

# defence & security technology

Showcasing Norwegian  
Industry Capabilities



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## facts:

#### Norway in Brief

Size: 385,155 sq. km  
(including the islands of Svalbard and Jan Mayen)

**Population** 4.7 million

#### Main Cities Population (incl. suburbs)

Oslo	811,688
Bergen	213,585
Stavanger/Sandnes	173,132
Trondheim	147,139

**GDP 2006** USD \$261.7 billion

#### Exchange Rate:

NOK/USD 6.42 (average 2006)

NOK/EUR 8.05 (average 2006)

#### Exports and Imports 2006

	NOK bill.	USD bill.	Amount of GDP
Total Exports	1,002	156	46.6%
Total Imports	610	95	28.3%

#### Main Export Commodities

Oil & gas, metals, machinery, chemical products, fish & fish products,  
pulp & paper and ferro alloys

#### Main Import Commodities

Transport equipment, machinery, chemicals, textiles and metal products



## Distribution

#### Norway Exports – Defence & Security Technologies is distributed through the following channels:

- The Norwegian Ministry of Defence
- Innovation Norway's offices and Norwegian embassies and consulates abroad
- The Norwegian Ministry of Foreign Affairs' offices abroad
- The Norwegian Ministry of Trade and Industry
- The Research Council of Norway's contacts and networks
- The Association of Norwegian Students Abroad's (ANSA) contacts and networks
- The Confederation of Norwegian Enterprise's (NHO) contacts and network
- Norwegian Chambers of Commerce worldwide
- Official state delegations in Norway and abroad
- The Norwegian Defence and Security Industries Association's (FSI) contacts and network

#### Recipients of Norway Exports – Defence & Security Products and Services will include:

- Relevant industry contacts in both the public and private sectors in Norway and abroad
- Relevant departments, politicians, and county and township offices in Norway
- Foreign military attaches abroad
- Purchasing departments and other decision makers in local defence-related organizations, institutions and departments in important markets internationally
- Attendees of international events, meetings and trade shows where Innovation Norway or Norwegian embassies are represented



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Norway's thousand-year-old Viking history of raiders plying the North Atlantic may seem far removed from the modern day military, but Norway's role in an increasingly globalized world still extends far beyond the defence of its coastline.



The global defence business is experiencing industrial convergence on all levels, and the Norwegian Ministry of Defence is working proactively to use this globalization in order to develop industrial cooperation opportunities that are being felt far outside of Norwegian borders.



Ethics, transparency and Corporate Social Responsibility (CSR), are becoming more important in all lines of business and government, and perhaps nowhere are these elements more important than in defence. It is here that people's lives – and nations – are often at stake, and the level of responsibility is high.

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### SPECIAL THANKS TO:

Anne-Grete Strøm-Erichsen (The Norwegian Minister of Defence), Colonel Tore Kvalvik, Jon Gunnheim, Elisabeth Bødtker Larsen, Alvhild Myhre Winje, Hilde Bryhn, Bård Bredrup Knudsen, Marita Isaksen Wangberg (The Norwegian Ministry of Defence), Leif Helge Salomonsen (Innovation Norway), Torbjørn Svengård, Steinar Jøssund (Norwegian Defence & Security Industries Association), Kim Davis (Research Council of Norway)

# defence & industry – working towards common goals



According to Defence Minister Anne-Grete Strøm-Erichsen, “It is the Government’s recommendation that the Armed Forces should be strengthened, both over the forthcoming four-year period and thereafter. This is a plan for building up the Armed Forces, not cutting them back.”

What security challenges do we face in 2008 and in the future? And

how will these affect the shaping of our defence and security policy? A balanced and prepared Armed Forces is a top priority for the Norwegian Government, signaled by our plan to increase the overall defence budget by nearly NOK 800 million.

## Strategic Investments

The Norwegian defence industry will continue to benefit from the short and long-term strategies of the Norwegian Ministry of Defence, strategies that call for a budget increase that will allow strategic investments in the country’s northern regions while at the same time maintaining sound national defence in addition to providing international support according to treaties and agreements.

At the same time, the emphasis on a continued strengthening of investment, Research & Development, and manufacturing within the defence industry is in focus with an ongoing effort to increase Norwegian industry’s access to foreign markets. The guiding document in this process is the White Paper (St. meld. nr. 38 (2006 – 2007)) “The Armed Forces and Industry – strategic partners”, providing incentives and facilitating the continued development of a strong relationship between defence and industry. At the same time, and most importantly from a defence perspective, the mechanisms that will ensure the ongoing Armed Forces access to competence, materiel, services – and solutions are in place.

## Strength at Home – Support Abroad

The Norwegian Government takes Norway’s international responsibilities very seriously. The UN and NATO are the bedrock on which Norway’s security policy is based. We will continue to make substantial contributions to international operations.

This international support is balanced with the ongoing emphasis on military strength and preparedness on a national level.

This emphasis is well-coordinated with the long-term planning to bring into focus the strengthening of the northern areas, addressing the tasks and challenges that are faced in the sea areas outside of the Norwegian coastline, and at the same time enhancing the national armed forces in general:

- Strengthening of the Army, increasing numbers as well as increasing preparation and training for operations
- Enhancing the operational capabilities of the Navy by commissioning new helicopter-equipped frigates and MTB, also continuing to give priority to the Coast Guard
- A stronger Air Force will be the result as a new transport aircraft is phased in and helicopter facilities are consolidated
- Manpower numbers will be increased



### **Transparency & Social Responsibility**

Transparency, social responsibility and the highest of ethics are the key words in any business, but especially within the Norwegian defence industry. It was with this in mind that the Norwegian Ministry of Defence developed and issued the “Ethical

Guidelines”. In the interest of the defence sector’s reputation in society and the general trust of the population on which we rely, it is essential that these guidelines be complied with.

The Norwegian defence industry’s reputation for technological expertise and

quality combined with the highest of ethics is a valuable tool in helping Norwegian industry gain access to an increasing number of foreign markets. This combined with the Norwegian Defence Industry’s emphasis on offset agreements as well as the building of military strength is continuing to build valuable synergies both nationally and internationally.

anne-grete strøm-erichsen

*The Norwegian Minister of Defence*



The Norwegian Coast Guard is one area of priority for the Norwegian Ministry of Defence.

# forging close cooperation



In the increasingly global defence and security industries, the demands for quality and excellence of service are high. In Norway, this is taken very seriously, and the Norwegian Defence and Security Industries Association (FSi) is the member organization that works with its more than 100 members in helping them to best serve society through protection.

The value of the industry being able to speak through one voice cannot

be underestimated. A large portion of technology and solutions currently referred to as “defence technology” are actually applicable also to the area of homeland security – in many cases without modifications. On this basis, FSi’s basic focus is broadened in scope beyond that of a mere defence and security industry association.

FSi’s members represent the broad spectre of expertise and experience in the industry, working with all its members to present what the Norwegian security and defence industry has to offer, also working in close cooperation with the Norwegian Armed Forces and the Ministry of Defence.

## Close Cooperation & Highly Skilled

Through decades of close cooperation with the Norwegian Armed Forces, NATO bodies and a strong link to the international defence industry, FSi’s

members have played a key role in helping the Norwegian military develop leading capabilities in select fields within a NATO context. Its members have also been highly successful in applying these technologies, skills and competences to the civil marketplace. Thus “dual use” is another shared quality represented by FSi members.

FSi member companies represent a combined total of more than 25,000 highly skilled employees. The turnover in defence is estimated at NOK 9.5 billion per year, of which approximately NOK 4 billion is exported. Approximately 85% of our member companies are, by Norwegian standards, SMEs. Many of these companies are becoming known outside Norway, joining the major Norwegian defence companies already making an impressive mark internationally. FSi and the Norwegian defence industry continue to work towards continuing this positive trend.

## Expanded Scope

FSi member companies, in addition to concentration on upcoming and future defence and security investments, will turn their efforts towards considerable investments expected within the police forces, coastal and harbour surveillance, air and airport security and security solutions for oil and hydroelectric infrastructure. Technology is in focus – technological measures to prevent and protect against terrorist attacks, technologies that can monitor potential natural catastrophes, technologies applied against organized crime, control systems for monitoring critical public infrastructure such as power networks, etc.

In the modern world, the notion of homeland security now is under the same umbrella, at least from an organizational and industrial point of view. FSi is the organization working with its members to improve support to this wide spectre of society, both in Norway as well as internationally.

torbjørn svensgård

President FSi

# the norwegian ministry of defence

The Norwegian Ministry of Defence is responsible for the development and implementation of Norwegian security and defence policy, and responsible for the overall management and control of the activities of subordinate agencies.

Anne-Grete Strøm-Erichsen has been the Minister of Defence since 2005, and is responsible for all Ministry activities. Civilian-led and strengthened through the incorporation of military expertise, the Ministry's aim is to integrate and coordinate the strategic planning and management of Norway's defence

resources, and is organized into five departments of operation:

- Department of Personnel and General Services
- Department of Security Policy
- Department of Defence Policy and Long-Term Planning
- Department of Operations and Emergency Planning
- Department of Finance and Management

A combination of civilian and military expertise raises the level of professionalism and flexibility, also leading to more effective communication with necessary areas of the Norwegian government as well as with all branches of the Norwegian Armed Forces. Through coordinated planning on both strategic and practical levels, the Ministry is well-prepared to meet short and long-term goals and requirements related to national defence issues as well as cooperative efforts on the international level.



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# norwegian defence & security industries association (fsi)

The largest and most important association in Norway advocating the interests of the Norwegian Defence and Security Industry and the primary interlocutor for the government in matters of importance to the industry

FSi's mission is to foster framework conditions for member companies to succeed in the domestic and global defence and security markets, thereby contributing to Norway's defence and security goals.

The association comprises more than 100 companies from all parts of Norway. It is a diversified group ranging from the major national defence contractors to one-man businesses with unique niche capabilities built on innovation and advanced technology serving both the military and civilian markets.

FSi is the single point of contact for the Norwegian Government and authorities in strategic and political issues that affect the Norwegian defence and security industry. The association is also a focal point for foreign contractors seeking cooperation with Norwegian companies in relation to Norwegian defence procurements abroad and international collaborative programmes.

## FSi Administration

The FSi administration supports the member companies through:

- **Advocacy** – Representing the interests of the industry to the Government, the armed forces, opinion leaders, international organizations and the general public
- **Networking** – Offering a plethora of seminars and workshops every year, frequently in close collaboration with the MOD and the armed forces of Norway

FSi is based in Oslo at the headquarters of the Confederation of Norwegian Enterprise (NHO).

- **Business development** – Fostering dialogue with the Government, relevant bodies in the armed forces, foreign contractors seeking partners in Norway and defence industry association in other nations and providing updated information to member companies on relevant events and activities
- **Member Services** – Providing general advice to member companies and undertaking seminars and courses in subjects relevant to the industry

FSi maintains direct contact with key governmental and military bodies through established committees and work processes. FSi's ability to represent its members' interests is strongly enhanced through its close links to these authority organizations.

FSi represents Norway in NIAG (NATO Industrial Advisory Group) and is a member of ASD (Aerospace and Defence Industries Association of Europe). Through these organizations, FSi is a key facilitator

for Norwegian industrial participation in international projects and studies.

FSi is affiliated, and shares premises, with the Confederation of Norwegian Enterprise (NHO), the main representative body for Norwegian enterprises with a current membership of over 17,000 companies – a link which provides FSi with additional clout in its dialogue with the government and the Armed Forces.

For further information, please contact:



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# the research council of norway

The Research Council of Norway offers project support to companies that invest in innovation through research and development. Industry projects are financed through the tax deduction scheme SkatteFUNN and within research programmes such as BIA. Long-term research projects are funded through the Centres for Research-Driven Innovation. Project support also can be found in thematic programmes such as VERDIKT (ICT) and NANOMAT (nanotechnology and materials technology).

Facilitating the development of knowledge and technology that supports sustainable development is an important target for the Research Council. One important measurement of the success of projects financed through the Research Council are measured on the basis of how they address environmental challenges.

## Expanding Research Frontiers

The Research Council's overall strategy Research Expands Frontiers complements three main areas of activities: environment, advanced equipment and open competition for applied research. This overall strategy is further defined by five strategic priorities developed to guide efforts to generate insight, enhance opportunity and promote innovative solutions:

- Enhancing research quality
- Increasing innovation research
- Expanding the dialogue between research and society

- Continuing the internalization of Norwegian research
- Fostering more national talent are all key success criteria.

The Research Council administrates and distributes public funding through more than 130 research projects, including seven large-scale research programmes.

These include the FUGE (Functional Genomics in Norway) programme, combining marine, medical and basic biotechnology, with environmental science and ethics also representing important aspects of the project.

## Security in Focus

The Research Council of Norway is working very closely with the Norwegian government and the European Union related to the Framework Programme focusing on security, a programme built on 4 mission objectives:

- Security of citizens

- Security of infrastructure and utilities
- Intelligent surveillance and border security
- Restoring security and safety in case of crisis

The overall objective of this new programme is to contribute to the security of European citizens and includes technical considerations as well as social, economic, ethical and system-related topics. This important Framework Programme initiative has its focus on Security and Society as a cross cutting topic, also with a focus on security Research coordination and structuring as well as security systems integration, interconnectivity and interoperability.

Another important Research Council initiative is "Societal Security and Risk" (Samfunnsikkerhet og risiko), a programme with the goal of increasing awareness and knowledge concerning threats, vulnerabilities and societal risk – and how crisis can be avoided through proactive preparation.

The activities of the Research Council of Norway are based on the vision that research expands the boundaries of what we know, understand and can achieve.

© Jon Solberg, Research Council of Norway



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## – We give local ideas global opportunities

Innovation Norway offers products and services to increase innovation in industry throughout Norway, to help develop the national regions and promote Norwegian industry and internationalization and to promote Norway as a tourist destination.

With offices in more than 30 countries worldwide and in all Norwegian counties, Innovation Norway is easy to reach. Its staff has knowledge of local and international factors that will help turn its customers' ideas into business successes.

### Products Tailor-Made to Customers' Requirements

Innovation Norway assists the entirety of Norwegian industry, but has particular responsibility for aiding entrepreneurs and assisting small and medium-sized companies with an ambition and potential for growth.

Innovation Norway offers:

- Funding provided as loans, guarantees and equity capital programmes
- Advisory and expertise development measures

- National and international network building and technology transfer
- Marketing of Norwegian industry and Norway as a tourist destination

With these measures as a point of departure, Innovation Norway customizes its products and services according to the needs of each individual client. Through its offices in Norway and abroad, Innovation Norway's clients also gain access to services from other public agencies – such as the Research Council of Norway, the Norwegian Design Council and the Industrial Development Corporation of Norway (SIVA).

### Dynamic & Result-Oriented

Innovation Norway supports the profitable development of industry in both individual companies and in society at large:

- Innovation Norway contributes to the creation and securing of 9,000 jobs annually
- Customer surveys show that 90% of Innovation Norway's funds have been allocated to projects viewed as important to companies' survival and profit growth

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*Innovation Norway took over the tasks of the Norwegian Trade Council, the Norwegian Industrial and Regional Development Fund, the Govt. Consultative Office for Inventors and the Norwegian Tourist Board on January 1, 2004.*

# ansa

## (association of norwegian students abroad)

ANSA – the Association of Norwegian Students Abroad – is a non-profit, independent organization voicing the interests of Norwegian students who study abroad. Currently 22,000 Norwegian students are studying abroad in over 60 countries at over 1,200 educational institutions worldwide.

ANSA was founded by Norwegian students in 1956, and through the years ANSA has worked to improve and change the rules and regulations governing grants and loans for students abroad. ANSA believes that all students should have the right to study any subject in any country they wish.

ANSA provides a broad range of services to students before, during, and after their studies abroad:

### Before Studies

ANSA is the national Information Centre for higher education abroad. The Information Centre is funded by the Ministry of Education and Research and gives unbiased advice on higher education abroad. Its five full-time educational advisers visit schools and student recruitment fairs, give individual counselling, and publish information both in print and on the Internet.

### During Studies

As the welfare organization of Norwegian students abroad, ANSA offers services and funds social events for its members during their studies. Members are organized locally in 21 groups spread all over the world, and more than 500 volunteers arrange various events and represent ANSA where they study.

Members also run professional committees in a variety of subjects. These committees arrange meetings for professional development and networking, often in close collaboration with Norwegian organizations such as Tekna (science and engineering), *Siviløkonomene* (business administration) and *Den norske lægeforening* (medicine).

In cases of international crises, ANSA cooperates closely with the Ministry of Foreign Affairs to secure the safety of Norwegian students abroad. ANSA also works with the Norwegian Church Abroad (*Sjømannskirken*) and the Student Health Services at the University of Oslo in giving individual aid to students in difficulty.

In cooperation with Norwegian service providers, ANSA offers high-quality and cost-effective banking and insurance solutions tailored to the needs of students abroad.

On the political front, ANSA acts as an advocate for students and studying abroad through its relations with the Ministry of Education and Research, the Norwegian State Educational Loan Fund (*Lånekassen*) and other players in the field of higher education. Six hundred yearly quotations in the media make ANSA's views known both to politicians and the general public.

### After Studies

ANSA Alumni is a career network set up to help former students gain access to the Norwegian job market. ANSA Alumni arranges seminars, cooperates with ANSA's professional committees and offers an extensive network for job recruitment.

ANSA also maintains close connections with both public and private Norwegian employers, and with the Confederation of Norwegian Enterprise (NHO). Employers regularly advertise for candidates in ANSA's magazine *ANSAnytt* and through ANSA's mailing list. Every year ANSA organizes a Symposium where employers and students meet to discuss job opportunities.



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*ANSA attends to the professional, economic, social, and cultural interests of Norwegian students abroad, and strives to strengthen the appreciation of the resources these students represent because of their international experience and qualifications.*

## defence products &amp; services

**APPLICATION AREAS****AEROSPACE****Aerospace Technology**

Heli-One (Norway) AS	.42
Jotne EPM Technology AS AS	.45
Kongsberg Defence & Aerospace AS	.46
Park Air Systems AS	.57
SINTEF ICT	.59
Techni AS	.64
Tinex AS	.68
Trondrud Engineering AS	.70

**Air Defence Communications Systems**

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Jotne EPM Technology AS AS	.45
Kongsberg Defence & Aerospace AS	.46
Park Air Systems AS	.57
SINTEF ICT	.59
Thales Norway AS	.66
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**Aircraft De-Icers**

T&G Elektro AS	.60
Tinex AS	.68

**Aircraft Engine Components**

Heli-One (Norway) AS	.42
T&G Elektro AS	.60
Trondrud Engineering AS	.70

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Tronrud Engineering	.70
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**Anti-Vibration & Anti-Shock Protection**

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Park Air Systems AS	.57
SINTEF ICT	.59
Techni AS	.64
Thales Norway AS	.66

**Ground Support Test Systems**

Eidsvoll Electronics AS (EIDEL)	.40
Kongsberg Defence & Aerospace AS	.46
SINTEF ICT	.59
Tinex AS	.68

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Eidsvoll Electronics AS (EIDEL)	.40
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Trondrud Engineering AS	.70

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# primed & ready:

## norway's armed forces in the 21<sup>st</sup> century

By Nancy Bazilchuk

Norway's thousand-year-old Viking history of raiders plying the North Atlantic in search of plunder may seem far removed from the modern day military. But the governing Norse law of the time, the Gulatingslovi, laid the very foundation for national defence: Every settlement had to provide and outfit a leidangskip, a communal boat to be used to protect Norway's long coast against rival clans and foreign invaders.

In the centuries that have passed, Norway has continued to rely on its citizenry to serve when called – but society's collective tax revenue, not individual communities, now pay for the equivalent of the leidangskip, the Fridtjof Nansen-class frigates, or the Ula-class submarine. And Norway's role in an increasingly globalized world extends far beyond the defence of its coastline. The realities of a post-9/11 world require Norway to respond in a variety of roles, with a variety of equipment, virtually anywhere in the world, says Norwegian Minister of Defence Anne-Grete Strøm-Erichsen.

"Action in Afghanistan and Sudan, Asia and Africa are serious reminders of how involved we are in matters of international security, and of how little significance geographical distances now have where our own security is concerned. There is no longer any such thing as 'far away'," the Minister says in a broad brush outline of Norway's military strategy given to the Oslo Military Society in early January, 2008.

### Ready to Respond

While Norway is a country of just 4.6 million people, its military is nevertheless well armed with modern weaponry, communications and transportation designed to manage the nation's unique challenges as an Arctic land with international responsibilities.

Norway's institutes and industry also play an important part in this successful readiness, whether through the development of new composites to protect soldiers, as is being done at Norwegian University of Science and Technology's SimLab, or new composites and light metals for components and reinforcement,



© Magne Åhjem

KNM Fridtjof Nansen and KNM Narvik  
together by Marstein lighthouse.



as are provided by Kongsberg Defence and Aerospace AS, Devold AMT AS, and TotAL-gruppen in Raufoss, to the production of traditional products like ammunition, by companies such as Nammo AS. The industry also has strong representation through the Norwegian Defence and Security Industries Association (FSi), which represents more than 100 companies across Norway.

Research is also a priority. The country's primary defence-related research is conducted at the Norwegian Defence Research Establishment (FFI), an administrative agency subordinate to the Ministry of Defence that acts as the chief advisor on defence-related science and technology to the Ministry of Defence and the Norwegian Armed Forces' military organization.

The country has allocated roughly NOK 31.5 billion for defence in 2008, and has an annual procurement budget of approximately NOK 14 billion for the purchase of equipment, goods, services and buildings, as well as various construction projects. About NOK 6 billion of this is spent on new equipment, including cutting-edge technologies, developed and supplied in part by

Norwegian-based companies. Roughly NOK 6 billion goes to the purchase of goods and services related to the running of the Armed Services. Another NOK 2 billion is used for building maintenance and new construction projects.

This purchasing power, coupled with willing contractors and cutting-edge research, enables the country to answer a call to aid – or arms – with well-trained, fully equipped soldiers, whose foremost goal is protecting the nation and supporting peace abroad.

### **Afghanistan, Kosovo & at Home**

While most of Norway's 23,000 active duty soldiers, officers and affiliated civilian staff serve at home, a number are found in some of the world's hot spots, in both military and humanitarian roles. Roughly 500 troops are currently deployed in Afghanistan, with about 250 of these in the north western part of the country, where they've met Taliban fighters in gun battle.

In contrast, just 7 officers are serving in Kosovo, in a mission designed to help the war-torn country. In late May 2008, for example, Norwegian officers helped organize a three-day mock earthquake to allow everyone to practise what to do in the event of a major emergency. "It's important that crisis and aid workers at all levels know what they should do if a crisis happens. Now everyone has had a chance to practise in the worst possible scenario," says Colonel Hans-Jacob Rødø, Chief of KIKPC, which is KFOR's inspectorate for the Kosovo Protection Corps (KPC).

Closer to home, the deployment of Norwegian Armed Forces reflects the country's political agenda, says Bård Bredrup Knudsen, Deputy Director General and Head of Policy Planning for the Norwegian Ministry of Defence's Department for Security Policy. NATO still has a vital role for collective defence, he says. "Collective defence remains very important as an insurance policy, even though with the lack of any military threat it is not at the forefront of the agenda," he says.

Norwegian KFOR soldiers during a crowd control exercise in Kosovo.



© Torgeir Haugaard



But Norwegian troops also contribute to societal security, by offering substantial resources for crisis management and protection of vital public functions and infrastructure, from water supplies to pipelines to transportation, he says. The Police and the Armed Forces' last major mock terrorist attack exercise held in Oslo featured a scenario in which bombs and poison gas were unleashed in the subway system. "It is the Armed Forces that have the ability to handle chemical and biological weapons, and not the police," Knudsen says. "That's a good example of how the Armed Forces are involved in providing societal security."

### All Eyes North

When the Stoltenberg Government took the reins of power in 2005, politicians agreed that one of the nation's top priorities was the high north, including the Barents Sea and the areas around Svalbard and Jan Mayen Land. It's an area that has long been important to the country because of its rich fishing grounds, and more recently, as a new source of oil and gas. In fact, fully 25% of the world's remaining petroleum resources are thought to lie in the Arctic.

At the same time, climate change is melting the Arctic ice cover, transforming the Arctic Ocean into an open highway to

northern natural resources. For all these reasons, it's vitally important for Norway to maintain a northern presence, the Defence Ministry's Knudsen says. "Just by having military forces in the north is a way for Norway to make a statement about our ability and willingness to defend our interests and rights in case they are challenged," he says.

The Norwegian Coast Guard, which is a part of the Norwegian Navy, has among its fleet a ship capable of towing a 100,000-tonne tanker, and an icebreaker that can slice through 4 metre-thick ice. The country absolutely must have this capacity, Knudsen says. "What would happen if a fully loaded 100,000 tonne tanker had engine failure off of Finnmark?" Knudsen asks. "It could be an ecological disaster. We have to have substantial towing capacity in the north."

The Norwegian military also shares its cold-weather expertise with its own troops and allied forces through its Centre of Excellence for Cold Weather Operations, based in Stavanger. The Centre works

with a network that is comprised of the Allied Training Centre South, Allied Training Centre North, the School of Winter Warfare, Norwegian Defence Research Establishment and the Norwegian Armed Forces Medical Services. In February 2008, for example, the Norwegian School of Winter Warfare hosted military personnel from Great Britain in an adventure training session, which focused on cross-country ski skills and basic winter training.

### Vigilance, Food & Shelter

But maintaining vigilance over northern lands and waters presents a considerable challenge: Norway's Exclusive Economic Zone (EEZ) and other ocean areas in which Norway enjoys sovereign rights are fully seven times larger than the country's land area. That's where cutting-edge technology comes in, particularly in the areas of remote sensing and satellite technology. Kongsberg Satellite Services, or KSAT, provides near real-time access to high-resolution satellite data from side aperture radar (SAR), which can peer through the thickest fog. The satellite

© Torbjørn Kjosvold



Vehicles are brought over open water during the Cold Response 2007 winter exercise.



imagery is particularly useful in oil spill detection, monitoring ships, and showing sea ice conditions – which can be critical for ships in the Arctic Ocean, or for oil platforms or structures in ice-prone areas.

Maintaining a presence in the north also requires attention to more down-to-earth challenges, such as clothing and equipment. Norwegian forces need to be able to operate in harsh weather or extreme cold, and Norwegian industry has responded to this demand. Companies such as Norsk Forsvarsmateriell AS (NFM) provide state-of-the-art clothing and equipment, particularly for armour and camouflage, while companies such as Equipnor AS supply name-brand specialized outdoor gear for military use.

Whether in northernmost Norway or in the remotest areas of Afghanistan, military forces need food and shelter. Drytech AS provides dried, vacuum-packed foods for field use that meet NATO requirements, while TAM AS provides lightweight, well-insulated mobile and semi mobile shelters. Rofi AS specializes in soft shelters and protection solutions, such as tents, body armour and lightweight ballistic protection for vehicles. The company's shelters include everything from field hospitals and command post tents to simple accommodations, many of which are specialized for arctic conditions.

A Norwegian F16 prior to a mission over Afghanistan.

### Prowling the Seas

Think of them as the modern day Leidangskips: Norway currently operates 6 Ula class submarines that prowl the murky depths of Norwegian territorial waters, along with Fridtjof Nansen class frigates – of which there will be five by 2010, when the last ship is due to be delivered. The Government's investment in the new frigates, at NOK 21 billion, is so far the largest ever investment made by the Norwegian military, although the planned purchase of new combat aircraft will be considerably more expensive.

Norwegian submarines and fast patrol boats regularly serve as a part of NATO standing forces in the Mediterranean, for example, to guard against the illegal transfer of weapons or goods. Norwegian companies have stepped up to offer the kinds of specialized services these far-flung and complex assignments require.

In early May 2008, for example, Kongsberg Defence & Aerospace signed a NOK 179 million contract with the Armed Forces' Logistics Organisation

for the delivery of a new Combat System Integration Infrastructure, a new passive sonar system and the upgrading of a tactical simulator for Norway's six Ula Class submarines.

Electronicon AS supports the Norwegian Navy with maintenance, engineering solutions, platform integration and maritime electronics, particularly sonar and radar, while companies such as Comrod AS and AnCom AS provide antennas and systems for marine and defence use. With 2,500 employees in 11 countries, Norwegian-based Kongsberg Maritime is the world's largest manufacturer of marine electronics, including for underwater navigation, telemetry and echo sounder and sonar technology.

### Ruling the Skies

The Royal Norwegian Air Force is entering a new phase in its patrol and defence of Norwegian airspace: by the end of 2008, the Government will have selected a replacement for the country's 57 F-16 fighter jets, which first went into service



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in 1980 and are due to be retired in 2020. The country is evaluating two options, the Swedish JAS Gripen, and the American F-35 Joint Strike Fighter.

Fighter jets, of which two permanently are on standby 24 hours a day with a 15-minute reaction time, are seen as a critical part of the Norwegian military strategy, particularly in the northern part of the country, where last year Norwegian pilots identified 80 Russian aircraft flying in international airspace south along the Norwegian coast. The purchase of the new generation of jets is expected to top NOK 40 billion, which will make it the largest purchase in the history of the Norwegian military.

While the fighter jets are the largest purchase, they are not the only ones. Norway's entire fleet of 6 C-130 Hercules transport aircraft, first put into action in 1969, has been retired and replaced with a new transport aircraft —the very latest of the Hercules family. The first of the new transports was delivered in November 2007, while the last of the old Hercules had its final flight in May 2008.

The Air Force also calls on other aircraft or helicopters for operations in areas such as Bosnia and Herzegovina, Kosovo,

Lithuania and Afghanistan. The Air Force's P-3 Orion surveillance aircraft operated out of Italy to help patrol the Mediterranean as a part of Operation Active Endeavour. Three DA-20 Jet Falcons, 15 SAAB Safari training aircraft, 18 Bell 412 SP helicopters, 12 Sea King Mk 43 search and rescue helicopters and 6 Lynx Mk 86 coast guard helicopters also form a part of the stable of craft available.

The air fleet is also due to modernize, with the Air Force awaiting delivery of 14 NH-90 helicopters with a price tag of NOK 5.8 billion, which will operate from the Navy's new Fridtjof Nansen frigates and the large ocean-going Coast Guard ships with helicopter capability. A number of companies help the Air Force in supplying and maintaining its aircraft, including Heli-One (Norway), a division of the world's largest helicopter group, CHC Helicopter Corp.

Topping off the Air Force's capabilities are six 6 NASAMS II (Norwegian Advanced Surface-to-Air Missile System) batteries. This weapon system is modular, flexible,

developed in Norway, and is the only system known in the world that can take out cruise missiles.

### The Chip Revolution

Developments in electronics, communication and computer technology have revolutionized modern society over the last two decades, and the military is no exception. "We're talking about a 'chip' revolution that colours everything," Knudsen says. "The Internet, mobile phones – all these things have transformed our lives. These new technologies are employed by the military as well. There are many new possibilities, new generations of weapons systems, but they are expensive."

Norway's chief purveyor of ammunition and missile products is Nammo AS, located in the Raufoss Industrial Park. Nammo AS is one of the world's leading suppliers of ammunition and missile products, including smart programmable airburst ammunition, hydro-ballistic mine clearance ammunition, and propulsion systems and warheads for missiles

Loading missiles during the test firing of NASAMS II at Andøya in 2007.



© Jon Anders Skau



such as the NSM, ESSM, IRIS-T and Exocet Bloc 3. The company also offers the environmentally friendly disposal of conventional ammunition and bombs, with a full range of services from full disassembly and recycling to thermal treatment that meets the strictest European air pollution regulations.

Perhaps the most visible aspect of the technological revolution is in advanced telecommunications options, whether delivered by giants such as the Thales Group, whose Norwegian offices provide state-of-the-art cryptographic products, military message handling and soldier networks, or companies such as Nera Networks AS, which specializes in wireless network solutions for strategic communication infrastructures. Teleplan AS provides C4ISR system solutions and crisis management systems, and Tinex AS offers a Defence Technology branch that works with secure and open systems radio communications, radar, command and control systems, and satellite-based C3I systems. Kitron AS designs and manufactures defence and marine electronics, including electronics for harsh and exposed environments.

Other areas where technology has made significant inroads are in optics and information technology. Simrad Optronics ASA is a top supplier of military electro-optical instruments, including laser rangefinders and target locaters, laser gun sights and night sights and night vision goggles. Jotne EPM Technology AS develops database solutions for sharing and storage of complex information, whereas Applica AS offers systems integration, software and hardware development, and EMC compatibility consulting.

The technological revolution has also allowed manufacturers to design equipment and systems that are intuitive to use and require a minimum of personnel to operate, which are perfect for Norway's active duty forces, whose numbers have dropped over the years, but whose training and equipment has increased in sophistication and utility.

One example of this is Kongsberg Defence and Aerospace's SL (Surface Launched)-AMRAAM (Advanced Medium

Range Air-to-Air Missile) System, which is delivered through the country's NASAMS batteries. Since 2004, NASAMS has been earmarked by the Norwegian armed forces to be deployed in support of international crisis management operations.

All of this equipment and training enables Norway's Armed Forces respond to a broad variety of tasks and missions. That's how Defence Minister Strøm-Erichsen wants it. "We must ensure the visibility of our capability and our will to defend ourselves. Maintaining a presence can of itself serve to emphasise policy and behaviour," she says in her speech to the Oslo Military Society. "And we must, to quote the Defence Commission, be able to raise the military threshold to such a high level that 'no rational adversary would be able to impose its will on Norwegian authorities without resorting to a use of force that would be totally unacceptable to the global community and to the Alliance'."

Soldiers from Norwegian Army Special Command during practice at Rena.



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# an invitation to cooperate

By David John Smith

The global defence business is experiencing industrial convergence on all levels - from total platform integration where joint ventures are becoming more and more common - down to the components and subsystems level where globalization is becoming the rule rather than exception. The Norwegian Ministry of Defence is working proactively to use this globalization in order to build cooperative Defence Industry opportunities that are being felt far outside of Norwegian borders.

The need for interoperability, the globalization of the supply chain, regulatory reform, multinational programmes and common requirements are just some of the reasons for industrial cooperation. According to Minister of Defence Anne-Grete Strøm-Erichsen, "The Government wants to establish a long-term strategy to ensure that defence acquisitions, operations and maintenance can be sourced from Norwegian industry without violating competition requirements in the defence acquisition regulations. This entails that the Ministry of Defence will emphasize acquisitions from Norwegian suppliers – provided that these are competitive with regards to both price and quality."

The background of this strategy of industry cooperation (IC) is based on the Norwegian Government 2006 White Paper (St.meld. nr. 38 (2006-2007), entitled "The Armed Forces and industry – strategic partners", laying the groundwork for closer cooperation between the Armed Forces and Norwegian industry. Formalized IC has been in practice in Norway since 1982, the goals being to increase the return on investment and

to stimulate a higher level of ongoing cooperation between the Norwegian Defence Industry and its international counterparts.

## Profoundly Positive

It was in 1992 that the Norwegian Parliament approved comprehensive guidelines, setting a threshold limit of NOK 50 million (approximately EUR 6 million), and focusing on specific areas of technology. These guidelines in updated format exist today and aim to facilitate leading-edge technological prowess in such areas as IT and communication, navigation systems, underwater technology, composite technology, cryptographic technology and other core-area defence activities.

The IC programme has had a profoundly positive effect within Norway as well, not only to Norwegian Defence, but to a wide range of companies such as Nammo, Volvo Aero Norge and Kongsberg Defence – with the latter using nearly 1,300 sub-suppliers for its various projects, programmes and products. Another positive side effect of this industrial cooperation process is that it in fact allows and facilitates a higher level of effectiveness through life-cycle agreements and more effective planning both in the short and long-terms.

## Success in Practice

There have been a number of important projects and initiatives conducted over the years as part of the Norwegian Ministry of

The Norwegian Government is laying the groundwork for closer cooperation between the Armed Forces and the defence industry.



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Defence's IC programme, and one of the best examples of success was a project led by Colonel Tore Kvalvik related to the delivery of frigates to the Norwegian Navy from the Spanish company Navantia. According to Colonel Kvalvik, "The original offset obligation in the year amounted to 10.6 billion Norwegian crowns, and by 2007 all obligations were fulfilled – in fact have exceeded 100% of the obligation." All obligations have been satisfied, and the project has set the stage for a closer cooperation on the long-term between Norway and Spain.

This project has had a ripple effect having not only a positive influence related to the long-term support of the frigate programme, but on a wide range of subcontractors both in Spain as well as in Norway. According to Colonel Kvalvik, "All together, more than 100 Spanish companies were involved in offset purchase contracts with some 250 Norwegian companies." Approximately 30% of the total frigate contract amount was awarded to the Norwegian shipyard industry, with companies such as Bergen Mekaniske Verksted, Mjøllem & Karlsen, Aker Yards Florø and others benefiting from the IC agreements.

### **Working together for the Long-Term**

In the Defence Industry, where transparency and consistency is of the utmost importance, there is the need for such cooperation. From this perspective, industrial cooperation is the key phrase as part of suppliers' marketing strategy and approach, the goal being that suppliers see it as a tool for business. As in the frigate project, the synergies of success result in long-lasting cooperative efforts that are a 'win-win' situation for those involved. Such industrial cooperation will open closed doors, emphasizing the concept of technology cooperation, and often involve, the private sector as well as R&D to facilitate the best possible results from transfer of technology.

According to Jon Gunnheim, Assistant Director General of the Norwegian Ministry of Defence, there are multiple goals that are achieved through industrial cooperation, "Much is achieved through industrial cooperation, including the establishment and development of

customer relations and functioning as a vehicle of business development and commercial cooperation. In addition, the nature of IC lends itself to facilitating expansion of business opportunities, building strategic alliances within the national defence industry, and allowing the correct strategies to gain a competitive edge in a 'closed' market."

### **The Future Looks Bright**

The future looks bright for the Norwegian IC initiative, with a number of current projects in the works that include replacing the aging U.S.-made F-16 aircraft.

The positive effects of the Ministry of Defence IC programme are continuing to evolve as potential collaborative projects are being identified at an earlier point in time, ensuring that not only does Norwegian Defence acquire "best-value" defence equipment, but cooperation is facilitated between the Norwegian Defence, the R&D community and industry in Norway and beyond – to the benefit of all parties.

Launching of the Norwegian frigate KNM Fritjof Nansen.



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# it & communication:

## innovating for the new military

By Dean Clark

The Norwegian IT and communication industry is becoming a meaningful hub for cutting-edge technologies focused on the defence industry. Long-established companies like Thales and Kongsberg are being joined by a wide range of smaller contractors to shape a dynamic cluster of businesses dedicated to meeting the strategic IT and communications needs of armed forces throughout the region.

The rapidly changing nature of conflicts and the role of security forces in the world have increased the focus on the IT and communications aspects of defence. During recent consideration of the creation of a Norwegian military satellite, Norway's Chief of Defence highlighted the importance of secure communication with Norwegian forces abroad, as well as with troops on missions inside the homeland. This awareness is now being backed by funding. A recent increase in the Norwegian military budget will increase support for programmes aimed at improving and upgrading the nation's military IT and communications capabilities

### Secure Communications

Thales Norway, one of the leading companies in the sector, recently partnered with the nation's Defence Department in holding an important event for security system programmers: the fourth Cryptel@-IP User Forum.

The main objective of the Trondheim meeting was to give security-cleared systems engineers and operating staff the chance to meet and discuss challenges in the operating environment of the secure programmes. Topics at the conference

included examining the latest trends in real-time applications such as secure video conferencing, and demonstrations of important breakthroughs in mobile installations with secure voice technology.

Thales has a long history in this area of expertise. In fact, the company delivered the very first direct line between Moscow and Washington in the 1950s. Today, Thales stands as NATO's approved supplier of encryption solutions for the IP network. Company management is in no doubt as to where their credit lies for Thales's success. "We've managed to export our solutions and see that we fare very well in international competition. Much (of our success) is thanks to a long-term perspective and very talented employees," wrote Thales administrative director Glenn Pedersen on the company's website.

### Tactical & Adaptable

Another important player in the Norwegian Defence IT cluster is Kongsberg Defence Communications. The company provides secure tactical command, control and

communication systems to army and air defence programmes around the world, from the arctic north to desert and tropical areas, including several NATO-countries.

Recently, the firm introduced an important new system to the market. EriTacIP is a new autonomous and high-capacity service-integrated tactical communication system which employs secure IP technology. The new system also facilitates multi channel integration with previous generations EriTac systems.

Key advantages to EriTacIP are that it supports deployed tactical networks and shows an ability to adapt rapidly to changes in topology. The new system

Ensuring secure data erasure is one key to IT security in today's military, and Norwegian firm IBAS is becoming an important supplier thanks to its advanced solutions.

© IBAS





also features secure IP technology and provides a black (secure) transport network.

Another innovation recently rolled out by the Norwegian company was TacLAN, which provides wired and wireless broadband communications infrastructure to tactical military units in areas of combat. This system features autonomous networks, wireless LAN for command posts and tactical surveillance and sensor systems.

### Advanced Radio Link

Kongsberg has been recently commissioned by the Norway's Armed Forces' Logistics Organisation to deliver a tactical radio link. The two-year contract calls for communications equipment for the high-speed wireless transmission of digital data and voice. The equipment to be delivered will feature higher transmission capacity than earlier generation radio links, and it will offer more connection opportunities including internet protocol. Air Defence and other Command and Control Systems will see enhanced performance by utilizing the new equipment.

The new defence industry is increasingly reliant on the ability to supply and repair crucial information and communication systems, and Norwegian firms are filling the need.

### Research-based Expertise

One of the main drivers of the creative and innovative process in the cluster is SINTEF ICT (Information and Communication Technology), one of the largest independent research organizations for ICT in Norway. The facility employs 250 researchers and provides expertise in the areas of microtechnology, communication and software technology, computational software, security and safety.

### Shields for Developers

Focusing on the growing desire amongst software developers and their customers (including the defence industry) to avoid security vulnerabilities, SINTEF ICT has chosen to participate in an international project under the title SHIELDS. The project's central goal is to bridge the gap between security experts and software developers and by doing so reduce security breaches and vulnerabilities.

### Correcting the Same Mistakes

Industry insiders point out that, even though many security vulnerabilities are known by experts, there seems to be a pattern that developers often fail to avoid these vulnerabilities. In other words, the same mistakes are repeated over and over again. It is thought that the central cause for this is that information on system weaknesses are not available to developers in a form that is conveniently accessible to them during the time they are designing and developing the software.

The SHIELD project hopes to remedy this by making it quicker and easier for experts to make identified security vulnerabilities known to the developer community, in a form that is directly accessible via widely-used industry tools.

The effort, slated to run until June of 2010, will also help individual developers to find and remove security weaknesses from directly within their usual development tools. SHIELDS will also work to increase



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awareness amongst developers about known security vulnerabilities and help software development organizations to verify (internally and to their customers) that they have successfully reduced security vulnerabilities in their products. SHIELDS is a truly international effort, with Swedish, Spanish, German, French, Italian and Hungarian institutes taking part.

### Well & Truly Erased

Norwegian firm Ibas is slated to provide secure data erasure on Norwegian defence department computers. A recent four-year frame agreement with Siemens Business Services has been agreed to, and the firm will carry out the work on "restricted" security computers which are due to be recycled. "This delivery reinforces the good customer relationship we already have with Norway's defence forces," comments Bjørn Arne Skogstad, President and CEO of Ibas, on the company website. "At the same time, the agreement confirms that we possess important value-enhancing products for key partners in the dealer chain."

Ibas will supply ExpertEraser, its uniquely-designed tool for data erasure, to the project. The process of erasure will take place at the military sites prior to the PCs being recycled. Due to the structure and design of today's operating systems, safely deleting all information from a hard drive is a very complex task. Contrary to popular opinion, commands such as "format",

"fdisk" and "delete" do not actually remove the data from a drive. These functions simply change the structure of the drive and leave most of the information intact – which makes it vulnerable to recovery with easily-available software

### Protecting Sensitive Data

Lysaker-based Norman ASA is considered to be one of the world's leading computer companies in the field of computer security, with subsidiaries and alliances in the United States, Europe, Asia and Australia. Norman offers the IT industry a wide variety of risk analysis, virus control, access control, encryption, network security and data recovery products. The company counts more than 12 million users worldwide.

### Database Solutions

Jotne EPM Technology (EPMT) is a member of the Jotne Group, specializing in information technology. The company

has, since 1990, developed database solutions for ISO 10303 STEP, and PLCS standards among others. These are open specifications with public availability used by aerospace, space and defence-related industries to manage information about complex systems. Jotne employs some 250 people, and counts clients throughout the world, including agencies such as the US Department of Defence, the European Space Agency and leading aerospace/ defence/space contractors.

### Antennas for all Situations

AnCom® is another niche expert in the cluster. The company specializes in developing small, effective and robust antenna solutions. This technology is characterized by various possible applications, with efficiency, reach and radiation characteristics that maximize performance for low-profile antennas.

### Wireless Microwave Transmission

A leading supplier of wireless microwave transmission network solutions, Nera Networks AS delivers technology to customers in segments such as defence, mobile, fixed line, carriers, broadcast, ISP & enterprise, governments, offshore and utilities. The company has an export focus, with more than 85% of its total revenue generated by international sales. The Bergen-based firm employs more than 500 people, 100 of whom work in research and development.



Technologies such as the IBAS Degausser are being used to aid in secure data erasure for the Norwegian military.

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[www.careerinnorway.no](http://www.careerinnorway.no)

# the norwegian security industry

– working out a “plan b”

By Ed Milsom

The mathematician James Yorke once remarked that “The most successful people are those who are good at Plan B.” In a post 9-11 world, Norway, just like anywhere else, is being forced to meet challenges to security with innovation, forward planning and meticulous research. “Plan A” is simply no longer adequate. Fortunately, there are hundreds of businesses, large and small, working on new solutions and technologies designed to meet these harsh realities with confidence. As long as threats to security continue, Norwegian companies will seek solutions.

Norway benefits from the presence of one association bringing many of the 5,000 skilled industry workers together and creating the degree of unity essential for overall progress in nationwide defence and security standards. The Norwegian Defence and Security Industries Association has 115 member companies, and has a strong niche focus. Through cooperation with the armed forces and NATO, FSi provides a framework for everyone from radar warning system innovators to data security experts to work together.

Many of the commercial security and defence solutions currently being developed have been influenced by a range of special research programmes. One such project concerns risk management in the aviation industry, and involves UiS (the University of Stavanger), and PRIO (the international Peace Research Institute in Oslo). Its full name is ‘The social determination of risk critical infrastructure and mass transportation protection in the Norwegian civil aviation centre’. The study aims to take a critical look at crucial local and international security measures within aviation.

UiS (the University in Stavanger), together with PRIO (the international Peace Research Institute in Oslo) are the settings for a new research project designed to improve aviation

## ISPAS AS – RF Systems for the Environment & Military

ISPAS (IKT System Partner AS) is one of the FSi’s 115 member companies. Established in 2001, its speciality is in providing expertise with measurements for a wide range of applications. “Our main markets are the military and monitoring. We are able to do geo-hazard monitoring using radars,” says ISPAS’ Richard Norland.

Applications for ISPAS’ technologies are wide ranging. ISPAS has worked together with the Norwegian University of Life Sciences (UMB) in the measurement of glacier movement in the Kronebreen on the Arctic Archipelago, Svalbard. ISPAS used its new interferometric radar to

make the measurements. The Norwegian military has also recently benefited from ISPAS’ expertise with the acquirement of transportable RCS measurement radar units.

There has clearly been a high demand for ISPAS’ proficiency with accurate measurements. Two European projects within the EU’s Sixth Framework Programme for Research and Technological Development have enjoyed ISPAS’ participation, whilst the AVITRACK project (Aircraft Surroundings, Categorised Vehicles and Individuals Tracking for apRon’s Activity Model Interpretation and Check) used ISPAS to help with small, netcentric radars.



© E. Torp, UiS



## Global Perspective

Kongsberg Defence and Aerospace, provides outstanding surveillance products for military and civilian uses. Emphasizing the importance of situational control, sensitive indicators and the ability to predict incidents, Kongsberg is able to unveil an impressive product range that confirms its status as one of Norway's most exciting innovators. Indeed, KDA casts its net so wide that command and control rooms, border areas and both military and civilian vehicles can rely upon its surveillance solutions. KDA has a truly global outlook. In the military alone, more than 25 countries worldwide use custom-made Kongsberg systems, including state-of-the-art secure and redundant networks, providing voice, data and video communication to connect sensor and control sites in a meshed network.

For 30 years, Kongsberg has provided maritime surveillance solutions. KDA has long been the world's leading supplier of VTS (Vessel Traffic Service) systems and, today, VTMIS systems (Vessel Traffic Management and Information Systems) provide real-time pictures of traffic in port areas. Risk assessment of each port allows KDA to offer tailored solutions. Surveillance systems can also be designed for

offshore installations, providing warnings of unauthorized access to platforms of FPSOs (Floating Production Storage and Offloading).

## Expanding Norway's Vision

Other outstanding Norwegian companies working within defence and security includes Teleplan AS, providing telecom, media and information technology solutions to over 40 countries worldwide. The United Kingdom Maritime and Coastguard Agency (MCA) is just one of the many recent beneficiaries of Teleplan's field expertise. The high performance GIS application MARIA© is to deliver the GIS functionality required for the UK AIS network. The standards set by MCA and IALA are high, but Teleplan, supporting Norcontrol IT as a subcontractor, is confident that it has the background and experience to succeed. Fifty workstations throughout the UK at the MCA's Maritime Rescue Co-ordination Centres will display live AIS data. Fast response is a prerequisite, so that both early warning systems and enough

situational awareness in the maritime domain to allow ready interaction between the Coastguard and vessels can be offered.

The technologies, products and services that the FSI's 115 member companies provide continue to challenge any lingering conceptions that having just a "Plan A" could be enough. Amongst those taking innovation to new levels is Bosch Security Systems Norway. Amongst the company's many prizes and industry shortlists greeting the release of new products, is a German Design Council nomination in 2006 for the 500-series smoke detectors, which also made the Security Industry Association's New Product Showcase list.

Despite all the uncertainties that the global climate engenders, it is clear that Norwegian companies in the security and defence industries are ready to demonstrate both their readiness to innovate, and their ability to answer difficult questions in the affirmative.

Evidence of Norwegian security activities can be found in strategic locations, here a Norwegian Telemark Task Force in Afghanistan.



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# accountability & trust

By David John Smith

Ethics, transparency and Corporate Social Responsibility (CSR), are becoming more and more important in all lines of business and government, and perhaps nowhere are these elements more important than in defence. It is here that people's lives – and nations – are often at stake, and the level of responsibility is high.

The Norwegian Minister of Defence Anne-Grete Strøm-Erichsen has been committed from the first day of her tenure to ethics and social responsibility. As she indicated in a speech held in her 100th day in office in January 2006, "I want to see the Armed Forces setting an example of integrity and espousing a culture in which everyone is conscious of their role as responsible members of society... I take this challenge with regard to our reputation, organisational culture and ethics very seriously. I have therefore taken an initiative to produce a plan of action to give added weight to the work on attitudes and leadership."

Later in that same year, Minister Strøm-Erichsen launched a new directive on ethics, attitudes and management for the entire defence sector in Norway. The directive put into action a renewed emphasis on looking at the way Norwegian Defence conducts its business. The process for guiding the development and implementation of the action plan was entrusted to Ministry of Defence Director General Elisabeth Bødtker Larsen and her staff, including Alvhild Myhre Winje and Hilde Bryhn - who understood that

Minister of Defence Strøm-Erichsen put great priority on ethics, attitudes and management within the Norwegian defence sector.

the ultimate success for the programme rested upon the coordination with all branches of Norwegian Defence, including civilian and research organizations.

## Bringing Everyone Together

Planning for this important initiative was undertaken knowing full well that the ripple effect of the success of the action plan could positively impact far beyond the Norwegian military, ultimately upon the Norwegian Defence Industry and beyond. The plan developed by the Ministry focused on gaining a better understanding of how the various defence sectors conducted their business, how they interrelated with each other, and externally with the defence industry, media, public and other stakeholders. Through a series of seminars, workshops,

interviews, conversations and applied research based on sound organizational development techniques and doctrine, revised goals were agreed upon using the knowledge, skills and support of all levels of the Ministry.

In addition, existing laws and guidelines within Norwegian Defence were in the spotlight, the goal being to achieve the highest level of consistency and professionalism across the board in all organizations. These laws and guidelines included:

- Ethical guidelines for the defence sector
- Armed Forces Procurement Regulations (ARF)
- Ethical Rules for the defence sector
- Ethical Guidelines for the Public Sectors



© Per Arne Juvang



Other important areas that were addressed included the Civil Service Act, the Act related to military disciplinary authority, the Public Administration Act and the General Civil Penal Code. The ultimate result of the process has been the renewal and revision of policies and supporting routines related to fair competition, an increased understanding of roles and responsibility – and laying the groundwork for the highest level of transparency and ethical activity.

### Tip of the Iceberg

One concrete result of the process was the development of the guiding document “Ethical Guidelines Regarding Business Contacts for the Defence Sector”. Although absolutely important as a steering document, it represents the “the tip of the iceberg” and it supported by a wide range of activities. According to Director General Larsen, “The long-term success of the Ministry of Defence focus on ethics and corporate social responsibility lies in the ability of all involved to consistently take stock, evaluate and assess how we are doing business. We support this process through a wide range of tools.”

In addition to the Ethical Guidelines, the Ministry of Defence supports the ongoing process with education, training as well as conferences and seminars that include a yearly Dialogue Conference, bringing together not only the top leaders within Norwegian Defence, but a wide range of key employees and personnel from

all levels of stakeholder organizations. The goal of this yearly conference is to refresh and renew the dedication and commitment to the highest levels of transparency and ethics through the use of such techniques as dilemma training in order to create social spaces for dialogue.

### Looking Ahead

There are also other projects in the works that include a specific long-term research project that will assess existing attitudes related to gender, diversity and other core elements of organizational behaviour. In order to make training more accessible, the Ministry is currently launching online e-learning courses that are related to dilemma training. In fact, many of the courses and training sessions staged are of such high-quality that participants receive credits eligible to be used towards university degrees.

The Ministry of Defence works closely with all sectors of Norwegian Defence in addition to the Defence Industry here in this country in order to facilitate a “level playing field” in regards to the contract bidding process, choice and follow-up.

In addition, the ongoing goals of the focus on ethics is to continue to expand cooperation with other countries and their defence infrastructure in seeking common visions and transparency as the world becomes ever closer together through globalization.

Supporting the process all the way is the Minister of Defence Strøm-Erichsen, who knows that the importance of this area can never be overemphasized. According to the Minister, “In the interest of the defence sector’s reputation in society and the general trust of the population on which we rely, it is essential that these guidelines be complied with.” This ongoing process goes hand in hand with the ongoing activities related to the White Paper entitled “The Armed Forces and industry – strategic partners” that facilitates closer cooperation between the Armed Forces and Norwegian industry (see the separate article in this edition related to this initiative). It is all part of the ongoing process to continue to champion ethics and transparency in the Norwegian Defence environment.

Education is one key to creating social spaces for dialogue.



© Arne Flaaten

# universal composite applications

– building a future

By Ed Milsom

Norway's long-heralded reputation as an environment where difficult problems find their natural solutions is built upon historic achievements that belie the natural challenges of a small population, demanding climate and a physical location stretching right up to the northernmost borders of humanity. Norwegians have been responsible for countless firsts in diverse fields from polar exploration to marine biology. The common theme – one of achievement against all odds – also permeates Norwegian industry and research communities. The bedrock of these achievements is a culture of resourcefulness, suffused with innovation and cooperation – philosophies shared by the composite industry.

Reidar Stokke, Special Advisor at SINTEF's Materials and Chemistry Division, explains that the industry has contributions to make beyond Norway's borders. "The Norwegian composite industry has a strong international position in areas within transport, aerospace, defence, offshore, marine and sports," he says. "The industry consists of many relatively small companies including producers of pleasure boats, a group of companies that produces technically advanced products based on traditional glass fibre-reinforced composite materials and a limited number of both large and small companies with production based on advanced composite materials," he adds.

The Nasjonalt Senter for Komposittkompetanse, or the National Centre of Competence in Composites, is hosted by RTIM and is fundamental for the future of the industry in Norway.

The product range is impressive: examples include sandwich construction Fast Attack Crafts and passenger vessels with carbon fibre reinforcements, advanced high-speed catamaran ambulances and Mine Counter Measure Vessels. The offshore industry has acquired subsea protection structures, and Gardermoen's new Airport Express Train has front ends in fire resistant composite.

## The SINTEF Group – Leading the Way in Composite Research

The SINTEF group is the largest independent research organization in Scandinavia and one of the largest polytechnic research organizations in Europe. The Materials and Chemistry Division, which conducts the material research related to composites, carries out research on a contract basis for industry in Norway and abroad.

Einar Hinrichsen, Ph.D, is a Research Manager at SINTEF Materials and Chemistry. He believes that the use of composite materials is important for some of Norway's most important economic activities, including oil and gas installations, the marine sector, wind energy and transport. "These fields of application often put high demands on materials, due to harsh environments and potential environmental risks related to material failure," he explains. Research is addressing important scientific and technological issues in order to exploit the advantages of composite materials. "The development of new knowledge within the area will certainly contribute to strengthening the competitive power of Norwegian companies that rely on the use of composite materials," says Hinrichsen. "SINTEF's ambition is to make a significant contribution to the development of the necessary competence that will enable a





reliable increased exploitation of composite materials.”

SINTEF collaborates extensively with NTNU (the Norwegian University of Science and Technology in Trondheim), and RTIM, which acts as the host for NSK, and will also be responsible for some of the experimental facilities that are planned by NSK. SINTEF owns 50% of the shares in RTIM, and Hinrichsen is keen point out the strategic alliances that SINTEF has with other research environments. Some of the research groups are small, so this level of cooperation is important for the future of the industry.

SINTEF's current project proposal, “COMPACT” (“Composite Structures Under Impact Loading) aims to create a high level of field knowledge and develop state-of-the-art technologies related to the design of composite structures under impact loading. Several companies, including Kongsberg Defence and Aerospace, Nammo Raufoss and StatoilHydro have expressed interest, and a proposal for this competence building project will be sent the Research Council of Norway in October 2008.

### **NSK – A National Centre of Competence for the Industry**

The establishment of a National Centre of Competence at Raufoss symbolizes the degree of synthesis within the industry.

Einar L. Hinrichsen, the Research Manager at SINTEF Materials and Chemistry, believes that the use of composite materials is increasingly important for some of Norway's most important economic activities.

Hosted by RTIM, the centre developed out of an initiative by the Ministry of Defence and the Ministry of Trade and Industry, backed by NOK 5 million from Innovation Norway. Enquiries by the Norwegian Defence and Security Industries Association (FSi) revealed interest from several member companies, including NAMMO and Kongsberg Defence and Aerospace. The procurement of new combat aircraft by the Air Force has provided a gateway for the development of the industry.

SINTEF is integral, collaborating with many of the business involved. Amongst the current projects is “A safe and Cost-efficient Basis for Design and Qualification of Composite Structures”, which sees SINTEF cooperating with FiReCo, Reichold, Devold AMT, Umoe Mandal, and Umoe Shat-Harding.

The Centre's Onno Verberne predicts that not only will defence and aerospace materials be adapted to civilian contexts, but also the reverse. “An increased cross usage of materials and methods will lower

the material and manufacturing costs of high quality parts and components,” he says.

Kongsberg's new composite factory has 30,000 metres of floor space and represents an investment of EUR 90 million. Verberne is excited about its potential. “As NSK is still in its starting phase, most projects are in their definition phase. However, NSK is working on establishing projects related to the activities planned at the Kongsberg Composite Factory, related to titanium composites for aircraft parts, and together with the national industry group, Norsk Komposittforbund, and Standard Norway, on the standardisation of composite materials. In the latter project, Norway has received the chairmanship on the Technical Committee in CEN,” he says.

“The most important task of NSK is to be a catalyst in building up sustainable industrial activity on advanced composites in Norway. Whilst most other countries have built up such an industry based on their aeronautical activities, Norway does not have this natural starting point for this industry to grow on,” admits Verberne. “It will therefore be imperative that Norway involves other industrial areas to reach in sum a sufficient amount of activities to also justify a sustainable institutional and educational activity on advanced composites.” Challenges remain, but the industry is building on that age-old national culture of achievement against difficult odds. A bright future is visible on the horizon.



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# working together

## – defence & norwegian societal security

By David John Smith

The Norwegian Ministry of Defence intensified efforts in the 1990s to lessen the gaps between security policy and defence policy. The tragic events of September 2001 then provided an additional impetus for a transformation of the Norwegian Armed Forces – aimed at achieving and maintaining a higher level of readiness, preparedness and flexibility in operations in order to be prepared to handle new threats.

This process has been a success, bringing the Ministry of Defence and the Armed Forces closer together to central civilian resources on practical, operational and strategic levels. The road to the current high level of flexible readiness has its roots in the Cold War period, when the concept of ‘Total Defence’ was the guiding doctrine, based on the mobilization of all national resources in support of an all-out military struggle. For Norway, the Soviet threat during the Cold War represented “existential defence” – truly homeland defence in a fight for survival.

During this period of time, civilian resources supporting military action in times of war or serious crises was an integrated part of operational planning, while focusing on potential crises outside country borders such as peacekeeping operations and stability missions was given much lower priority than today. The fundamental transformation of Norway’s Armed Forces that started in earnest in 2001 represented a change from a predominant focus on territorial defence

based on mobilization and a mass army to a more integrated, flexible and readily available military.

### Societal Security

As a result, the focus of “Total Defence” changed. A new focus on *societal security* – called “homeland security” in the United States – redefined the old Cold War concept into a more mutual and reciprocal relationship between the Armed Forces and civil society. The main direction of support changed from “civil resources in support of the military” to “military resources in support of civil society”. This redefined concept was integrated into the Norwegian Government’s long-term 2005–2008 plan to put into operational

terms the ability to handle all major dimensions of security – state security, societal security and human security.

“Total Defence” is now a two-way street. Civilian resources are earmarked to provide support in the time of military crises, and the military operationally prepared to assist the civilian environment in times of need, whether man-made or natural disasters. According to Bård Bredrup Knudsen, Head of Policy Planning in the Department for Security Policy, Norway’s Ministry of Defence, “Securing domestic interests, utilizing a higher degree of coordination between government, industry and private sectors has increased the ability for Norwegian Defence to maintain a proactive state of readiness in a national and international environment that is becoming increasingly more complex.”



© Jon Anders Skau

The concept of total defence has changed, now with a focus on societal security.



### Preparedness on all Levels

In Norway, societal security is defined as safeguarding the population and key societal functions and infrastructure against attack or damage where the existence of the country is not threatened. The basic concept is using all available national resources and capabilities – civilian as well as military. The country has made great progress during the past decade in repositioning its military posture and security policy to reflect this modern environment. As a larger degree of military flexibility is essential, a hard look at the roles of the various parts of the military has been necessary.

The result has been an altered focus on the use of military resources in a selected number of areas within the Norwegian regional environment – including the Coast Guard as well as the Russian frontier Border Guard – the goal being the highest level possible integration of support within the country. This strong cooperative network lends itself to better operational results both nationally as well as in support of international operations related to NATO and the United Nations.

### Supporting Society

The Norwegian Armed Forces are now seen in a new light, often working side-by-side with civilians in tackling a number of assignments. For the Norwegian Coast Guard, these assignments include

Emergency training is an important part of preparing to support civilian society in a number of functions.

working on behalf of civilian authorities in supporting immigration policy on the high seas as well as support related to customs activities. The Coast Guard is also active in enforcing Norwegian public regulations in Norway's Exclusive Economic Zone and other ocean areas in which Norway enjoys certain sovereign rights – areas more than seven times larger than the Norwegian mainland.

During the Cold War, the 196-kilometre border between Norway and Russia (then the Soviet Union) was in essence a "trip-wire" guarded by relatively small military units on the Norwegian side. There were few cross-border incidents, and the border was guarded by important Soviet forces far into the Soviet Union. The opening of the border resulted in immense changes, and there are now bustling cross-border activities. Operational responsibilities outside of the main border crossing fall upon the Norwegian Army, working closely with police authorities in the role of patrol and border guards.

Although the Norwegian Search and Rescue (SAR) helicopter service falls under the responsibility of the Minister of Justice, it is operated by the Norwegian Air Force, yet another example of the positive results that close cooperation produces. The Norwegian Navy is certainly not left out of the mix when it comes to societal security. Navy Special Force Seals as well as other Special Force units have operational responsibilities in regards to offshore activities in the North Sea, including situations related to terrorist attacks against oil and natural gas installations.

In the modern world of societal security, planning and training is conducted with the understanding that even a minor incident that may be a police matter may quickly escalate into a larger crisis having to do with national sovereignty, where the Ministry of Defence assumes responsibility. Finally, international cooperation continues to be of great importance, including NATO alliance, U.N. and peacekeeping operations as well as many other activities. Societal security cannot be seen in a purely national context – for Norway and its Armed Forces, the focus is global.



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3D perception's core business is the design, manufacture, installation, and implementation of highly sophisticated projection systems for use in training simulators. The product portfolio includes all hardware, software and services needed to facilitate any simulator projection system.

#### Wide Range of Use

3D perception simulator systems are used in a wide range of military and civil training simulators, from relative slow-moving ship simulators to extremely fast jet fighters. 3D perception has the background experience and expertise required to meet even the most demanding requirements in the market place. The company products have an outstanding reputation with quality that is regarded as the best available on the market.

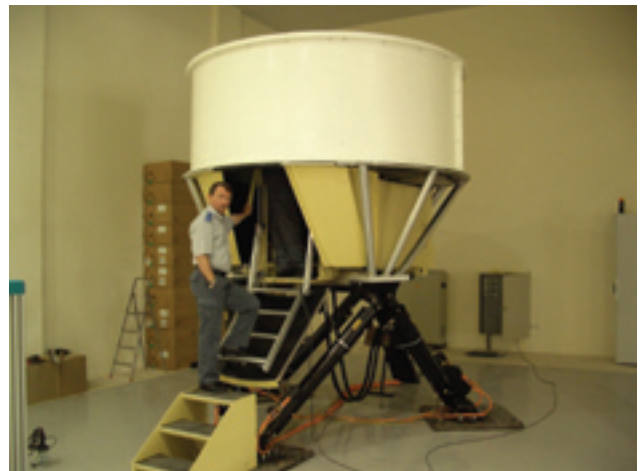
#### Worldwide Customer Base

By mid-2008 3D perception has delivered more than 6000 channels to the simulation industry in more than 65 countries worldwide. Company customers include well known companies like Indra, RDE, RUAG, British Aerospace, Dassult, Lockheed Martin, Boeing, Eurocopter, NASA, CueSim, BASC, Alenia and Avia. Company products and solutions are supported by 3D perceptions' regional offices in Japan, China, UK, a subsidiary in the United States, as well as the corporate headquarters in Asker, Norway.

#### Military & Industrial Applications

3D perception also supplies projection systems to industrial control rooms. This technology is also delivered to military operation centers on both tactical and strategic level. 3D perception has also developed a mobile workstation with a built-in large screen that can be made operational in a matter of minutes thanks to the patented self-calibration technology. This product is designed to support battle management in the field and the product can interface to any CCI system on a visual level, leading to security management that can be dramatically simplified.

**Please visit our website for contact details of our international offices.**





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Aclima has developed and manufactured functional underwear since the beginning of the 1920's. Their aim has always been to combine comfort and function by choosing the optimal mix of fibres, knitting method and seaming.

In close co-operation with the Norwegian Army, Aclima has designed the soldiers' new flame-retardant, insulating and breathable underwear. Also the terry wool underwear has been designed by Aclima, in addition to the renowned, classical Norwegian Field shirt in terry cotton.

Today, the company delivers functional underwear to several armed forces in different NATO countries, and the company also markets their Aclima underwear through high class sports stores in Scandinavia and Northern Europe.

solutions, has brought the company up to the top division of European underwear suppliers. Today they deliver underwear for people of all ages, both sexes and all kind of activities and temperature.

Aclima focuses only on the development and production of high quality underwear. This is the reason that professional buyers trust the company as specialists that understand solutions for a wide variety of climates, situations and needs.



Aclima's ability to listen to their customers and help them define the right





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Bedriftssystemer AS is a supplier of systems for information security, high-technology niche products within the field of computer security and standard commercial products from leading manufacturers and partners.

### Customers

Bedriftssystemer AS's customers come from the following sectors:

- Government administration
- The foreign service
- Defence
- The finance industry
- Data processing centres
- Industry
- Business

### Solutions

Bedriftssystemer AS's solutions within secure computer products include:

- Protection of sensitive and business-critical information
- Secure data communication
- Control over and editing of high-volume printed material
- Remote control and surveillance of PCs and networks

### Services Offered

Bedriftssystemer AS offers the following services within each product area:

- Installation
- Integration with existing systems
- Support
- Maintenance
- Operational and emergency agreements with agreed-upon response times



BOBm is the first fully rugged PDA in the world with true VGA resolution (480 x 640) and Windows

CE.NET 4.2. It is based on the Intel XScale PXA255 – 400 MHz CPU with 128 MB RAM and 64 MB Flash ROM. The display is a 4" VGA sunlight readable transfective TFT LCD. BOBm has built-in speakers and optional microphone.

MIL-STD-461E, MIL-STD-810F and IP67 are standard.



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Located in Bergen, Norway, ComPower AS is a major supplier of power supplies to military and civilian installations. Main products are emergency power supplies (AC and DC UPS), rectifiers, inverters, frequency converters, regulators for solar panels, battery monitoring systems and battery discharge systems. In addition, the company has emergency shutdown systems for telephone lines.

### Products

ComPower AS' main products are tailor-made uninterruptible power supplies for offshore telecom systems. The company also provides power supply systems for military applications which include the new Norwegian Navy Fridtjof Nansen Class Frigates, and the new Skjold Class MTB. ComPower AS' product range also includes shutdown systems, sun and wind power systems, battery discharge test units, insulation monitors and control and supervisory systems for stationary battery banks.

Examples of ComPower AS' products and services include:

- Battery chargers
- AC UPS
- Rectifiers
- Frequency converters
- DC/DC converters
- DC/AC inverters
- Battery discharge test units
- Battery monitoring systems
- After sales service
- Engineering, design, and development

Solutions to special problems

Experience within analogue and digital techniques and modern data programs and hardware enables ComPower AS to quickly provide electronic solutions, circuit boards and wiring diagrams according to customer requirements.

### Quality & reliability

Continuous quality control is a vital factor in order to secure highly reliable and well documented products to ComPower AS' professional customers

### Experience

Experience runs deep at ComPower AS, with a number of company engineers having more than 30 years experience in development and production of power electronics and power supply systems for military, telecom and offshore installations.



All photos: Norwegian Defence Media Centre



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Comrod was founded in 1948, and is today one of the leading producers and distributors of antennas and antenna systems for both marine and defence use. For more than 50 years, Comrod has combined service, know-how and experience to achieve optimal development and production of antennas and antenna systems. All activities take place in-house, from the design and development phases to the final product. Comrod antennas are synonymous with good and reliable communication at any latitude.

### Antenna Systems

Comrod delivers antenna systems for both vehicle and boat installations. The system is primarily designed to reduce the number of antennas on a single installation, and allows the simultaneous use of several radios to one transmit antenna or to individual directional antennas. A receiver distribution amplifier is included to allow simultaneous reception on all receivers.

### Power Supplies & Battery Chargers

Comrod's power division develops and manufactures power supplies and

battery chargers for demanding military applications. The product line ranges from small power supplies integrated in the customer's system with complex systems with supervision, and battery chargers for lead acid and Li-Ion batteries. The products are designed with a focus on high EMC and EMP immunity, low noise emission, high efficiency, demanding environments and high reliability. The standard power supplies and battery chargers have universal input voltage and power factor correction for optimum adaptation to weak power sources, such as portable generator sets.

### Defence Antennas

Comrod has collaborated extensively with end-users around the globe in the development of HF, VHF and UHF antennas for defence applications. The result is a product line of sturdy broadband antennas for tactical applications, consisting of handheld, manpack, vehicle, base station and shipboard antennas. The line includes combined antennas for VHF/GPS, VHF/DECT, UHF/GPS and UHF/DECT. All antennas have been through full military testing for different programmes around the globe.





# ***drytech***

## **DRYTECH AS**

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Customized field rations are Drytech's main products with freeze-dried meals providing user nutrition for 24 hours. Advantages include different sizes and calorie levels that are adjusted to temperate, tropic and arctic climates along with lightweight and easy preparation. The Norwegian-based company uses carefully selected ingredients to ensure the highest quality and food safety.

### **Real Field Meal**

In collaboration with the Norwegian and Swedish Army, Drytech AS has developed modern solutions for field catering.

The products are the "Real Field Meal" pouches (single meals) and the "Field Ration".

### **Meals**

The Real Field Meal breakfast with 650 kcal offers seven different dishes, and the lunch/dinner package with 520 or 800 kilocalories (kcal) offers a variety of 14 different dishes. These are also available as section packs breakfast 4,800 kcal and dinner 4,160 kcal.

### **Rations**

The content of the Field Ration can be adapted to satisfy the demands of the individual consumer and meet stipulated NATO requirements.

The standard product range consists of Field Rations with 1,000 kcal – complete nutrition for six to eight hours in the field, all in one chamber.

The Field Ration with 3,800 kcal is suitable for 24 hour's normal field activity and the Field Ration with 5,000 kcal provides energy for 24 hours in situations requiring strenuous physical activity. Both products are composed of three chambers – breakfast, lunch and dinner. Each chamber contains one of Drytech's Real Field Meal courses.

The rations range in weight from 260 grams to 1.2 kilograms, with a shelf life of approximately two and a half years, depending on storage and climate.

### **Contents & Production**

The carefully selected ingredients are inspected at the Drytech's plant throughout the whole production process, thoroughly monitoring production to assure top quality. Main ingredients such as fish, meat, poultry, potatoes and carrots are of Norwegian origin. Each meal is specially prepared in a freeze drying process and vacuum-packed in light, airtight and waterproof pouches, with an average of five year's shelf life.

The production method maintains both nutritional values and natural look and taste. Both lightweight and compact, the meals are quick and easy to prepare, simply by adding hot water and leaving to rest for five minutes. All products are exported to the armies of several nations.



Drytech's best-sellers are FR 3800 and FR 5000 designed to fit into the pockets of field uniforms.





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Eidsvoll Electronics AS (EIDEL) has specialized in remote capabilities like the Remote Crypto Distribution System (RCDS) and the remote radio ground-air-ground control system SISAM. EIDEL has also developed advanced telemetry products for space applications, flight testing and missile data collection. EIDEL expertise and knowledge are built on 40 years of design experience.

### Remote Crypto Distribution System (RCDS)

The RCDS system integrates the ability to remotely load crypto variables (CVs) and initialization data to a terminal by making use of NATO-approved Virtual Private Network (VPN) cryptographic equipment.

The system consists of a computer-based management system which can fit on any operative system and a master/slave hardware which is placed in a small rugged casing.

The Master Crypto Management (MCM) and the Master Crypto Unit (MCU) have the ability to input, temporarily store and distribute CVs. A firewall prevents and reports unauthorized access from the computer software. The Slave Crypto Unit (SCU) will have the ability to input, receive from distribution, temporary store and load CVs and initialization data into the terminal.

The solution has Norwegian National Security Authority approval for status *Hemmelig* (Secret). The RCDS is approved for tempest and EMC. NATO accreditation is in progress.

### Radio Control System (RCS)

The Radio Control System (RCS) provides flexible control of radio transceivers at remote radio sites. An installation-dependant number of UHF or VHF radio sites can be connected simultaneously. The radio sites are selected from a shared pool of radio sites available through a digital network. Other control centres can connect to other co-located or geographically distributed radio sites within the shared pool at the same time. The RCS has supported the NATO air-policing task in Norway since 1999 and in the Baltic countries since 2004, with deployable control centres in Norway and abroad since 2002. EIDEL is currently defining next generation RCS system which will be a total ip solution which will include solutions for Saturn radios.

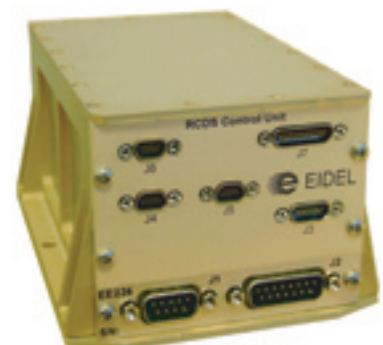
### Telemetry Systems

EIDEL's standard telemetry products include PCM encoders, PCM ground decoders EE350, airborne decoders EE360 and solid system decoder. EIDEL is delivering a new state of the art flight test system to Jas Gripen. The FTS consist of a new PCM encoder core with functional modules to handle custom specific equipments and a new IIRIG 106 fully chapter to compatible recorder.

EIDEL is also moving into the area of more complete telemetry systems like High Speed Acquisition Systems, HSAS, which can be used for missile testing. HSAS covers a complete system including sensors, encoder, transmitters, receivers, decoders, high seed cameras and opta presentation and analysis tools.

### Space

EIDEL strategy is to continue to become an increasingly consistent supplier of technology to the space industry with products originating in telemetry & defense products. EIDEL has delivered diagnostic control solution to the artemes program, solid state recorder to areane-5 launcher, ESA's atmospheric reentry demonstrator program and a ground decoder system to the areane launcher. Currently EIDEL is designing a hotel payload for sounding rockets; this pay pad has its origin from the new flight test system.





## FotoPhono AS

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During the last four years FotoPhono and the Norwegian Home Guard have co-operated to develop a shooting cinema using live fire, and recently the company has also signed a contract with the Swedish Home Guard.

### Real Time Communication

Use of force in peacetime is something that demands thorough training at all levels in both the Police and Armed Forces. The "Rules of Engagement" is the basic guide for both the training and the solving of tasks including use of armed force.

The two-way audio-visual system makes possible the training of personnel with this challenge in mind through the simulation of real-life situations. The solution in short: a police officer/soldier is presented with a live situation, on a 7 x 10.5 foot screen, and must decide how to solve it. The opposing parties (actors) are situated

in front of a camera at a safe distance and act out the scenario in real time with the soldier/police officer. The system enables verbal and visual communication, and even live fire directly at the screen, providing a unique opportunity to resolve conflict situations at the lowest possible level using diplomacy, or as a last resort – opening fire according to the Rules of Engagement.

### Rigorous Testing

The system has been subjected to rigorous testing, covering over 50,000 kilometres on Norwegian roads, and has been tested by over 600 soldiers. The soldiers or police officers receive an introduction into the legal aspects of using force and on non-lethal conflict resolution, and lawyers brief the operatives on the applicable laws.

1. Use of force in peacetime is something that demands thorough training at all levels in both the Police and Armed Forces. The "Rules of Engagement" is the basic guide for both the training and the solving of tasks including use of armed force.

2. The system makes it possible to execute training of personnel in situations which are as similar to reality as possible. It uses verbal and visual communication, line on screen, in a large picture format.





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For more than 50 years Heli-One has supported helicopters in the most demanding environments on the planet. The company is a division of the world's largest helicopter group, CHC Helicopter Corporation. Heli-Ones's total helicopter support means advanced aircraft, greater flexibility, increased aircraft availability and less downtime. Heli-One's customers include commercial and military operators worldwide. The company employs a staff of highly skilled specialists and engineers in modern, well equipped facilities and is EASA Part-145, ISO9001 and Part 21 DOA/POA approved.

### ILS Services

Heli-One offers Integrated Logistic Support services to helicopter operators worldwide. ILS from Heli-One means reduced resource costs, shorter lead-times and increased mission capacities for military and civilian operators.

### Turbohaft Engine Repair & Overhaul

Heli-One performs maintenance on more than 200 engines each year. It serves as a GE-approved, full support centre for CT58 and T58 engines for commercial and military operators worldwide, and is also a Turbomeca approved repair and overhaul centre for the Makila engines series.

### Airframe Inspection, Repair & Overhaul

Heli-One offers:

- Airframe inspection, repair, overhaul and maintenance
- Comprehensive airframe upgrades and modification programmes
- Engineering support
- Design and Integration

Heli-One's expertise encompasses all types of customization, retrofits, modernization and conversion upgrades for avionic and mechanical systems.

### Dynamic Components

Heli-One's transmission and rotor head facility is a worldwide approved Eurocopter overhaul and repair centre for AS 332

Dynamic components with full-load test cell capabilities. The company's dynamic component maintenance engineers process more than 100 components a year.

### Components Inspection, Repair & Overhaul

Further services include inspection, repair and overhaul of more than 1000 components for avionics hydraulics, rescue equipment etc.

### Lease

Heli-One can meet any rotor wing requirement anywhere in the world, offering flexible leasing terms and helicopter support to the highest standards.

1. Heli-Ones's total support provides greater flexibility, increased aircraft availability and less downtime.

2. Heli-One performs major inspections and modifications at its large, modern facilities at Stavanger Airport.





# SecureD™

Encryption Technologies

**HIGH DENSITY DEVICES AS**  
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High Density Devices (HDD) was established in 1998 and is the owner and developer of the SecureD™ technology. HDD cooperates closely with the US Department of Defense (DoD) for the enhancement and certification of the SecureD technology.

### Protection of Sensitive Data

SecureD™ protects all stored data by enforcing strong military-strength encryption, transparent and operating system independent. It is one of the easiest and most secure ways to ensure that no one gets access to the data stored on your laptop, desktop or USB storage device.

Sensitive data stored in laptops or on external disks can easily end up in the wrong hands – something that could have very serious consequences. The risk of losing sensitive information increases with the increase in mobility, because information in the hands of an analyst becomes intelligence.

The US Department of Defense has granted over USD 8 million to enhance and certify the SecureD™ technology, and SecureD™ is FIPS and Common Criteria certified for encryption of graded information, placing SecureD™ at the high end of data security solutions.

### The SecureD™ Product Line

- SecureD™ Desktop
- SecureD™ Laptop
- SecureD™ USB
- SecureD™ OEM solutions

Theft and loss of laptops and storage units results in 8.5 times more data leakages than conventional hacking in the US, according to the Ponemon Institute.

**Christian Fredrik Horst, Department Head of the Norwegian Ministry of Government Administration and Reform:**

*- I depend on the best in information protection to perform my everyday duties. HDD offers, what I consider to be, the very best in this area. HDD's solutions have more or less eliminated the threat of unfortunate consequences occurring should any equipment go astray. Even if such an incident was to occur, I will still be protected as I keep a backup with the same level of security.*



### Key Features

- Real-time hardware encryption/decryption
- No performance penalty
- Operating system independent
- No security information is handled by the computer processing system
- No annual licensing fees
- No end-of-life disposal costs

### Certifications

- FIPS 140-2 Level 3
- Common Criteria EAL4+, augmented with AVA\_VLA.3
- CMMI Maturity Level 2 (Level 3 in Progress)
- Common Criteria EAL4+, augmented with AVA\_VLA.3
- NSM BEGRENSET certification in progress – estimated release August 2008
- NATO RESTRICTED certification in progress – estimated release August 2008





# JAG

## JAG VISION AS

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JAG Vision is recognized as a leading systems integrator and supplier to defence, law enforcement, high security and challenging civil markets, providing innovative video surveillance solutions and specialist defence products. The company's main activities, managed through two different divisions, include award winning systems integration of high security networked video and supply and integration of specialist weapons, ancillary equipment and underwater ammunition. JAG Vision offers real solutions, often in extreme conditions, with exceptional customer service.

### High Security Real-Time Video Surveillance Systems

JAG Vision designs, integrates and installs high performance real-time video surveillance systems for fixed and mobile applications on land, sea and air. The company's systems give unprecedented access to live video images and audio on any authorized PC via IP networks anywhere in the world and from virtually any location. Combining live and recorded video, audio and data, thermal imaging and video content analysis, JAG Vision solutions represent a paradigm shift in high security asset protection.

### Fixed & Mobile

Applications include air and ground sides of military airbases, remote mountain top field surveillance, fixed and mobile video networks for police forces including live helicopter-mounted cameras, secure server farm protection, nuclear industry monitoring and in-vehicle integrated video surveillance systems. Solutions are custom-built for each situation, integrating high resolution cameras, thermal imaging,

direct control and full recording from every camera. JAG Vision has built a reputation within the defence and law enforcement sectors as the leading provider of real-time video solutions, which exceed expectations and work reliably the first time, even in the most extreme conditions.

### Customers

JAG Customers include:

- Spec Ops
- Police Forces
- Airborne Police units
- Military Airbases
- Nuclear sites
- Government departments

### Technology Independent

Using its Wireless Strategic Vision System (WSVS™) JAG Vision is able to integrate within one networked system whichever communications technology is most appropriate for that situation, whether land line, WiFi, microwave, 3G or satellite.

### Defence Solutions & Supplies

JAG Vision (DSS) supplies innovative and specialist sector specific products that include high performance weapon accessories, weapons, laser sights, night vision solutions, ruggedized laptops and a wide range of ancillary products for police, military and special forces applications.

JAG Vision is the exclusive distributor of

Armalite™, BE Meyers™, DI Optics™ and MEA™ underwater ammunition and the authorized distributor of General Dynamics ruggedized laptops. The company's rapid procurement service can meet the most pressing customer timescales.

JAG Vision is located in Norway and UK, with customers worldwide.





1



# EPM TECHNOLOGY

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Jotne EPM Technology (EPMT) is a member of the Jotne Group, specializing in information technology. Since 1990 the company has developed database solutions to handle standards such as ISO 10303 STEP, PLCS, etc. These are open specifications with public availability used among others by aerospace, space and defense related industries to manage information about complex systems. Jotne employs about 250 people. Its IT products are used by clients all over the world, including the US Department of Defence, the European Space Agency and leading aerospace/defence/space contractors.

## Achievements

Over the years, EPMT has worked closely with some of the most advanced aerospace and defense projects in the world, including the MODs, EADS, Lockheed Martin, SAAB, Boeing, etc. EPMT has proved itself to be trustworthy and capable. Recent contracts at ESA will utilize the EPMT EXPRESS Data Manager™ server as the heart of ESA's innovative Concurrent Design Facility (CDF). The CDF is used for the design of cutting-edge space projects. It allows the various system engineers to work simultaneously to optimize the spacecraft integration and development.

## Products

The suite of products, called EXPRESS Data Manager™ (EDM), is designed to meet the needs of engineering, manufacturing and operating enterprises for the purpose of accurately and reliably exchanging and sharing technical data about products with colleagues, customers, sub-contractors, suppliers and other business partners and for archiving product data.

EDM products ensure that the data is stored, available and usable for the life of the product and beyond regardless of the proprietary hardware or software system

being used. Products from Jotne EPM Technology can be used for:

- Data modelling and database management
- Application development
- Data sharing
- Open-format data exchange
- Data quality assurance
- Long-term data archiving

EPMT products are used worldwide to facilitate cost-effective business practices ranging from concurrent engineering to product life cycle management to electronic commerce.

1. EPMT's EXPRESS Data Manager™ is among the new generation of archiving and long-term data retention solutions. The picture above shows how CAD/PLM and logistics data is managed for the Eurofighter aircraft.

2. The picture to the right is taken at the ESA Concurrent Design Facility (CDF).



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**KONGSBERG**

**KONGSBERG DEFENCE & AEROSPACE AS**  
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Kongsberg Defence & Aerospace AS (KDA) is part of Kongsberg Gruppen ASA (KONGSBERG), a Norwegian-based international technology enterprise with operations in 25 countries. With 1,595 employees, KDA had operating revenues of NOK 3,338 billion in 2007.

KDA's most important product areas in the defence market:

**Command and Weapon Control Systems**

Since the early 1970s, Kongsberg has supplied various command, weapons control and information systems to all armed services. In cooperation with national and international companies, Kongsberg has participated in comprehensive programmes that especially cover the Royal Norwegian Armed Forces' recent and future investments.

*Air Defence:* In partnership with Raytheon, KONGSBERG offers one of the world's best short- to medium-range air defence systems, the SL-AMRAAM and HAWK XXI. The modular design and open system architecture allows for integration with other weapon systems and/or higher echelon units, ensuring maximum

flexibility for future growth. Adaptable to a number of tactical data links and interface message protocols, the systems are highly interoperable and increases combat power.

*Naval Systems:* Kongsberg's naval expertise and systems span the requirements of Naval Units from patrol crafts and mine counter measures through submarines to advanced frigates. Achievements in Underwater Warfare are so far to a large extent based on improvements in sonar technologies and the human ability to interpret. Kongsberg adds new dimensions to the performance of Underwater Systems by implementing the science and technologies from oceanography as well as new aids for improved interpretation of signals.

*C2IS – ComBatt Command & Control Information System for tactical Army operations:* The system has been developed in close cooperation with the users. Since ComBatt was fielded within the Norwegian Army in 2002, it has continuously been evaluated and modified based on experiences from large multi-national exercises as well as in international operations in Afghanistan.



1. NASAMS II test launch, Andoya Feb. 07.
2. The Naval Strike Missile (NSM) is an anti-ship and land-attack missile from KONGSBERG.
3. Naval Command and Control System.
4. Army C3I - ComBatt.

*BMS – Battlefield Management System:* ComBatt BMS is a “C2IS on the move” and the main purpose of the system is: Where am I, where are my buddies, where is the enemy?

The system supports manoeuvre operations at company, platoon and squad level.

### Surveillance

Situational awareness is a key factor for airports, seaports, coastal authorities and land border authorities. Over the years, Kongsberg has developed and delivered optimized surveillance solutions within a range of areas requiring situational awareness, situation management and decision making.

### Dynamic Systems

When NATO restructured their forces during the last decade and established the Immediate Reaction Forces (IRF), the need for light armoured vehicles came into being. These vehicles would also need light and medium calibre weapons for self-defence. Among several demands, protection of the gunner was most important.

*Remote Weapon Station:* The Kongsberg PROTECTOR Family with more than 3 000 systems in service world wide represents a wide range of quality products, mounted on multiple platforms. Kongsberg is providing five different Remote Weapon Stations; M151, CROWS, NM221, PROTECTOR Lite and Sea PROTECTOR. As of May 2008 PROTECTOR has been chosen by 14 nations and Kongsberg continues to be the world’s leading provider of Remote Weapon Stations.

The battle proven PROTECTOR Remote Weapon Stations is developed to protect military personnel in armoured vehicles. Weapons and sensors are mounted on the outside, while the operator remotely controls the system from a protected position inside the vehicle.

1. Remote Weapon Station (RWS).

2. Communication Systems.

### Communications

Kongsberg has been supplying mobile communication systems to more than 30 countries around the world. The equipment is used in all kinds of user conditions, ranging from arctic, desert and rain forest environments. Kongsberg systems are typically used on Brigade and below. The product range includes wide area systems including radio relays and switches as well as fully mobile and soldier oriented radio equipment.

### Missiles

In 1996, Kongsberg signed a contract with the Royal Norwegian Navy for the development of a new generation anti-ship missiles – the New anti-Ship Missile (NSM). NSM is designed for littoral waters, however, is as well suited for open sea scenarios.

The advanced design allows the missile to fly around islands and over landmasses. NSM has furthermore capabilities for the detection and engagement of both surface targets and targets on land. Through its long range, advanced navigation system, low Radar Cross-Section combined with sea skimming target approach, NSM offers exceptional defence penetration capabilities.

### Simulation & Training

Kongsberg has been a supplier of simulators and trainers in the international market for the last three decades. The company has accumulated a unique experience across the complete spectrum of training systems, ranging from small simulators to complex military team trainers.



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Kongsberg Mikroelektronikk AS develops and manufactures electronic shooting ranges. Since 1994 the company has delivered more than 8,000 targets to over 700 different military units and shooting/hunting clubs in Europe, North America and Australia. KME's largest shooting range consists of 167 rifle and pistol targets.

### KME Shooting Ranges

KME makes electronic shooting ranges with accurate detection and this is presented on each shooter's monitor. The system is designed for training and competition, as well as tests of weapons and ammunition, for all kinds of rifle and pistol calibres between 4.5 mm and 12.7 mm (cal .50). The system covers all shooting distances between 10 m and 1,500 m.

### Advantages of Kongsberg Electronic Shooting Ranges

- Effective training and evaluation of soldiers
- Immediate and accurate feedback, easy to store and print out
- Equipment designed for wet, windy, hot and cold conditions
- Can be operated from -40 to + 70 degrees Celsius
- Monitor designed for rough conditions;
  - Display readable in bright sunlight
  - Ability to withstand the impact of cartridges from automatic weapons
  - Waterproof stainless steel chassis
  - Mil. spec. connectors
  - Vandal-proof buttons
- Smart card solution to identify the shooters
- Target software available for a vast variety of standard target templates
- Handles fully automatic fire up to 22 rounds per second

- Radio communication for long-distance shooting and moving targets
- Experienced in running large championships
- Easy to operate and low maintenance costs.

### Mobile Electronic Firing Range (MELFIRE™)

The KME MELFIRE is specifically designed for international operations, enabling troops to maintain their shooting skills and zero their weapons while abroad. The containers are rapid to deploy and easy to install. Shooting distances can vary from 25 metres up to whatever distance the user may desire. Electronic targets with individual monitors give immediate feedback to soldiers and instructors, with radio or wire communication between the target and firing containers. The results can easily be stored and printed out.

Powered by battery, generator or mains power, the system is environmentally correct since no projectiles (lead etc) are left in the nature. The target container is designed to be bullet proof and the rubber panels make it totally ricochet free. Time and money is saved compared to traditional shooting gallery infrastructure which cannot be disassembled and shipped home, or re-used in another operation area.

### The following equipment is permanently mounted in each MELFIRE target container:

- Electronic targets (130 x 130 cm wide)
- Bullet traps
- Armour grade steel and rubber granular panels in front of the container.



### The following equipment is permanently mounted in each MELFIRE firing container:

- Monitors for each shooter
- Insulation for noise reduction





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Kitron specializes in contract design and the manufacture of defence and marine electronics, as well as providing electronics for exposed environments. This includes manufacturing services for the worldwide defence, marine, oil and gas, and seismic markets. With more than 40 years of experience in its field, Kitron ranks as one of the leading contract electronics manufacturers in Scandinavia. The Kitron Group consists of companies in Norway, Sweden and Lithuania, offering a full range of design and manufacturing services. Kitron has earned excellent references from international partners through participation in Norwegian and Swedish offset trade programmes.

**Wide Range of Services**

Kitron takes full or partial responsibility for design, industrialization, sourcing and procurement of components, logistics, production, testing and deliveries of complete products to end-users. Kitron's manufacturing facilities carry out cutting-edge technology in the assembly and testing of end-products as well as thick-film, multi-chip modules and printed circuit boards. This includes 16 modern SMT lines and modern test stations as well as clean room facilities. Kitron's Development Company consists of 100 highly skilled engineers and has locations in Norway and Sweden.

**Electronics for Exposed Environments**

Kitron provides circuit board assembly, including special cleaning and coating processes. A special anti-corrosion process for boards, with four different levels, makes it possible to produce electronics for all types of operating environments.

**Dual Use of Technology**

Kitron has separate facilities for manufacturing military applications. Technology from other market segments such as telecom, industry and medicine are studied and adapted to the processes. Kitron has special knowledge and experience in military communications, command and control systems, missiles and avionics, and training and simulator systems. All activities are ISO 9001:2000, ISO 14001:2004, and AQAP-2120 approved. Most of the employees are cleared for NATO Secret.



**Offset Partner**

In recent years Kitron has been engaged in a number of offset programmes delivering subunits as well as complete systems for use in fire control systems, communication systems, missiles and electronic modules for military aircraft for major customers in the defence industry, both in Europe and the United States.





# NAMMO

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The Nammo Group is a leading supplier of ammunition, shoulder fired weapon systems, propulsion products and demilitarization services. The company has subsidiaries in Finland, Germany, Norway, Sweden, Switzerland and the United States. Nammo's operational structure is divided into five strategic business units and the shareholders are the Norwegian Ministry of Trade and Industry (50%) and the Finnish Defence and Aerospace Group, Patria Oyj (50%).

### Small Caliber Division

The Small Caliber business unit is a leading supplier of niche technology and core products within small caliber ammunition. The extensive product range includes premium combat and commercial products for armed forces' base needs, Special Forces, law enforcement, premium target shooters and Olympic winners.

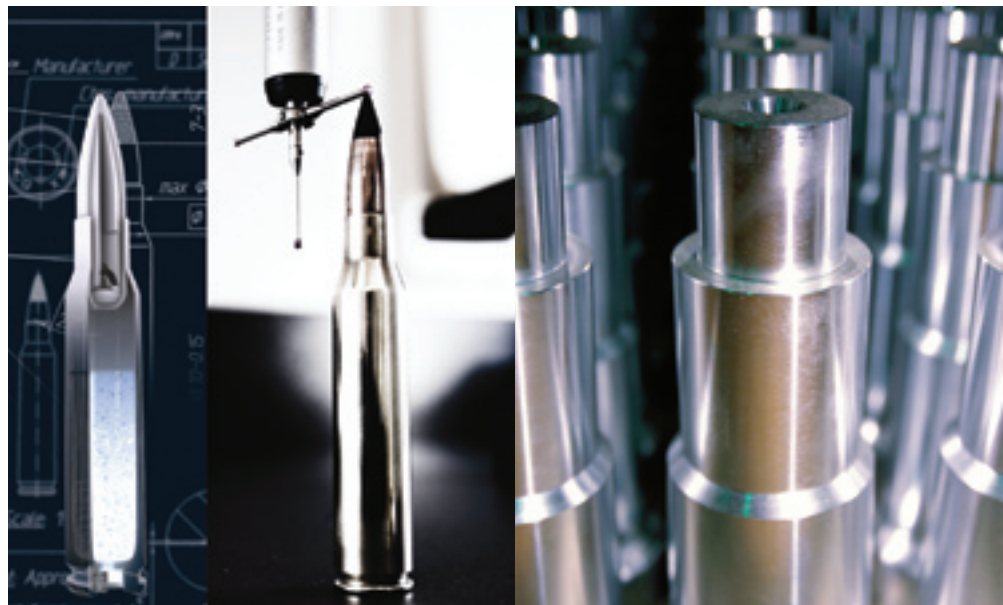
The Business Unit operates in the following business areas:

- Military Home Markets; Customer integrated ammunition and logistics/life cycle supplier
- Military Specialities; Focused speciality ammunition developer and supplier
- Civil Centerfire; Worldwide target shooting ammunition partner
- Rimfire; Worldwide premium target ammunition supplier

### Medium & Large Caliber Division

The Medium & Large Caliber Division is a leading supplier of a broad range of combat and training ammunition for Army, Navy and Air Force applications. The Division provides full up rounds and components for ammunition ranging from 12.7mm up to 155mm artillery.

Pyrotechnics, M72 light shoulder fired anti-armor weapons, hand-grenades and restoring of ammunition are also important parts of the product range. In addition, the Division offers services such as ballistic, environmental and hazard ("IM-Insensitive Munitions") testing, laboratory services, mechanical manufacturing, surface treatment and explosive filling.



### Missile Products Division

The Missile Products Division mainly comprises production of propulsion systems and warheads for missiles as well as small rocket motors for space applications. The propulsion capabilities include advanced Thrust Vector Control systems.

Development and major production programmes such as NSM, ESSM, IRIS-T and Exocet Block 3 have created an industrial environment enabling advancements in design, engineering and manufacturing capabilities. The Unit has become an attractive partner for the world's leading missile groups.

Within the space industry, the separation boosters and a new acceleration motor for the "Ariane 5" Second Stage comprise the main product area.

### Demil Division

Nammo's Business Unit within demilitarization offers environmentally friendly recycling and disposal processes for all conventional ammunition and explosive products. The range covers everything from full disassembly and recycling of most types of ingoing materials, to thermal treatment fulfilling the strictest European air emission control regulations and environmentally controlled underground detonations.

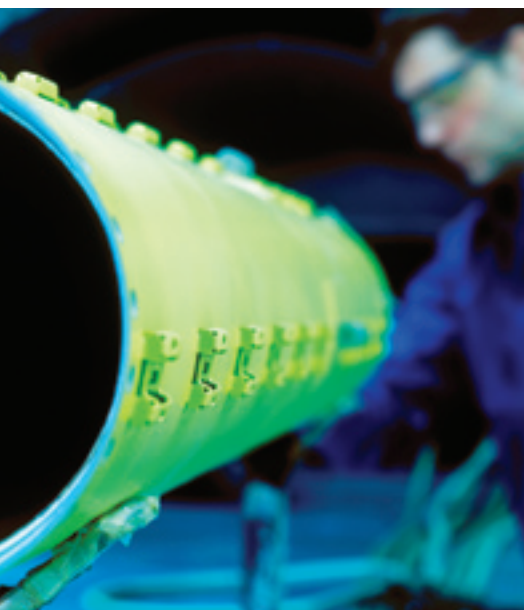
The Unit has an extensive range of in-house developed equipments and technologies that are unique on a global scale.

### Nammo Talley

Nammo Talley operates as a separate and fifth Business Unit within the Nammo Group. Talley has full design, analysis, development, test and production capabilities. The Business Unit started with aircrew escape systems and automotive safety airbags and a solid propellant heritage of over 45 years.

The core business areas are:

- Shoulder fired weapon systems such as M72 (LAW), Bunker Defeat Munition (BDM) and Shoulder Launched Multipurpose Assault Weapon (SMAW)
- Rocket Motors (Solid propellant devices)
- Gas generators, actuators, dispersion systems and ejection racks
- Warhead activities





1



**MARITIME PARTNER**

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Founded in 1994, Maritime Partner AS is one of the world's leading designers and suppliers of work boats, fast rescue boats, patrol boats and daughter craft to the international maritime and offshore industries, as well as military and institutional users. Some 1,250 boats of Maritime Partner's designs are in service today all around the world. The company's turnover in 2006 was approximately NOK 150 million.

**Product Range**

Maritime Partner has a wide selection of daughter craft, rescue, patrol, pilot and work boats, including the ALUSAFE®, SEABEAR®, WEEDO® and MP® models. The craft range in size from 5 to 25 metres and are designed and constructed according to international standards, in addition to individual customer needs and requirements.

**Worldwide Service**

Maritime Partner places great emphasis on after-sales service. Its company service personnel undergoes continual training to ensure detailed, up-to-date product knowledge.

1. Demanding North Sea operators, from oil operators and rig owners to supply ship owners and seismic enterprises, choose MP741 Springer.
2. Highly sophisticated design for the Norwegian Navy.
3. Alusafe 2000 – designed for high speed in adverse weather conditions for rescue, patrol, ambulance, personnel transport and inspection services.
4. Fast Rescue Daughter Craft (FRDC) – setting new standards.

**Export Markets**

Maritime Partner exports its products around the globe through a network of representatives with major deliveries to companies in:

- Algeria
  - Angola
  - Argentina
  - Australia
  - Belgium
  - Brazil
  - Brunei
  - Canada
  - China
  - Cyprus
  - Denmark
  - Faeroe Islands
  - Finland
  - France
  - Greenland
  - Germany
  - Greece
  - Iceland
  - India
  - Indonesia
  - Italy
  - Japan
  - Latvia
  - Malaysia
  - Mauritius
  - Namibia
  - The Netherlands
  - Oman
  - Philippines
  - Poland
  - Qatar
  - Russia
  - Saudi Arabia
  - Singapore
  - South Korea
  - Spain
  - Sweden
  - Tunisia
  - Turkey
  - UK
  - United Arab Emirates
  - USA
  - Vietnam
5. Redningselskapet has worked together with Maritime Partner's specialists in developing new, lightweight, highly manoeuvrable boats.



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5



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Nera Networks AS is one of the leading suppliers of wireless microwave transmission network solutions for market segments such as governments and defence; carriers and broadcast; ISP and enterprise; Offshore and utilities; and mobile operators. More than 95% of company total revenue is generated by international sales. Customer satisfaction is vital and quality foremost; Nera Networks is approved according to AQAP 2110 and ISO 9001:2000.

Nera Networks has designed, developed, manufactured and deployed transmission solutions since its inception in 1947. The company has approximately 700 employees – including over 20% working within technology and development. Nera Networks has more than 30 sales and customer support offices worldwide. Company headquarters are in Bergen, Norway, with regional offices located in the Americas, Middle East, Africa and Asia (through Nera Telecommunications, a separate company listed in Singapore).

### Defence Partner

In the defence segment, Nera Networks has delivered wireless network solutions to strategic communication infrastructure for several NATO nations and other demanding customers for more than 60 years.

### Turnkey Solutions

Nera Networks provides turnkey solutions that specifically address customer requirements, providing point-to-point and point-to-multipoint microwave radio-relay systems ranging from 2 Mb/s to nx155 MB/s, operating in frequency bands from 2 GHz to 38 GHz.

WiMAX solutions according to IEEE 802.16 are also available with OFDM modulation, ensuring a high degree of immunity to interference and multi path conflicts with Non-Line-Of-Sight (NLOS) capabilities.

### Evolution Series

Recently the new Evolution Series was launched, a market-leading, common microwave platform radio system, with Ethernet/IP, scaleable PDH access networks and SDH/SONET backhaul networks versions/capabilities, putting Nera Networks at the forefront of the industry. The Evolution Series is a breakthrough in software defined radio technology.

### Customer Support

A special support organization, based on Service Level Agreements (SLA), is available to customers on a 24-hour basis. Special training courses are available for system planning, installation and commissioning, operation and maintenance, and network management of transmission systems.

Neras' network solutions are comprised of several key building blocks integrating IP-based services, design/implementation and "Neracare" – always putting the customer first:

- Turn key solutions
- Focus on customer needs
- Designing, building and operating
- Enabling new services
- Future proof backhaul network



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Nordic Defence Supply AS (NDS) has more than 25 years of experience in representing foreign industry in our local marketplace. We are a trading & consulting agency offering the most modern and cost-effective solutions for the Army, Navy and Air Force and other professionals.

Nordic Defence Supply AS has experience combined with an extensive network of contacts within the Armed Forces and with Norwegian industry, providing an optimal basis for gaining detailed knowledge on programs relevant for the company's foreign partners.

NDS has delivered defence materiel, directly or indirectly, within most categories of special equipment including:

- Weapons and ammunition
- Explosives and pyrotechnics
- Demining / EOD
- NRBC

- Personal soldier equipment
- Security and protection
- Vehicles
- Optical / electro-optical
- Simulation / command and control
- Life support equipment

NDS is part of the Simrad Optronics Group.



We offer advice and support on creating the best solutions for our local customers, and our capabilities include:

- Sales and Marketing
- Project planning and management
- Bidding processes and negotiations
- Spare parts and maintenance
- Customer support / ILS
- Industrial cooperation
- Political issues
- Public relations

Nordic Defence Supply AS seeks foreign partners interested in designing winning solutions for company customers.

### Designing winning solutions





# FFI Forsvarets forskningsinstitutt

Norwegian Defence Research Establishment

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In Norway the Norwegian Defence Research Establishment (FFI) manages the main responsibility for defence-related research. The establishment is also the trusted adviser on defence-related science and technology for the Norwegian Ministry of Defence.

The demand for transformed and flexible armed forces requires constant renewal, and Norway's commitment to defence technology keeps FFI busy. Developing the Armed Forces in a way that secures its principal role as the security policy tool of society comprises great challenges.

As the Armed Forces are no longer purely a national emergency tool, but also one of international security, even R&D requires greater international cooperation. FFI collaborates with national and

international scientific institutions and industry in order to ensure its position at the forefront of science and technology within chosen areas. FFI also has a close working relationship with its partners and customers.

### R&D for Protection of Norwegian Interests

Demand for FFI's research increases as the nature of armed conflict evolves, creating the need for new communications technologies in new areas of conflict or for

new forms of protection against biological and chemical weapons. These are just two of the fields in which FFI is working. The overall goal is to enable men and women in uniform to be more effective in the field, and, inevitably, to return home alive.

FFI seeks to resolve such challenges by covering a broad research spectrum, ranging from assisting operational units, to supporting security policy via defence planning, to technology studies.

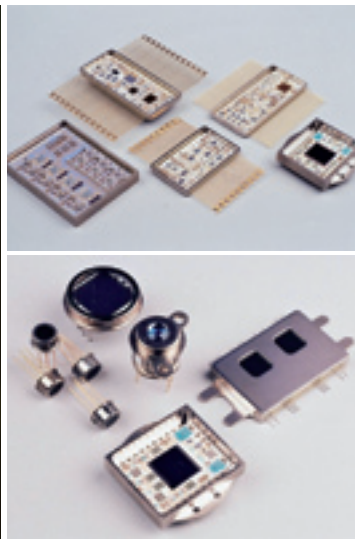
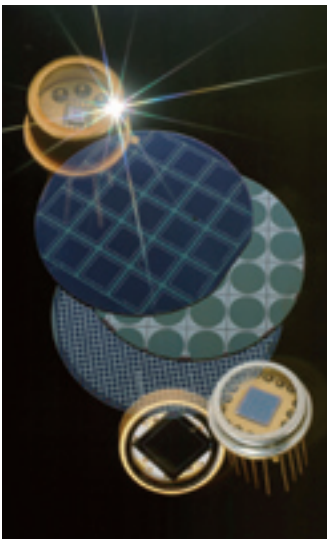
1. Environmental assessment of white phosphorus and toxic compounds in military ammunition.

2. FFI command & control systems and synthetic environments laboratory turn knowledge and ideas into efficient defence.



[www.ffi.no](http://www.ffi.no)

FFI turns knowledge and ideas into an efficient defence



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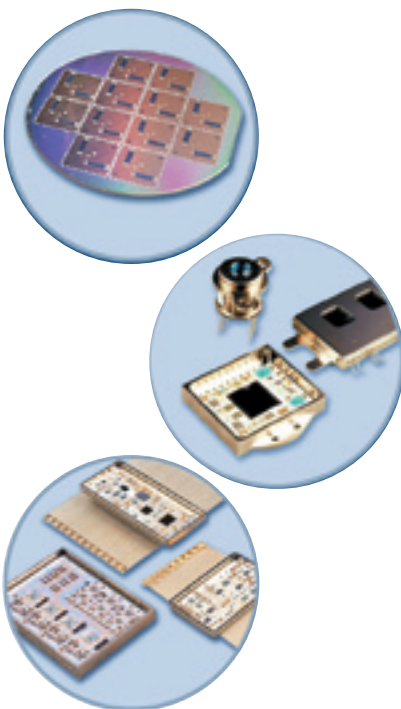
Formerly AME AS



OSI Optoelectronics AS has been a leading micro-electronic manufacturer since its establishment in 1965. Today the company offers innovative solutions for optoelectronic development and manufacturing. The company's more than 60 highly qualified employees supply the European market with fully European-made detectors and solutions. OSI Optoelectronics AS' turnover was USD 22,2 million in 2007.

### Detector Products

OSI Optoelectronics AS has more than 30 years of experience in the design, development and production of silicon-based photo-detectors, and continues to work on improving its process technology through close collaboration with its customers and the research foundation SINTEF.



All of the company's detectors are OEM products, and the company offers the following range of customized silicon detector products:

- PIN photo detectors ranging from UV to near infrared light
- Deep UV and blue-enhanced photo detectors
- Nuclear and radiation detectors for low and high energy
- Multi-element silicon detectors optimized for YAG laser detection
- Non-opto MCM including thin- and thick-film
- Avalanche silicon photodiodes (APD) for YAG laser detection
- Optohybrids
- Multiple element arrays, matrices and stripe detectors
- Quadrant detectors/PSDs
- Flip-chip assembled multi-element diode arrays

OSI Optoelectronics AS products are used in a variety of fields, including positioning satellites, ozone layer monitoring, x-ray and particle detection, missile guidance, proximity detection, gas analysis and position sensing.

### Manufacturing Process

OSI Optoelectronic AS's production facilities include specialized equipment providing maximum flexibility and clean rooms from class

10. The company manufactures products for space, military, life science and industrial customers. Prototypes and hi-rel products are produced in close cooperation with the company's engineering group. Serial or high-volume production is produced in the plant most suitable to meet customer logistic needs. Close cooperation with OSI Systems Inc. plants in the US and the Far East provides the quality, flexibility, and cost structure the customer needs.

### Main Technology Capabilities

- Design, qualification, and industrialization according to customer requirements
- 4" & 6" silicon wafer processing
- Connected vias through silicon
- InGaAs detectors
- Thin-film processing
- Automated assembly line
- Automated glue dispensing and high-accuracy die mounting
- Automated fine-pitch wire bonding
- Micro and polymer flip-chip
- Hermetic sealing and potting
- Laser trim
- Electro-optical test lab
- Full environmental qualification and screening
- Full traceability to the component level



## Park Air Systems

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Park Air Systems is a wholly owned subsidiary of Northrop Grumman Corporation, an international aerospace and defence company. The company comprises Park Air Systems AS, located in Norway, and Park Air Systems Ltd, located in Peterborough, England. Park Air Systems provides complete communication, navigation and surveillance (CNS) solutions for the world's airspace with references in over 170 countries.

### Company History

Park Air Systems' history dates back over 80 years, and throughout this time the company has specialized in providing leading-edge technology and systems to the aviation sector and to other transport applications. Today, Park Air Systems dedicates itself entirely to the design, manufacture and installation of ground-based systems for use in air traffic control and air defence applications.

### Product Lines

Central to Park Air Systems' ability to provide sophisticated airspace management solutions is its range of world-renowned product lines:

- **GAREX** – Voice communication control systems (VCCS)
- **NORMARC** – Navigation systems, instrument landing systems (ILS) and satellite landing systems (SLS)
- **NOVA** – Area control and approach control systems (ACC/APP), and surface movement guidance and control systems (SMGCS)
- **PAE** – Radio communication systems

Park Air Systems' products are adaptable and configurable to meet every need of its vast number of customers worldwide. The company's engineers design next-generation products, incorporating the latest technologies. They use their vast experience from installed operational systems worldwide to develop new projects together with the company's customers that go beyond expectations. This ensures that Park Air Systems not only meets the needs of today's sophisticated ATC users, but also the requirements of future CNS/ATM applications.

Park Air Systems delivers turnkey projects, including third-party products. Qualified and highly skilled partner relationships ensure the company's customers the very best solutions in this demanding marketplace.

### References

Park Air Systems' reference list ranges from the smallest airports and control centres to some of the world's busiest airports, including London Heathrow, Paris Charles de Gaulle, Toronto Pearson, Hong Kong, Dubai and Beijing.

For more information, please visit the company's website –

**[www.parkairsystems.com](http://www.parkairsystems.com)** – or send an e-mail to **[sales@no.parkairsystems.com](mailto:sales@no.parkairsystems.com)**.





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The ROFI Protective line comprises lightweight armouring of vehicles for protection against landmines, body armours, helmets and visors, and a customized selection of deminer vests and aprons. In addition, the ROFI Camp Kit is increasingly becoming the solution of choice for organizations and units in need of temporary accommodation for both exercises and field deployment, and is also available for rent/lease. ROFI's complete solutions, a sort of "one-stop shopping", simplify the process and solve logistical challenges for field operations worldwide.

### Multi-Purpose Tents

The multi-purpose tent collection features a range of tents designed for use in various climates. Structures made of hinged aluminium and stainless-steel parts are easy and safe to assemble and dismantle. A variety of covers and designs secure reasonable working and living conditions in all ROFI shelters. The range of inflatable tents comprises both low-pressure and high-pressure technology, and come in a variety of sizes, colours and features.

In cooperation with container suppliers, ROFI has designed multi-functional connectors between tents and containers, facilitating affordable working conditions during field operations.

1. Demining in Eritrea.

2. Norwegian forces utilizing Amplifier Inflatable Tents as camp modules.

3. ROFI Innova – the next-generation frame tent.

4. ROFI Ballistic Blankets and Wheel Arch Panel (WAP).

### Protection

During the mid-1990s, ROFI developed and full-scale tested a concealed lightweight ballistic panel system to be fitted into administrative vehicles. Over the last few years, the company has fitted several thousand vehicles with this protection against landmines in a number of conflict areas, including Iraq, Afghanistan, Kosovo, Angola, Uganda, Eritrea and Sudan.

ROFI has also developed different models of protective clothing for deminers, which have been deployed by the thousands for use around the world. The company's extensive presence in the field helps it secure up-to-date information about new requirements and client preferences.



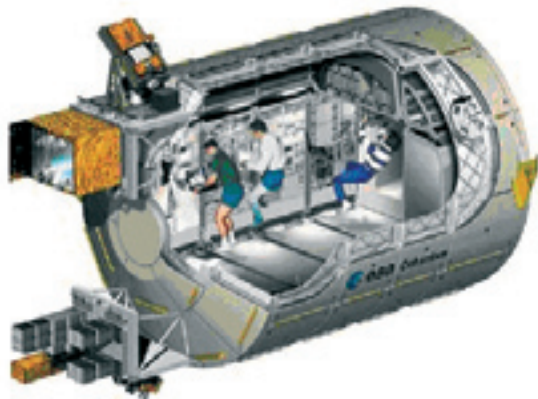
### Product Range – Shelters

- Accommodation tents
- Staff quarters
- Hospital tents
- Multi-purpose tents
- Command post tents
- Multi-fuel heaters

### Product Range – Protection

- Ballistic suppression systems
- Wheel Arch Panel (WAP)
- Flak jackets
- Deminer vests and aprons





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SINTEF ICT (Information and Communication Technology) is the largest independent research organization for ICT in Norway, and one of the institutes in the SINTEF Group. SINTEF ICT employs 250 researchers and provides research-based expertise in the areas of microtechnology, communication and software technology, computational software, security and safety.

Applications related to defence and aerospace have a strong focus in SINTEF ICT, and projects ranging from sensor development to system architecture have been carried out. SINTEF ICT's main focus areas are:

- Development and production of silicon-based sensors and actuators
- Gas monitoring
- Noise calculations, measurements and planning
- Communication in rough environments
- Radar systems
- Information security
- Command, Control, Communications, Computer and Intelligence (C4I)
- System architecture

### Multicomponent Trace Gas Monitoring

Preparations for the upcoming European Space Station have included significant attention to multicomponent trace

gas monitoring. The atmosphere of manned spacecrafts requires continuous monitoring in order to safeguard the crew's health; response to harmful contaminants or malfunctions is essential. SINTEF ICT has developed equipment for instant detection of toxic, harmful or unpleasant gases. In a project for the European Space Agency (ESA), SINTEF has developed a FTIR (Fourier Transform Infrared) system for trace gas monitoring in cooperation with Kayser-Threde GmbH.



### Remote Monitoring of Physiological Parameters

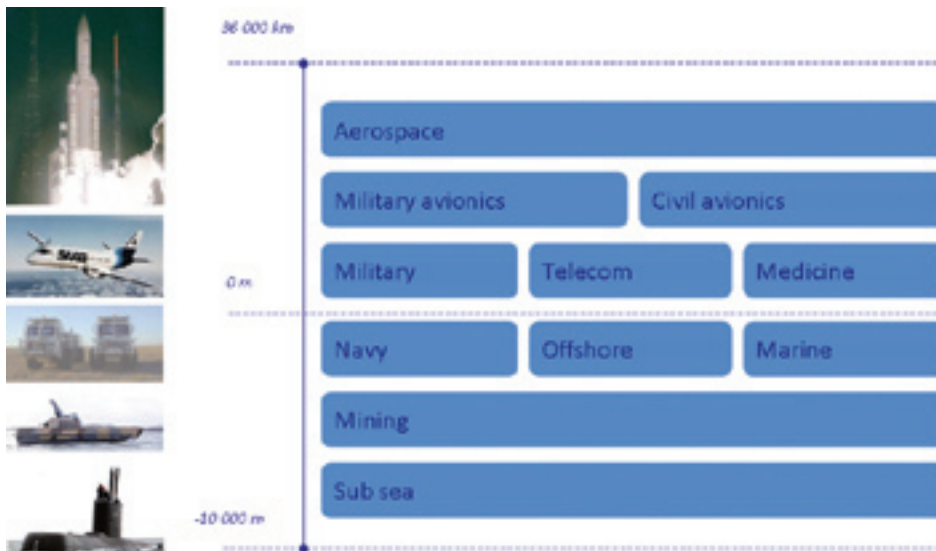
Fire fighters, oil workers and others facing extreme working environments can benefit from the monitoring of their physical parameters, such as temperature, pulse, respiration rate and blood oxygen saturation. SINTEF has developed a system for monitoring physiological parameters and communicating results by radio. This ensures that workers' physical condition can be continuously communicated to external rescuers in the event of critical situations.

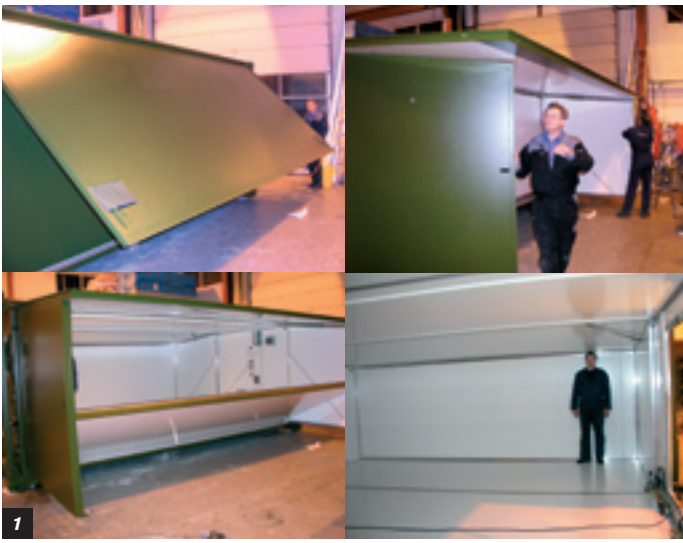


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T&G Elektro AS is one of Norway's leading suppliers of connectors, cable systems, fiber-optics, tools and training for telecommunications, defence and offshore applications. The company and its subsidiaries, TGC Harnessing AS and other affiliates in Finland, Sweden and Poland, are active in trading and manufacturing electrical and optical connectors and cable systems. T&G's world-class products and services are sold to a customer base which includes the defence, aerospace, telecom, offshore, marine and heavy-duty industries, as well as armies, air forces and navies. T&G has established customer bases in Denmark, Finland, Germany, Greece, Poland, Singapore, Sweden and the United States. T&G has both QPL and NS-EN ISO 9001:2000 certifications.





# TAM AS

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Since 1981 TAM AS has produced durable military and civilian shelters using high-quality glued sandwich systems. Designed according to client specifications, TAM shelters vary in complexity, but all are lightweight, strong, well-insulated and easy to maintain. The high quality of the shelters ensures low life-cycle costs.

### Mobile & Semi-Mobile Shelters

TAM has developed a wide range of lightweight mobile shelters for rapid deployment to meet relevant military and civil standards. The company develops new products and refines existing ones in close collaboration with military and civilian clients.

### Expandable Shelters – Three Basic Systems with Several Options

TAM specializes in lightweight expandable shelters for all-around transport as ISO 10' or 20' containers with CSC safety approval. Integrated hook lift frame and automatic expansion are options. TAM has also recently delivered a new ISO 10' expandable communication shelter type 68000 for tactical data links (Link 16).

### TAMEX = TAM Expandable Shelter

The most important features of the TAMEX shelters include low weight, 2–3 times expansion capabilities, flat floor space and full standing height all over.

The TAMEX has hydraulic jack legs for levelling in terrain and expansion is hydraulically operated, all by remote control. Due to TAM's high quality, lightweight sandwich system, no support at the expandable parts is required. A wide range of options are available.

### Shelters on HMMWV

TAM has a wide range of shelter designs, including shelter type 63000, which is designed for the HMMWV and extremely hot climates. The shelters are delivered with newly designed super-silent, diesel generators to meet high ambient temperature requirements.

As with all of TAM's shelters, the 63000 is also produced in the company's advanced lightweight, hard-skin sandwich system. This provides the shelters with excellent performances and very low life-cycle costs.

1. TAMEX expanding.

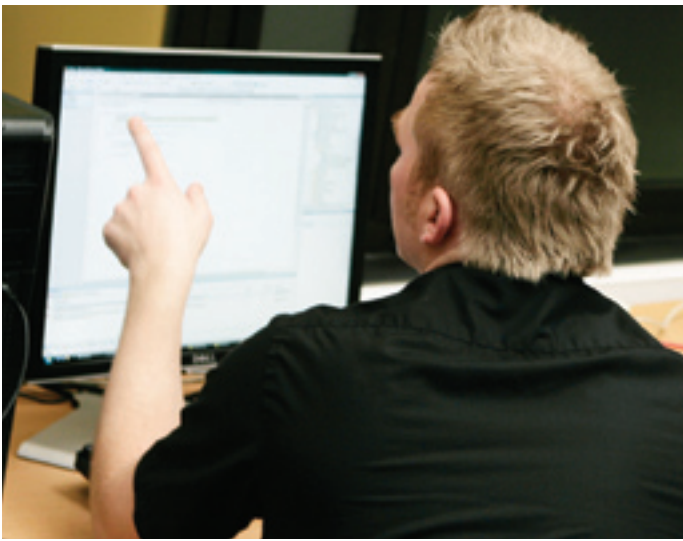
2. Expandable ISO 10' shelter for Link 16, expanded.

3. Shelter 56MJ expanded on ground.

4. Expandable ISO 10' shelter for Link 16, closed.

5. HMMWV shelter with integrated silent diesel generator.





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Teleplan Globe is a software engineering company with a strong international reputation. The company offers a broad spectrum of solutions relating to defence, telecom and business system solutions. Teleplan Globe and its sister companies have 50 years of experience within the defence and telecom industry since the establishment in 1959.

### Defence System solutions

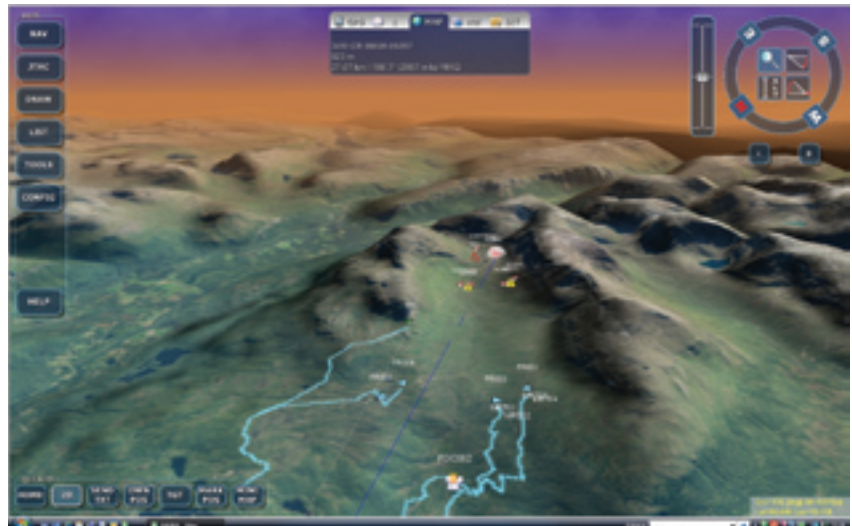
Teleplan Globe supplies a wide range of defence solutions already in daily use internationally. The company provides command and control systems, battle management systems, dismounted soldier systems, weapon control systems, geographic information systems, frequency and communication management systems, simulators, mission planning, electronic warfare, intelligence collection and analysis tools.

The main focus areas for the next two years within the C4ISR and ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance) domains are Battle Management/ Dismounted Soldier Systems and CCIRM (Collection Coordination and Intelligence Requirements Management) respectively.

**MARIA™ BMS** (Battle Management System) is a system supporting tactical navigation in the field, automatic information exchange and FAC/JTAC operations.

**MARIA™ DSS** (Dismounted Soldier System) provides an updated situation picture and has the capability to send and receive secure e-mail to operational units utilizing PDAs.

**NORCCIRM** is a collection management tool designed to provide support to the military collection coordination and intelligence requirement management (CCIRM) process according to NATO doctrines and procedures. The tool is applicable to the CCIRM process at all command levels and services.



Most importantly, Teleplan Globe listens to military personnel in the field and joins their exercises and training when appropriate. As a result the company creates products and solutions that support client needs and meets requirements in the warfare theatre.

### **Telcom System Solutions**

Teleplan Globe has been a pioneer in the development of a radio planning system for the Norwegian telecom industry. Together with its sister company, Teleplan Consulting, they provide a wide range of services for start-ups as well as mature operators. Regulatory authorities also use Teleplan's systems and consultancy services to control and monitor the operators according to regulations.

### **ASTRIX RADIO PLANNING SYSTEM**

ASTRIX is Teleplan Globe's suite of application modules designed for telecom operators, regulators and telecom consultants. It has been used for planning, deploying, implementing, optimising and maintaining small to large cellular networks world-wide. As an example, ASTRIX optimises a UMTS cellular network by 15–25% on average. Logistically that represents a significant expenditure cut. ASTRIX also significantly improve predictions with its Correction Layer functionality, by combining drive test measurements with calculated coverage predictions. ASTRIX plans 2G and 3G networks and is also used for planning secure and mission critical TETRA networks. Teleplan Globe continuously adapts to new technologies to stay ahead.

### **Business System Solutions**

Teleplan Globe decided to create a new business branch early 2008 as a response to several requests from customers within other segments than defence and telecom. Solutions range from Integrated Business Systems, Trusted Third Party (TTP) Management, Personal Violence Protection Systems, Police Command and Control Systems, Geospatial Audio/Visual Data Recording and Analysis systems as well as Crisis Management Systems.

The main purpose is to create open source innovative business software solutions in cooperation with company customers.





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The Techni Group is a leading provider of development services and product integration in all sectors of the defence industry, supplying the entire chain of services from engineering through installation to life cycle support. The company has completed more than 350 projects, and it aims to be an effective partner in fulfilling its customers demanding requirements. A vast partnership network enables complex system delivery, in both low and medium volumes. By combining an interdisciplinary, ISO 9000-approved approach with a creative, problem-solving mindset, Techni makes customers' projects a success.

**Areas of Market Expertise & Experience**

- Sensors and system integration
- CCIS integration in all defence sectors
- Electro- and hydro-mechanical drives and controls



- Soldier modernization/special forces equipment

**Areas of Technical Expertise & Experience**

- Useability, system integration
- Rugged embedded electronics and mechanics
- Microtechnology and microphysics
- RF, thermal, magnetic and structural design
- Optics, electro-optics and display technology

The Techni Group has the ability to set up highly challenging science research and development activities in combination with industrialization across numerous production processes. These cluster packages are appealing to companies seeking industrial partnership opportunities since they spur a high multiplication factor on any offset trading agreements.

**Team Technology**

Cluster groups provide large Industrial Partnership opportunities and Techni AS has a history of experience working with a varied range of technology, teams and sub suppliers. Locally, a team of specialists across technical sectors and manufacturing processes have been formed to comply with the ever demanding need from global defence sector suppliers that offer their products to the Norwegian MoD.



1. Techni has delivered control and simulation consoles to the defence sector with great success.
2. Field testing of working prototypes for the Normans Soldier.
3. Quality control of JSF parts using precise measurement devices.



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Telenor Satellite Broadcasting (SBc) technical infrastructure is based upon the three Telenor-owned satellites (THOR 5, Thor II & Thor III) and the partly owned Intelsat 10-02, all at the 1° W orbital position. SBc is a part of Telenor ASA, the largest Norwegian telecom operator. Telenor Satellite Broadcasting is headquartered in Oslo, Norway, but has operations in Nittedal (just outside Oslo), London, Sofia, Bratislava, Stockholm, Copenhagen and Helsinki. Together, they service customers in Europe, the Middle East, South Asia and South Africa.

### Satellite Technologies

From the orbital position at 1° West, Telenor Satellite Broadcasting provides the satellite network that supports the distribution of TV and radio programming to consumers in the Nordic market via DTH, CATV and SMATV networks, as well as voice, data and IP services.

Today, 95 percent of the DTH satellite dishes and 100 percent of the head-end antennas for CATV and SMATV operators in the Nordic region point toward 1° West.

SBc is also on the front line with the development of new technologies, such as the company's DVB-RCS platform which was launched in 2004. Shared Access is just one example of a full range of digital and interactive services available via SBc's platform at 1° W.

Additionally, Telenor Satellite Broadcasting offers services on a number of satellites accessible from the two main teleports at Nittedal, Norway and Central London, together with connectivity into terrestrial national and international voice, data, video and Internet backbone networks.

Responsible for the Thor II, Thor III, THOR 5 and THOR 6 (launch June 2009), as well as participating in the Intelsat 10-02 programme, the company masters all the key elements of purchase, commissioning and operation of a satellite.

### Oslo Satellite Control Centre

The Fornebu Satellite Control Centre, manned 24 hours a day, currently controls Telenor's THOR 5, Thor II and III satellites at 1° West through the two tracking sites at the Eik and Nittedal Earth stations. The Fornebu SCC is currently preparing to take control of the new THOR 6 satellite, which is scheduled to be launched in June 2009.

The control centre can provide in-orbit control service for other geostationary spacecraft at positions from 50° West to 70° East.



1. Nittedal Earth Station.

2. Oslo Satellite Control Centre.

3. Launch of THOR 5.



# THALES

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Thales is a leading international electronics and systems group, addressing defence, aerospace and security markets worldwide. The Group employs 68,000 people in 50 countries. Thales Norway AS is one of the largest industrial centres of expertise for military IT and telecommunications in Norway, and the principal supplier of military communication systems to the Norwegian Armed Forces. Drawing on a multinational, highly skilled team of advanced systems integration Experts and R&D resources, the company's products meet the operational requirements of secure and reliable information exchange in tri-service communication networks.

### Secure Communications

Thales Norway delivers state-of-the-art cryptographic products for fixed and mobile applications. The company has developed the Cryptel®-IP system including the TCE 621 crypto device and the TCE 671 security management centre. The TCE 671 is used for automatic key generation and distribution, and remote management of the TCE 621. The TCE 621 consists of several variants. Cryptel-IP is defined by NATO as the NATO IP-crypto Equipment NICE, and approved for all NATO security classifications. Cryptel-IP is now in use by NATO and most NATO countries.

### Military Message Handling

The XOMail system is an electronic message-handling system for both fixed and mobile applications. Tailored to the message-handling tasks of military organizations, the system offers multilevel security and implements civilian X.400 and X.500 standards, as well as military enhancements defined by NATO. The XOMail system efficiently handles messaging using advanced XO mail clients or Microsoft Outlook clients, and can be integrated with Microsoft Office tools. It can be supplied as a stand alone military message system or as a building block in Command and Control Information System

(CCIS), as well as message gateway for interconnection of message applications with different security accreditations.

### Electronic Key Management Systems

eCustodian is an Electronic Key Management System (EKMS) for the planning, generation, storage, distribution and accounting of crypto keys and other crypto material according to NATO standards (AMSG 293).

Compared with traditional manual methods, eCustodian improves security by minimizing the handling of classified red



1. TCE 621/B - 100Mbit IP Crypto Device.

key material, while reducing operational cost through automation of many labor intensive tasks. The capability to distribute keys electronically reduces the use of couriers and results in much faster turn-around times, especially important for supporting dynamic user needs, e.g. in out-of-area operations. Further cost saving is achieved through the automated accounting system, giving a continuously updated view of crypto material status. eCustodian is deployed with several NATO nations and is approved by SECAN for handling NATO key material with any classification, up to and including COSMIC TOP SECRET.

### Control & Surveillance

ACEcom is the VCS – Voice (and data-) Communication System – from Thales Norway selected by NATO for the NATO Air Command Control System programme. The first on-site installations started in 2006. The system is unique in its ability to handle all types of narrow and broadband traffic and offers multilevel security communication from each operator position. The system is based on IP-technology in an architecture providing the robustness required for air

traffic management systems. ACEcom has been installed both at military and civilian facilities. Modern IP technology is replacing old-fashioned TDM systems. This creates unique new capabilities for superior networking, improved sharing of resources, lower operational costs and more homogeneous networks supplying both voice and data communication.

### Reliable Communication Infrastructure

Thales Norway has a long history in the development and implementation of communication infrastructure to support military operations. The focus is on switching and network management products that offer highly reliable services even with transmission links that have various and unpredictable quality and bandwidth. The range of implementations includes Nationwide Tri-Service infrastructure networks, Wide Area Networks for high mobile Army operations as well as dedicated communication systems for weapon control. This activity is now focused on migration of legacy networks towards requirements for IP services and support of networkcentric warfare and out-of-area operation.

### Key References

Thales Norway AS has provided systems and solutions including the following:

- TADKOM Army Tactical Network
  - Cornerstone tactical communication network for the Norwegian Army
- TS9000 Army Tactical Network
  - Principal tactical field communication network for the Swedish Army
- Security systems and cryptographic equipment for the Norwegian Armed Forces
- Security systems to NATO and NATO countries
- Classified military networks for Eastern Europe, the Middle East and the Far East
- Cryptel IP for NATO data networks
- Voice communication system (VCS) for NATO/ACCS
  - Nationwide VCS system for Finish Air Force military networks for Eastern Europe, the Middle East and the Far East
  - ACS -VCS for Swedish Naval operation centres
- NORGIL - Norwegian Link16 ground infrastructure





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TINEX was founded in 1991 and is active within defence, security as well as communications and railway technology. Conducting international activities from company headquarters outside of Oslo, TINEX has gained the respect of customers from all over the world. Company focus includes consulting, development, deliveries, training operations, system integration and maintenance of components and systems.

### **Defence and Public Security Technologies**

The TINEX strategy is to make company customers more competitive by offering optimal solutions, cooperating with different partners depending on projects in order to achieve optimal use of resources, maximum economy and efficiency. An example of projects and systems within the TINEX areas of expertise include:

- Electronic Warfare Systems
- Tactical Communications
- Weapon Stabilisation Systems
- Sensor Systems
- Electro Optical Systems
- High Secure Entrance Systems

### **Industrial Cooperation**

Offset activities are a priority in the defence industry, and TINEX is very active within this area, acting as a contact point for Norwegian interests abroad, support contacts between foreign and Norwegian industry, and coordinating Norwegian production abroad. In addition, the company does extensive financial consulting and other multinational activities related to industrial cooperation.

### **Communication Technology**

TINEX supplies its customers with the latest products and solutions within communication technology related to:

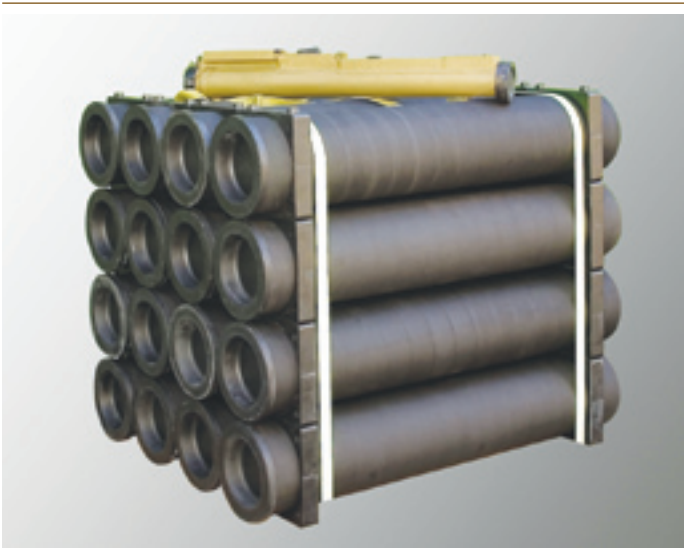
- Mobile Communications
- Broadcast
- Professional Antennas for Terrestrial Systems
- System Component and Connectors

### **Workshops & Training**

TINEX understands customers' need for assistance in implementing solutions, and the Company offers a wide range of training activities that help their customers increase performance. This training includes:

- System Integration
- Electronic Prototype Production
- Maintenance and Repair of Electronics and Communications Systems
- Electronic and Mechanical Design

TINEX Workshop has assisted many clients to maximize their potential when implementing complicated solutions.



## TRELLEBORG

ENGINEERED SYSTEMS

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Trelleborg Viking AS is a part of the Trelleborg Offshore business area and is the largest producer of rubber products in Norway. The company serves customers around the world from corporate headquarters in Krokstadelva, 60 km west of Oslo. For more than 100 years Trelleborg Viking competence has been refined into advanced polymer technology, serving the worldwide market with advanced rubber technology solutions.

### Rubber Tracks for Military Vehicles

Trelleborg Viking has more than 30 years of experience in producing and developing rubber tracks for Military Vehicles. Tracks for the Hägglunds BV206 are suitable for both winter and summer conditions – and provides reliable quality at competitive prices.

### Viking Protector

Fireproof and shock resistant packaging for ammunition has been an important part for Trelleborg Viking activity. Viking

Protector is a concept for protection of explosives and weapon-systems against fire, shock and mechanical damage during handling, storage and transportation. Viking Protector may also be made buoyant and watertight.

### Vikodeck Missile

Vikodeck missile is a special developed rubber-protection concept for fire and blast protection of missile launch areas. The system is based on the well-established Fire-Stop concept developed by Trelleborg Viking for the offshore

industry. Panels of blast and fire resistant rubber may easily be installed on deck, structure and equipment to give ultimate protection if a hang fire occurs.

### ELASTOPIPE™

ELASTOPIPE™ is corrosion free flexible rubber piping system developed with support from the Norwegian Navy for deluge and sprinkle systems. Also used for other piping applications, the ELASTOPIPE™ system is an explosion-, impact- and fire resistant piping system.





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Ola Tronrud founded Tronrud Engineering AS in 1977. Since then, the company has grown vigorously. One of the company's main areas of business – and one in which it has a great deal of experience – is defence equipment and services for the armed forces. Tronrud Engineering's employment of former maintenance officers from the Norwegian Armed Forces' technical crews makes up over 10% of its staff.

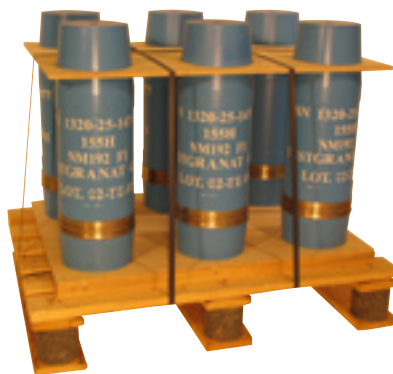
### Weapon Security Locks

The small sizes of the security locks allow the weapons to stay assembled when inserted. The locks' shapes are similar to the heads of the rifle bolts, and lock into position according to the same principles as the respective rifle bolts. The lock with the yellow indicator tag is designated for Heckler Koch (H&K) weapons; the slightly smaller circular lock is for Colt C7 and similar Colt weapons. (The lower picture shows the H&K MP5 locked and secured.)



### NM 192F1

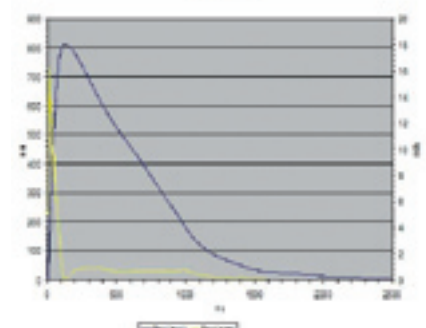
The NM 192F1 (NATO stock #: 1320-25-147-4877) is a 155-mm inert shell, designed for internal ballistics analysis. Due to its high drag, the NM 192F1 is suitable for heavy-duty firing in short firing ranges – e.g. for weapon qualification after maintenance.



### Recoil Process Data Logger for CVs

The data processing unit (DPU) stores a CSV file for each recoil process. The diagram below is extracted from such a CSV file. The CSV files in the DPU are easily accessible by viewing them with, or downloading them to, a laptop computer or PDA. The Recoil Process Data Logger's (RPDL) further security measures include the completion of a CV's fire control system.

The RPDL's NATO stock # is 1025-25-151-6294.



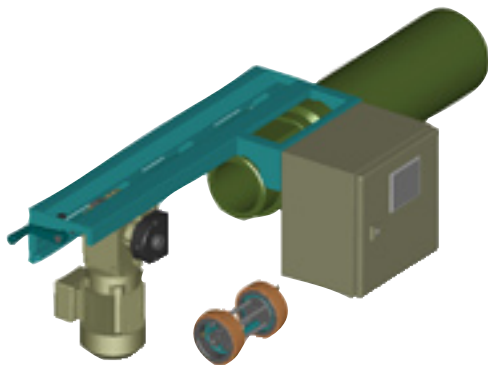
### Automatic Bore Cleaner

Tronrud Engineering has developed an Automatic Bore Cleaner (ABC) for the Norwegian Army. The ABC works both fast (>300mm/sec) and quietly (<70dB). The system works unattended while the Technical Crew is attending to other tasks.

The ABC can save a parametric set-up for several CVs and barrels to be selected when needed. For each CV set-up the operator can initiate the following programmes:

- Oiling
- Complete barrel cleaning programme
- Chamber cleaning programme
- Intensive barrel cleaning within a specified area in the barrel

The ABC can be mounted in a matter of minutes without the use of any tools. The Leopard 2 version of the ABC has the NATO stock #: 4933-25-152-4993.



### Ring Mount Stand

Tronrud Engineering has designed a ring mount stand (NATO stock #: 2510-25-151-6395) adaptable to all kinds of Light Utility Vehicles (LUVs). The photo shows the stand on an ISAF vehicle with the ring mount, soft mount and the 12.7 mm machine gun. From this configuration the LUV is ready for helicopter deployment in just a couple of minutes by dismantling the soft mount and tilting the top of the stand and the ring mount upside down.

### FalconEye

The FalconEye (NATO stock #: 6230-25-149-0749) is a powerful torch/flashlight developed specially for the professional market. The FalconEye is used by various armed forces, police forces, anti-terror forces, fire-fighters, etc.



### FalconEye Bracket for Soft Mount

Tronrud Engineering has designed a bracket for rapidly attaching the FalconEye torch/flashlight to Vinghøg's soft mount for 12.7-mm machine guns. The combination of visible light and firepower has a constructive effect on forces which represent a danger to peacekeeping forces. Norwegian troops deployed in Afghanistan use such a configuration.

The FalconEye bracket is to be assigned a NATO stock number in the future.



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Torre do Rio Sul/Botafogo-RJ, BR-22290-160  
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## bulgaria

### Sofia – Embassy

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## canada

### Ottawa – Embassy

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### Toronto – Innovation Norway

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Ontario M4W 3E2  
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## chile

### Santiago de Chile – Embassy

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## china

### Beijing – Embassy/Innovation Norway

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E-mail: emb.beijing@mfa.no  
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### Shanghai – Consulate General/Innovation Norway

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## colombia

### Bogota – Embassy

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## croatia

### Zagreb – Embassy

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## cuba

### Havana – Embassy

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La Habana  
Tel: +53 7 204 0696 / +53 7 204 4411, Fax: +53 7 204 0699  
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## czech republic

### Prague – Embassy

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### Prague – Innovation Norway

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## denmark

### Copenhagen – Embassy/Innovation Norway

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## egypt

### Cairo – Embassy

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## eritrea

### Asmara – Embassy

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## estonia

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## ethiopia

### Addis Abeba – Embassy

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## finland

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### Helsinki – Innovation Norway

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## france

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### Paris – Embassy

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## germany

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### Hamburg – Innovation Norway

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## greece

### Athens – Embassy

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## guatemala

### Guatemala – Embassy

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## hungary

### Budapest – Embassy/Innovation Norway

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## iceland

### Reykjavik – Embassy

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## india

### New Delhi – Embassy/Innovation Norway

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## indonesia

### Jakarta – Embassy

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JI Mega Kuningan Lot no 5.1,  
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## iran

### Teheran – Embassy

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## ireland

### Dublin – Embassy

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## israel

### Tel Aviv – Embassy

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## italy

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### Milan – Innovation Norway

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Ufficio Commerciale e dal Turismo  
Via G. Puccini, 5, I-20121 Milan  
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E-mail: milan@invanor.no  
Website: www.invanor.no/milano

## ivory coast

### Abidjan – Embassy

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## japan

### Tokyo – Embassy/Innovation Norway

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Website: www.invanor.no/tokyo

## jordan

### Amman – Embassy

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E-mail: emb.amman@mfa.no

## kenya

### Nairobi – Embassy

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## latvia

### Riga – Embassy

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### Riga – Innovation Norway

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## lebanon

### Beirut – Embassy

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Tel: +961 1 365 704 / +961 1 372 977/+961 1 372 978  
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E-mail: noremble@cyberia.net.lb

## lithuania

### Vilnius – Embassy

Mesniu g. 5/2, 01015 Vilnius  
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E-mail: emb.vilnius@mfa.no

### Vilnius – Innovation Norway

Royal Norwegian Embassy Commercial Section  
PO Box 564, 01014 Vilnius - 1  
Tel: +370 5 2624020 / +370 5 212 2746  
Fax: +370 5 212 3186  
E-mail: vilnius@invanor.no  
Website: www.invanor.no/vilnius

## macedonia

### Skopje – Embassy

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E-mail: emb.off.skopje@mfa.no

## madagascar

### Antananarivo – Embassy

Explorer Business Park, bâtiment D2, Ankorandrano  
101 Antananarivo  
Tel: +261 20 22 305 07, Fax: +261 20 22 377 99  
E-mail: emb.antananarivo@mfa.no

## malawi

### Lilongwe – Embassy

Anwa House, City Centre, P/Bag B 323, Lilongwe 3  
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E-mail: emb.lilongwe@mfa.no

## malaysia

### Kuala Lumpur – Embassy/Innovation Norway

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50400 Kuala Lumpur  
Tel: +603 2175 0300, Fax: +603 2175 0308  
IN, Tel: +603 2162 1200, Fax: +603 2162 2200  
E-mail: emb.kualumpur@mfa.no  
Website: www.invanor.no/kualumpur

# norway abroad

## mexico

### Mexico D.F. – Embassy

Avenida Virreyes 1460; Col Lomas Virreyes, 11000 Mexico D.F.  
Tel: +52 55 5540220-21, Fax: +52 55 52032019  
E-mail: emb.mexico@mfa.no

## morocco

### Rabat – Embassy

9, rue de Khenifra, Rabat  
Tel: +212 3 7764084-6, Fax: +212 3 7764088  
E-mail: emb.rabat@mfa.no

## mozambique

### Maputo – Embassy

Ave. Julius Nyerere 1162, Maputo  
Tel: +258 21 480 100/+258 21 485 072 to 75  
Fax: +258 21 480 107/+258 21 485 076  
E-mail: emb.maputo@mfa.no

## nepal

### Katmandu – Embassy

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Tel: +977 1 5545307-8, Fax: +977 1 5545226  
E-mail: emb.katmandu@mfa.no

## the netherlands

### The Hague – Embassy/Innovation Norway

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IN, Tel: +31 70 346 7348; Fax: +31 70 360 7428  
E-mail: emb.hague@mfa.no  
E-mail: holland@invanor.no

## nicaragua

### Managua – Embassy

Plaza España, 100 mtr. al Oeste, Managua  
Tel: +505 2 665197-9, Fax: +505 2 6633003  
E-mail: emb.managua@mfa.no

## nigeria

### Abuja – Embassy

Plot 1529, T.Y. Danjuma Street, Asokoro, Abuja  
Tel: +234 9 3149127, Tel. satellite: +882 165 420 7489/  
+882 165 420 7515, Fax: +234 9 3149309  
E-mail: emb.abuja@mfa.no

## pakistan

### Islamabad – Embassy

H 25, Str. 19, F 6/2, Islamabad  
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E-mail: emb.islamabad@mfa.no

## palestinian territory

### Al Ram – Representative Office to the Palestinian authorities (West Bank/Gaza)

World Bank Building (c/o Rosary Sisters Convent)  
Dahiat Al-Bareed, Al Ram, West Bank  
Tel: +972 2 234 5050, Fax: +972 2 234 5079  
E-mail: rep.office.alaram@mfa.no

## philippines

### Manila – Embassy

Petron Mega Plaza Bldg., 21st floor  
358 Senator Gil Puyat Avenue, Makati City, Metro Manila  
Tel: +63 2 886 3245-49, Fax: +63 2 886 3384  
E-mail: emb.manila@mfa.no

## poland

### Warsaw – Embassy

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E-mail: emb.warsaw@mfa.no

### Warsaw – Innovation Norway

c/o Royal Norwegian Embassy  
Warta Tower, ul. Chmielna 85/87  
PL-00-805 Warsaw  
Tel: +48 22 581 0 581, Fax: +48 22 581 0 981  
E-mail: warsaw@invanor.no

## portugal

### Lisbon – Embassy/Innovation Norway

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E-mail: lisbon.trade@invanor.no  
Website: www.invanor.no/portugal

## romania

### Bucharest – Embassy

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## russia

### Moscow – Embassy/Innovation Norway

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Website: www.invanor.no/moskva

### Murmansk – Consulate General

Ulitsa Sofji Perovskoj 5, RUS-183038 Murmansk  
Tel: +7 815 2 400 600  
Fax: +7 815 2 457 451/+7 815 2 456 871  
E-mail: cons.gen.murmansk@mfa.no

### St. Petersburg – Consulate General/Innovation Norway

Nevskyj Prospekt 25, RUS-191186 St. Petersburg  
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### St.Petersburg – Innovation Norway

Kaluzhskij per.3, RUS-193015 St. Petersburg  
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## saudi arabia

### Riyadh – Embassy

Diplomatic Quarter, Riyadh  
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E-mail: emb.riyadh@mfa.no

## serbia and montenegro

### Beograd – Embassy

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## singapore

### Singapore – Embassy/Innovation Norway

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Singapore 048581  
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## slovakia

### Bratislava – Embassy

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## slovenia

### Ljubljana – Embassy

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## south africa

### Johannesburg – Innovation Norway

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### Pretoria – Embassy

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## south korea

### Seoul – Embassy/Innovation Norway

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## spain

### Madrid – Embassy

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### Madrid – Innovation Norway

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## sri lanka

### Colombo – Embassy

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## sweden

### Khartoum – Embassy

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## sweden

### Stockholm – Embassy

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### Stockholm – Innovation Norway

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## switzerland

### Bern – Embassy

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## syria

### Damascus – Embassy

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Malki, Damascus  
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## tanzania

### Dar es Salaam – Embassy

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## thailand

### Bangkok – Embassy/Innovation Norway

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## turkey

### Ankara – Embassy

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### Istanbul – Innovation Norway

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## uganda

### Kampala – Embassy

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## ukraine

### Kiev – Embassy

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## united arab emirates

### Abu Dhabi – Embassy

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## united kingdom

### Edinburgh – Consulate General

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### London – Embassy

25 Belgrave Square, London SW1X 8QD  
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### London – Innovation Norway

Trade and Technology Office  
Charles House 5 Lower Regent Street, SW1Y 4LR  
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## usa

### Boston – Innovation Norway

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Website: www.invanor.no/boston

### Houston – Consulate General/Innovation Norway

2777 Allen Parkway, Suite 1185, Houston, TX 77019-2136  
Tel: +1 713 521 2900, Fax: +1 713 521 9648  
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### Minneapolis – Consulate General

800 Foshay Tower; 821 Marquette Avenue, Minneapolis  
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### New York – Consulate General

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### New York – Innovation Norway (Tourism)

655 Third Avenue, Room 1810, New York, NY 10017-9111  
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### San Francisco – Consulate General/Innovation Norway

20 California Street; 6th floor, San Francisco, CA 94111-4803  
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### Washington DC – Embassy/Innovation Norway

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## venezuela

### Caracas – Embassy

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## vietnam

### Hanoi – Embassy/Innovation Norway

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## zambia

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## zimbabwe

### Harare – Embassy

5 Lanark Road; Belgravia, Harare  
Tel: +263 4 252428, Fax: +263 4 252430  
E-mail: emb.harare@mfa.no

# find new business partners in norway



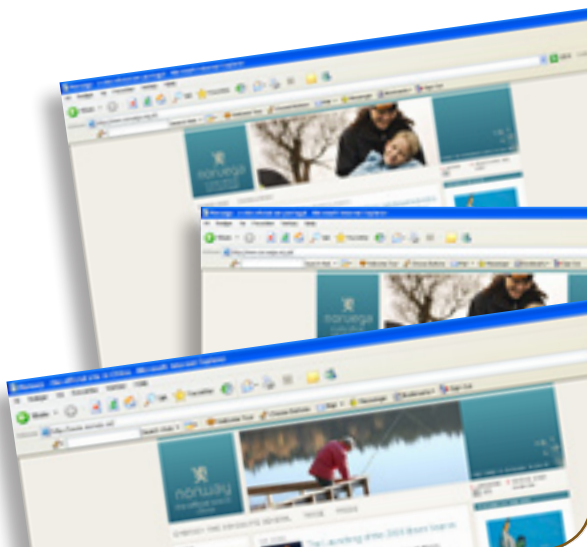
The Official Norwegian Trade Portal

At [www.nortrade.com](http://www.nortrade.com) you will find up-to-date information on more than 4,000 Norwegian manufacturers and exporters within 35 different industries. There you will find a search tool which allows you to perform searches for companies, products or services in the Norwegian Export Directory.



[www.norway.info](http://www.norway.info)

**“Norway – the official site”** provides extensive background information on Norway, as well as news and details of Norwegian-related events abroad. The large number of articles on politics, travel, culture, business, education, research and history are presented by the Norwegian Ministry of Foreign Affairs and its partners. “Norway – the official site” has been established in 90 countries and in 18 languages.



**Innovation Norway** promotes nationwide industrial development profitable to both the business economy and Norway's national economy, and helps realize the potential of different districts and regions by contributing to innovation, internationalization and promotion. The company has approximately 700 employees. Headquartered in Oslo, Innovation Norway has offices in over 30 countries worldwide, along with all of the counties across Norway.

English-language information about Innovation Norway is available at [www.innovationnorway.no/english](http://www.innovationnorway.no/english).



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