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– the Scandinavian Military Magazine –

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## THE CYBER THREAT CONCERNS EVERY ONE OF US

When the Norwegian Intelligence Service recently presented FOKUS 2016, the “Secret Intelligence Service’s evaluation of current security challenges”, the five pages long chapter on “Threats in the digital space” was located towards the very end of the 90-page long report.

Despite the lowly placement of the chapter on cyber-threats in this essential report, there is no reason to presume that the intelligence services are failing to take this threat seriously. Quite the opposite is the case, in actual fact. The intelligence services are emphasising that the threat in the digital space has been on the increase for several years running, and that 2015 was certainly no exception.

For the society at large, however, it may seem like the cyber threat is quite some distance away from ‘top of mind’. Terror attacks such as we have seen for instance in Paris, attract a great deal more attention than attacks in the digital sphere. Terror is perceived as a threat to every one of us as persons, while cyber-attacks seem to be regarded as something that concerns only the computer geeks.

Such attacks in Western Europe have so far to all intents and purposes had the purpose of gathering information, be it from public authorities or from the industry. A further purpose of note may be that of distributing propaganda and disinformation via the digital realm. For ordinary citizens, this matter may seem to concern only those who have confidential information to protect, such as proprietary business information, as well as public authorities and organisations. FOKUS 2016, however, underscores that this enterprise in the digital sphere also means that hostile foreign powers and organisations are accumulating significant knowledge about technical vulnerabilities, weak points and human frailties that affect our digital systems. This knowledge can then be used as the basis for direct and targeted sabotage attacks. The FOKUS 2016 report mentions as an example of this that around the turn of the new year, massive parts of the Ukrainian electrical power grid was knocked out by hackers. Files were deleted, computer control systems were destroyed, and a few hundred thousand people were bereaved of electrical power supply in the middle of winter. Power was not returned until the electrical supply was restored by manual intervention.

We must assume that those who are conducting cyber-intelligence gathering against us, are also aware of many of our weaknesses in the digital domain. This is knowledge that can be used to perform sabotage acts, with the worst case potential of loss of human lives. It may even come to the point that just such an act of terrorism executed via the cyber domain, is what it will take to wake us all up to the fact that the cyber threat concerns us all.

## CONTENTS:

### ARTILLERY FOR NORWAY

- 2 Winter testing of Norway’s next artillery

### TRUCKS FOR DENMARK

- 6 Denmark starts truck tests

### PATROL VEHICLES FOR DENMARK

- 8 Turks offering patrol vehicles to Denmark

### FSI

- 11 Norwegian Defence and Security Industries Association

### DANISH FIGHTER PROJECT

- 15 Funding problems delay Danish fighter decision

### BULLETIN BOARD FOR DEFENCE, INDUSTRY AND TRADE

- 17 Next-generation helmet technology  
19 Patria AMV selected by the United Arab Emirates  
23 F-35 JSF development programme to complete in autumn 2017  
24 Archer artillery systems to Swedish armed forces

### GLOBAL EYE

- 26 Surveillance of air, land and sea  
28 A26 – coming to Norway as well?

### LAIVUE 2000

- 32 Finland’s new multipurpose vessel

### Coverphoto:

**Winter testing of artillery.** Four candidates for the supply of new artillery to Norway underwent testing at Rena encampment, some 200 km (120 miles) NW of Oslo. The picture shows the K9 Thunder, which is one of the four contenders.

Photo: FMS/Forsvarsmareriell/Simen Rudi



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# WINTER TESTING OF NORWAY'S NEXT ARTILLERY

The four candidates under current consideration as Norway's new 155 millimetre artillery were during the period of 11-30 January tested at Rena, some 120 miles (200 km) north-east of Oslo. The suite of candidates includes Caesar of France, the K9 Thunder from Hanwha Techwin (South Korea), the M109G from Ruag (Switzerland), and the Panzerhaubitze 2000 from the German Krauss-Maffei Wegmann.

The primary purpose of the testing was to find how the four candidates performed under Norwegian winter conditions. Particular emphasis was given to mobility and transportability, besides fire-power and precision in snowy conditions. And while the snow depth was admittedly below par for the season, the temperatures were quite what should be expected from a Norwegian winter, from a couple of degrees Centigrade to teeth-rattling 29 degrees of frost during the test period.

Landkapasiteter or Land Capabilities in the Norwegian Defence Materiel Agency (Forsvarsmateriell) has a distinct department for Test and Verification, which gathered close to a Terabyte of test data from

measuring instruments such as cameras in sync with various GPS units and inertial navigation on all four howitzers. Further to this, measurement data were collected from various radar instruments.

All in all, close to a Tb of test data was gathered for analysis, both for the purpose of making a recommendation in the choice of supplier, as well as to serve as documentation vs. the suppliers that failed to make the grade.

## Equal treatment

From the standpoint of the Norwegian Defence, ensuring equal treatment of the four candidates has been of paramount importance. All the candidates have gone

through the exact same test programme, and the order among the candidates was chosen by random draw. Tests were conducted separately, whereby no single supplier had any knowledge of how the other candidates were doing.

Each of the four candidates brought with them 70 charges, and all the howitzers fired 66 rounds each, so that there should be no differences in this respect. The guns were operated by representatives of the suppliers, who paid for all expenses in transporting the weapons systems to Norway and Rena, as well as carrying their own costs in conducting the tests.

## The New Artillery project

In the aftermath of Norway in December 2013 pulling out of the collaboration with Sweden with a view to procurement of the Archer artillery, Norway has started its own procurement process. The Norwegian Defence is planning to buy a total of 24 artillery units that should be operational by 2020, thereby replacing the current Norwegian M109 A3GN artillery that Norge procured in 1969. It is expected that

**CAESAR**



<ul style="list-style-type: none"> <li>▶ <b>Manufacturer:</b> Nexter, France</li> <li>▶ <b>In production since:</b> 2006</li> <li>▶ <b>Weight:</b> 17.7 tons</li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>Length/height/width:</b> 10/3.7/2.55 metres</li> <li>▶ <b>Crew:</b> 5-6</li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>Top speed:</b> 100/50 kph (62/30 mph) (on/off road)</li> <li>▶ <b>Range:</b> 600 kilometres</li> <li>▶ <b>Power/weight:</b> 13.6 hp/tonne</li> </ul>	<p><i>The French Caesar being tested for mobility in deep snow.</i></p> <p><i>Photo: FMS/Forsvarsmateriell/Simen Rudi</i></p>
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## PANZERHAUBITZE 2000



▲ **Manufacture:** Krauss-Maffei Wegmann (KMW), Tyskland  
 ▲ **Developed since:** 1996  
 ▲ **Weight:** 55.8 tons

▲ **Length/height/width:** 11.7/3.1/3.6 metres  
 ▲ **Crew:** 5

▲ **Top speed:** 67/45 kph (42/28 mph) (on/off road)  
 ▲ **Range:** 420 kilometres  
 ▲ **Power/weight:** 17.92 hp/tonne

*The German Panzerhaubitze 2000 (PzH 2000) being test fired.*

*Photo: FMS/Forsvarsmateriell/  
Simen Rudi*

a contract for new artillery will be entered into by mid-2017.

The four candidates currently competing for the contract have been selected following an RFI (Request for Information), and all comply with the range requirement of 40 kilometres. This is

a substantial increase over the M109 units of today, which are effectively limited to a range of 28 kilometres.

The procurement project is conducted by the Norwegian Defence Materiel Agency (Forsvarsmateriell), which came into being as of January 1st this year, as

a direct subordinate to the Ministry of Defence. The NDMA does planning, acquisition, management and disposal of materiel for the armed forces and other agencies in the sector, and has thereby taken over many of the tasks formerly assigned to the Defence Logistics Operation (FLO).

## M109G



▲ **Upgraded by:** RUAG, Switzerland  
 ▲ **In production since:** the 1960's  
 ▲ **Weight:** 27 tons

▲ **Length/height/width:** 11.3/3.1/3.1 metres  
 ▲ **Crew:** 6

▲ **Top speed:** 60 kph (37 mph)  
 ▲ **Range:** 350 kilometres  
 ▲ **Power/weight:** 16.3 hp/tonne

*Test shooting from the M109G by the Swiss company Ruag.*

*Photo: FMS/Forsvarsmateriell/  
Simen Rudi*

In addition to the range requirement, emphasis is given to increased precision and better mobility over the current weapons, as well as increased protection against for instance mines, flat trajectory weapons and grenade splinters. Obviously, purchase price and life span costs are also important factors. Significantly, the artillery system that Norway chooses must be in operation with at least one other nation's defence, to provide a firmer basis for estimating the need for spare parts and wear parts, which are key factors for the calculation of life span costs. Norway wants to buy a system that is completely developed and fully operational, while requiring the barest minimum of adaptations and modifications to Norwegian conditions and requirements, since this often causes costs to escalate rapidly.

The testing at Rena was done with observers from both Denmark and Finland present. Both these nations are also approaching a phase of planning the procurement of new artillery. ■■

## K9 THUNDER



▶ **Manufacturer:** Hanwha Techwin, South Korea  
 ▶ **In operation since:** 1999  
 ▶ **Weight:** 47 tons

▶ **Length/height/width:** 12/2.73/3.4 metres  
 ▶ **Crew:** 4  
 ▶ **Top speed:** 67 kph (42 mph)

▶ **Range:** 480 kilometres  
 ▶ **Power/weight:** 21 hp/tonne

*Photo: FMS/  
Forsvarsmateriell/Simen Rudi*

*NOTE: The suppliers state that the vehicles that were used in testing, and that are shown in illustrations, may differ slightly from the actual vehicles in the bidding contest. Facts and figures may also differ according to different configurations.*



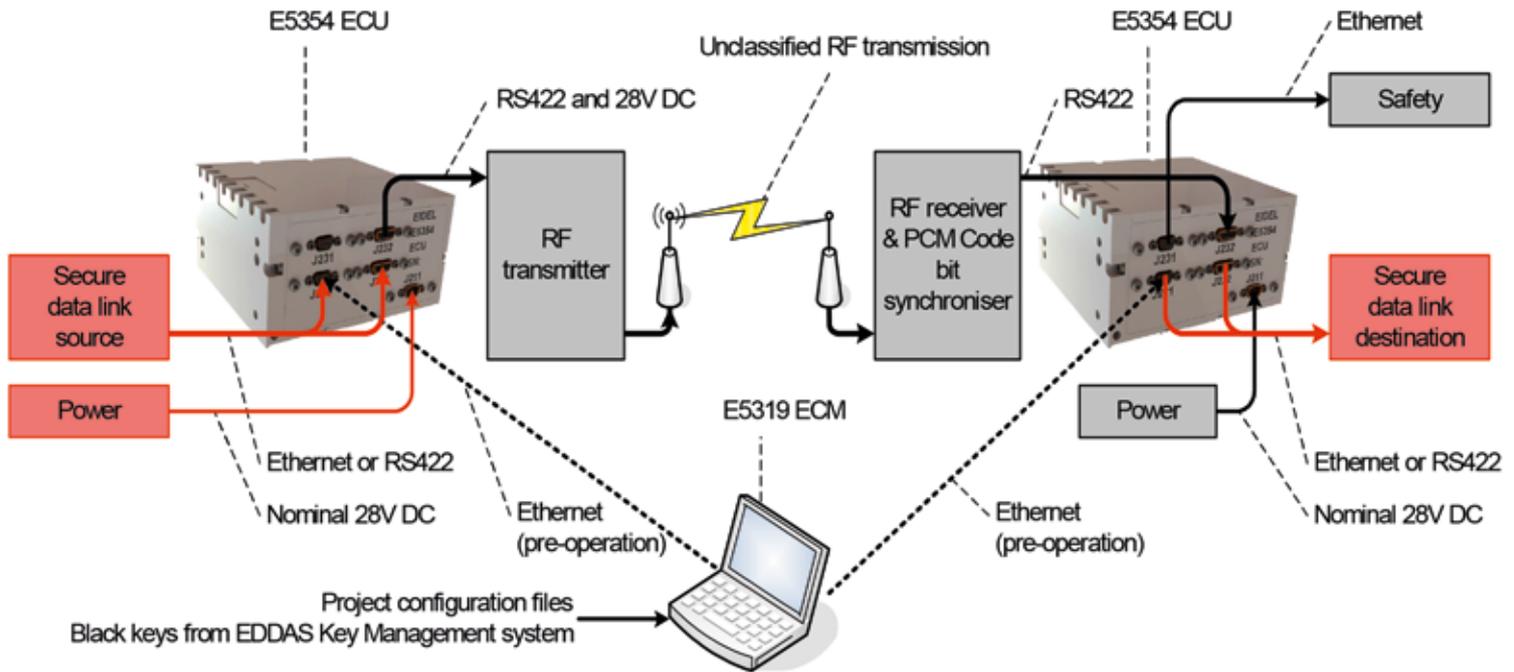
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- E5353 EKM - EDDAS Key Management system

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Iveco trækker 8x8. Iveco delivers a range of truck versions.

Photo: Iveco

# DENMARK STARTS TRUCK TESTS

**Denmark has started a three month long test of tactical trucks from four different manufacturers as part of their upcoming procurement of up to 900 trucks.**

**By Andreas Krog**

In the month of March, the Danish Defence Acquisition and Logistics Organization (DALO) and the Danish Army will begin a three month long test of tactical trucks from four different European truck manufacturers. The trial is part of Denmark's tender for up to 900 trucks in various sizes and configurations.

The contract will consist of a seven-year framework agreement for the procurement itself, and a very attractive 20-year service and maintenance agreement.

Sources estimate that about 40 percent will be ordinary commercial trucks, while 60 percent will be tactical trucks driving on all four, six or eight wheels. A certain proportion of the tactical trucks must be armoured to begin with, or be capable of being retrofitted with armour.

## All four invited

In the autumn of 2015, five truck manufacturers were pre-qualified and asked to submit a first indicative offer a few days before Christmas. The American company Oshkosh, however, chose not to submit an

offer. MAN, Scania, Iveco and Mercedes-Benz did submit bids. It was expected that one of the four would be sent home before the tests started. But in the beginning of February DALO announced, that this would not be the case. All four manufacturers were invited to the tests at The Danish Army's training terrain at Oksbøl in Jutland.

In August or September this year, the manufacturers must submit their best and final offers. A winner is expected to be announced in November. Prototype development will then take up to one and a half years. The first trucks are accordingly set to be delivered in 2018.

## Special solutions

The Danish Defence has defined 13 different configurations that they can imagine being built up on the trucks. Mercedes-Benz points out that it has already delivered military trucks in a variety of configurations and therefore may have already developed special solutions that the defence can use. This makes it unnecessary for The Danish Armed Forces

to develop its own solutions together with Danish subcontractors.

Mercedes-Benz is offering the Zetros trucks in a 4 × 4 and a 6 × 6 version. The truck has a long front, since the engine is not below the cockpit, but in front of it. This gives the truck lower axle loads and more space for the installation of armour and equipment such as ring mount and machine gun et cetera. In addition, it makes the truck lower in the height, so that it can fit into a C-130J Hercules machine. The Danish Armed Forces has four C-130's.

### Install afterwards

Scania's philosophy is to stick to the standard solutions. The manufacturer has only three different size wheel-houses and two different types of wind-screen. The military trucks are similar to the commercial trucks. And armour is something you can install afterwards – if or when necessary.

If a MAN truck should have Level 3 protection as DALO is demanding, it requires a special driver cab. Therefore Denmark must either purchase a number of vehicles that are armoured from the start, or buy two driver cabs for several trucks.

### Run on NATO fuel

All trucks in Denmark are currently required to comply with the Euro 6 standard. This is the strictest environmental standard, demanding small amounts of emission of harmful substances. The defence has however been granted an exemption from the Euro 6 requirements. The trucks acquired can only meet the Euro 4 standard due to the fact that the tactical trucks must be able to run on NATO fuel. It is an all-round fuel that all kinds of vehicles, ships and aircraft more or less can use for example in a war zone.

Only two of the five manufacturers can deliver tactical trucks that can run on NATO fuel while complying with Euro 6 standard. These are reportedly Scania and Iveco. Therefore, there is demand for Euro 4 and extra points to earn if the manufacturers can deliver trucks with higher level compliance.

MAN is seen by several as the favourite due to the fact that about 1200-1400 of The Danish Armed Force's current 3000 trucks are MAN trucks. In 2007-2010 the German truck manufacturer delivered 300 tactical trucks similar to those that MAN is now offering to Denmark. Choosing MAN ensures that many of Denmark's new vehicles will easily complement the existing vehicles. ■■



MAN won the contract for logistic vehicles to the Norwegian and the Swedish armed forces. Photo: MAN



Mercedes-Benz is offering the Zetros trucks in a 4 × 4 and a 6 × 6 version. Photo: Mercedes-Benz



The military Scania trucks are similar to the commercial trucks. Photo: Scania

# TURKS OFFERING PATROL VEHICLES TO DENMARK

**The Turkish company Otoman is among the pre-qualified bidders in the competition for new armoured patrol vehicles for the Danish Army.**

By **Andreas Krog**

The Danish Army is in the market looking for 36 new armoured patrol vehicles with an option for buying more vehicles in the future. In the middle of February, the Danish Acquisition and Logistic Organization (DALO) prequalified five very different manufacturers of armoured patrol vehicles.

Most remarkable was the prequalification of Otokar Otomotiv Ve Savunma Sanayi from Turkey. The company has delivered the Cobra and Cobra 2 patrol vehicles to a number of countries in Eastern Europe, Africa and Asia. None of the countries are anywhere close to being allies with Denmark and it seems very unlikely that Denmark would select a vehicle from Otokar.

Nevertheless, it is worth noting that the manufacturer has not yet offered a specific vehicle to Denmark. They have

only submitted references about what vehicles they have already delivered to other countries.

## Among the cheapest

The American company Oshkosh Defence is also among the bidders, and has pointed at the M-ATV and L-ATV as their references for earlier deliveries to other countries. Oshkosh last year won an order from US Army for 16,901 Joint Light Tactical Vehicles. Oshkosh is probably among the cheapest of the bidders. It will however be interesting to see if Oshkosh Defence is actually bidding. In the ongoing tender for procurement of up 900 new trucks to The Danish Armed Forces, Oshkosh was also prequalified but did not submit a bid.

The large American defence company General Dynamics has two subsidiary companies in the competition. The first one is the British company

General Dynamics Force Protection Europe. The Foxhound armoured patrol vehicle is Force Protection's reference vehicle. In 2010 Great Britain procured 325 Foxhound vehicles, and these have been used by the British Armed Forces since 2012.

## Replacing Eagle I

The Swiss manufacturer Mowag is the second General Dynamics company participating in the Danish tender. Mowag is part of General Dynamics European Land System and has pointed to the Eagle V vehicle as their reference. 176 Eagle V vehicles has been bought by the German Army in 2013. Denmark already has 36 Eagle I and 90 Eagle IV vehicles. The new vehicles are planned to replace the 36 Eagle I vehicles.

In December last year, the Danish Armed Forces signed a contract with Mowag for 309 Piranha V armoured personnel carriers.

The last participant is the French manufacturer Nexter Systems with the Aravis as the reference vehicle. The Aravis has been bought by France, Albania, Gabon, and Saudi Arabia.

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The Turkish vehicle manufacturer Otoman has been pre-qualified in the Danish tender for new armoured patrol vehicles.

### Five different vehicles

The five companies are now going to submit indicative offers to DALO. The number of participants is then expected to be narrowed down to three. They will submit vehicles for a three-month long trial at the Danish Army's exercise grounds at Oksbøl in Jutland.

### The first vehicles are expected to be delivered in 2018 and Denmark is looking for five different varieties:

▲ Patrol (Command and Control (2C), Liaison, Troop Transport. 4-5 persons).

▲ Electronic warfare (Collect military intelligence from enemy communication systems through monitoring and processing their networks in order to support the Danish Contingent (DANCON) and external partners. 4-5 persons).

▲ Support (Line Logistic Equipment transport. 2-3 persons).

▲ RECCE open (The vehicle will primarily act in the role of a scout vehicle, covering Light Reconnaissance. Conduct protective security and escort support during advance and with-

drawal as well as mounted. Surveillance. 5-6 persons. Armaments, as in weapons, are expected to be the same as on the Patrol configuration, e.g. heavy machine gun on top).

▲ RECCE closed (Light Reconnaissance. Conduct protective security and escort support during advance and withdrawal, dismounted as well as mounted. Surveillance. 5-6 persons).

The armoured patrol vehicles must be able to fit inside the C-130J Hercules aircraft, of which Denmark has a fleet of four. ■■

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Image source: Krauss-Maffei Wegmann GmbH & Co. KG

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## LEDEREN HAR ORDET:

### STORTINGET VIL STYRKE FORSVARSINDUSTRIEN

Den 1. mars avga Utenriks- og forsvarskomiteen innstilling (Innst. 185 S (2015-2016)) til stortingsmeldingen om Nasjonal forsvarsindustriell strategi (Meld St. 9 (2015-2016)). Det er bred politisk enighet på Stortinget om målet og rammene for strategien. Bl.a. er komiteen tydelig på at Forsvaret bør velge nasjonale leverandører når forholdene ligger til rette for det og at det ved anskaffelser fra utlandet skal kreves industrisamarbeidsavtaler som sikrer norsk forsvarsindustri markedsadgang. Det bidrar til å legge til rette for stabile og forutsigbare rammebetingelser som er helt nødvendige for å videreføre og styrke forsvarsindustrien.

En enstemmig komitee slutter seg til at det bør være et mål for strategien å videreføre og styrke en internasjonalt konkurransedyktig norsk forsvarsindustri med evne til helt eller delvis å utvikle, produsere og understøtte forsvarsmateriell og systemer innenfor prioriterte teknologi- og produktområder som er viktige for å ivareta nasjonale sikkerhetsinteresser og Forsvarets behov. Det er et ambisjonsnivå som er realistisk og nødvendig.

Innstillingen er tydelig på behovet for å satse på forskning og utvikling og at det er et offentlig ansvar å finansiere forskning og utvikling i tilknytning til større svarsanskaffelser. Den etablerte

samarbeidsmodellen for teknologi- og produktutvikling mellom Forsvaret, Forsvarets forskningsinstitutt og forsvarsindustrien forutsettes videreført.

Komiteen er enig i at det etableres åtte teknologiske kompetanseområder som er vesentlige for Forsvarets behov og nasjonale sikkerhetsinteresser og at forholdene blir lagt best mulig til rette for å videreutvikle og styrke norsk forsvarsindustri innenfor disse områdene. En samlet komitee forutsetter at ved anskaffelser av materiell der norsk industri har forutsetninger for å levere kosteffektive løsninger som møter Forsvarets behov, og som er relevante for å opprettholde industriell kompetanse innenfor de åtte teknologiske kompetanseområdene, bør Forsvaret benytte nasjonal industri. Dette er avgjørende for å opprettholde nasjonal industriell kompetanse som er nødvendig for å styrke forsvarsevnen og for å ivareta behovet for leveringssikkerhet og nasjonal beredskap. Komiteen er også innforstått med at konkurranse i det norske markedet innen de prioriterte teknologiområdene legger til rette for at utenlandske konkurrenter som opererer ut fra lukkede hjemmemarkeder, av strategiske hensyn, kan presse norsk industri. Dette mener vi tilsier at hovedregelen ved anskaffelser av materiell der

norsk industri har forutsetninger for å levere kosteffektive løsninger som møter Forsvarets behov, og som er relevante for å opprettholde industriell kompetanse innenfor de åtte teknologiske kompetanseområdene, er at nasjonal industri prefereres, og at dersom utenlandske leverandører inviteres til å konkurrere om slike anskaffelser er det unntak som må begrunnes.

Det anses å være av vesentlig betydning for å ivareta nasjonens sikkerhetsinteresser at norsk forsvarsindustri sikres markedsadgang internasjonalt da slik adgang er en forutsetning for å kunne opprettholde og videreutvikle forsvarsindustrien i Norge. Derfor forutsettes det i innstillingen at når Forsvaret anskaffer materiell fra utlandet, som har relevans for norsk forsvarsindustri evne og muligheter til å opprettholde og videreutvikle kompetanse og teknologi innenfor de åtte teknologiområdene, skal det stilles krav til utenlandske leverandører til Forsvaret om forpliktende industrisamarbeidsavtaler. Dette skal også være hovedregelen når anskaffelsen gjennomføres etter prosedyrene i Forskrift om forsvars- og sikkerhetsanskaffelser (FOSA) som gjennomfører EUs direktiv om forsvars- og sikkerhetsanskaffelser i norsk rett.

Eksport av forsvarsmateriell forutsetter støtte fra norske myndig-

heter. Derfor er det viktig med enstemmighet om at regjeringen viderefører ordningen med myndighetsstøtte til markedsføring for eksport av forsvarsmateriell og at komiteen understreker viktigheten av at industrien får støtte også på politisk nivå. I denne sammenheng er det viktig at et bredt flertall i komiteen støtter at regjeringen viderefører dagens retningslinjer for behandling av søknader om eksport av forsvarsmateriell. Det er også enighet om at det vil være positivt å etablere en ordning for myndighets salg av forsvarsmateriell fordi det vil styrke norsk forsvarsindustri konkurranseevne.

Med de presiseringene som fremgår av komiteens innstilling ligger forholdene godt til rette for at den forsvarsindustrielle strategien vil sikre at norsk forsvarsindustri kan fortsette å bidra til nasjonal sikkerhet og til å styrke forsvarsevnen ved å levere løsninger som møter Forsvarets behov. Det er en forutsetning for at industrien skal forbli internasjonalt konkurransedyktig og bidra til nasjonal verdiskapning, industriell utvikling, arbeidsplasser og betydelige inntekter for Staten.

Nå er det Forsvarsdepartementet, Forsvaret, forsvarsindustrien og andre relevante aktørers ansvar å implementere strategien i tråd med Stortingets føringer.



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# PROGRAMME CONFERENCE AIR AND INI

The first programme conference of the year took place at the Royal Christiania Hotel in central Oslo, on 11th of February. The subject was INI and air systems, and some 75 delegates from the Defence community, the Ministry of Defence and the defence industry participated.

Assistant Director General Roar Smedsrød from the Ministry of Defence presented the new White paper on the defence industry, about to be finalised by the Ministry. He opened his statement by saying that the new report will to all intents and purposes be continuing the substantial

contents of the existing White paper Report no. 38. The news contained in the updated report mainly relates to two issues:

The first is that the new report carries a clearer message regarding why Norway maintains and needs a defence industry.

The second important change is that the report includes a strategy in relation to the EU directive 2009/81/EU on defence and security procurements.

Further to this, the new report will essentially be outlining a steady continued course ahead, Smedsrød concluded.

Commander Egil Bolæren-Hansen of the Ministry of Defence presented current materiel plans with special focus on the air domain and INI. In his opening statement, Bolæren-Hansen emphasised the importance of the longer

view, before continuing to provide a review of ongoing projects and planned projects. In his discourse on products in planning, new air surveillance radars are among others. Other subjects included tanker aircraft/Multi Role Tanker Transport (MRTT) a multi national program where Norway is co-operating with other European nations including the Netherlands.

The main project currently ongoing in the air side at this time, is naturally the F-35 fighter programme. Deliveries have started, while work is still going on regarding the operations and support concept for the F-35 fighters. – Norway is pushing on to achieve a joint solution with other users of the F-35, explained Col Oberst Egil Sørstrønen from the Air Force. – Over and above this, we are working on various so-



From the left, Col. Egil Sørstrønen, dept. mgr. Roar Smedsrød and Commander Egil Bolæren-Hansen.

Photo: MilitærTeknikk

lutions, while we are envisioning a combined military and civilian effort in this field.

**Data security is not just about technology**

Gudmundur Einarsson of Hiddn Security AS made the human factor in data security his starting point. Most entities, be they public, private or military enterprises down to private individuals, use one or more data security systems such as encryption, access control, firewalls, anti-virus and malware protection programs, web filters etcetera. But what happens when the people working there bring laptop or a browser to their home to do some work over the weekend? Security goes out the window.

The American FBI holds that some 10% of all laptop computers are stolen during their life span, and that 57%

of all computer crime directed at businesses and 35% of all stolen data spring from stolen laptops.

Hiddn Security presents a user-friendly solution to this problem: A simple USB memory stick that must be inserted before the PC can be used, and requires the user to enter a PIN code for access to the computer and its data. When the memory stick is extracted, all info about the encryption key that is entered into the PC will be erased, and all the data on the PC will be encrypted. Nobody will have a chance to see this data, unless they can provide both the USB stick and the correct PIN code, Einarsson explains, while adding that this memory stick is developed and manufactured in Norway, and is already approved by the national data security authorities of several countries. ❏



*Gudmundur Einarsson of Hiddn Security presented a simple solution to ensure that the data on the laptop or the web browser cannot be misused in the event that the computer or web pad is stolen.* Photo: MilitærTeknikk



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# BREAKFAST SEMINAR WITH FINLAND'S DEFENCE ATTACHÉ

Breakfast seminars constitute a new meeting forum which the FSi is looking to establish. The first one out was the Finnish defence attaché to Norway, Denmark and Iceland. If the feedback is positive, the FSi will host several more breakfast seminars over the upcoming months.

Finland's defence attaché to Norway, Lieutenant Colonel Janne Sarpoma, opened by explaining that "as far as security politics are concerned, Finland is an island".

Finland's armed forces have three main tasks: National defence, supporting other authorities, and crisis management.

When it comes to national defence, Finland's doctrine is that that the whole country shall be defended.

-No matter if the enemy comes from the east, north, west or south, we will defend all of Finland, Sarpoma emphasised.

Finland has seen significant cuts in defence budgets in recent years. This has in turn led to major reforms of Finland's armed forces between 2011 and 2015. The main objectives of the reform were to ensure required military defence capability and to bring the size and activities of the armed forces into balance with funding.

As of 2011, Finland's defence budget was Euro 2450 million, and in 2015 the budget was reduced to MEUR 2300. The number of military per-

sonnel has in the same period been reduced from 350,000 to 230,000.

Finland's army has been reduced to approximately 50% of its former maximum peacetime size, and the navy and air force has been reduced to about two third of their size during the cold war.

On the positive side, in the period of 2012 - 2015, the reform has resulted in a slight increase in the armed forces procurement budget.

## Procurement plans

Lt Col Sarpoma listed several of Finland's armed forces main procurement programmes, among other the NH-90 helicopter system, a midlife update of the MLRS long range rocket artillery system, and upgrading and additional equipment for the main battle tank Leo 2AG.

More specifically, Sarpoma presented the plans for a new naval vessel class, including four multipurpose offshore patrol vessels with mine-layer capability. The new vessels will be replacing both the current Rauma class vessels and the



Lt Col Janne Sarpoma is Finland's defence attaché to Norway, Denmark and Iceland.  
Photo: MilitærTeknikk

current minelayer vessel. Beside mine-laying capacity, the new navy vessels will have anti-surface, anti-submarine and anti-air capabilities.

– But the major upcoming procurement will be replacement of the Air Force F-18 fighters. Within three years we have to decide if we will buy new fighters. And if so, the process of selecting the new fighters will start thereafter. If

Finland decides to renew its fighters, a contract is due to be signed between 2020 and 2030.

On the logistical side, Sarpoma pointed to outsourcing as a tool to a more cost effective logistics operation, supported by a presentation of the Millog Oy. Millog Oy is privately owned by several defence companies in Finland, and is a major logistics partner to the Finnish Defence, both inland and abroad. ■



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# FUNDING PROBLEMS DELAY DANISH FIGHTER DECISION

The Danish Government has a hard time finding the money for the procurement of up to 30 fighter jets and has postponed the decision once again.

By **Andreas Krog**

A few days before Christmas last year the Danish defence minister Peter Christensen once again postponed the decision on new fighter jets for Denmark. It is the sixth postponement since the competition first started more than 10 years ago.

In a letter to the defence committee at the Danish Parliament Folketinget, Peter Christensen announced that the government in the spring of this year will present a recommendation about the type of aircraft to choose as well as the number of aircraft. It will also point out how the procurement can be financed. The defence minister argued that the recommendation needed to be more consolidated before it can be presented. He did not give a more detailed explanation about the need for consolidation.

## Budgets under pressure

According to government sources the real reason is that prime minister Lars Løkke Rasmussen's government has a hard time finding then necessary funding for the procurement. During the last about six months, more than 20,000 refugees and migrants has come to Denmark from the Middle East and Africa. This has put the government budgets under pressure and has made it more difficult to find extra funding outside the defence budget.

Denmark is looking at procuring up to 30 new fighter jets at an approximate price between 20 and 30 billion Danish kroner. Out of Denmark's yearly defence budget at around 20 billion kroner, three billion goes to procurement of new materiel. Denmark risks being locked with no opportunity to do other major procurements for many years to come if the fighter jets must be financed within the existing defence budget.

At a hearing in the parliament's defence committee in November, defence minister Peter Christensen promised what he called "a large, glorious and graceful debate" about the procurement and the recommendaton from the new fighter jet office. The minister will make everything public except the confidential commercial and military information. The politicians in the parliament will be able to see this information behind closed doors in the defence ministry.

## Feel safe

The Danish defence policy is historically based upon four-year long political agreements between a broad coalition of parties. All parties except two are part of the existing defence agreement, and each can veto a decision. Peter Christensen promised in November that a down selection will not be made before all parties behind the defence agreement "feel safe" about the decision. And that can take a while. Especially The Socialist People's Party is sceptical about the decision and the favourite F-35 fighter jet.



*In December last year, Danish defence minister Peter Christensen delayed the country's fighter jet competition for the sixth time since the beginning in 2005.*

So a Danish down selection might not be made before the third or fourth quarter this year, depending on how the public debate develops and how much time the political parties behind the defence agreement need.

## Very sceptical

In the meanwhile, a debate about F-35 and Lockheed Martin's offerings to the Danish defence industry has been raised by former chairman of the Danish Defence and Aerospace Industry, Jan Falck-Schmidt, and six other CEO's from Danish defence companies in a Letter to the editor in the center-left newspaper Politiken. The newspaper is generally very sceptical about the fighter procurement.

Denmark has been a partner in the F-35 Joint Strike Fighter Program since 1997. And as part of the partnership Denmark has agreed not to demand offset from Lockheed Martin for an amount equal to the procurement price. The two other candidates, Boeing and Airbus, are obliged to deliver 100 percent offset.

Jan Falck-Schmidt and co. fear that as soon as Denmark chooses the F-35, Lockheed Martin will not care about the Danish defence industry and providing orders to it. They have got the down selection and moves on to new fighter competitions in Belgium and Finland. The companies argue that Denmark should demand offset from Lockheed Martin just as they do from the two other candidates. ■■



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

### 3,750 New Airplanes in Southeast Asia?

Boeing projects a demand for 3,750 new airplanes, valued at \$550 billion, over the next 20 years in Southeast Asia.

The company presented its Southeast Asia Current Market

Outlook (CMO) today in Singapore, ahead of the biennial Singapore Airshow, forecasting the region will continue its strong annual traffic growth at 6.5 percent.

### Next-generation helmet technology

3M Deutschland and helmet manufacturer Schubert are to develop improved ballistic head protection systems for military and law enforcement applications.

The firms signed an agreement to create custom head protection solutions for European clients.

Schubert will also serve as a distributor of 3M ballistic helmets, which will be manufactured by 3M subsidiary Ceradyne.

The goal is to offer lighter weight, effective protection in the face of growing threats.

Ceradyne produces lightweight body armour and ballistic helmets, and is a major supplier for the US Armed Forces.

### Honeywell to support French Dassault Falcons

The French Navy has contracted Honeywell Aerospace to provide support services to its fleet of Dassault Falcon Guardian surveillance aircraft based in Tahiti.

Under the contract, which will extend over a period of five years, the company will supply parts and repair and overhaul

services and engineering support for the fleet's Honeywell ATF3 turbofan engines.

The Falcon Guardian was incorporated in the early 1980s and is a twin-engine version of the Falcon 20, suited for maritime operations such as surveillance and search and rescue.



A US P-3 Orion aircraft

Photo: US Navy

### AAMSI to support P-3 Orion

Associated Aircraft Manufacturing and Sales (AAMSI) has been selected by Lockheed Martin to serve as the authorised P-3 Orion support provider.

Under the agreement, AAMSI will supply its manufacturing and avionics repair services to multiple systems and components to support the global operators of the P-3 Orion aircraft.

AAMSI is said to leverage on its manufacturing capabilities for structural parts and legacy avionics support, including identification friend or foe (IFF) systems.

Authorised by Lockheed Martin and Northrop Grumman Corporation, AAMSI designs, manufactures and offers repairing and overhaul services to legacy electronic systems across a comprehensive range of military platforms.

The P-3 Orion is a long-range, anti-submarine warfare patrol aircraft that features advanced submarine detection sensors such as directional frequency and ranging sonobuoys and magnetic anomaly detection equipment.

### BAE ready to demonstrate solution for ADF's Land 400 programme

BAE Systems Australia has announced plans to demonstrate its armoured modular vehicle (AMV35) combat reconnaissance vehicle (CRV) for Phase 2 of the Australian Defence Force's (ADF) Land 400 programme.

A result of the partnership between BAE and Finnish Patria, the AMV35 is designed to meet the Australian Army's mounted combat reconnaissance requirements.

The vehicle integrates BAE Systems Hägglunds' CV9035

turret onto a highly protected military-off-the-shelf (MOTS) Patria AMV.

If selected, the BAE Systems/Patria team are expected to manufacture, assemble and support the AMV35 in Australia.

The Land 400 Phase 2 project focuses on delivering a replacement for the Australian Light Armoured Vehicle, which has been used by the Australian Defence Force in East Timor, Iraq and Afghanistan, and is scheduled for retirement in 2021.



A French Air Force Dassault Falcon 20 (Photo: French Air Force)

## US Air Force makes \$120bn budget request

The US Air Force (USAF) has presented its fiscal year 2017 president's budget request for \$120.4bn, which it is using to support its modernisation and mission readiness programmes, as well as the force strength of 492,000 personnel.

A major decision taken by the USAF is to cut the production of F-35 Lightning II multi-role fighter to 43, from the previously planned 48, with \$10.1bn allocated in FY 2017 for 43 F-35As for the air force,

16 F-35Bs for the marine corps and 4 F-35Cs for the navy.

Another Lockheed Martin product, C-130J Super Hercules transport aircraft, is also facing a cut as the USAF has decided to lower the procurement by three, to 11 jets during FY17. C-130J will eventually replace the C-130Hs.

The budget request has allocated \$1.4bn for long-range strike bombers, and \$3.1bn to buy 15 KC-46A Pegasus refueling tankers.

## US Navy conducts first operational test of Raytheon-built JSOW C-1 weapon

The US Navy and Raytheon have conducted an operational test of the new precision-guided C-1 gliding joint standoff weapon (JSOW) to display its capabilities against a broad set of land targets.

The JSOW C-1, which was launched from a F/A-18F Super Hornet at approximately 29,000ft, flew through the pre-planned route and destroyed the designated land target.

The battlefield scenario included a well-defended target that had employed tactical countermeasures.

The weapon is an upgraded version of the existing JSOW C, which adds a weapon data-link radio and modified seeker software to increase capability for the anti-surface warfare mission.

It can be launched at ranges exceeding 100km.



Excalibur projectile

Photo: Raytheon

## Raytheon to supply Excalibur projectiles to US Army

Raytheon has secured a contract to continue providing Excalibur Increment b (Ib) precision-guided projectiles to the US Army.

The \$31.8m contract requires the company to produce and deliver 464 extended-range projectiles.

Developed in collaboration with BAE Systems / Bofors, the Excalibur projectile uses GPS precision guidance to offer accurate, first-round, fire-for-effect capabilities to 155mm howitzers in urban environments.

Equipped with fewer parts, the Excalibur Ib projectile has a simplified development process

compared to the Excalibur Ia. It addresses the army's objectives for improved reliability at significantly reduced costs.

Raytheon is currently developing Excalibur N5, a 5in / 127mm variant of the standard version for the US Navy.

In May 2015, the US Army successfully fired two Excalibur Ib precision-guided, extended-range projectiles from a M109A2 / A3 howitzer to confirm that the precision round is now compatible with global artillery platforms.

Excalibur has been fielded by the US Army, the Marines, and several foreign military forces worldwide.

## EDA order for Carl-Gustaf Ammunition

Saab has signed a contract with the European Defence Agency (EDA) for the production and delivery of Carl-Gustaf ammunition. Deliveries will take place during 2017.

The order comes under the terms of Saab's framework agreement signed between Saab and EDA in 2014, allowing for

the co-ordinated purchase of Carl-Gustaf ammunition by the agency member states Estonia, Latvia, Lithuania, the Czech Republic and Poland. The agreement is in effect for five years, with a possible extension of two further years. The framework provides for potential orders of approximately SEK 460 million.

## New Seagull USV system for maritime warfare missions

Elbit Systems has unveiled Seagull, its new multi-mission unmanned surface vehicle (USV) system, designed to revolutionise the dynamics of underwater warfare.

The company is said to have made use of its experience in designing, developing and operating unmanned aircraft systems (UAS), as well as its

naval capabilities to introduce the new platform.

The 12m-long Seagull USV can be deployed for a range of missions, including electronic warfare (EW), surface force protection, hydrographical missions, in addition to the core mine counter measures (MCM), and anti-submarine warfare (ASW) missions.



Seagull is designed to be able to scan the entire stretch of water, as well as operating underwater vehicles to track and terminate mines

Photo: Elbit



The photo displays a Polish Air Force CASA C-295M. Photo: Polish Air Force

## Mali to acquire Airbus-built C295W aircraft

The Mali Defence Ministry has awarded a contract to Airbus Defence and Space to deliver a C295W transport and mission aircraft.

Under the terms of the deal, the company will deliver one winglet-equipped C295W model in transport configuration for the Mali Air Force.

Delivery under the contract will take place in the second half of this year.

Equipped with two Pratt & Whitney PW127G turboprop engines, the C-295 is a stretched derivative of the CN-235 transporter, and is designed to perform tactical airlift, search-and-rescue (SAR), maritime patrol and environmental surveillance missions.

The aircraft is capable of conducting short take-offs and

landing on semi-prepared runways.

Currently, the medium-sized tactical airlifter has been sold to Algeria, Brazil, Chile, Colombia, Egypt, Finland, Jordan, Poland, Portugal and Spain.

## Philippines Air Force accepts C295 Fleet

The Philippines Air Force has taken delivery of the third and final Airbus C295 medium transport aircraft. The aircraft was ferried from the final assembly line at Seville, Spain to Clark Air Base, Philippines. In Philippines Air Force service the C295 will play a key role in the modernization of the force's transport fleet and will undertake a wide variety of military and humanitarian missions.

## Programme to address diminishing submarine manpower

The Royal Australian Navy (RAN) has initiated a new programme, which is aimed at increasing and retaining the size of the submarine work-force.

The programme, termed as Submarine Deliberately Differentiated Package, is said to be a new approach to cater to the RAN's work-force requirements.

Described as a first-of-its-type by the Australian Defence Force, the programme will develop a model to project the navy's approach to tackle work-

force challenges in other areas by conducting an in-depth research of the things that motivates people.

This is expected to help the work-force to continue with their area of employment and then to boost conditions, which allows personnel retention.

In June 2009, the RAN aimed to provide a glimpse of life in submarine to potential recruits, with the help of a high-tech recruiting tool.

## Patria AMV selected by the United Arab Emirates

The General Headquarters of the United Arab Emirates' Armed Forces has ordered Patria AMV 8x8 armoured wheeled vehicles. All details of the contract are classified.

This is an extension for the ongoing, co-operation between the UAE Armed Forces

and Patria. UAE Armed Forces have been satisfied with their existing AMV vehicles. These vehicles will be produced by our Polish partner in a very tight time schedule., says Mika Kari, President of Patria Land business unit.



AMV in Afghanistan. Patria AMV has received excellent feedback from customers for its performance in operations in Afghanistan and Chad. Patria has contracts for over 1,400 Patria AMV vehicles. Photo: Patria

## Estonia launches unmanned ground vehicle

Estonia-based defence solutions provider Milrem has launched the tracked hybrid modular infantry system (TheMIS), a modular hybrid unmanned ground vehicle (UGV).

The TheMIS is a multi-mission vehicle that allows different superstructures to be mounted and integrated onto its platform. It can facilitate a wide range of operations, such as rescue, transport, and reconnaissance missions.

Developed in collaboration with Singapore Technologies

Kinetics (ST Kinetics), TheMIS ADDER variant is equipped with ST Kinetics' remote weapon station, the RWS ADDER.

The company has successfully completed initial running tests for the TheMIS prototype, and the vehicles are expected to be ready for production in late 2016.

The company has also launched the Digital Infantry Battlefield Solution (DIBS), which uses smart unmanned systems to analyse and provide new approaches to warfare strategies.



TheMIS ADDER will be ready for production by the end of this year.

Photo: Milrem AS



Cristanini was honored to be included with a picture by BORDEAUXROT, the magazine published by the German CBRN Defence Corps and curated by an important CBRN expert, LtCol. Bernd Allert. Photo: BORDEAUXROT/Cristanini

## CBRN Decontamination

Cristanini protagonist at the 3rd International CBRN Symposium. Recently, the specialized military magazine "BORDEAUXROT" mentioned the CBRN decontamination of the CRISTANINI camouflage Maserati made by CRISTANINI CBRN DECONTAMINATION SYSTEMS, during the "3rd International CBRN Symposium". This is the most important event about CBRN in Europe, and it was successfully held in Berlin, on 19th – 21th October 2015.

The German Association for Defence Technology hosted in October last year the 3rd International symposium about the development of CBRN protective capabilities. More than 625 delegates from 53 nations participated.

With increasing terror threat in most part of the world, and the possible recent use of chemical weapons in Syria, the conference theme of CBRN protective capabilities was "spot on"

with regard to today's situation.

Several companies presented their capabilities during the conference. One of the more spectacular demonstrations was the decontamination of a Maserati sports car, owned by the CEO of Italian company Cristanini.

The car was decontaminated with the multispectral decontamination/detoxification product BX 24, applied to the car by Cristaninis own Sanjet Spray gun. The main purpose of the demonstration was to show the effect of the effect of the BX24 and the Sanjet Spray gun against contaminants, and to highlight that vehicles or other equipment are not harmed due to the decontamination process.

Cristanini provides also BX29 for decontamination of personnel, BX 40 for radiological decontamination and SX 34 for decontamination for sensitive equipment like aircraft cockpits, electronic equipment, sensors and detectors.

## Bergen Group bags Norwegian frigate maintenance contract

Norwegian maritime services company Bergen Group Services has been awarded a one-year extension of the contract for the ship technical maintenance of the Norwegian Navy's Fridtjof Nansen frigates.

The company said the contract has an estimated value of NOK 70 (approx. \$8.1) million.

The project involves planning, coordination and implementation of scheduled maintenance, corrective maintenance and other additional work on the Navy's five frigates. Work will mainly be conducted on the Navy's main naval base at Haakonsværn just outside Bergen.

## Deliveries of NH90 helicopters

Patria delivered the last NH90 helicopter to Sweden under the NH90 assembly agreement concluded in 2001, and correspondingly, Finland received the first NH90 helicopter under the NH90-retrofit agreement concluded in 2013.

The last helicopter delivered to Sweden was configured

in the TTT-IM-version. Under the assembly agreement, Patria assembled a total of 29 NH90 helicopters in 2003–2015, 19 for Finland and 10 for Sweden. The last NH90 for Finland was delivered in June 2015. One of Finland's 20 NH90 helicopters are manufactured in France.

## Philippines to buy air surveillance radars from Israel

The Philippines has ordered three ELM-2288 air surveillance radars from Israel Aerospace Industries' (IAI) subsidiary Elta Systems for \$56m. The first delivery is scheduled to take place by the end of 2017, second in May and third in November 2018.

The ELM-2288 is an air defence and air traffic control radar (AD-STAR), which can operate independently and as part of a larger air defence system.

The mobile, long-range radar has ballistic missile detection and advanced electronic counter measure capabilities. Its integrated antenna is foldable making it convenient to transport it on standard roads, under bridges and inside a C-130 transport aircraft.

The long-range s-band family radar also supports early warning and traffic control activities.







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## BAE Systems and Mahindra to supply M777 howitzers to India

BAE Systems has partnered with India-based Mahindra on an \$885m contract to supply 145 M777 ultra-light howitzers (ULH) to the Indian army.

Under the terms of the deal, the companies will develop an assembly, integration and test (AIT) facility to enable better access to maintenance, spares and support for the M777.

In 2013, India requested a foreign military sale (FMS) of 145 M777 ULH systems from the US government.

As part of the sale, India requested laser inertial artillery pointing systems (LINAPS), spare and repair parts, support and test equipment, maintenance, personnel training and training equipment, as well as engineering and logistics support services.



An MH-53E Sea Stallion helicopter lifts an M777 155mm lightweight Howitzer. Photo: US Navy/Alvarez

The M777 is an advanced self-propelled artillery system that is designed to deliver up to five rounds per minute at ranges of 24.7km with unassisted rounds and 30km with rocket-assisted rounds.

The howitzers are expected to help modernise India's armed forces and augment its operations in hazardous conditions.

## Triton UAS Completes Operational Assessment

The MQ-4C Triton unmanned aircraft system (UAS) built for the U.S. Navy by Northrop Grumman Corporation has successfully completed Operational Assessment (OA). Pending final data analysis, the completion of this milestone signals the maturity of the system and paves the way for a positive Milestone C decision. Milestone C will transition Triton into low rate initial production.

As part of OA, an integrated test team made up of Navy personnel from Air Test and Evaluation Squadrons VX-1 and VX-20, Unmanned

Patrol Squadron, VUP-19 and Northrop Grumman demonstrated the reliability of Triton over the course of approximately 60 flight hours. The team analyzed sensor imagery and validated radar performance of Triton's sensors at different altitudes and ranges. The aircraft system's ability to classify targets and disseminate critical data was also examined as part of the operational effectiveness and suitability testing. Successful evaluation of Triton's time on station confirmed that it will meet flight duration requirements.



The Triton unmanned aircraft during first flight in May 2013  
Photo: Northrop Grumman

## KC-30A Successfully Refuels C-17A

The first air-to-air refuelling from an RAAF KC-30A Multi Role Tanker Transport (MRTT) to a United States Air Force (USAF) C-17A Globemaster III occurred on February 10 over Edwards Air Force Base in the United States.

The five-hour sortie saw 39 contacts between the KC-30A and C-17A aircraft. During these contacts approximately 6,800 kilograms of fuel was transferred to the C-17A via the KC-30A's Advanced Refuelling Boom System (ARBS).

Air-to-air refuelling of a C-17A significantly increases the aircraft's range, making it capable of carrying heavy payloads further.

RAAF C-17A crews will soon begin refuelling trials with the KC-30A, having trained in the role in late 2015 with a Republic of Singapore Air Force KC-135 tanker.

The RAAF operates five KC-30A MRTTs, with two more

joining the fleet from 2018. The KC-30A has a fuel capacity of more than 100 tonnes, allowing it to fly up to 1800 kilometres from its home base and offload up to 50 tonnes of fuel for four hours.

The RAAF also operates a fleet of eight C-17A transport aircraft, the latest two examples of which were delivered in 2015. These aircraft are extensively employed in support of Defence operations abroad, and are currently conducting missions to Antarctica for the Australian Antarctic Division.

The KC-30A's ARBS is also compatible with refuelling the F-35A Lightning II, as well as the E-7A Wedgetail, P-8A Poseidon, and other KC-30As. Each KC-30A is also equipped with two hose-and-drogue refuelling pods that are compatible with the RAAF's own Hornet and Super Hornet strike fighters, and the Growler electronic attack aircraft.

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## Rheinmetall to deliver logistic vehicles to a Latin American customer

Rheinmetall has received a contract worth more than 53m EURO to deliver logistic vehicles for an undisclosed Latin American customer.

Under the contract, Rheinmetall MAN Military Vehicles will initially provide 92 TGS-MIL and 216 TGM MIL logistic vehicles for the customer's army and a further 30 TGS-MIL for its navy, as well as support services.



MAN truck 6x6 Photo: Rheinmetall

## Indian carrier may be modified into a luxury hotel

The Indian Navy's Centaur-class aircraft carrier, INS Viraat, is reportedly planned to be modified into a luxury hotel, as part of efforts to promote tourism in the Indian state of Andhra Pradesh. The plan is to have 500 rooms onboard in addition to a conference hall to seat 500 people. Since it is an aircraft carrier, helicopters can easily land on it.

Following its decommissioning this year, work on the proposal to develop the aircraft

The current order consists of troop carrier and cargo trucks, water and fuel tankers, and mobile repair shops.

Deliveries under the contract, which features an option for 337 more vehicles, will be carried out from March 2016 to May 2017.

Developed based on MAN Trucknology generation, the TGM and TGS model series have travelled millions of kilometres in development. They are designed to operate under extreme conditions and temperatures from -32°C to 49°C.

The armed forces of more than 50 nations have shown interest in the trucks, 80,000 of which are being used worldwide.

carrier into a hotel in the sea, or a museum will depend on logistics and receipt of approval from the country's defence ministry.

The aircraft carrier, after being modified, will be docked at the shores of Visakhapatnam city, and will serve as a tourist attraction.

The 226.5m-long aircraft carrier is fitted with a 12° ski jump to launch Sea Harriers, a reinforced flight deck, and 3cm of armour over the magazines and machinery spaces.



Indian Navy's aircraft carriers INS Viraat. The carrier was launched in 1953 for the UK Royal Navy, and sailed under the name HMS Hermes until she was acquired by the Indian Navy in 1987 and renamed INS Viraat. Photo: Indian Nav

## PROTECTOR 30mm contract with General Dynamics

The selection of KONGSBERG as the supplier of the 30-mm weapon system solution to the U.S. Army was announced in December 2015 by General Dynamics Land Systems in Sterling Heights, Michigan, USA

KONGSBERG has been awarded a contract by General Dynamics Land Systems and the U.S. Army for the PROTECTOR MCRWS to be integrated onto the Stryker Infantry Carrier Vehicle (ICV). The contract, the first of a multi-phase initiative, includes production, delivery

and testing of the initial systems for the program.

PROTECTOR MCRWS is the latest Remote Weapon Station (RWS) technology delivered to the United States Department of Defense by KONGSBERG Protech Systems. It is the direct product of 15 years of RWS experience supporting the needs of the U.S and the other 16 customer nations across the world. PROTECTOR MCRWS will ensure Stryker formations are able to fulfill new and expanding mission roles across the globe.

## Saab and Kalyani team up to form JV in India

Saab has joined forces with India's Kalyani Strategic Systems Ltd (KSSL) to support a multi-billion dollar contract for short range surface to air missile and man-portable, very short-range air defence (VSHORAD) programmes.

Both the companies will form a joint venture (JV) that will provide additional support for the Indian Army's short range surface to air missile (SRSAM) air defence programme.

The new entity will handle the main part of production and delivery of subsystems and systems for SRSAM and VSHORAD programmes.

As part of the latest development, orders of missile parts have already been issued to KSSL followed by production-

readiness reviews to ensure production quality.

The companies are currently planning for the technology transfer for different packages within the programmes.

Previously, Saab had partnered with India-based transport specialist Ashok Leyland to compete for the SRSAM air defence programme.

The solution offered for the SRSAM requirement combines the Saab BAMSE missile system with Ashok Leyland's Super Stallion 8x8, a high-mobility vehicle capable of operating in all types of terrain under all weather conditions.

All SRSAM components are expected to be integrated into the Super Stallion 8x8 high-mobility vehicle for transportation to specific locations.



Saab BAMSE missile system on Ashok Leyland's Super Stallion 8x8 Photo: Saab

## Coastal Surveillance System for Croatia

Saab will supply a coastal surveillance and border protection system to Croatia. The system has a strategic role to secure the maritime borders of Croatia and is scheduled to be operational by June 2016.

The coastal surveillance system will provide real-time information from radar sensors, advanced long range and thermal closed circuit television cameras plus Automatic Identification System (AIS). The sensors are deployed at strategic sites along the coastline and will be connected to several control

centres in one of the most advanced maritime monitoring systems operational in Europe. The system will be operated by the Croatian Ministry of Interior Border Police.

The system will detect, identify, track and monitor vessels at a distance of up to 100 km, while providing operators with an accurate maritime situational picture on a 24/7 basis. The system will help the Ministry of Interior to protect its sea borders from all threats and intruders.

## NSPA orders RBS 70 BOLIDE Missiles

Saab has received an order for RBS 70 BOLIDE missiles from NATO Support and Procurement Agency (NSPA). The order value amounts to SEK 106 million and deliveries will take place during 2016-2017.

The Saab portfolio of short-range ground based air defence missile systems comprises of the RBS 70 and the further enhanced RBS 70 NG. The order for RBS 70 BOLIDE missiles, placed by NATO Support and Procurement Agency (NSPA), is part of the customer's long-term plan to enhance their air defence capabilities.

19 countries have procured more than 1,600 RBS 70 systems, including more than 17,000 missiles. The BOLIDE missile is the 4th generation all-target very short range air defence (VSHORAD) missile from Saab. With the missile the RBS 70 system aims at the complete threat spectrum from fixed and rotary wing aircraft down to small targets such as cruise missiles and UAVs, with a range of more than 8 kilometres and with altitude coverage in excess of 5,000 metres.

## F-35 JSF development programme to complete in autumn 2017

Executive officer of the F-35 Lightning II joint strike fighter (JSF) programme has said that the aircraft development is scheduled to be completed in the autumn of 2017.

According to US Air Force (USAF) lieutenant general Christopher C. Bogdan, the development programme is moving forward while addressing various challenges including incorporating fixes to address the current flight restrictions on lightweight pilots.

Currently, the programme has 419 deficiencies to be corrected. So far, 700 to 800 deficiencies have already been addressed.

Bogdan said: "In the big picture, I would tell you that the programme right now is accelerating, growing and changing."

"The mark of a good programme is you find the problems, you solve the problems and you keep the programme moving forward without derailing it.

"What we're trying to do right now is work toward that very large \$50bn-plus contract and turn that into a modernisation programme."

The problems observed in the programme include issues

with software, hardware, and the Autonomic Logistics Information System (ALIS).

Bogdan added that due to a possible risk of neck injury should ejection be necessary, lightweight pilots are restricted from flying the F-35s.

For a pilot weighing between 103lb and 136lb, the odds of that person having to eject and then being injured in the ejection are one in 50,000.

The changes being implemented include a 'heavy / light' weight switch and when

in the 'light' position, the seat would delay the parachute's extraction by milliseconds if the pilot had to eject, so the shock and stress on the neck would be reduced.

As part of the programme, a restraining device also was sewn into the risers behind the parachute so that if a lightweight pilot were to eject at a 'weird angle' it would stop the pilot's head from going backward.

The head restraint and the seat switch have been tested, and they work, adding that

those fixes are ready to go into the field and in production by the end of this year.

In addition, the helmet's weight has to be reduced from 5.1lb to between 4.6 and 4.8lb.

Bogdan noted that the USAF's announcement to buy 43, rather than 48 F-35s in fiscal 2017 is 'almost a non-news event'. He explained that the intention is to defer purchases, not cut aircraft.

The programme is aimed at delivering more than 870 airplanes over the next six years.



F-35 A

Photo: US Air Force

## UK MoD invests £201m for Successor submarine design work

The UK Ministry of Defense (MoD) has announced an investment of £201m to support the design and development of the Royal Navy's future nuclear deterrent Successor submarines.

The investment is said to be a part of the overall £3.3bn package, which was announced in the last parliament for the assessment phase of the Successor submarine programme.

BAE systems will use the funding to develop the design of the submarine including designing the layout of the new vessel's equipment and systems, plan the manufacturing process, and produce early prototypes.

The Successor programme will also see participation of Babcock International, Rolls-Royce, as well as other suppliers from small and medium-sized businesses in designing and developing the stealth submarine.

The new submarines are set to replace Royal Navy's existing fleet of four Vanguard-class submarines by the early 2030s.

The MoD stated that the new set of submarines will be one of the stealthiest submarines in the world, and will be incorporated with features to facilitate a safe operation with technical enhancements.

The project, which will employ 2,500 skilled personnel from the companies associated, is expected to generate 1,400 new jobs, increasing the number of people in employment at HM Naval Base Clyde to 8,200 by 2022.



An artist's impression of the new submarine Photo: GOV.UK

## Archer artillery systems to Swedish armed forces

The Swedish Defence Materiel Administration (FMV) has officially handed over the Archer artillery systems to the country's armed forces and the artillery regiment.

During the handover ceremony, a demonstration involving the firing of two Archer guns was carried out.

The Artillery Regiment unit is set to receive 24 series of pieces, which will be made throughout this year.

The FMV took delivery of the first production series Archer artillery system from BAE Systems' facility in Karlskoga, Sweden, in October 2015.

BAE received a \$200m contract in 2010 to supply of a total of 48 artillery systems, including 24 each for the Swedish and Norwegian Armed Forces, as well as associated ammunition handling systems. But in late 2013 the Norwegian Armed



Archer Artillery system Photo: FMS

Forces redrew from the contract.

The company handed over the first four Archer systems to the Swedish Government in 2013, which are used by the Swedish artillery regiment.

A development of the 155mm towed FH77 L39 system, the Archer is a fully automated 155mm howitzer and a M151 Protector remote-controlled weapon station mounted on a modified 6x6 chassis of Volvo A30D all-terrain truck.

It is designed for rapid deployment and high-mobility in demanding operational scenarios.

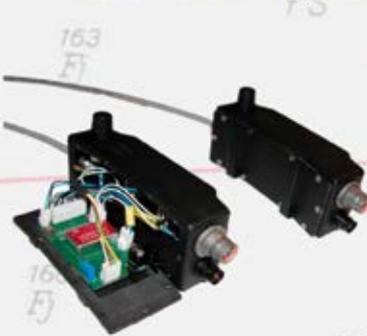
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## Saudi Arabia requests of Phalanx close-in weapons system from US

The US Defense Security Cooperation Agency (DSCA) has notified Congress of the potential foreign military sale of MK 15 Phalanx Block 1B Baseline 2 Close-in Weapons System (CIWS) Guns to the Kingdom of Saudi Arabia.

Under the estimated \$154.9m sale, Saudi Arabia has requested for MK 15 Phalanx CIWS Block

1B Baseline 2 kits, equipment, training, and logistics support, as well as upgrades and modifications to five MK 15 Phalanx CIWS Block 0 systems.

The Block 0 systems are currently installed on the Royal Saudi Naval Forces' (RSNF) four patrol chaser missile (PCG) ships in their Eastern Fleet, with one system located at its Naval Forces School.

Phalanx is an anti-ship missile system that defends vessels and their crews from threats, including helicopters, floating mines and standard and guided artillery, in addition to a range of shore-launched, anti-ship missiles.

The rapid-fire, computer-controlled radar integrates the 20mm gun system, and is capable of automatically acquiring, tracking and destroying enemy hazards that have infiltrated other defence systems on vessels.



Phalanx Block 1B close-in weapon system. Photo: Raytheon



F-22 Raptor

Photo: USAF

## USAF deploys four F-22 Raptors to South Korea

The US Air Force (USAF) has deployed four F-22 Raptors to South Korea to demonstrate the alliance's air combat capabilities in response to a recent satellite launch by North Korea.

The F-22 Raptors were deployed alongside South Korean F-15K Slam Eagles and the USAF's F-16 Fighting Falcons during the flyover that demonstrated the high level of integration and interoperability between the two air forces.

Powered by two F119-100 Pratt & Whitney turbofan en-

gines, the F-22A Raptor is a fifth generation, supersonic, tactical dual fighter jet, designed primarily as an air superiority fighter, but can also be configured to conduct ground attack, electronic warfare, and signals intelligence missions.

Last week, North Korea launched an earth observation satellite amidst international criticism.

The countries including the US, South Korea and Japan have requested a strong UN resolution against North Korea.

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# GLOBALEYE; SURVEILLANCE OF AIR, LAND AND SEA

Saab extends its airborne early warning and control portfolio, with the introduction of the GlobalEye multi-role airborne surveillance system. GlobalEye combines Saab's all-new Erieye ER (Extended Range) radar and mission system with the high-end Global 6000 jet aircraft from Bombardier.

Saab has supplied airborne early warning and control (AEW&C) systems with operational customers in eight countries worldwide. Now Saab offers a new level of multi-mission airborne surveillance capability. For the first time on the market GlobalEye provides a system that can conduct simultaneous long-range detection, tracking and surveillance in the air, land and maritime domains, all from a single platform.

"With GlobalEye we expand and sharpen our offering, targeting customers looking to maximise their return on investment in extended AEW&C capabilities as a national asset to benefit their country," says Micael Johansson, head of Saab's business area Electronic Defence Systems.

The multi-role GlobalEye automatically detects and tracks air and surface targets over a huge area. Ground surveillance of moving vehicles can be conducted through long-range, wide-area ground moving target indication (GMTI) radar modes. With the Erieye ER radar, detection and tracking ranges have been significantly increased compared to existing airborne radars, and against the smallest targets. The GlobalEye system can track very low-observable air and sea targets, including 'stealthy' aircraft, cruise missiles or submarine periscopes, even in heavy clutter and jamming environments.

"GlobalEye delivers a swing-role capability for simultaneous air, maritime and ground surveillance in a single

solution, with the ability to change role dynamically, while airborne during any mission," says Micael Johansson.

The GlobalEye integrates a suite of sensors, including signals intelligence, and advanced self-protection equipment with a newly-developed command, control and communication system. Cost-effective system availability is assured through the combination of a small organisational footprint and in-service support.

A key element of the GlobalEye system is the Global 6000 ultra-long-range jet aircraft from Bombardier. It is a high speed aircraft with short field performance and low operating costs. Thanks to the Global 6000 platform GlobalEye mission endurance can extend up to 11 hours.

The launch customer for GlobalEye is the United Arab Emirates, which ordered the system as the Swing Role Surveillance System (SRSS), in November 2015. ■



Art impression of GlobalEye on a Bombardier Global 6000 aircraft  
Ill. Saab

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# THE A26

## – COMING TO NORWAY AS WELL?

The Swedish Saab Kockums has started the construction of two new submarines designated the A26 type for the Swedish Navy. The Swedish Navy and Saab Kockums are joined in the hope that Norway, Poland and the Netherlands will plunge for the A26. The design and capabilities of the A26 are to an great extent connected to the previous Viking project, where the Norwegian, Danish and Swedish experts were gathered to design the next generation submarine.

The A26 is a conventional air independent (AIP) submarine. The new A26 is some eight feet longer than the current Swedish

subs of the Gotland class. For the Swedish navy, the new A26 vessels will be replacements for the venerable Södermanland class.

### Flexibility

The A26 is distinctively different from both the Gotland class and the Södermanland class on several counts. Says project manager Per Nilson of Saab Kockums: – With the A26 we have designed a submarine that not only can fulfil today's needs, but also has the flexibility to make it possible to equip the boat with the capabilities that the Navy might be looking for in the future.

In particular, the large hatch, the Flexible Payload Lock, being built into the bow of the sub affords a lot of extra flexibility. As of today, there are no subs with a similar feature. In addition to the deployment of unmanned underwater vehicles (AUV/ROV), the hatch can also be used to deploy navy SEALs, perhaps with a Swimmer Delivery Vehicle (SDV); also the placing of mines, listening buoys, and so



much more. Just this hatch provides the A26 with a formidable level of flexibility, meeting current demands as well as such future requirements as the Navy might identify and specify.

## No Periscope

The A26 will not be equipped with the periscope common in today's submarines. Instead, it will rise an optronic sensor to the surface, attached to a telescopic mast. The advantages of this are numerous. Firstly, there is no need for a periscope hole in the hull, which is a definite constructional plus. Furthermore, there is no longer a requirement for the control room to be centred around the periscope, like it is today. In the design of the submarine, there is a free choice of the most workable design. For the A26, this entails that the control room is located towards the front of the vessel.

A further advantage of the optronic sensor is that the sensor breaches the surface for only a very short time. While a conventional periscope means that a person inside the submarine looks into the periscope while turning it to get an all-round view of what is happening on the surface, a camera sensor will only breach the surface for about 3 seconds to acquire a 360-degree

## A26

- ▶ **Length:** 65 m
- ▶ **Displacement surfaced:** 2,000 tonnes
- ▶ **AIP endurance at patrol speed:** >18 days
- ▶ **Standard complement:** 26 persons (17–35)
- ▶ **Operational environment:** Tropical – arctic
- ▶ **Propulsion:** Stirling AIP and diesel electric
- ▶ **WEAPON SYSTEM:**
  - 4 x weapon tubes
  - Multi-Mission Portal (MMP)
  - SOF divers lock using the MMP
  - Torpedoes and mines
  - Unmanned/manned vehicles
- ▶ **COMBAT SYSTEM:**
  - Combat Management System
  - Optronic sensors
  - Full sonar suite
  - R-ESM and C-ESM

*A26. The Flexible Payload Lock in the bow has a number of practical uses and purposes today, offering the A26 a huge amount of flexibility with regard to meeting future demands.*

*Ill. Saab Kockums*

## JAPAN'S SORYU-CLASS SUBMARINES

- ▶ The first submarine of the Soryu class went into operations in the Japanese self-defence navy in 2009. After this time, a further seven vessels of this submarine class have been delivered, and the plan calls for the Japanese self-defence navy to have a total number of 11 Soryu-class submarines.
- ▶ The Soryu class is some 84 meters long, and with a displacement of about 2900 tons, these submarines are significantly bigger than the A26. The Japanese submarines carry four Stirling units on board (against two for the Gotland and three for A26).

## A26 IS VIKING

- ▶ – The Viking project was a joint Norwegian, Swedish and Danish submarine project, with a view to developing a joint submarine concept for the three nations, says Hans Wicklander of Kockums. Within the project, an agreement was achieved on a joint design to cover the requirements of all three countries. And even if Denmark wanted a somewhat smaller version of the Viking submarine than Norway and Sweden, the vessels were for all practical purposes identical. The Viking project came to an end in the early years of the new millennium, when Denmark decided to disband its submarine force, and Norway decided against renewing its submarines of the Kobben class. But the experiences gained from the Viking are fully implemented in the A26 submarine, and Kockums is confident that the A26 fulfils the requirement specifications that for example Norway laid down for the Viking submarine. By the same token, we regard the A26 to be capable of fulfilling all requirements of the nations interested in the A26 submarine.

## LONG ENDURANCE



- ▶ The Stirling AIP units recharge the submarine batteries while the vessel is submerged. On non-AIP submarines, the batteries must be recharged from the diesel engines on board, and these are dependent on a massive air supply. Charging of the batteries can only be done while the submarine is near the surface, drawing air through a snorkel.
- ▶ While a conventional submarine can stay submerged for no more than 2 to 3 days before having to come up to snorkel in order to run the diesels to recharge its batteries, an AIP powered submarine can stay below for more than three weeks.

- ▶ This capability poses other challenges to the conditions on board, however, and not least to the environment for the crew. On the A26, much effort has gone into achieving a functional and effective environment on board, precisely with a view to the crew having to stay below for weeks at a time. The illustrations show the control room (above) like it has been planned for the A26. The sketch to the right shows what the mess area onboard might look like.



view, for the camera then to submerge again. The on-board operators can then at leisure take a look at the surface view from their monitors, and several crew members can view the surface situation together and evaluate the sensation as a group, says Nilson in closing.

### Stirling AIP

– Kockums tested its first Stirling AIP (Air Independent Propulsion) as early as 1984, and the Swedish Navy has been operating Stirling-powered submarines since 1988, says Stirling manager Mikael Scott at Kockums.

Stirling is accordingly the most thoroughly tested AIP concept on the market today. The Swedish Navy is not alone in the use of AIP submarines, as the Japanese navy is also a Stirling AIP user. Japan makes their Stirling engines under licence, and the Japanese Stirling units are quite identical to the Swedish.

The Stirling principle is one of continuous combustion – as opposed to a series of small explosions working on a piston in conventional diesel and petrol engines. This makes the engine particularly silent in operation. Furthermore, the continuous combustion is not dependent on a steady supply of air, like with a regular diesel engine – it is accordingly Air Independent.

In addition to being silent running and air independent, the Stirling engine is easy to maintain and economical in operation. The standard fuel for the Stirling engines is normally ordinary diesel. The engines can operate on other similar fuels, at the cost of somewhat increased wear and tear. Each Stirling unit develops some 70 KW, which is about 100 horsepower.

– Further confirmation of the Stirling engines' ease of operation and fuel economy comes from hearing how much the Navy uses its Stirling engines. It goes without saying that the Navy could not be doing this with machinery that was expensive to run, hard to maintain and difficult to operate, explains Scott.

The Stirling machinery, like all combustion engines, generates an amount of surplus heat, which is used in the heating of the interior. Furthermore, the excess heat from the engines is used to regenerate the air purification system on board.

A total of more than 40 Stirling AIP engines have been built around the world, and the engines have collectively accumulated more than 100,000 test hours. The Stirling engines have been operational on

submarines since 1988, and more than 70,000 hours of operation have been logged in Sweden, Denmark, Japan, Singapore and Australia. This last fact indicates that the operational conditions the engines have been subject to, has been varied to say the least.

– We have also sought to achieve a higher degree of availability for our new A26 subs, which we are bound to, since the total number of submarines in the

Swedish Navy has been reduced. This has meant that for the A26, we are looking at extending the interval between major overhauls to eight years, unlike the current generation of submarines, which require a main overhaul after six years. At the same time, we hold that the costs of operating the A26 will be lower than the current fleet, due in part to the lower direct maintenance costs as well as the reduction in the number of people on board. ■■



Hans Wicklander (left) and Per Nilson of Kockums in Malmö.

Photo: MilitärTeknikk



Mikael Scott with the latest version, MK 5 of the Stirling AIP module. Compared with the Mark 3 used in the Gotland class, the MK 5 takes up only two thirds of the space, even though the power is the same. Even the Gotland class is up for the MK 5 Stirling module in connection with its upcoming midlife update.

Photo: MilitärTeknikk

# THE MOST MODERN SUBMARINE YARD IN THE WORLD

It is not a secret that when Kockums was German-owned, no major investments were made into Swedish submarine facilities, says Gunnar Wieslander, Managing Director for Saab Kockums.

But this also gives us an advantage. Having to start the production work almost from scratch this time, we are in the process of building the most modern submarine yard in the world, says Wieslander. – We are seeing that with the A26, we can break down two curves that have almost come to be accepted as laws of nature in the defence industry: That all new defence materiel will be more costly to buy and more expensive to operate and maintain than the equipment it replaces.

– It is our position that we shall be able to make the A26 submarines at a lower cost than earlier submarines, due in part

to the modular design whereby the units can be completed fully before installation in the submarines, thereby cutting down on work time inside the pressure hull where space is at a premium. In addition, we are seeing that the modern yard we are building, with a high degree of automation, will give us both lower costs and enhanced quality. Our welding robots make a perfect weld every time, and it does so in a single operation, faster than any human worker could. In designing the submarine, we are also providing for the need for the robot to enter and have the space to perform operations. This means

that we can use the robots a lot more than before, thereby saving costs.

Furthermore, we are confident that the life cycle costs of the A26 will be less than what is the case for today's submarines. We hold that the A26 will have lower maintenance costs at the outset, and not least through the increased degree of automation on board, will enable the number of crew to be reduced.

At the same time, we are seeing that the A26 will be a more flexible submarine than earlier units.

– We cannot say what future operators will require of



Managing Director for Saab Kockums, Gunnar Wieslander, would welcome collaboration between Norway, the Netherlands and Poland for the purpose of acquiring A26 submarines.

Photo: MilitärTeknikk

their submarines in a couple of decades from now, but we feel that the A26 is the most flexible submarine in today's market, and that it will prevail as the easiest and least expensive submarine to adapt to the needs and requirements of the future, says Wieslander in conclusion.



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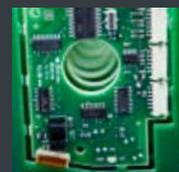
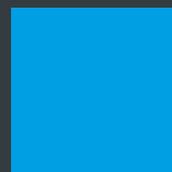
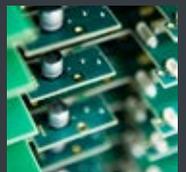
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# FINLAND'S NEW MULTIPURPOSE VESSEL

Finland has begun its 'Laivue 2020' (Squadron 2020) programme to build a new class of four multipurpose offshore patrol vessels (OPVs).

The new vessels are intended to replace the Finnish Navy's four Rauma-class fast-attack missile boats, and its two Hämeenmaa-class minelayers. Both of these classes are planned to be retired in the mid-2020s, as their service life "cannot be extended in a cost-efficient way", according to the Finnish Ministry of Defence (MoD).

Speaking to IHS Jane's on 1 October, a spokes-

person for the MoD stated, "The exact timing of the different milestones will be determined in the course of the programme, but as the first stage, an RFI [request for information] is foreseen to be issued in 2015-2016. Construction of the ships is foreseen in the years 2019-2024."

The new Laivue 2020 vessels are intended to be truly multirole, with anti-surface, anti-submarine, anti-air, and mine-laying capabilities in the Baltic Sea. The vessels are also intended to be able to take part in international crisis management missions.

The MoD estimates that building the new vessels will cost EUR1.2 billion (USD1.34 billion) ■■



Art impression of the Finnish Navy's planned new 'Laivue 2020' (Squadron 2020) vessels, four of which will replace the country's existing Rauma-class and Hämeenmaa-class vessels. Ill: Finnish MoD

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