NiDV DEFENCE & SECURITY
THE NETHERLANDS INDUSTRIES FOR DEFENCE & SECURITY

4– 2023

MAGAZINE

SAAB DAMEN COLLABORATION

SUSTAINABILITY AT NL MOD

SUSTAINABLE SECURITY: A PRIMER

CASE BRAINPORT INDUSTRIES CAMPUS

NIDV DEFENCE & SECURITY
THE NETHERLANDS INDUSTRIES FOR DEFENCE & SECURITY

Word of welcome

Dear Guest to the NEDS,

This is our magazine dedicated to the NIDV Exhibition on Defence & Security (NEDS) and its theme for this year: Sustainable Security. A very relevant theme during the current geopolitical turmoil that we all face, hence the need to rebuild our defence forces and rethink the interaction and cooperation with the defence industries and with society at large. While sustainability has become a key driver for policies, economies and societies at large, defence and security have been neglected in many of our democratic countries. Still, there is an intrinsic, but often forgotten link between sustainability and defence: defence and security are the precondition for any sustainability goal, freedom and prosperity. At the same time, many of the future conflicts are likely to have its basis in scarcity of raw materials and/or basic resources such as water, fertile land, - rivers and - seas. Hence, my position would be that sustainability and defence can and should mutually reinforce each other.

Private sector innovations are finding their way to the defence market, but not in the pace that is needed. New materials and resource scarcity all require sustainable bonds of cooperation between nations and industries. Furthermore, the armed forces do not operate in a vacuum. They are part of society and societal needs and goals. Therefore sustainability and security can and should mutually reinforce each other. Already today effectiveness, enhanced deployability and mission endurance on the battlefield require smart approaches to reducing the need for fossil fuels and using alternative materials.

Given all this, the NIDV and this year's main sponsors Saab Damen have proudly chosen sustainable security as the theme for this year's NEDS. Both companies are excellent examples of defence industries that really integrate sustainability and security in their activities for the defence market and in their research and development programmes.

We have opted for a symposium on November 29 to discuss the theme of Sustainable Security from many different angles: NATO, Industry, and the Dutch Ministries for Defence and Economic Affairs and Climate Policy, giving ample room for debate and interaction with the audience. We have also asked all exhibitioners at the exhibition that will take place on November 30 to give special attention to the theme from their perspective in their interactions with NEDS visitors.

At this NEDS many Dutch and international defence companies will present their latest innovations that should help our defence forces to create a very credible deterrence and - if deterrence fails - to prevail in conflict. I hope that there will be many fruitful interactions between governments and businesses, among businesses and with interested visitors to create new bonds and cooperations to be even more innovative.

The challenges we face together make it necessary to cooperate more, better and faster. And it takes the commitment of everyone within our democratic societies, including the willingness to work together as industries and governments from likeminded democratic nations.

I sincerely welcome you all at the NEDS 2023.

Raymond Knops
Chairman of the board
Netherlands Industries for Defence and Security

CONTENT

Register your NEDS attendance before November 22nd

Cover: Soldiers with roll-up solar panels. The Ministry of Defence aims to achieve 50 percent self-sufficiency in energy at encampments in mission areas by 2030. By 2050, this will even be 100 percent. And then the dependence on fossil fuels must also be reduced by 70 percent. There is a lot of work to be done for the Defence Energy Transition Programme.

Photo: Defence Media Centre

Deep-sea sustainability

Saab and Damen work together for a stronger alliance and a greener future

A message from the NEDS 2023 main sponsors

The maritime world cannot underestimate the importance of sustainability in the maritime sector. Of course, protecting our oceans and reducing the ecological footprint of shipping activities are crucial challenges to keep the world livable. Less visible is that the results of our answers to those challenges greatly benefit the users and the suppliers. The introduction of renewable energy and lightweight, recyclable materials has enhanced the performance of their vessels, thereby strengthening the navies that use them. Saab and Damen Shipyards are known as modern and innovative builders of naval vessels, jointly competing to replace the Walrus-class submarines. For both companies, sustainability is a top priority in this respect.

A striking example of Damens commitment to sustainability is the RSD-E Tug 2513, nicknamed 'Sparky.

Saab offers four Expeditionary Submarines to the Netherlands

Text and photos: Saab Damen

Sustainability extends beyond just technology. It covers a range of topics from energy to social. All these elements need attention to meet tomorrow's challenges and fulfil our mission today and in the future. For example, a social policy is an integrated part of Saab's sustainability policy. It includes a safe work environment for those working for Saab and an active diversity policy. These elements of sustainability connect to Saab's vision of keeping society safe.

Both companies actively pursue innovation and technological advances to green the maritime sector. They invest in energy-efficient solutions, emission reduction technologies, integration of low or zero-carbon footprint energy storage and conversion technologies and the development of composite structures to reduce the weight and, thus, the ships' fuel consumption. Moreover, they are pursuing forms of (semi) autonomous sailing to optimize the performance of ship systems and ensure energy efficiency.

Longterm

Saab and Damen Naval, two global players in the defence industry, each approach sustainability in their own way but share a strong commitment to environmental protection and innovation. Sustainability is not just about the ecological footprint for these companies but also involves long-term, intensive cooperation. For them, a 'sustainable partnership' means more than just a business relationship; it represents a joint effort to transform the maritime sector.

Saab has joined the United Nations' Race to Zero campaign to reduce greenhouse gases to zero by 2050. It has an Innovation and Technology Council (I&TC) focusing on sustainability and innovations. Saab has a holistic approach to sustainability. It focuses on the efficient use of materials, waste management, energy conservation, and large-scale innovative investments and collaborations with universities. This has led to remarkable projects and initiatives.

Saab offers four Expeditionary Submarines to the Netherlands

Supported by Sweden and the United Kingdom, Saab has, in July 2023, submitted its proposal for replacing Netherland's current submarines. The proposal comprises four advanced Expeditionary Submarines with the latest innovations and technologies and includes cooperation with Dutch shipbuilder Damen Shipyards Group.

Saab's offered solution is based on a successful, proven, and future-proof design. It will incorporate the latest capabilities and technologies, while its genuinely modular design will allow for new technologies as they evolve to ensure relevance for many years to come.

Saab and Dutch shipbuilder Damen Shipyards Group have cooperated since 2015, and the offer to build submarines to replace the Dutch Walrus-class is a balanced cooperation between The Netherlands and Sweden.

The C718 is an advanced Expeditionary Submarine that offers an unsurpassed level of endurance and exceeds the Royal Netherlands Navy's needs for long-distance operations, sufficient accommodation, crew comfort, and increased weapon payload capability.

As part of the proposal, Saab offers a proven and integrated weapon-launching system and one of the best sensor systems in the world. Saab's innovative design features signature solutions to minimize detection by active sonars, all combined in an undetectable and extremely capable submarine.

The offer includes knowledge transfer to The Netherlands. Once delivered, the Royal Netherlands Navy will fully maintain the submarines, including upgrades throughout their lifespans. Through Saab's business area, Kockums, Sweden, has a long tradition of producing world-class submarines. Four nations operate submarines and submarine technology designed by Saab's business area Kockums: Sweden, Australia, Japan, and Singapore.

Efficiency

One example is the VDES (VHF Data Exchange System) system, recently introduced to the market. This system saves fuel, protects the environment, increases efficiency, and improves safety in shipping. Moreover, VDES enables future route exchange via STM (Sea Traffic Management) technology, allowing ships to share power and future routes. Saab has also invested in multi-purpose Gripen aircraft with an optimized design for lightweight materials and low fuel consumption. It has developed unique maintenance concepts to extend the service life of these aircraft.

Saab is also committed to sustainability in its operations. It uses district heating and fossil-free electricity on its sites. Production halls and warehouses are well-insulated and equipped with LED lighting. Saab reuses excess heat from compressor units to maximize energy efficiency and encourages the use of electric vehicles for employees and transport at the shipyard.

All-electric

Damen Shipyards has set itself the goal of becoming the world's most sustainable shipbuilder. It focuses on developing all-electric vessels, a technological revolution shaping the maritime industry's future. A striking example of its commitment to sustainability is the RSD-E Tug 2513, nicknamed 'Sparky.'

The customer requested a design for this all-electric tug specially designed for the Auckland, New Zealand ports. This tug can perform powerful towing operations and recharges in just two hours.

A typical other example of the application of modern sustainable technologies developed in naval construction is the Nuyina, an impressive Antarctic research vessel that, despite its considerable size, is a textbook example of environmental friendliness. The Damen-built Nuyina offers significant fuel efficiency despite its larger size than its predecessor, the Aurora Australis. The elongated hull minimizes fuel consumption during expeditions in the Southern Ocean. This decreased consumption allows her to supply two research stations in one voyage without returning to Australia.

In addition, the Nuyina reuses waste heat from exhaust pipes, reducing its energy consumption. Low-level exterior lighting minimizes the risk of bird strikes. With advanced technology, the Nuyina also features dual sewage treatment plants to treat grey and black water from showers, toilets, and the kitchen. To protect marine life, this ship treats ballast water twice: before it takes the water in and again when disposed of. Moreover, an oil-water separator removes up to three times more oil than standard marine installations.

The Damen-built Nuyina offers significant fuel efficiency despite its larger size than its predecessor, the Aurora Australis.

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Reduction

Saab has a targeted waste program that safely stores and smartly recycles hazardous waste. It is working on innovative projects, such as using aluminium incineration and AI-based drones to protect ecosystems. It has also developed the eWROV, a remote-controlled electric vehicle, and the Falcon underwater robot to support scientific research on coral reefs around the Maldives.

With Universeum, the national science centre in Sweden, Saab works together to promote sustainable developments. In addition, Saab supports Pratham Sweden as a partner of the Swedish industry for quality education. Saab has long-term partnerships with universities. These partnerships give Saab insight into the latest research and contribute to university knowledge development.

Saab also works with startups to gain access to the most up-to-date information when developing new products and technologies. Saab works with the Smarc program, with a focus on the Arctic. This program significantly impacts the environment and safety due to the new shipping route.

Battery

Damen Shipyards cooperates with Dutch companies, knowledge institutes, and industry associations in the Battery Competence Centre. This innovation program focuses on battery technology and aims to strengthen the competitive position of the Dutch manufacturing industry. Dutch companies such as DAF Trucks, VDL Groep, and Damen Shipyards are committed to electrifying their vehicles and vessels. By collaborating and sharing knowledge with startups and knowledge institutions, it aims to assemble battery packs in the Netherlands, thereby increasing economic opportunities.

Having led the EU consortium of Naval Shipyards and Research Institutes in the EDIDP SEA DEFENCE project, Damen Naval, Saab and other Shipyards have contributed to the assessment of emerging technologies for future naval vessels. The project delivered clear roadmaps and valuable input for the EDF programme, leading to concrete follow-up projects such as EDINAF and dThor. Energy storage and conversion and collaborative efforts to enable the energy transition of naval capabilities have been defined, and lead to current EDF calls in the field of sustainability.

Oceans

Both companies are committed to protecting the oceans. Their ships are crucial in Coast Guard duties and detecting environmental crimes. The naval units help protect the oceans, which is essential for the sustainable use of this vital resource for the global population. In a world where sustainability and technological innovation go hand in hand, Saab and Damen demonstrate that their sustainable cooperation delivers the best results and contributes to a greener and cleaner future at sea. Together, they form an essential part of Europe's maritime sector and contribute to protecting our planet and oceans for future generations.

As mentioned, sustainability at Saab extends beyond technology. At Saab, diversity and inclusion are part of the strategy. Saab strives for a diverse workforce and an inclusive culture that welcomes everyone. Diversity increases employee creativity and stimulates innovation. In addition, Saab is firmly committed to the safety of its employees. ●

The State Secretary was at the DSEI to position the Dutch business community internationally.

State Secretary Van der Maat: Fast, sensible and together

Defence acts sustainably

Times are changing: Defence is acting sustainably. "With 68,000 people, the armed forces are the largest employer in the Netherlands. Our responsibility comes with the obligation to work as climate neutrally as possible."

Text: Riekelt Pasterkamp
Photos: Defence Media Center

The monumental ministry on the Plein in The Hague is by far the least sustainable Defence building in the Netherlands. "You experience this in all seasons," jokes State Secretary Christophe van der Maat, at a table in his office.

Elsewhere in the country the situation is not much better. Defence real estate is outdated, unsustainable, poorly maintained and expensive. Making this real estate sustainable and future-proof is therefore of great importance. "We must move towards barracks that support the growth and deployment of the armed forces. It must offer our employees the working conditions they deserve while being sustainable and affordable."
In December 2022, Van der Maat sent the Strategic Real Estate Plan to the House of Representatives. "Of course, everything contained therein was not achieved overnight. But there is a dot on the horizon."

Emissions

Defence invests heavily in sustainable energy. With the transition from fossil fuels to clean energy, Defence is reducing CO2 emissions, among other things. Defence integrates climate change into policy as much as possible. "There is no choice, it simply has to be done," says Van der Maat. "With 68,000 people, the armed forces are the largest employer in the Netherlands. Our responsibility comes with the obligation to work as climate neutrally as possible. The world is getting hotter and drier. The climate is changing, the world around us is changing. And as Defence, we must respond to this."

Defence aims to use 30% biofuel for all fuel types (sailing, flying and driving) by 2030. The goal is also to generate 25% sustainable energy for Defence real estate by 2026 (50% by 2030 and 100% by 2050).

Heavy

"Can we do without fossil fuels? No. An F-35 really flies on kerosene and such an aircraft has a lifespan of thirty to thirty-five years. Controlling a naval frigate with electric motors is not yet possible, but we must look at what is possible. And with this we can win the war, because sustainability should not be at the expense of our operational readiness. As an armed force we go far; it's tough and we must do things that a consumer will never do. But like everything, it starts with one. You continue to build from there." The State Secretary gives some examples. "Our civilian fleet is going electric. It is preferred that the charging stations are located outside the barracks fences so that society can also benefit from using them. There will be a lawn with solar panels around Leeuwarden Air Base. The Royal Navy will receive eight maritime auxiliary vessels that will be equipped with dual fuel on methanol. In principle, they run on climate-neutral methanol, but if that's not available, they use gray methanol or diesel.

"By building the vessels in the Netherlands, the development of climate-neutral technology here will receive a strong boost. I think this is a good example of cooperation between industry and market – it's getting off to a good start. But whether we are ready to replace the LCF frigates is an exciting question."

Protect

At the beginning of September, Van der Maat visited the Defence and Security Equipment International (DSEI) Event in London. The DSEI is one of the leading trade fairs for the defence sector worldwide. "As Europe we must do more to protect our own security and way of life. An important step has been taken with the substantial and massive increase in European defence budgets. The main question is how to use that extra money concretely and efficiently. The short answer - fast, sensible and together."

The air Defence and command frigate Zr.Ms. De Ruyter was moored in the Thames and hosted various events for the NIDV.

The State Secretary was at the DSEI to position the Dutch business community internationally, one of the measures from the Defence Industry Strategy updated in 2022. The air defence and command frigate, Zr.Ms. De Ruyter, was moored on the Thames and hosted various events for the NIDV. "There is a great need for a resilient industry that can scale quickly. I am also aware that it only makes sense for companies to invest in more production capacity if governments guarantee a certain demand for a longer period. In return, the industry must leverage this opportunity effectively. We also must work smarter, for example through standardization. Europe now has sixteen types of fighter planes, twelve types of tanks, and thirty-three types of frigates. This number is not ideal."

Good

From his office at the ministry, Van der Maat has more to say. "Independent military production on the European continent must increase. We must think operationally: What if we first halve that number of sixteen aircraft? When do European countries look at each other's kitchens and buy? And we need to know what each country is good at. For the Netherlands it's Radarland. But we are also doing well in the world of smart materials, strong and very light. Innovation is essential. For example, with TNO we think about the warfare of the future and what it will require in terms of technologies. We can then discuss this with the industry and follow up with our investments in knowledge institutions."

"As an armed force we go far, it is tough and we have to do things that a consumer will never do."

"Furthermore, many innovative ideas are emerging within SMEs and we want to build more ecosystems, from low to high Technology Readiness Levels. We must take advantage of that. The money is there. We are almost at two percent of the gross national product for Defence for the next two years. Then we fall back but that shouldn't happen – two percent must be the minimum and structural. And if parliament thinks that laying down such a percentage in a law will help with this, then fine by me."

Artist impression of the new maritime auxiliary vessels of the Royal Navy.

The advantage of anchoring the budget is that there is no longer a need for politicians to haggle over budgets every few years. "This provides long-term prospects for industry, knowledge institutions and the armed forces. Where two percent of GDP is the minimum, the lower limit. The United States' long-term strategy is focused on Asia. In Europe, we will have to save ourselves. But apart from the Americans, shouldn't we also be able to save ourselves? We owe it to our position to be able to defend our continent."

Van der Maat outlines the dilemma he finds himself in. "We want to fill the shelves as quickly as possible, especially with a conflict not far away. Naturally, we also look at production on European soil, however that does not always result in the shortest delivery time."

Voter

Van der Maat (1980) has been State Secretary of Defence for almost two years, now in a caretaker state. Is he thinking about a second term in Defence? "First the voter can speak, then it is my turn. But until my last day at this ministry, I will work for better employment conditions for all our people, for space for defence such as low flight routes in the Netherlands, training landing sites for the Marines, ammunition depots, barracks, for innovation, you name it. That is my assignment."

And as State Secretary, will he sign the contract for four new submarines? "If I'm still there in the first quarter of 2024, then I will do it. The best boat for the best price. With as much Dutch participation as possible." ●

On October 30th, Christophe van der Maat assumed the role of state secretary of Justice and Safety as caretaker for his fellow cabinet member Eric van den Burg on sick leave. Minister of Defence Kajsa Ollongren will take over state secretary Van der Maats responsibilities. We wish state secretary Van der Burg a speedy and full recovery.

Organising transition: the NIDV Sustainability Platform

As facilitator of public-private dialogue, the NIDV is proud to regularly present the progress of its working groups. The NPDVM policy platform takes the opportunity to present itself.

Text and photos: NPDMV

During COP26 in November 2022 in Egypt, UN Secretary-General António Guterres emphasized the urgency of immediate action against global warming, referring to it as a "Code Red" for humanity. His warning is supported by the successive AR6 reports from the IPCC. Agreements have been made regarding the phase-out of coal, methane reduction, and changes in land use. However, the sense of urgency is still insufficiently visible in national policy plans and actions, despite significant concerns voiced by NATO, the EU, and national armed forces, including those of the Netherlands, about security risks resulting from climate change and environmental pollution.

Mixing with 30% biofuel in 2030

That is the aim of the Dutch Ministry of Defence for all three services. Sustainability creates operational benefits for the Air Force: less contrail formation and therefore lower visibility.

Cradle-to-cradle

Teijin Aramid BV recently acquired approximately 20 tons of Twaron ballistic protection material from the Dutch Ministry of Defence. Approximately 5,000 bulletproof vests and fragment blankets had reached the end of their 'first' life and are now being processed by Teijin Aramid BV into raw materials for new Twaron products.

Nevertheless, the world is undeniably transitioning to the use of renewable energy (derived from natural processes such as sunlight, wind, tides, plant growth, and geothermal heat), and a circular economy. Future equipment of the Defence and Security sector is influenced by this trend. In fact, armed forces must adapt to keep increasing their capabilities and efficiency, because sustainable innovations offer huge benefits. Examples of this are the development of lighter, more efficient, and faster land vehicles, aircraft, and ships, self-sustaining camps which are less vulnerable against attacks of fuel transport, and increased use of advanced training and simulation techniques.

These developments also have a significant, irreversible impact on the Defence and Security industry. Therefore, in 2022, the NIDV Sustainability Platform (NPDMV) was established, with the participation of 24 Dutch companies and research institutions. The Ministry of Defence and the National Police are also involved as observer members of the platform. The goal of NPDMV is to enhance the safety and security of our society by making the entire sector, including the supply chain, more sustainable.

The Ministry of Defence and the National Police heavily rely on civilian infrastructure. For example, civilian investments now focus on electrification, electric motors, batteries, hydrogen, and fuel cells, rather than diesel engines. Will there still be sufficient access to diesel, kerosene, ship diesel, and spare parts for traditional engines by 2050? The energy transition requires a delicate balance to address such issues with urgency, without the risk of not being able to fulfil constitutional core tasks at any point. This calls for a vision, an implementation agenda, and a concrete roadmap in collaboration between The Ministry of Defence (Air Force, Army, Navy, Military Police, COMMIT, DOSCO, etc.), the National Police, the Dutch Defence and Security Industry, policymakers, politicians, and the broader Dutch society. In this respect, it is promising that framework agreements, like the Paris agreement, the European Green Deal and the Dutch climate law are being translated into concrete sustainability policies.

The NPDMV platform brings together companies, research institutions, The Ministry of Defence, and the National Police jointly endorsing the importance of climate and environmental measures, while committing to transitioning to a strong, decarbonized, and circular sector. NPDMV also promotes opportunities for participants through networking and sharing of knowledge. It aims to facilitate market expansion, market growth, export, and the international visibility of these technologically advanced companies through collective efforts.

The tasks of NPDMV are organized into three working groups, namely:

- Regulation, Policy, and Reporting
- Science, Technology, and Innovation
- Marketing, Communication, Management, and Organization

Interested in more cases and projects in sustainability? Pass by the NEDS Press Corner for a collection of early successes. More information about NPDMV can be found at https://www.nidv.eu/platform/nidv-platform-duurzaamheid-milieu-en-veiligheid-npdmv

Furthermore, you can contact the Secretary of NPDMV (Paul de Witte) by sending him an email at p.dewitte@nidv.eu

Sustainable security in the voting booth

In the parliamentary elections November 22nd, 26 parties present their plans to the Dutch voter. What is the political landscape for Defence and Security? The following comparison of policy proposals from published programs offers a brief overview.

Text: Peter Buiting

About the method

A new generation of parties, candidates and alliances faces enduring challenges. For conciseness' sake, 8 parties were selected from the political and polling spectrum, with their EU affiliation for international perspective. Topics for comparison reflect the new realities in Defence and Security: the uncertainty of rising budgets in the long term, deepening international collaboration, expectations for the technological and industrial base (DTIB, EU prefix where relevant), and perspectives on the interdependence of security and sustainability. By the time NEDS opens we will know the public's opinion.

Political Party		EU Affiliation	National Defence contributions	International collaboration	Technological and Industrial Base	Sustainable Security
VVD	People's Party for Freedom and Democracy (VVD)	Renew	Proposes legally binding measures to embed the 2% GDP NATO commitment in the national budget.	Supports a stronger EU pillar within NATO.	Supports new entrepreneurs in the sector, multi-annual contracting for investors in capabilities, and common EU export regulation.	Advocates green industrial policy and reduced resource dependency through new materials.
GroenLinks PvdA	Greenleft-Labor (GL/PvdA)	Greens / S&D	Supports the 2% GDP NATO commitment.	Supports a stronger EU pillar within NATO and joint procurement, and national specialization.	Calls for strict export compliance, intensification of the EUDTIB and joint development, proposing fiscal measures to combat potential excess profit.	Argues for sustainable sourcing of raw materials, and an EU solidarity pact matching increased Defence spending with international sustainability measures and climate compensation.
nsc	New Social Contract (NSC)	tbd	Proposes legally binding measures to embed the 2% GDP NATO commitment in the national budget.	Prefers international cooperation but insists on full national control.	Supports non-sector specific strategic industrial policy.	
BBB	Farmer-Citizen Movement (BBB)	tbd	Proposes legally binding measures to embed the 2% GDP NATO commitment in the national budget.	Emphasizes domestic investment to effectively contribute in NATO and EU.	Supports the innovative Defence and security sector's contributions to safeguard national security.	Prioritizes incremental evolution to sustainable strategic industries. Argues that capability development requires exemptions in environmental regulations when necessary.
CDA	Christian Democratic Appeal (CDA)	EPP	Proposes legally binding measures to embed the 2% GDP NATO commitment in the national budget.	Supports a stronger EU pillar within NATO and joint procurement, with specific attention to seabed capabilities.	Supports domestic industrial capacities, international business, and European coordination in EUDTIB investments.	Recognizes the climate challenge and supports strategic green industrial policy, fully applying private sector expertise.
D66	Democrats 66 (D66)	Renew	Supports the 2% GDP NATO commitment.	Calls for a single European Defence and security strategy with binding commitments for a single EUDTIB, fewer national barriers, and joint development and (faster) procurement.	Calls for higher production and development in the EUDTIB, and deep collaboration between Defence, research organizations and industry .	Advocates sustainable Defence materiel less dependent on fossil fuels, international agreements on more sustainable raw materials, and a sector-specific transition strategy.
ChristenUnie	Christian Union (CU)	EPP	Proposes legally binding measures to embed the 2% GDP NATO commitment in the national budget.	Supports a stronger EU pillar within NATO, EU joint development and procurement, and bilateral cooperation.	Calls for a competitive strategic industrial base, maintaining strict adherence to export regulations.	Calls for increased sustainability efforts within Defence, and holistic security policy.
SGP	Reformed Political Party (SGP)	ECR	Proposes legally binding measures to embed the 2% GDP NATO commitment in the national budget.	Emphasizes domestic investment to effectively contribute in NATO.	Advocates high involvement of domestic industrial capabilities.	

Debate review

Tuesday November 7th at HART Museum Amsterdam, NIDV and EW Magazine hosted the traditional Defence Debate. 5 candidates defended their proposals after opening statements from Lt Admiral Rob Bauer, NIDV chair Raymond Knops and Gerard Zondervan, CEO of AI Armaments and new entrant in the Defence and security sector. Regrettably, the deadline for this magazine was by then long gone. Reporting on the debate is available in Dutch and English on nidv.eu/news.

Interested in the outcome of the debate? Visit us at nidv.eu/news

Out of service

The first of the four Walrus-class submarines was officially taken out of service in mid-October after 31 years.

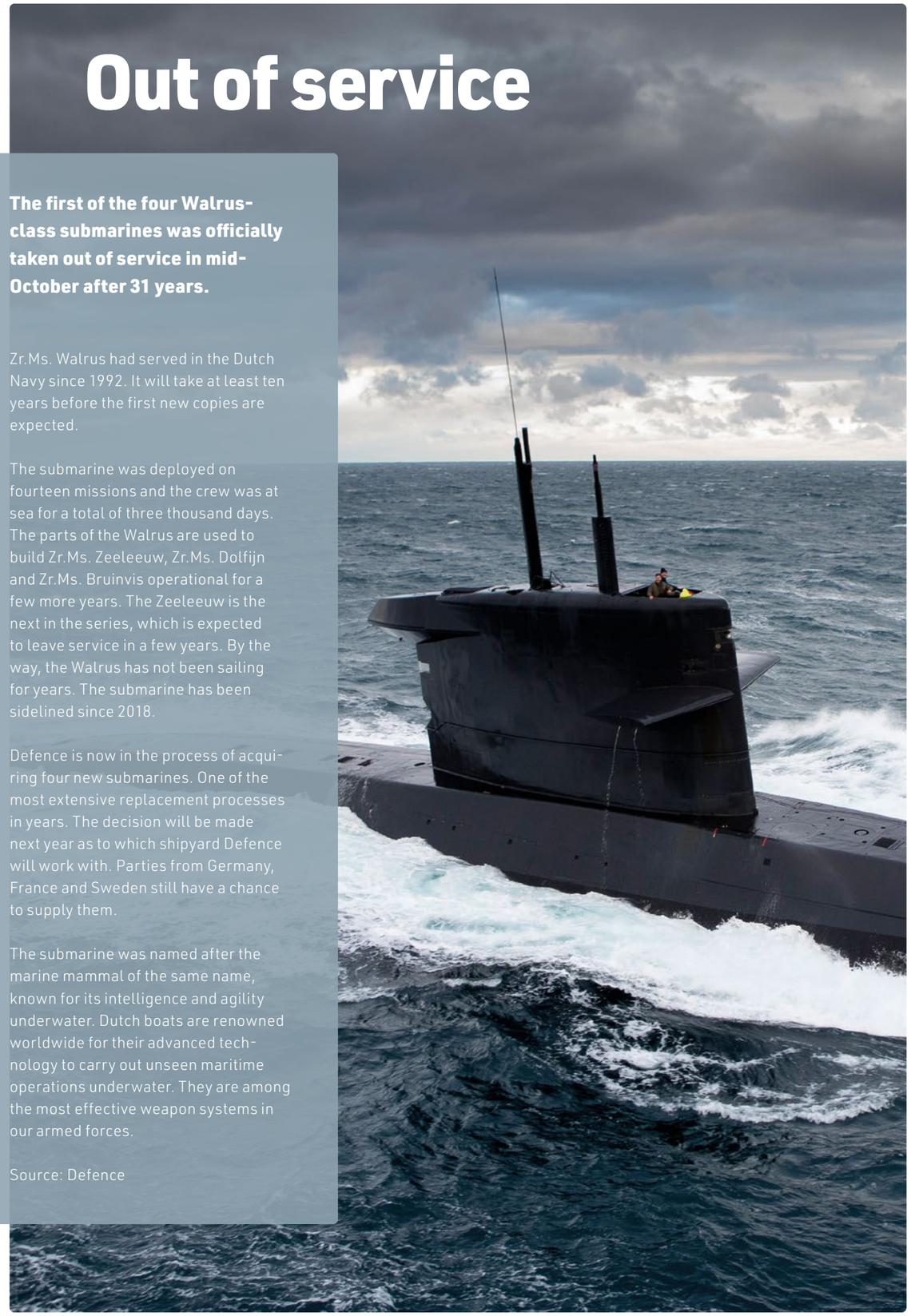
Zr.Ms. Walrus had served in the Dutch Navy since 1992. It will take at least ten years before the first new copies are expected.

The submarine was deployed on fourteen missions and the crew was at sea for a total of three thousand days. The parts of the Walrus are used to build Zr.Ms. Zeeleeuw, Zr.Ms. Dolfijn and Zr.Ms. Bruinvis operational for a few more years. The Zeeleeuw is the next in the series, which is expected to leave service in a few years. By the way, the Walrus has not been sailing for years. The submarine has been sidelined since 2018.

Defence is now in the process of acquiring four new submarines. One of the most extensive replacement processes in years. The decision will be made next year as to which shipyard Defence will work with. Parties from Germany, France and Sweden still have a chance to supply them.

The submarine was named after the marine mammal of the same name, known for its intelligence and agility underwater. Dutch boats are renowned worldwide for their advanced technology to carry out unseen maritime operations underwater. They are among the most effective weapon systems in our armed forces.

Source: Defence



Climate Change and Defence by the numbers: the European context

Grasping a problem on a global scale can be daunting. Fortunately, the Task Force for Climate change and Defence of the Aerospace, Security and Defence Industries Association of Europe (ASD) shared the following overview.

Text and photos: ASD

Deborah Allen

Climate change is one of the great global challenges of our time. Governments, civil societies and industry are urgently working to mitigate climate change and adapt to a warming Earth.

The Paris Agreement, a legally binding international treaty on climate change, seeks to limit global warming to 1.5°C above pre-industrial levels. Signatory countries are committed to reducing man-made greenhouse gas emissions (GHG) and levels of carbon dioxide. In 2019, the European Climate Law set the goal for the European Union to be climate neutral by 2050.

Many countries have prepared transition strategies for their entire economies. In the defence sector, both the demand side (national governments with the armed forces as end-users) and the supply side (the defence industry) can contribute to the global effort of reducing GHG emissions. A number of European countries have incorporated specific milestones for the decarbonisation of defence activities into their national or military climate strategies (International Institute for Strategic Studies).

Understanding the problem: GHG emissions of the European defence industry

GHG emissions associated with the broader defence sector are currently not well documented and estimates vary. A recent study estimates the total carbon footprint of the defence sector to be approximately 520 MtCO2e each year or 1% of global man-made GHG emissions (Roland Berger). This compares with 12% from road transport, and 2% from each the civil aviation and the maritime sectors (Roland Berger, Table C: "Defence vs. other sectors' emissions"). The European defence sector is estimated to contribute approximately 6% of global defence emissions (Scientists for Global Responsibility).

Defence emissions can be broken down as follows:

- Emissions resulting from the production of military equipment (from raw material extraction to final product delivery) and its operation by the armed forces today account for 70% of the total.
- The remaining 30% stems from military facilities and infrastructure. (Roland Berger).

The defence industry contributes to the emissions associated with military equipment production and operation. These can be categorised in 'scopes', which cover industry's own operations (scopes 1 and 2), its supply chains (scope 3 upstream), and the usage of its products by militaries (scope 3 downstream).

It is estimated that for military equipment, manufacturing accounts for 5-10% of the lifecycle carbon footprint (scope 1 and 2), emissions from the supply chain account for 20-30% (scope 3 upstream), and emissions from the operation of the product for the remaining 65-75% (scope 3 upstream; all scope percentage data from Boston Consulting Group internal report 2022).

While there are increasing efforts to reduce the carbon footprint of existing military equipment, the defence industry is also working to reduce the footprint of future products across their lifecycle. To achieve this, industry is improving manufacturing processes and future product design, and working with its suppliers to decarbonise their operations.

The challenge of decarbonising defence

The defence industry does not get a free pass but does face some unique challenges. Our mission is to provide our armed forces with the capabilities they need to protect citizens and nations. Measures to reduce GHG emissions must maintain the safety, reliability, and operational performance that European militaries will continue to require from defence products.

Many energy-intensive defence platforms, such as tanks, combat aircraft or naval vessels, are technically complex, requiring many years of engineering design and development. They are planned to be in service for decades while retaining the ability to operate across different geographical regions, with different climatic conditions and infrastructure, and alongside the equipment of our allies. The long lifecycles of these platforms and the diversity of the environments in which they could potentially be deployed make rapid technological evolution difficult and emphasise the need for consideration of future climate impacts at the point of design and manufacture.

Most importantly, defence is a market where national governments play a unique role as sole customers, sponsors, and regulators. We must work in close partnership with our customers to meet the challenge of decarbonisation.

Advancing decarbonisation

There are many cases where technological advancements within the industry are already contributing to decarbonisation. Although decarbonisation is a challenge for Europe's defence industry and militaries, it has the potential to bring important advantages beyond reducing the impact on the climate. For our armed forces, reduced carbon usage, for example through improved fuel efficiency, simulation-based training, and electrification-enabled silent manoeuvrability, can bring an operational advantage. The use of decarbonisation technologies, like sustainable aviation fuels, can also reduce the strategic dependence on foreign and non-secure energy supply sources.

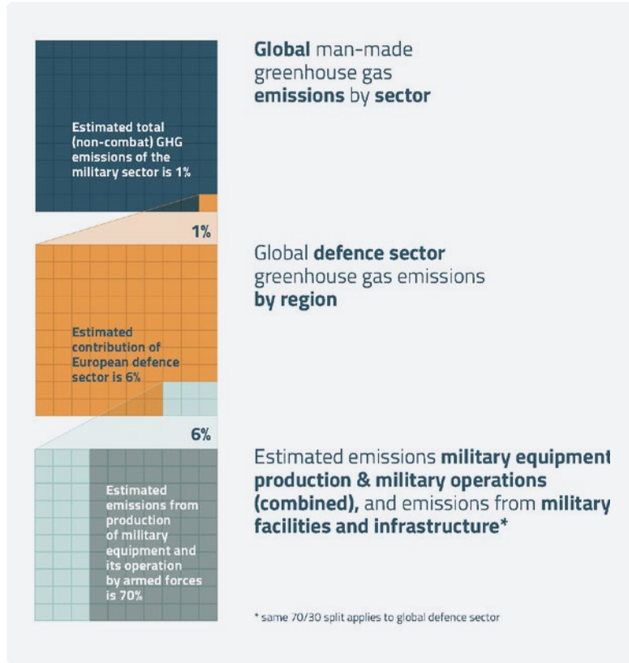


Figure 1 – Breakdown of Defence Sector Emissions

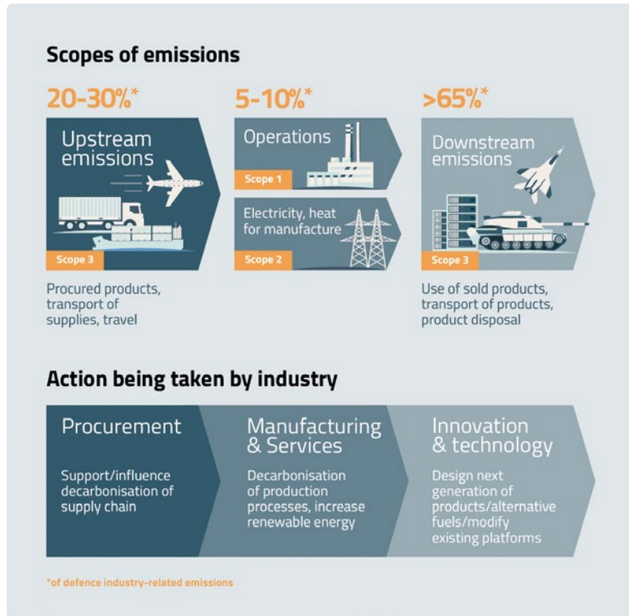


Figure 2 – GHG emission scopes of the defence industry

The way ahead

The European defence industry must fulfil its primary objective of meeting the demanding military capability requirements of our armed forces while reducing GHG emissions. Despite the challenges, the European defence industry is determined to play its part. We aim to:

- Reduce GHG emissions from industry's own operations (scopes 1 and 2), in accordance with the Paris Agreement, aligning with a 1.5-degree pathway. Major European defence companies have quantified carbon reduction targets to be achieved within the next decade. A review of major European defence companies' published data indicates more than 10% reduction in operational carbon emissions since 2020. The specific ambitions and reduction targets of individual companies are publicly available through company websites.
- Collaborate across the intricate and co-dependent supply chain to minimise GHG emissions (scope 3 upstream). Companies of all sizes are developing best practice standards and tools to quantify and address carbon emissions. The work is being driven across number of national defence industry associations and international forums (e.g. ASD, IAEG) and through adopting and adapting initiatives from other sectors.
- Address the full life cycle of military products and systems (scope 3 downstream), including emissions associated with production, use and disposal. This includes designing products for longevity, repairability, circularity and recyclability to minimize lifecycle emissions. The concept of eco-design is relatively new for defence manufacturing and needs to be further evolved to provide the required understanding and evolve the application of the principles of eco-design at the earliest stages of product development.
- Use technology and innovation to drive decarbonisation of military platforms and products. While there are specific operating parameters for military equipment, there is potential for innovative developments in the civil space to be adapted for military use (see examples in Table 1).
- Implement circular economy principles to reduce waste and emissions through strategies like remanufacturing, reuse, and recycling of equipment and materials.
- Improve transparency, reporting and disclosure of both climate impacts of the defence sector and progress against key milestones and communication of research development and technological advancement.

The challenge demands a collective and collaborative effort. As these developments are rolled out across Europe, coordination among all relevant stakeholders is essential to ensure a common approach to technologies, infrastructures, and military requirements.

Examples of technology driving decarbonisation

Fuel use is the primary source of carbon for the air, maritime and land sectors. Decarbonisation will result from use of alternative fuels, increased platform efficiency and reduction or elimination of the use of the platform.

Use of Alternative Fuels

Sustainable Aviation Fuel: In France, the Netherlands, Sweden, and the United Kingdom, alternative fuels have been tested in selected air platforms, which has the potential to provide a life-cycle carbon reduction of up to 80 percent compared with traditional jet fuel. Significant R&D effort is still needed in this area, but actual results have already been obtained. The UK RAF as well as the Swedish Airforce have achieved flights on 100% sustainable aviation fuel (SAF) and new French Falcon 10X, under development, will also fly with 100% SAF.

Electricity: Electric unmanned aerial vehicles (eUAVs) are being developed and trialled across a number of European countries. For missions where electric power is appropriate, this could lead to a near-complete elimination of carbon emissions while increasing stealth and removing pilot safety risk.

Hydrogen: Hydrogen as a fuel could have a key place in a zero-carbon future. Solutions to the technical and logistical challenges associated with its use in the civilian world are accelerating. The potential for its use in the defence sector is initially being explored using digital twinning in military infrastructure and logistics. The evolution in the civil aerospace sector is also being closely monitored for potential adaptation.

Increased Efficiency/Reduced Energy Use

Digital Twin Technology: Shipping produces significant emissions and is proving hard to decarbonise, so fuel efficiencies are critical in the short term. Maritime digital twin technology developed by Norwegian and German defence companies uses on-board and environmental data to provide fuel efficiency advisory on trim (the way the ship is floating), 3D visualisation of the vessel, and situational awareness, including the impact of weather conditions. This could deliver reduced emissions and cost-effective vessel energy management.

Composite materials: Materials reinforced with carbon fibre are widely used in military aviation due to their high mechanical strength and low density. These materials being more lightweight for equivalent strength, reduce fuel use. However, conventional recycling methods such as laser cutting or grinding produce recycled materials with poor mechanical properties and limited application for reuse. The EU-funded SPARTA project claims its new linear cutting and compression recycling method for aircraft thermoplastics produces less than 10% loss in mechanical properties, and so can achieve up to 80% reuse.

A recent study concludes that the transition from mainly metallic fighter jets to aircraft built using composite material has reduced operational GHG emissions by up to 50%. While this has increased emissions in the supply chain by around 30%, product-operational emissions are an order of magnitude greater. (Roland Berger, Table I: "Fighter jets supply chain and operational emissions")

Simulation/synthetic training: Battlefield and vehicle operating simulation programmes are being widely deployed by armed forces particularly in the land and air domains. These reduce the need for equipment to be deployed for training and significantly reduce cost.

Questions for the authors?

We are proud to welcome BAE's Deborah Allen, chair of ASD's Taskforce for Climate Change and Defence, as speaker at the NEDS Symposium 29 November. As BAE Systems' Sustainability Director, Governance & Business Conduct, her role encompasses the many and varied aspects arising from the Environment, Social & Governance (ESG) issues affecting the company. Replies to invitations are possible until 23 November. Alternatively, visit the BAE Pavilion or speak to attending representatives of your National Defence Industry Association (NDIA).

Hybrid Electric Systems: Hybrid electric systems are increasingly penetrating the transport sector and European defence companies are trialling the same technology in military vehicles and exploring the potential for application in naval vessels. In this instance, the switch to a low-carbon technology has potential to upgrade mission-critical capabilities, as it can increase stealth compared with purely fossil fuel-powered alternatives. ●

"Local innovative resourcefulness" and sustainable security

"The Royal Netherlands Air Force runs on local resourcefulness", according to the recent dissertation of dr. Boskeljon-Horst at the Dutch Defence Academy (NLDA). As the sustainable transition of Defence and Security will require contributions from familiar and new players in the ecosystem, we took up the offer of KMWE, a neighbour of Eindhoven Air Mobility Command, to showcase the local resourcefulness of the Brainport Industries Campus.

Text and photos: KMWE

In the south-east of the Netherlands adjacent to the perimeter of Eindhoven Airport, the Brainport Industries Campus stands as a symbol of technological progress and innovation. Among the numerous companies that call this vibrant tech hub their home, KMWE Precision and KMWE Aerospace shine as beacons of excellence in precision Engineering and Aerospace manufacturing technologies. With their rich history and dedication to cutting-edge technology, these two companies are merging to make significant contributions to the defence industry in the Netherlands.

A Legacy in Precision Machining

KMWE Precision has a storied history that dates back over more than 65 years. Founded in 1955, this private owned Dutch precision engineering company has been at the forefront of innovation in the field of high-tech machining and assembly. Over the years, it has continually evolved, adapting to the changing demands of the Semiconductor, Health-tech, Industrial and Aerospace market with leading OEM's and Tier 1's as customers.

Throughout its history, KMWE Precision has played a pivotal role in crafting critical components for these various industries. Their expertise in high-precision manufacturing, including machining of complex materials, has contributed significantly to advancements in technology. It's no wonder they've earned a reputation as a trusted partner for global players in the aerospace and defence sectors.

Aerospace Excellence at KMWE Aerospace

KMWE Aerospace BV, a subsidiary of the KMWE Group, specializes in providing advanced manufacturing solutions for the aerospace sector. Founded in 1996 as Philips Aerospace and latterly changing its name to DutchAero, this offshoot has rapidly grown into a key player in aerospace supply chain solutions. It offers a wide range of services,

including precision machining, complex sheet metal applications, and the assembly of aircraft and engine components.

One of KMWE Aerospace's most significant recent achievements has been its contribution to the F-35 Lightning II program. KMWE Aerospace has been an integral part of the supply chain, delivering essential Aerostructure components and F135 engine parts that ensure the F-35's performance and reliability. A major achievement in the Dutch aerospace industry.

Brainport Industry Campus: The Epicenter of Innovation

The Brainport Industries Campus (BIC), where both KMWE Precision and KMWE Aerospace are located, is a remarkable initiative that has transformed the region into a technological hotspot. This campus fosters collaboration and synergy among various high-tech companies, research institutions, and educational organisations. As part of this dynamic ecosystem, KMWE Precision and KMWE Aerospace have access to a wealth of resources and talent that they need to achieve their ambitions.

The BIC is located in the Eindhoven Brainport region, known for its innovative spirit and dedication to research and development, ensuring that companies like KMWE Precision and KMWE Aerospace remain on the cutting edge of technology. Their proximity to renowned research institutes and the Technical University of Eindhoven enables them to tap into the latest advancements in materials, automation, digital manufacturing and sustainable technologies

The Future of Technology at KMWE

As technology continues to advance, KMWE Precision and KMWE Aerospace remain committed to staying at the forefront of innovation of manufacturing companies. With a strong focus on sustainability, they are exploring eco-friendly materials and processes to reduce their environmental footprint. Moreover, the advent of Industry 4.0 technologies, such as IoT, AI, and automation, is transforming the manufacturing landscape. KMWE is actively investing in these areas to enhance efficiency and productivity.

Both companies are working on the development of next-generation processes and manufacturing techniques such as Additive Manufacturing (AM) of lightweight and exotic metals. These innovations are expected to play a pivotal role in the defence industry, particularly in the creation of lighter and more durable components for military aircraft and equipment. Aerospace in this field can still be a conservative industry preferring the proven technologies, but they are convinced that this will change rapidly within the next decade in line with the ongoing developments in the innovative high-tech industries and the drive for environmental sustainability.

Read more on page 35

Brainport and the Innovation Square

To make full use of the Brainport's inventiveness and ingenuity, the Materiel and IT Command (COMMIT) opened a MINDbase at the Strijp-S Microlab in Eindhoven on November 24th 2022. It has proven an inspiring environment, resulting in nearly half the nominations of the 17 startups at this year's Innovation Square at NEDS, who can present their products free of charge through co-financing of COMMIT and NIDV. Visit nidvexhibition.eu for a full list of startups. Meet the Ministry for Economic Affairs and Climate, partner of the 2022 Innovation Square, and Brabant Development Agency (BOM) at their stands for collaboration opportunities.

Continued from page 33

Contributions to the Defence Industry

The defence industry relies on cutting-edge technology to ensure national security. KMWE Precision and KMWE Aerospace, with their history of precision engineering and commitment to innovation, are well-positioned to make significant contributions.

Their involvement in the F-16, Apache, Stinger and F-35 program are just some of a number of examples of their crucial role in the Dutch defence industry. They are also exploring the market to develop AM advanced components for military helicopters, unmanned aerial vehicles (UAVs), and missile systems. These components and sub-systems are essential for enhancing the performance and reliability of your defence equipment and platforms. They are proud to have this niche legacy, to be part of this challenging Eco-system and are ambitious to make the next steps.

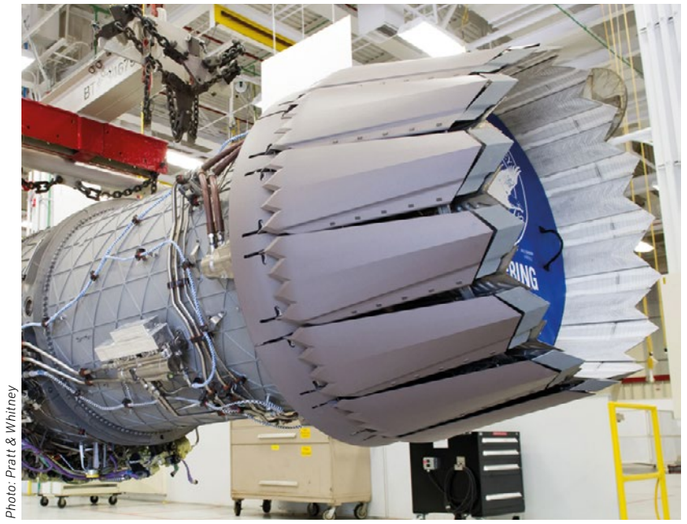


Photo: Pratt & Whitney

Rectification

The September edition featured Sun Test System's Multifunctional Ground Support Equipment (MFGSE) used by the Royal Dutch Air Force in F35 maintenance after testing by Lockheed Martin and a contract with the JSF Program Office. Unfortunately, the photo showed the previous MFAGE.

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Het nieuwsmagazine verschijnt enkele malen per jaar
Eindredactie Riekelt Pasterkamp

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