up and revised in close collaboration with the European Union, and the lists used by Norway are by and large identical to the lists used in the EU in general, explains Asgeir Berg of the Ministry of Foreign Affairs, adding that the USA manages its own set of lists (the USML list).

In order to apply for an export licence, a good place to start is the search tool of the Ministry of Foreign Affairs, called "Elisens", and found on the web site of [www.eksportkontroll.no](http://www.eksportkontroll.no).

### Sanctions

Sanctions are largely based on which country is the destination for the export.

Sanctions are decided in international regulatory bodies, such as the United Nations' Security Council. Further to this, the EU may decide upon and enforce restrictive measures against certain countries, and Norway has a tradition of "always" adopting any restrictive measure taken by the EU, as the Norwegian side in general



Deputy Director Erik Furu (left) and Senior Advisor Asgeir Berg, from the Export Control section of the Ministry of Foreign Affairs.

Photo: MilitærTeknikk



Legal Assistant Magnus Viddal (left) and Partner Stein Ove Solberg of the Law Firm Arntzen de Besche gave advice on how businesses in practical terms should relate to export control and the sanction regulations.

Photo: MilitærTeknikk

desires a common policy with EU, and a similar set of rules applied to export industries.

### Challenging for the businesses

Messrs. Stein Ove Solberg and Magnus Viddal of the Law Firm Arntzen de Besche reviewed the more practical sides of how the businesses must manage their relations to Export controls and sanctions.

It is of vital importance that the company keeps abreast of the sanction rules and the export control rules and statutes at all times, opened Magnus Viddal. For this purpose, the Ministry of Foreign Affairs maintains a good set of home pages on their highly recommended web site. The Ministry of Foreign Affairs is also a very willing provider of information, but it is worth noting that seeking clarifications in a specific matter may take some time.

– For the businesses, it is a good idea to have a clear picture of who are the actual partners to any agreement, and who are

the third parties they are fronting, said Stein Ove Solberg in his opening. Businesses should also have routines to check up on agreement partners, and as a bare minimum, any information provided by the agreement partners should be verified, perhaps against publicly available records. In many cases, businesses are well advised to perform independent risk analysis of agreement partners, third parties and stake holders.

Businesses should also take protective steps in the contract documents, adding precautionary statements that the delivery must be approved by the Ministry of Foreign Affairs. Businesses must at all costs avoid finding themselves in a situation where they are torn between a breach of contract and upholding the regulations from the Ministry, emphasises Berg. Breaching contracts is usually quite costly, so businesses need to be protected by agreement clauses that includes provisions and exclusions based on export licences and possible sanctions. ■

FSi SMB CORPORATE PRESENTATION:

# dspnor

Dspnor was founded in 2003. Our initial product was the ScanFaker radar simulator hardware and software product range. Within a couple of years, we established a good reputation as a system problem-solver worldwide and have since worked for most of the major system integrators in the world.

Our business model allows us to offer both standard COTS products (60%) and custom design services (40%).

In 2012 a decision was made to add software to our portfolio and the ScanView Radar Processing Framework emerged as a result of this work.

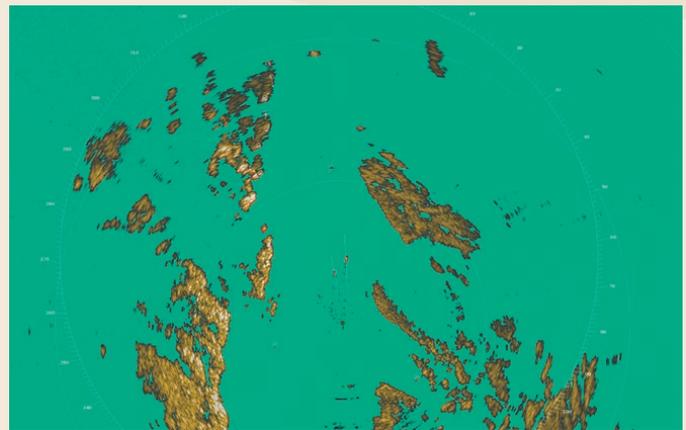
In 2015 we received the first orders for the ScanView servers that are now the foundation for the largest radar network in the

world, with more than 100 radars operating simultaneously.

In later years we have added RF capabilities and we are currently developing microwave applications for several customers.

In 2017 we moved into new purpose-built offices with multiple labs at the finest location in Bergen.

Dspnor employs 15 highly skilled engineers and have an export share of more than 90%.



## FACTS

▲ **Owners:** 90% Agde Group AS, 10% Others  
 ▲ **CEO and Chairman of the board:** Geir Agdesteen

▲ **FSI:** Dspnor has been a member since 2013. We decided to join FSI since the membership expands our network and may increase the chance of meeting the appropriate people when working internationally. Further, leaning on "lessons learned" from other Norwegian SME's is important for our own business development.

▲ **Input to FSI:** Maybe a more consistent distribution of offset opportunities?

▲ **Defence related activities:** We never disclose our customers, but the defence related activities are less than 30% of total sales.

▲ **Product range:** We offer what is probably the largest radar interconnect and processing range in the world, of which some are described here:

▲ **Radar Signal Converter (RSCC):** Analog signal converter that handle conversion to and from a number of proprietary formats. More than 50 different combinations are available.

▲ **ScanFaker Radar Simulator** With a few exceptions every navigational simulation vendor in

the market is using the ScanFaker/SoftFaker series to provide realistic radar video for their training scenarios. The interface supports the full functionality required by the different radar display vendors.

▲ **ScanStreamer Radar to LAN converter** With close to a 1000 units sold, the ScanStreamer has been a success since its introduction in 2012. It is the only converter on the market that offers both a sophisticated radar video processor and a seamless connection to any marine radar transceiver brand. No ScanStreamer has ever failed in operation, and an extremely low cost of ownership can therefore be achieved. Several versions are available.

▲ **DeStreamer LAN to Radar converter** Converts LAN radar data to various analogue formats in order to support existing C2 investments.

▲ **ScanView Radar Processing Framework:** The most significant package is the ScanServer Coastal Surveillance Server which is capable of extraction and tracking of more than 20000 targets and distributing the data in a number of formats including Asterix, IVEF, NMEA and HTTP. Other packages includes Fusion Server, Radar Display Servers and LAN format converters.

# EU DISAPPROVES OF DANISH OFFSET RULES

The EU Commission has opened an infringement procedure against Denmark over the country's offset rules.

By **Andreas Krog**

In the last part of January, the EU Commission opened infringement procedures and sent letters of formal notice to Denmark, Italy, the Netherlands, Poland and Portugal for not applying EU rules on public procurement in defence and security markets, or applying them incorrectly.

- In the case of Denmark, the Commission is concerned that the country has imposed unjustified offset requirements demanding compensation from non-national suppliers when purchasing defence equipment from them. It is Denmark's procurement of armoured personnel carriers and artillery that has caught the EU Commission's attention.

## Found a loophole

Denmark actually changed its offset rules back in 2014 to avoid having the EU Commission opening infringement procedures against the country. The commission found that the existing Danish rules were more a general setup, than they were a result of an evaluation of the specific acquisition. They also found that job creation was the main reason for demanding offset, and not the protection of Denmark's essential security interests. Finally, the rules did not take into account how offset obligations affects competition on the common market for products not specifically intended for military purposes.

After an extensive process the Danish Business Authority was convinced that they had found a loophole that made it possible to maintain an extensive degree of offset obligations for foreign industry doing business with The Danish Armed Forces.

The Danes found their loophole in Article 346 in the "Treaty on the Functioning of the European Union" (TFEU). This article's section b) allows EU countries to take measures they consider necessary for the protection of their essential security interests in connection with the production of or trade in arms, munitions and war material. Measures taken under Article 346 may not adversely



*The Danish offset rules from 2014 seems not to be acceptable for the EU Commission.*

*Photo: EU Commission*

affect competition on the common market for products not specifically intended for military purposes.

## Essential security interests

The key message in the new rules was therefore that it was necessary for the protection of Denmark essential security interests to have a competitive defence industry within certain strategic areas. If other measures were not sufficient to provide for this, offset obligations could come into the picture if the contract value is over DKK 50 million.

The Danish Ministry of Defence assesses the need for offset obligations on a case by case-basis. The Danish Business Authority thereafter assesses if the obligations will adversely affect the competition. Finally, The Defence Ministry decides if the foreign companies shall be obliged to deliver offset work equal to the whole value of the acquisition, or only a lesser share.

## Free movement of goods and services

The Danes believed the rules would be acceptable to the commission, but it now seems that they were not. The EU Commission sees offset requirements or equivalent forms of industrial return, compensation, industrial participation and industrial cooperation required from non-national suppliers as restrictive measures which go against the basic principles of the EU Treaty, because they discriminate against economic operators, goods and

services from other Member States and impede the free movement of goods and services.

A contract may only include the requirement to implement part of it in the recipient's country based on local resources if such a measure is necessary, if it is not possible to obtain this same result using less restrictive measures and if the measure does not adversely affect competition of non-military products, the EU Commission underlines in a press release.

With the European Defence Action Plan, the Commission wants to ensure the effective application of defence procurement rules to help companies operate across borders and help Member States get best value for money.

## Not that communicative

The Danish defence industry is following the EU's interest for the offset rules intensively. But the Danish Business Authority is not that communicative about the opening letter and Denmark's possible response.

"We are now in a process of reviewing the opening letter from the EU Commission. But due to national security interests, we cannot say more than that," director Katrine Winding from the Danish Business Authority said at a conference for Danish defence industry in the beginning of February.

Denmark and the four other EU Member States now have two months to respond to the arguments put forward by the Commission. ■■



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## – BULLETIN BOARD FOR DEFENCE, INDUSTRY AND TRADE –

### Hauled Self-Defence Pod

Israel Aerospace Industries (IAI) released a new electronic warfare system which provides an added layer of self-defence for aircrafts. The cost-effective system is hauled by the aircraft, protecting it by acting as distractor to radar-guided missiles. The new hauled "bait" is named ELL-8270.

The ELL-8270 is differentiated from other solutions in being completely autonomous, which means it needs no power or signals from the leading air-

craft and is hauled behind with a simple cord.

During flights in areas threatened by enemy missiles, the bait is deployed at a safe distance from the leading aircraft and emits signals to attract the missile, away from the aircraft. The system is capable of handling several threats simultaneously, can be used by all aircraft types, is extremely lightweight and can be rolled back into the aircraft or abandoned, if necessary.



Photo: IAI

### Saab to support South Korean AESA fighter radar development

Saab has received an order to support the development of an airborne AESA fighter radar for South Korea.

The radar development programme will be carried out in collaboration between the Korean Agency for Defence Development (ADD), Saab, and its contractual partner LIG Nex1.

Based in Seoul, LIG Nex1 is involved in the development

and production of a variety of advanced precision electronic systems.

Under the SEK125m (\$15.2m) order, Saab will support algorithm development and evaluation for the AESA fighter radar.

South Korea seeks to develop a domestic fighter aircraft equipped with relevant avionics equipment such as the AESA radar.

### XM17 and XM18 Modular Handgun System

The XM17 and XM18 handgun systems from Sig Sauer are replacing the M9 pistol. The "X" in "XM" stands for experimental and will be used until February 2018 when the weapons complete Type Classification. Afterwards, the weapons will be referred to as the M17 and M18. The XM18 is the compact version of the XM17. Both weapons are capable of firing 9 mm rounds.

The Army currently has plans to buy approximately 238,000 units of the new pistol system.

The main reason for the change in weapon systems is to make the soldier and units more lethal.



Photo: Sig Sauer

### Lightweight torpedo for Hamina-class ships

The Finnish Navy has signed a contract with Saab for the development and supply of new lightweight torpedoes for the four Hamina-class fast attack crafts (FACs).

The delivery is expected to form part of the navy's Squadron 2000 mid-life upgrade programme for the FACs, which will help ensure and develop the navy's mission capability.

Saab will also deliver torpedo systems, documentation, training and support services as part of the arrangement.

The contracted lightweight torpedo system is a flexible, advanced anti-submarine warfare

(ASW) solution that has been designed for littoral conditions.

The torpedo's wire control system enables operator support, allowing commanders to engage targets in close vicinity of friendly units, as well as in narrow spaces.

Delivery of the equipment is slated to begin this year.

The torpedo system can be launched from surface vessels, aircraft and submarines in various anti-submarine and anti-surface roles.

It is suitable for operations in both littoral and blue waters, as well as under cold, warm and brackish conditions.

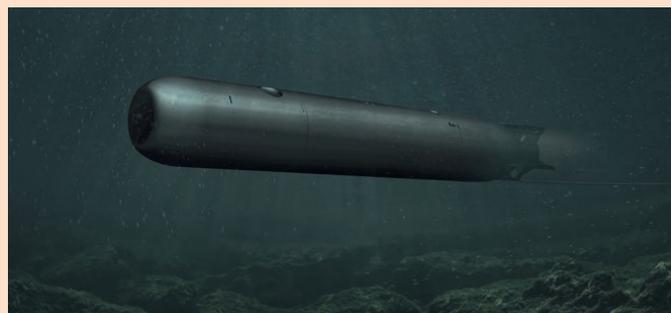


Photo: Saab

## Concerns over Carrier Strike budget

A UK parliamentary committee has expressed apprehensions regarding a potential threat to defence projects, which could be caused by possible cost overruns related to the country's Carrier Strike project.

The committee noted that the project is expensive and that

there is still a need to fully verify the cost of certain aspects of the initiative.

Carrier Strike is currently slated to involve the delivery of two Queen Elizabeth-class aircraft carriers, as well as new F-35 Lightning II jets and a new radar system.



The Queen Elizabeth aircraft carrier.

Photo: Royal Navy

## Tactical radios to Latvian Army

US-based manufacturer Harris has developed and delivered military tactical radios worth more than \$10.5m to the Latvian Armed Forces.

The acquisition is a part of the continuing efforts to develop a sustainable communications system compatible with other NATO allies. The tactical radios are expected to help strengthen the command capability of the Latvian Army.

The radios that were de-

livered last year use an encryption technique and were procured under a specific contract with the US Government.

In December last year, the Ministry of Defence and the US government signed a new deal for the delivery of tactical radios and accessories valued at more than \$17m.

Under the contract, the first batch of radios will be delivered to Latvia at the beginning of next year.

## Crypto telephones from Dutch ministries

The Dutch Ministry of the Interior has renewed and expanded its contract for secure communications with Sectra. The contract extends over four years and comprises Sectra's Tiger solutions for secure communications and will be delivered as a service, in which Sectra assumes overall responsibility for the system. With Sectra's solutions, Dutch ministries and government officials can communicate clas-

sified information relating to national security without the risk of eavesdropping.

All Dutch ministries have used Sectra's secure communications service since 2007. The service comprises Sectra's solutions at the very high SECRET level, and the contract is now being extended to also include Sectra Tiger/R, Sectra's solution for the secure use of smartphones, at the RESTRICTED level.

## Kongsberg and Patria support missile systems development

Norway-based Kongsberg Defence & Aerospace has entered into an agreement with Finnish firm Patria to create new opportunities for cooperation on missile systems.

Under the deal, the companies will work on the development of a Missile Competence Centre in Finland, open tactical framework (OTF) core technologies and system architecture software for missile programmes in the country.

The companies will also develop international opportunities linked to these capabilities.

The new centre will focus on advanced missile system technology to help support the Finnish Defence Forces in supplying effective local security. It will also support industrial missile development activities with Kongsberg's global customer base.

The collaboration will enable the two companies to support new opportunities in missile systems and coastal defence systems. This will develop a long-term partnership with the Finnish and international markets.

In March 2016, Kongsberg acquired 49.9% shares in Patria.

## Modular bridging system

BAE Systems has successfully demonstrated the safety and performance of its new Modular Bridging System, supporting its bid to provide the system for the British Army and export customers.

During testing, the company simulated more than 22,000 crossings of the Challenger 2 Main Battle Tank on the system. These have the equivalent weight of 121,000 double-decker buses.

The simulation was carried out at the company's bridge test facility in Telford, England.

Designed to offer a flexible and rapidly deployable military gap crossing solution, the new lightweight Modular Bridging System can be easily transported by air.

It can be used by army personnel to carry out assault crossings, restore vital lifelines and military routes, and provide rapid replacement of civilian infrastructure in combat and disaster relief.

Several smaller tests were also conducted with more than 300,000 fatigue cycles being carried out on individual components.

The bridge panels have been equipped with new Bluetooth-enabled sensors that help analyse approximately 100 strain readings each second.

This provides the soldiers with a more complete and real-time picture of the health of the bridge systems.

The development of the bridge involved 28,000 engineering hours.



Photo: BAE

## Piranha for Romania

General Dynamics European Land Systems (GDELS) has signed a \$1bn contract to supply Piranha 5 armoured vehicles to the Romanian Armed Forces.

Under the contract, the company will be responsible for delivering up to 227 units of the Piranha 5 vehicles to Romania in six different configurations.

The 8x8 wheeled Piranha 5s will be manufactured in

the country under a strategic cooperation and transfer of technology project between GDELS company Mowag and Romania-based Uzina Mecanica Bucuresti (UMB).

Since 2006, the Romanian Armed Forces has fielded variants of Piranha vehicles that have been used in a range of missions within the country and globally.



Photo: GDELS

## F-35 for Belgium

The US Defence Security Cooperation Agency (DSCA) has notified Congress of a possible foreign military sale (FMS) of 34 F-35 joint strike fighter conventional take-off and landing (CTOL) aircraft to Belgium for an estimated cost of \$6.53bn.

Along with 34 F-35 Joint Strike CTOL, the Government of Belgium also requested to buy 38 Pratt and Whitney F-135 engines, which include 34 installed and four spares.

The possible sale also includes electronic warfare systems, an autonomic logistics

global support system (ALGS), autonomic logistics information system (ALIS), full mission trainer, weapons employment capability, as well as other subsystems and F-35 support equipment.

Lockheed Martin Aeronautics Company and Pratt and Whitney Military Engines have been cited as the potential prime contractors for the FMS.

In 2015, the Belgian Government confirmed a requirement for 34 new multi-role combat aircraft to replace the 54 ageing F-16s.



A Dutch F-35. Recently the Belgium Government decided to buy 34 F-35 fighters. Photo: US Air Force

## Raytheon wins \$641m contract for BMDS testing activities

The US Missile Defence Agency has awarded a \$641.8m contract to Raytheon for conducting ballistic missile defence system (BMDS) tests for multiple radar platforms.

The work will be carried out by Raytheon's Integrated Defence Systems (IDS) business segment.

Under the indefinite-delivery, indefinite-quantity (IDIQ) contract, Raytheon will help the contractor test multiple radar platforms.

This includes planning, execution and evaluation of sensor performance in flight and ground tests as set out in the BMDS integrated master test plan.

## 3D-Audio system the US Air Force

Terma North America has received a \$44.3m contract to supply the 3D-Audio system to the US Air Force (USAF) until January 2024.

The company will provide engineering, integration, support equipment, spares, and repair services to the 3D-

Audio system of the F-16 C and D Fighting Falcon aircraft operated by the US Air Force Reserve Command and the US Air National Guard.

The 3D-Audio solution is designed to reduce acoustical and electrical noise in aircraft.



A Russian navy Ka-27PS factory-standard machine. The Navy's Ka-27PL antisubmarine versions are now being upgraded. Photo: Vladimir Karnozov

## Ka-27M helicopters to Russian Navy

Russian Helicopters has successfully completed the transfer of a batch of shipborne anti-submarine Ka-27M helicopters to the Russian Navy.

The upgrade provides the helicopters with all-around visibility in order to facilitate the detection of all types of vessels and submarines.

In addition to increasing the detection and destruction range of the aircraft, advanced methods of transmitting information to land and ship

based command posts have been installed on the helicopters as part of the initiative.

Ka-27-type helicopters have been designed to carry out anti-submarine warfare missions for the navy and can be integrated on-board a wide range of naval vessels, including aircraft carriers.

The Russian Naval Aviation's helicopter fleet includes several Ka-27 multipurpose helicopters featuring various modifications.

## First C-130J Super Hercules for France

France's Armée de l'Air has officially received the country's first C-130J Super Hercules aircraft for the airforce's 62nd Transport Wing.

The French Air Force will procure a total of four Super Hercules aircraft, which includes two C-130J-30 combat

delivery airlifters and two KC-130J aerial refuellers.

The deliveries of the jets are slated to take place throughout next year.

France's new C-130Js will be operated with its existing Hercules aircraft fleet.



Photo: French Air Force

## Ballistic missile defence for Turkey

Turkey has awarded Eurosam, Aselsan and Roketsan a contract for the definition study of the future Turkish Long Range Air and Missile Defence System.

Scheduled to last 18 months, this definition study aims at preparing the development and production contract for the future system meeting the operational requirements of the Turkish Air Force.

This study paves the way for the launch of a three-country joint Long Range Air and Missile Defence Program.

The future system will be ready by the middle of the next decade with a military capability designed to counter the most challenging threats (stealth aircraft, UAVs, cruise missiles, and ballistic missiles).

## Mid-life upgrade of Hamina Class fast attack craft

Patria has signed an agreement with the Finnish Defence Forces on the mid-life upgrade and overhaul of the Finnish Defence Forces' Hamina Class fast attack craft. The procurement is part of the Naval Capability Development Programme, based on which the overhaul of Hamina Class vessels will ensure continued naval defence capabilities in the period between the decommissioning of Rauma Class fast attack craft and the commissioning of Squadron 2020 corvettes during the 2020s. The total value of

the delivery contract, without options, is around 170 million Euros (excluding VAT). The estimated employment effect of the programme in Finland will be around 300 person-years.

Patria will act as the prime contractor, designer and lead system integrator having the overall responsibility for the project. The delivery includes a number of sensor, weapon and communication systems, system upgrades, as well as ship technical modifications and overhauls.

## 3D-printed aircraft engine part for Hornet fighter

Finland's first 3D-printed aircraft engine part had its maiden flight on 5 January 2018. The part has been installed in the F/A-18 Hornet fighter. Patria has been working on the manufacturing process for 3D-printed parts over the last two years.

The part was designed in accordance with the MDOA approval granted to Patria and was manufactured from the Inconel 625 superalloy. MDOA approval refers to Military Design Organisation Approval in accordance with European Military Aviation Requirements (EMARs) and granted by the Finnish Military Aviation Authority (FMAA).

Patria is actively involved in exploring new methods of manufacturing and repairing various parts. "For this part, the development work has been done over the last two years, with the aim of exploring the manufacturing process for 3D-printable parts, from drawing board to practical application. Using 3D printing to make parts enables a faster process from customer need to finished product, as well as the creation of newer, better structures. We will continue research on additive manufacturing methods, with the aim of making the new technology more efficient," says Ville Ahonen, Vice President, Patria's Aviation business unit.

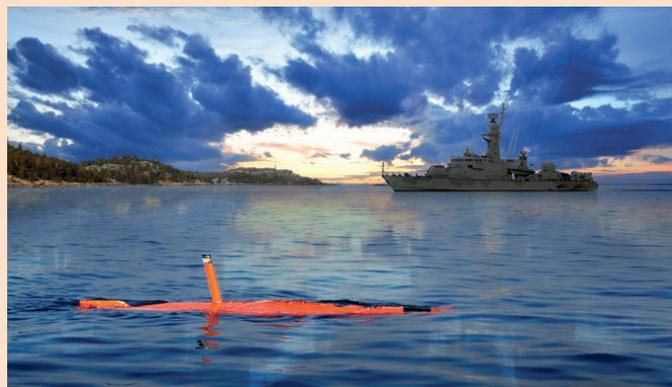
## U.S. Navy to Evaluate Anti-Submarine Warfare Training System

Saab will demonstrate its anti-submarine warfare (ASW) training system, the AUV62-AT, for the U.S. Navy (USN). The AUV62-AT is an artificial acoustic system that mimics a submarine.

The USN will evaluate Saab's AUV62-AT against USN systems through the Foreign Comparative Testing (FCT) Program. The demonstration is planned for summer 2018, with an option to continue testing into 2019.

The USN is investigating a replacement to its current ASW training system for its Undersea Warfare Training Range.

Saab's AUV62-AT package trains operators in submarine surveillance, detection, identification, classification, and target engagement. The AUV62-AT is an artificial acoustic system that mimics a submarine in a way that is compatible with any torpedo- and sonar system on the market today. The system fully replaces the use of a submarine in the role as a manoeuvring training target and can be launched from a ship, a submarine, or shore. The system is in service today with a number of countries worldwide.



Art impression of AUV62-AT

Ill. Saab

## Ballistic missile defence for India

The Indian Defence Research and Development Organisation (DRDO) has successfully completed the test-firing of its ballistic missile defence (BMD) system.

During the test, DRDO's interceptor missile successfully engaged an incoming ballistic missile.

Testing was carried out on LC-III integrated test range

(ITR) complex on Dr Abdul Kalam Island off the coast of Odisha.

The incoming target was intercepted at an altitude of more than 15km.

The latest interception is the fourth in a row where the missiles have accurately hit incoming targets, according to the statement.

## Iveco vehicles to German and Romanian armed forces

CNH Industrial's defence and civil protection brand Iveco Defence Vehicles has signed new contracts for the delivery of major orders to German and Romanian armed forces.

The first contract signed with German company Bw-Fuhrpark Service will provide a new fleet of military medium multipurpose 4x4 trucks for the German Army.

Under the contract, Iveco will be responsible for providing the army with a total of 280 Eurocargo trucks this year.

The current deal between Iveco Defence Vehicles and BwFuhrpark Service resulted from a two-year intensive market evaluation and comprehensive practical trials with a demonstrator vehicle.

The second order is for the supply of 173 military logistics vehicles to the Romanian

Ministry of National Defence. The delivery is due to be completed by this year.

The Romanian contract will supply purpose designed 6x6 military logistic vehicles from the Iveco Defence Vehicles high-mobility truck range.

The vehicles are designed to transport troops and equipment. They are equipped with a self-recovery winch, improved mobility and fording abilities to offer tactical support for any military operation.

In addition, the military logistic vehicles are C-130 air transportable.

Iveco Defence Vehicles has also secured other recent contract awards with German Bundeswehr.

The deals include orders for 133 armoured Trakker-8x8 trucks.

## Ballistic missile defence for Japan

The US Defence Security Cooperation Agency (DSCA) has notified Congress of a possible foreign military sale (FMS) of Standard Missile-3 (SM-3) Block IIA missiles to Japan.

The potential \$133.3m FMS was requested by the Government of Japan and has been approved by the US State Department.

Japan is slated to procure four SM-3 Block IIA missiles and four MK 29 missile canisters under the possible deal.

The missile systems is expected to provide Japan with an improved ballistic missile defence capability in order to assist the defence of the country's homeland, as well as US personnel stationed in the region.

Raytheon is set to deliver the SM-3 Block IIA missiles under the arrangement, while BAE Systems will be responsible for supplying the MK 29 missile canisters.

Developed in cooperation with Japan, Raytheon's SM-3 Block IIA interceptor can be deployed both on land and at sea.

The missile features larger rocket motors that enable it to defend broader areas from ballistic missile threats, and a larger, enhanced kinetic warhead that helps improve its search, discrimination, acquisition and tracking functions to address emerging threats.

Japan initially requested the FMS of Standard Missile-2 (SM-2) Block IIIB missiles, equipment and support for an estimated cost of \$821m in July last year.

## US Army contract for M109A7

BAE Systems has secured a new contract from the US Army to begin the full-rate production of the M109A7 self-propelled howitzer and M992A3 ammunition carrier vehicles.

The contract includes an initial \$413.7m award to carry out the third and final option for low-rate production on the programme.

It also comes with extended options, which could take the total value of the contract to approximately \$1.7bn.

BAE Systems will be initially responsible for manufacturing 48 vehicle sets.

The contract also includes provisions for the development of 60 vehicle sets each year for three years.

Featuring a new chassis design, the M109A7 howitzer will help provide enhanced performance and survivability.

The howitzer uses the existing main armament and cab structure of the M109A6 Paladin self-propelled howitzer.



Iveco High Mobility Truck

Photo: Iveco



M109A7 in Alaska

Photo: BAE Systems



Art impression of rotary-wing drone for warships

Ill. Naval Group

## Building the first demonstrator of a rotary-wing drone for a warship

The DGA (Direction Générale de l'Armement) has awarded a contract for technology development in the field of rotary-wing drones to the Naval Group and Airbus Helicopters consortium. The contract covers de-risking studies ahead of construction of a future tactical helicopter drone demonstrator aboard warships.

The purpose of the contract awarded by the DGA is to identify, deploy and test the technologies necessary for the integration of a tactical drone-system capacity within a heavily armed vessel. It forms part of the preparation of the SDAM (Navy Airborne Drone System), whose entry into service is foreseen for the middle of the next decade on new Intermediate-

Size Frigates (FTIs) and other French Navy ships.

### VSR700

Based on an innovative, versatile, robust and economical helicopter platform, the VSR700 drone system is being developed by Airbus Helicopters to offer its military clients the combination of multi-role performance, reliability and operating costs. This 700-kg drone is derived from a light civilian helicopter, the Cabri G2.

The VSR700 can exceed 10 flight hours of operational autonomy with a payload capacity of up to 150 kg, offering performance levels that have, until now, been the reserve of aircraft of a significantly higher category and size.

## Terma to modify Belgian Defence's F-16 pylons

The Belgian Defence (BD) has awarded a contract to Terma to supply the pylon integrated dispensing system (PIDS+) for the airforce's F-16 aircraft.

The latest PIDS+ variant features both left and right-hand pylons integrated with three dispensers.

The additional dispenser magazine was installed using a new compact variant of the Terma digital sequencer switch.

With the award, all original European Participating Air Forces (EPAF) countries, which involve Denmark, Norway,

the Netherlands, and Belgium, have ordered the Terma PIDS+ pylons for their F-16 aircraft.

All of Terma's PIDS+ pylons are integrated with the Hensoldt AAR-60(V) 2 missile warning system (MWS).

Terma has also separately secured another contract from the Belgian Defence for its aircraft audio management system (AAMS), which includes major 3D-audio and noise reduction capabilities.

The Terma AAMSs are slated to be deployed on a total of 54 BD F-16 aircraft.

## First Tiger HAD attack helicopter

The French Army Aviation has received the first of 36 Tiger multi-role attack helicopters retrofitted into the hélicoptère de attaque y destrucción (HAD) version.

The Airbus Helicopters delivery follows a formal acceptance process with the French Defence Procurement Agency (DGA).

More than 100 airframe modifications and 1,500 new parts will be installed as part of the conversion of Tiger from the hélicoptère d'appui et protection (HAP) to the HAD version

Powered by two new improved MTR 390 E engines, the HAD Tiger has an

increased maximum take-off weight (MTOW).

The Tiger also features a new STRIX roof-mounted sight system with a laser designator that allows the Hellfire II air-to-ground missile to be fired.

The Tiger HAD is capable of performing a variety of missions in adverse conditions, such as armed reconnaissance, air or ground escort, air-to-air combat, and ground firing support.

To date, the global Tiger fleet has recorded more than 92,000 flight hours.

The Tiger attack helicopter is currently in service with the armed forces in France, Germany, Spain and Australia.



Airbus Helicopters delivered the first Tiger retrofitted into the HAD version to the French Army Aviation  
Photo: A.Pecchi/Airbus

## NH90 for Qatar

Qatar has signed a contract for the purchase of 28 NH90 military helicopters. The agreement, which includes 16 NH90s in tactical transport (TTH) configuration and 12 NH90s in naval (NFH) configuration, will support the country's plan to modernise their military helicopter fleet. As part of the plan, Qatar will receive 16 H125 light single-engine helicopters in training

configuration for operation by the Qatar Armed Forces Air Academy.

The NH90 is well suited for operations in the most demanding conditions and has been combat-proven in many theatres of operation worldwide. This contract for 28 helicopters brings the total order book to 543 aircraft. To date, 350 aircraft have been delivered to 20 customers in 13 countries and have accumulated around 170,000 flight hours.



NH90

Photo: Airbus Helicopters

## KC-46 tanker to Japan

Boeing has secured a \$279m contract to deliver first KC-46 Pegasus multi-role tanker to the Japan Air Self-Defence Force (JASDF).

With the latest contract award, the JASDF becomes the first international customer to procure the KC-46 aircraft.

The Boeing-built KC-46 tanker has been chosen by Japan through its KC-X aerial refuelling competition.

The KC-46 will be an addition to the JASDF's current fleet of four KC-767J tankers.

The KC-46 multi-role tanker is capable of refuelling all allied and coalition military aircraft that are compatible with international aerial refuelling procedures.

The tanker also features a main deck cargo door and strengthened cargo deck, and can carry passengers and patients.

The KC-46's floor includes seat tracks and a cargo handling system that enables the aircraft to simultaneously carry palletised cargo, personnel, and aeromedical equipment in a variety of combinations.



A US Air Force KC 46 tanker

Photo: Boeing

## F-35 Avionics Test Centre in Denmark

Terma Group has collaborated with Scandinavian Avionics to establish Avionics Test Center Denmark to offer European regional maintenance capabilities for the F-35 fighter aircraft.

This will help support the F-35 Lightning II programme in Europe and will increase the maintenance, repair, and overhaul capabilities of the fighter jets.

The company is responsible for designing and producing advanced composite structures and electronic components for F-35 primes.

Terma develops, designs and manufactures electronic components and software for industries and customers within the international defence market.

Under the collaboration, Terma and Scandinavian Avionics will jointly provide a proposal on the support of F-35 avionics toward the F-35 Program Office, and will invest in depot stand-up capability and seek possibilities to develop the facility in close cooperation with the Danish Ministry of Defence.

## Russia's new tanker conducts first flight

The Russian Air Force's advanced prototype tanker IL-78M-90A has conducted its maiden flight.

Built in Russia, the aircraft is the first tanker in the post-Soviet period that has been designed by Ilyushin Aviation Complex and manufactured at aircraft factory Aviastar-SP.

Earlier, the production of the IL-78 tanker was carried out in Uzbekistan.

The new variant is based on the military and transport aircraft IL-76MD-90A.

The IL-78M-90A is equipped with four advanced PS-90A-76 engines with high bypass ratio engine and increased take-off rating.

The fuel consumption level of the latest engines is 12%-

14%, which is lower than that of the D-30KP engines installed on the previous tanker modifications.

This enables IL-78M-90A to have increased flight distance and fuel capacity.

The IL-78M-90A aircraft is expected to become the main tanker, adapted for aerial refuelling of long-range, front line, and special aviation aircraft.

The system is capable of simultaneously refuelling two front-line aviation aircraft such as Su-27/30/34/35 and MiG-29/35.

When positioned on the ground, the new tanker will be able to fill up to four aircraft at the same.



First flight of the new tanker IL-78M-90A Credit: Ilyushin Aviation Complex

## Upgrade of German Army Vehicle Simulators

Saab has received an order from the Federal Office of Bundeswehr Equipment,

Information Technology and In-Service Support, BAAINBw, for

upgrade of the German Army's vehicle simulators. The total order value is SEK 107 million. The upgrade programme will commence in 2018.

For this upgrade Saab will provide new software and hardware to German Army vehicles and tanks operating the laser simulator BT 46, such as Leopard, Fennek, Marder and Wiesel. The new standard for laser codes, SISO, will be

implemented in the upgrade, meaning that the German Army will be interoperable with most of the European countries. The number of multinational exercises is increasing and that's why more and more countries choose the SISO standard. In the near future, there will be 12 countries in Europe using the new standard.

The BT 46 system has been delivered to more than 20 countries supporting both combat training with vehicles and their weapons. More than 7000 vehicle simulators have been delivered for more than 100 applications worldwide.

## Saab buys Swedish firm Dockstavarvet and Muskövarvet yard

Saab has acquired Sweden-based vessel manufacturer N. Sundin Dockstavarvet and the repair shipyard Muskövarvet.

The transaction is expected to help strengthen Saab's product offering in the naval sector.

Dockstavarvet is based outside Örnsköldsvik in northern Sweden and primarily focuses on the production of aluminium boats.

The company was established in 1905 and specialises in the development and manufacture of modern, high-speed combat and patrol boats that can be deployed for both military and civil applications.

It has provided more than

200 boats to customers across three continents to date.

Muskövarvet is situated at the Muskö naval base in the southern part of the Stockholm archipelago and offers full service repair works.

The facility primarily carries out works on the Swedish Navy's amphibious forces and has been a sister company to Dockstavarvet since 2007.

Both acquisitions will form a new business unit within Saab's business area Kockums.

Dockstavarvet and Muskövarvet generate combined sales of approximately Skr250m (\$30.57m) and employ a total of 80 personnel.



High speed vessel from Dockstavarvet

Photo: Dockstavarvet

## More Eurofighters for Saudi Arabia

The Kingdom of Saudi Arabia has signed a memorandum of intent with the UK Government to purchase 48 Eurofighter Typhoon multi-role fighter jets.

The new order, with a potential value of approximately £10bn, will help sustain job opportunities at BAE Systems after the company announced 1,400 job cuts in October, reported the Independent.

In December, the company signed a £5bn deal to deliver 24 jets to Qatar.

Founded by four major countries, Germany, Spain, the UK, and Italy, Europe's Eurofighter Typhoon programme is being carried out by the Eurofighter consortium, which comprises BAE Systems, Airbus Defence and Space, and Leonardo – Aircraft Division.

Eurofighter Typhoon is an advanced flexible, agile and enduring multi-role combat aircraft that offers simultaneously deployable air-to-air and air-to-surface capabilities.



Eurofighters from Royal Saudi Air Force at Zeltweg, Austria, Airpower 2011 Airshow. Photo: Eurofighter - Katsuhiko Tokunaga

## Canada receives ultra-light combat vehicles from Polaris

The Canadian Special Operations Forces Command (CANSOFCOM) has taken the delivery of its first ultra-light combat vehicles (ULCVs) from US-based Polaris Industries.

Capable of providing fast and mobile transportation over rough terrain, the new ULCVs will be deployed to help protect CAF personnel operating in challenging environments.

In addition, the vehicles are specifically designed to support rapid deployment by most of the Royal Canadian Air Force aircraft, in particular, the CH-147F Chinook helicopter.

In December 2016, the Canadian Government awarded the contract for the procurement of 52 units of the ULCVs to Polaris, valued at approximately C\$20.6m (\$16.69m).

The contract also included the option of 26 additional vehicles at an additional cost over two years.

In July last year, CANSOFCOM exercised the option to buy an additional ten ULCVs, which took the total number of vehicles under the acquisition to 62. The total value of the contract increased to approximately C\$23m (\$18.64m).



Ultra light vehicles from Polaris Industries

Photo: Canadian Armed Forces

## Huge potential for KONGSBERG in Qatar

KONGSBERG has signed a cooperation agreement in Qatar for long-term technology development programs within defence, maritime industry and digitalization.

The first programme in relation to the cooperation will be delivery of communication, digitalization and tower solutions for military vehicles, a programme with a potential of approximately NOK 15 billion over the next eight years.

The programme will be the largest in KONGSBERG's history and entail 15.000 Norwegian man-labour years and involve more than 170 Norwegian sub-suppliers.

Together with Barzan Holdings, KONGSBERG has established a new company for technology development programs. The company, BK Systems, will have its main office in Qatar Science & Technology Park, and KONGSBERG holding the CEO position. The park is an innovation hub for leading international industry and universities.

Today, Barzan Holdings announced the companies that have been selected to deliver to the country's upcoming vehicle programme which is to be delivered over the next eight years.

KONGSBERG is to deliver tower solutions, and digitalization and communication solutions to 490 armoured vehicles delivered by the French company Nexter. The next steps in the process will be detailing and final negotiations prior to signing the final contract for the programme.

KONGSBERG is to deliver the solutions "PROTECTOR Remote Weapon Station" and "Medium Caliber Turret" to the programme, both tower solutions developed for increased protection of personnel.

The PROTECTOR Remote Weapon Station is a system that was developed in cooperation with Norwegian armed forces towards the end of the 1990s, and has since been continuously developed and is now the world-leading solution with close to 20.000 systems delivered to 19 nations.

The Medium Caliber Turret is a further developed, larger sized solution currently under delivery to the US armed forces. In addition to the delivery of the tower solutions, the agreement also includes delivery of integrated digitalization and communication solutions for the vehicles.

## Boxer for Australia

Rheinmetall set to supply the Australian Defence Force with over 200 Boxer wheeled armoured reconnaissance vehicles.

The multi-billion dollar project will see Rheinmetall deliver at least 211 of the latest generation Boxer 8x8 vehicles, with Rheinmetall's advanced Lance 30mm turret fitted to the reconnaissance variants.



Boxer 8x8 armoured vehicle is currently being used by Germany, The Netherlands and Lithuania. Photo: Rheinmetall

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# LESS NH90 FLIGHT TIME FOR THE COAST GUARD

On the 1st of February, the Chief of Defence submitted a recommendation to the Ministry of Defence on how to compensate for the lacking delivery of operational service with the NH90.

The Gap Analysis for the NH90 by the Defence was submitted to the Ministry of Defence in October 2017. The analysis pointed to a considerable discrepancy between the operative needs of the Defence in terms of flight hour deliveries from the NH90, and what currently looks like a possible future delivery might consist of.

The assessment of available flying hours for the NH90 suggests a delivery of some 2100 hours per year when the helicopters are operational, while the actual needs have been stipulated to approximately 5400 annual hours. These analyses indicate that the NH90 will not be capable of meeting the needs of both the frigates and the Coast Guard.

– We are now in a situation where we are compelled to reassess what we can do to achieve the most defence capability from this investment. My recommendation is to prioritise the NH90 for frigate duty. This is because the helicopter is a weapons platform which is essential for the frigates' ability to detect and engage submarines. This is a task that is of crucial importance for the defence of our coastal areas, and one that cannot be solved by outsourcing to alternative civilian systems. This means having the helicopters configured for anti-submarine operations, but with the ability for rapid prioritising of CG assignments when such a need arises. Otherwise, available hours must be increased substantially over what

is the current expectation, says Admiral Haakon Bruun-Hanssen.

An assembled fleet of NH90's will not cover the full needs of the Coast Guard in any case, and the Coast Guard assignment can be resolved by finding other measures such as the leasing of helicopter materiel, and possibly the use of UAV's.

Norway has just taken delivery of the first NH90 in the frigate version, and will continue the work on optimising the concept in order to produce as many flight hours as possible. Any left-over hours may be assigned to the Coast Guard, and will thereby reduce the need for alternative solutions.

The analysis has not evaluated the possible procurement of other helicopters, terminating any current contracts, or other actions that lie beyond the area of responsibility under the Chief of Defence, or any actions that entail a change of ambitions. Any solutions based on the recommendation will need further deliberations. ■■



In the time leading up to 2024, the Coast Guard fleet of the Nordkapp class will be replaced by a trio of new vessels. The original planning called for these new vessels to carry NH90 helicopters on board. Having received offer submissions from three yards, The Norwegian Defence Materiel Agency has chosen to enter into negotiations with Vard Group AS Langsten for the possible contract to build the three new vessels. Ill. Forsvarsmateriell



## THE LOGISTICS VESSEL KNM "MAUD" MADE ITS MAIDEN VOYAGE OFF THE SOUTH KOREAN COAST

Just before Christmas, the South Korean shipyard DSME started its seaworthiness testing of the new logistics ship destined for the Norwegian Navy, the KNM "Maud". DSME will continue the test phase until the 30th of April this year, when the Norwegian Navy will take delivery of the

new ship. The original delivery date for the vessel was said to be September 30, 2016, which means the delivery has been delayed by a total of 18 months. The total costs for the project amounts to 1.9 BNOK, or about 200 million EURO, which is within the original budget frame.

The KNM "Maud" will be the largest vessel of the Norwegian Navy, at a total gross length of 182 meters. The armament of the ship will be very limited, however, and restricted to just a quartet of Kongsberg Sea Protector weapons stations for self-defence. Photo: DSME

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# NAMMO'S NEW ARTILLERY SHELL: DOUBLING THE RANGE

While artillery traditionally has been limited to a maximum range of 20-30 km, recent years have seen the introduction of new systems that support a maximum range of more than 40 km. This has significant tactical advantages, as it increases the area one artillery gun can cover by more than 75%.

These advantages have driven a number of countries to begin upgrading their artillery guns with longer L-52 barrels necessary to fire at such ranges. This investment has however been held back by a lack of suitable ammunition. One solution has been to fit the shells with expensive guidance systems, but forces can rarely afford to buy as many of these shells as they would need.

To address this issue, Nammo began in 2012 developing a new type of extended range ammunition that would have sufficient accuracy without a significant increase in costs. Now, five years later the ammunition is tested and ready, and recently Nammo secured the Finnish Armed Forces as its first customer.

The new shell design is known as the 155 mm IM HE-ER (Insensitive Munitions, High Explosive, Extended Range.)



Nammo's new artillery ammunition reaches a maximum height of 16 km, or more than 50,000 feet, when fired at its maximum range of more than 40 km. The base bleed is easily visible in this photo. Photo: Nammo

The new 155 mm IM HE-ER shell is fitted with a small rocket motor known as a base bleed. A base bleed is essentially a small rocket installed at the base of a shell that is ignited when it is fired. As it burns, the base stabilizes the airflow over the projectile, reducing drag, and thereby adding range. The base bleed itself do not add thrust to the shell.

## Tomorrow's extreme range

In a not-so-distant future one may see the introduction of 'extreme range' ammunition, using ramjet-assisted shells, something that Nammo is already exploring. This could allow a standard 155 mm gun to fire at ranges up to 90 km. ■■



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# SWEDEN SEEKS \$3.2BN SALE OF PATRIOT MISSILE SYSTEMS

The US State Department has approved an estimated \$3.2bn potential foreign military sale of Patriot Configuration-3+ modernised fire units to Sweden.

Notified by the US Defence Security Cooperation Agency, the sale requires Congress approval. Raytheon Corporation and Lockheed-Martin will serve as the prime contractors for the sale.

Under the proposed sale, Sweden has also requested for four AN / MPQ-65 radar sets, four AN / MSQ-132 engagement control stations, nine antenna mast groups, 12 M903 launching stations, 100 Patriot MIM-104E Guidance Enhanced Missile-TBM (GEM-T) missiles, 200 Patriot Advanced Capability-3 (PAC-3) Missile Segment Enhancement (MSE) missiles, and four electrical power plants (EPP) III.

- This requested approval for the USD 3.2 bn sale of Patriot systems represents at total list of the maximum operational needs for the Swedish armed forces. So far, our budget for buying Patriot missile systems is approximately 10bn SEK (USD 1.35bn), says Joakim Lewin in the Swedish Defence Material Administration (FMV). Then it will be up to our political authorities to decide if we get further budget funding to purchase additional Patriot systems.



The Patriot missile system will enhance Sweden's missile defence capability. In photo German soldiers fires the Patriot air defense missile system during Exercise Artemis Strike in Chania, Greece on November 7, 2017. Photo: US MOD/S. Apel

- In our evaluating process we selected the Patriot systems based on the ability to counter incoming ballistic missiles, like the Russian Iskander missile. This was one of the main requirements in our evaluation process.

- We have also registered that Poland, Germany and Holland are looking to buy or upgrade their Patriot based systems, and we hope to achieve some kind of cooperation with these nations.

- The Swedish armed forces plan to operate the Patriot Systems as air defence and missile shields for crucial military infrastructure, like air force and naval bases, Lewin says in conclusion, and adds that delivery within the expected SEK 10 bn order is expected to take place from 2020 to 2025. ■■

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# DANISH DEFENCE TO HAVE A BRIGADE, MISSILES AND TORPEDOES

A six-year Danish defence agreement will have the country's military build up a brigade, install missiles and become capable of anti-submarine warfare with ships and helicopters.

By Andreas Krog

In the end of January, the Danish government and the Social Democrats, the Danish People's Party and the Social-Liberal Party reached an agreement regarding the Danish defence for the period of 2018-2023.

The new defence agreement represents what the government calls a substantial investment in defence to protect and defend Denmark. The Parties agree to increase defence spending with DKK 800 million in 2018 with an increasing trend to DKK 4.8 billion more in 2023. This is an increase in defence spending by more than 20 per cent as well as a significant increase in equipment investment.



The Danish defence will buy dipping sonar and torpedoes for their new MH-60R Seahawk helicopters.

Photo: Simon Elbeck / Forsvarsgalleriet.

## KEY ELEMENTS OF THE DANISH DEFENCE AGREEMENT 2018-2023

### BUILD-UP OF A BRIGADE

The Danish Army shall build up the capability to deploy a brigade in the event of an extraordinary security political situation, and with due warning.

Based on the Army's current operational capabilities, work will be undertaken to build the brigade which can contribute to deter a more equal opponent and take part in collective defence under a NATO framework. When not fully deployed, the brigade's composite units can also be deployed individually, thereby also enhancing the overall ability to participate more in international missions.

The brigade comprises of new and strengthened capabilities:

- More battle tanks for operations.
- Ground-based air defence.
- Anti-armour weapon systems for the combat battalions.
- Additional artillery.
- An additional reconnaissance squadron.
- Further equipment for electronic warfare and new sensors.
- A drone operating capacity.
- Logistics, command support, engineering equipment, etc.

With the investments from 2018 to 2023 the Armed Forces will by 2024 have a deployable brigade of approximately 4000 troops who meet NATO's force goals for a medium sized brigade.

### STRENGTHENING THE FRIGATES WITH AREA AIR DEFENCE

The Danish frigates of the Iver Huitfeldt class will be prepared and equipped with missiles so they can defend and protect a naval force and coastal areas against enemy aircraft and certain types of missiles. The frigates would also be able to deploy to international missions in a littoral area air defence role.

As part of preparing the Navy frigates for carrying missiles, a number of SM-2 missiles will be acquired, and initial preparatory work will be commenced with a view to acquiring SM-6 missiles with a longer range. This provides Denmark with a more complete frigate capacity that meets NATO's force goals on maritime area air defence.

### ANTI-SUBMARINE WARFARE

The armed forces will build an effective anti-submarine capacity that can both track and combat submarines. The anti-submarine capacity shall consist of the following:

- Three of the Navy frigates and support ships will be equipped to take part in anti-submarine warfare by providing them with sonar equipment that can detect submarines.

- Anti-torpedo systems will also be acquired, so ships equipped with such a system can defend themselves against enemy torpedoes.

- A number of dipping sonars will be purchased for the Armed Forces MH-60R Seahawk helicopters so they can participate in anti-submarine warfare.

- Torpedoes will be procured for the Seahawk helicopters.

The Danish Defence will also prioritise enhanced cooperation with other countries regarding education and training in anti-submarine warfare.

### BALLISTIC MISSILE DEFENCE (BMD)

The declaration from the NATO Summit in Wales in 2014 by which Denmark pledged to contribute to NATO's defence against ballistic missiles with a sensor capacity is re-confirmed by the parties behind the agreement. A final recommendation is awaiting further studies to

identify alternative, flexible options including, if necessary, a land-based contribution.

### LONG-RANGE PRECISION GUIDED MISSILES

A potential future acquirement of long-range precision guided missiles will be investigated through a preliminary study that will assess a possible subsequent acquisition in the medium term (2023-2026).

### TRANSPORT AIRCRAFT

Two additional flight crews will be added to the Air Force transport aircraft C-130J and the maintenance structure will be enhanced. This will increase the transport aircraft potential generation of flight hours by approximately 20 percent.

### FIGHTER AIRCRAFT

The Political Agreement of 9 June 2016 on the acquisition of 27 F-35 aircraft is endorsed. This ensures a continued ability to uphold Danish sovereignty and the ability to insert combat aircraft in international operations, or ultimately to contribute to NATO's collective defence of Danish and Allied territory.

### MINE LAYING

Training of a small number of officers will be launched to ensure that a fundamental knowledge of mine-laying operations is maintained.

### NEW NAVY MULTI TASK VESSELS

An ongoing tender for new pollution control vessels has been cancelled. Instead the Danish defence will examine a solution where new military vessels, in addition to their operational military tasks, when necessary, can also solve environmental protection and pollution control tasks. This will increase the number of military vessels within Danish domestic waters. The existing aging pollution control vessels are not armed and can only perform tasks related to pollution control.

**A core ally**

The Agreement will strengthen Danish Defence contributions to NATO’s collective deterrence, improve capacity to contribute to international operations, enhance Defence contributions to national security and increase cyber defence as well as the national emergency preparedness.

The Danish defence minister Claus Hjort said: *“The Agreement demonstrates our resolve and determination to protect and defend a safe and secure Denmark as well as maintaining our position as a core ally to NATO. The strengthening of Defence is necessary in the light of the deteriorated security political situation. Today’s Agreement delivers a strengthened Danish Defence – with more troops and better equipment – and an enhanced national preparedness.”*

The agreement comprises among other of the build-up of a deployable brigade, equipping the Danish frigates with area air defence and making the Navy and the Air Force able to contribute to anti-submarine warfare with sonar and anti-submarine torpedoes. A potential future acquisition of long-range precision guided missiles will be investigated through a preliminary study.



The three Danish frigates will be equipped with missiles for Area Air Defence.

Photo: Carsten Sandberg / Forsvarsgalleriet.

**Living up to NATO guideline**

The equipment investments over the agreement period demonstrate that Denmark aims to live up to NATO’s guideline of investing 20 percent of the defence budget on new equipment, the defence minister points out.

With the agreed investments in the Danish defence, the country will however still not spend as much on defence as Denmark and the other NATO countries have promised each other to do in 2024. The defence agreement will increase the Danish defence spending from 1.14 percent of the country’s GDP to 1,3 percent. ■■

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# FIRST GLOBALEYE AEW&C AIRCRAFT

Roll-out of first GlobalEye. Saab is currently producing the GlobalEye AEW&C, combining air, maritime and ground surveillance in one single solution. GlobalEye combines a full suite of sensors including the powerful new extended range radar (Erieye ER), with the ultra-long range Global 6000 jet aircraft. Photo: Saab

In February Saab rolled out the first GlobalEye Airborne Early Warning & Control (AEW&C) at its Linköping site, Sweden. GlobalEye is a swing role airborne surveillance system based on a Global 6000 jet aircraft from Bombardier, which has undergone a thorough modification programme to adapt it for its role.

This first aircraft is equipped and being prepared for ground and flight trials to gather aerodynamic data as part of the ongoing development and production programme.

The USD 1.27 billion development and production contract was awarded in 2015 by the United Arab Emirates with an initial order for two systems. An additional USD 238 million order by the UAE for a third system was announced in 2017. ■■

## GLOBALEYE AEW&C

### GROUND SURVEILLANCE

- ▶ Detects moving objects through long-range wide area GMTI
- ▶ Radar images, weather independent, with a dedicated radar

### AIR SURVEILLANCE

- ▶ Powerful new Erieye ER (Extended Range) radar to reclaim the detection distance for small and future targets
- ▶ Detection and tracking range highly increased

- ▶ Designed to work in severe clutter and jamming conditions
- ▶ Adaptive AESA radar – energy is focused on areas or targets of interest

### MARITIME SURVEILLANCE

- ▶ Detects sea targets out to the elevated horizon
- ▶ Detects small boats, like jet-skis at long distances
- ▶ The unique combination of Erieye ER and maritime surveillance radar allows for detection of objects

- ▶ down to the size of a periscope
- ▶ AIS, EOS and ISAR for identifying objects

### MISSION CAPABILITY

- ▶ Ultra-long range business jet, ideally suited for special missions applications, >11 h endurance
- ▶ Excellent airfield performance, 6500 ft (2000m), allows the use of smaller airports
- ▶ Full Self-Protection Suite



GlobalEye AEW&C, system overview Ill. Saab

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