Driving Innovation in Aviation, Space & Defense

Towards autonomy, hi-tech manufacturing and unprecedented connectivity

AKKODIS

Editorial

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What lies ahead for the aviation, defense, and space industries?

Some might see dark clouds hanging over them with the global economy now gradually recovering from the COVID-19 pandemic and in light of current challenges such as geopolitical unrest, energy insecurity, and supply chain issues.

But the aeronautics and defense sectors are strong. They're bouncing back, and based on Akkodis' industry experience and knowledge, we predict that change and innovation will come even faster and be more drastic than before.

Why?

Because continuous technological advancements in connectivity, robotics, automation, manufacturing, new materials and digitalization are creating new windows of opportunity for industry leaders to develop innovative products and services. This technology push holds the potential to reshape entire value chains: From developing products with new features and capabilities, to manufacturing them using new methods, to creating data based digital maintenance and servicing solutions optimizing product use and lifetime.

The potential is there, no doubt. The question is how to maximize it.

We feel confident to answer that question, based on our significant footprint in aeronautics and defense. We see four main challenges:

Digital transformation is the crucial component in all of this. To build flexibility, agility and resilience, the industry must embrace digitalization even more: Such as the Smart Factory concept, increasing manufacturing flexibility and efficiency, or the concept of the Digital Thread, which links together information from across the product life cycle, connecting engineering, supply chain, manufacturing, and aftermarket.

Innovation will be everywhere: The next generation of civil aircraft will be quite different from conventional aircraft in terms of shape, wingspan and propulsion systems. Also, we'll see new electric vertical takeoff and landing (eVTOL) aircraft offer new ways to move people and cargo around. And in the space sector, the New Sky Economy will flourish, with launch costs drastically reduced and new satellite systems being put into operation.

The issues of sustainability and decarbonization will affect the industry on all levels. Reaching the goal of net zero emissions in 2050 requires a great effort, and many different steps must be taken to build an eco-friendlier sector. Whether it's operational improvements, sustainable aviation fuel or greener ground services, every aspect counts on the road to net zero.

All this intensifies the race to attract, retain and develop tech talent. Automation and the use of advanced digital technologies are bringing a change in the industry's workforce composition, driving the need for a workforce with more advanced aerospace engineering, math, data science, and digital skills than before.

The following pages demonstrate how we collaborate with our clients to exploit the full potential of technology, as well as addressing the challenges that come with it.

Let’s build a Sustainable and Digital Aerospace & Defense Industry Together

Aviation – Autonomy, Connectivity, and Hi-tech Manufacturing

In the last 15 years, commercial aviation has boomed, and over the next 20 years the number of global air passengers is expected to nearly double again. Aerial mobility is certainly taking off – and technology with it.

As stated by the International Civil Aviation Organization (ICAO) in a recent report about the future of aviation, “In a little over a century, our industry has gone from learning to fly, to learning to fly faster, learning to fly further, learning to fly heavier planes, and now to having 100,000 plus commercial flights occurring around the world each and every day.”

Aviation is a global growth sector, and technology is continuing to play a key role in its development. However, while the technology push is still ongoing there are several factors unique to the sector that are potentially slowing down innovation. Compared to other industries, product development is costly, customer demands are high, product life cycles are long, and there is an abundance of legacy systems. And perhaps the most crucial difference, aviation is highly regulated, to ensure maximum safety.

Little wonder the sector is taking inspiration from other industries with more wiggle room for innovation. The digital domain is the obvious role model, and indeed digital technologies are playing a key role everywhere. They are the backbone of new advances in engineering, manufacturing and logistics.

Sensor data from connected machinery and devices can be used for optimizing their usage and performance, for scheduling maintenance and as input for new designs.

Data and digital tools can increase supply chain efficiency, and offer transparency in supply and demand, enabling real-time component tracking to optimize production flow, and reducing production cost.

And production can be optimized by using Smart Industry concepts, as is the case for training machine operators with immersive technologies like AR and VR, tracking raw materials, monitoring the performance of production lines in real-time, processing data from production equipment to assess their condition and avoid costly downtime.

Aviation is a global growth sector, and technology is continuing to play a key role in its development.

From Automated to Autonomous

Autonomy is a hot topic in the aerospace industry, and it begins with automation. While automation is nothing new in aviation, as innovations such as the autopilot have existed for decades, its complexity is increasing significantly. Advances in computer vision, sensor fusion, data processing and machine learning allow for ever more sophisticated and capable systems like automatic take-off and landing. In the future, air crews will be guided by increasingly competent and dynamic decision support systems, potentially changing the relationship between human and machine.

Nevertheless, there still is quite a big jump from automatic to autonomous. No doubt, we're seeing a clear progression towards autonomy, and aviation may come closer to full autonomy than the vehicle industry ever will. At least, the task is easier, as air travel is much more regulated and thus more predictable than street traffic.

But for the foreseeable future, there will still be a pilot to take the final decisions.

The question is: how many?

Technology has already reduced the number of pilots in the cockpit from three to two. The next frontier is the one pilot cockpit. This is something many airline operators are looking forward to, as it could be a way to reduce operating costs as well as address future pilot shortages.

Powerful Connectivity

A prerequisite for advanced aircraft automation and autonomy is powerful connectivity.

Connectivity has evolved significantly in recent years, to enable pilots to communicate with increasingly capable and complex ground-based support systems and services. Stronger antennas, more bandwidth, new radio frequencies etc. are needed to accommodate the rise in data transfer to and from the aircraft. And not only for the crew. Passengers demand on-board Wi-Fi for their mobile phones and laptops, expecting to be able to use the same services they are accustomed to using on the ground.

However, increased connectivity and an aircraft's closer integration with external systems puts high requirements on its cyber security capabilities, and aircraft cyber security will be a major growth area in the future.

Increasing demand for in-flight connectivity goes hand in hand with developments in satellite communication. As many aircraft connect over satellite as well as radio, satcom is quickly adapting to the rising connectivity needs. In short, satellites have to cope with the same trends we've seen in smartphones in recent years: More functionality, more data, more bandwidth.

To give an impression of the capabilities of satellite communications, some satcom players are even preparing to offer 5G over satellite.

Akkodis has supported a major aircraft manufacturer in installing a KU band large antenna for satellite communications on its aircraft, to amongst other things, provide on board Wi-Fi. The project was conducted in conjunction with other partners from the Telecoms and Airline sectors.

Digital & Data Driven Engineering

Digital Engineering lies at the heart of the aeronautics industry's drive towards shorter development cycles and reduced costs. Advanced tools, powerful software, and collaborative platforms allow for more speed, even as complexity is increasing as well.

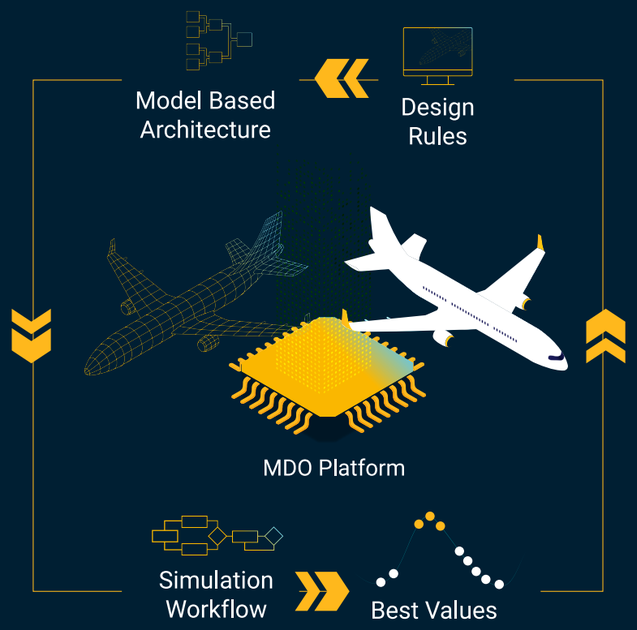
Instead of the various technical disciplines being siloed, design is becoming multi-disciplinary, with platforms connecting different skills related to aerodynamics, structure, propulsion, flight control, performance etc. Multi-physics simulation tools offer all the building blocks the engineers need, gathered in one place.

Digital models streamline the engineering process, securing digital continuity.

And digital twin technology is modeling the physical world in virtual, allowing a virtual representation to follow the product from mock-up over engineering to manufacturing and customer service.

Testing is becoming increasingly automated and testing management is becoming increasingly data driven.

Moreover, data science and advanced algorithmics can turn the vast amounts of data produced into a competitive advantage, with Big Data and Data Science platforms offering smart tools for analysis.



Building on an open-source platform, Akkodis has developed its own optimization algorithm, experience plan, state-of-the-art coupling, and machine learning capabilities.

This scientific software allows designers to easily describe issues using mathematical formulations, and it automatically generates calculation sequences that identify the optimal scenario, thus reducing lead-time and development costs. This powerful technology will change the future of the design process.

Smarter Manufacturing

As the tools to engineer an aircraft are transforming, so is its manufacturing. With the number of global air passengers predicted to double over the next 20 years, aviation will be a significant growth area for a long time to come. Developing smarter products and manufacturing them in a smarter way will be crucial to that growth, and the industry must build more resilience and flexibility and speed up processes to meet the challenge.

Smart Industry is the keyword here, and manufacturing will be increasingly digitalized, automatized, and robotized. Paper based quality inspection is replaced by digital tools, and track & trace solutions for spare parts and equipment are optimizing production flow. Sensors monitor machines and production lines to secure optimal performance and uptime.

Large amounts of monitoring and measuring data crunched by sophisticated algorithms will provide an even more fine-grained view of build quality, to drive the rigorous quality control that distinguishes the sector even further.

Taking advantage of the convergence of industrial production and digital expertise, Smart Industry leverages big data and analytics, implements immersive technologies like VR and AR, connects physical assets through IoT, utilizes robotics and autonomous vehicles, with software wiring everything together.

The Maintenance and Servicing Challenge

As products and services within aviation become more and more complex, the task of servicing and maintaining grows equally tricky. Digitalization offers a way to handle that challenge.

Safety and reliability are paramount in the sector. Equipment is “mission critical” and must remain operational and dependable always. Hence the value of services in aviation is immense, with properly sustaining an aircraft resulting in up to seven times the value of the initial purchase price.

Mounting costs due to rising complexity is an issue increasingly on the mind of leaders in the sector. For instance, more frequent software upgrades are required, leading to shorter maintenance cycles, and thus rising cost.

Software is Optimizing Maintenance

While the increase of software components in products leads to faster maintenance cycles, software at the same time has the potential to optimize maintenance considerably. In fact, digitalization is initiating a paradigm shift in maintenance and servicing, enabling it to evolve from time-based to condition-based, and from there towards predictive maintenance.

The foundation of this shift lies in sensors, data, and algorithms.

Recent advances in sensor technology, wireless communication, data science and processing power are enabling the paradigm shift in monitoring and maintenance of physical assets, whether it’s manufacturing equipment, infrastructure, or aircraft.

Just as the trend towards Smart Industry incorporates the digitalization of manufacturing and assembly lines, the physical assets when constructed and put into operation can be made smarter. By deploying swarms of sensors, data can be harvested from the assets and processed, thereby allowing their current condition to be assessed. This enables the transformation ofmaintenance procedures, going from scheduled maintenance to condition-based maintenance. Performing maintenance based on the asset’s actual condition improves planning, performance, and uptime, saves money, and eliminates over-maintenance.

Predictive Maintenance

Looking into the future, data-driven condition-based maintenance systems will gradually evolve into systems that are able to predict the long-term maintenance needs of assets. These predictive maintenance systems will harness vast amounts of data and complex algorithms to forecast far in advance when a breakdown is going to happen and what the breakdown will be. They will deliver decision support for ultra-precise planning of maintenance procedures just-in-time and thus optimize maintenance even further.

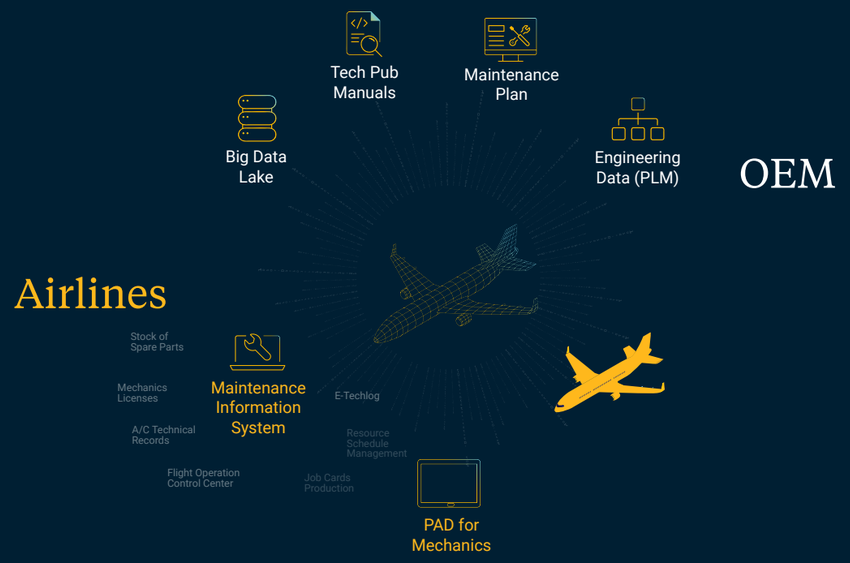
In short: Digital tools are a crucial part of the answer to the challenge of increasingly complex and expensive maintenance in the aviation sector.

AKKODIS

Akkodis offers worldwide daily end-to-end Field Service Support to airlines, providing technical assistance and supporting customers in managing their legacy fleets and entry-into-services of new aircraft. Services include technical processes, aircraft and equipment maintenance, engineering solutions and flight operation.

Akkodis has developed AR and VR based 3D training environments for engine maintenance procedures for a leading aircraft engine manufacturer.
The immersive environment provided virtual use of tools, together with integration of the physical management of materials (gravity, liquid, and collision). The training environment allowed for guided as well as free courses and integration of monitoring and follow-up of learning actions.maintenance, engineering solutions and flight operation.

Connected aircraft also offer the potential to enhance fleet management and maintenance operations. The future will involve even greater connectivity between OEMs and airlines, with data continuity between digital twins and physical aircraft allowing for improved operational efficiency and seamless maintenance procedures. The Maintenance Information System (MIS) and digital twin of the aircraft will play a central role in maintaining data continuity during operation.



The New Sky Economy

Access to space has become cheaper than ever, lowering the threshold for innovation built on space-based resources. Launch costs are falling, leading to a growing number of satellites. New generations of satellites are becoming increasingly software-defined, leading to satellite-provided services becoming affordable for a growing number of application developers. The New Sky Economy is upon us. The communication infrastructure floating high above our heads is already an integral part of our lives and livelihoods. It will become even more so in the future.

More and more satellites are circling the Earth, whether they're large conventional satellites positioned in high and medium Earth orbit or the new, emerging low Earth orbit satellite systems. The closer to Earth they are, the smaller and more numerous they become, going from 10s to 100s to even 1000s, although these swarms of mini satellites are still in their infancy.

Experts call this trend "The New Sky Economy". Our satellite infrastructure is becoming more and more powerful to serve the needs for communication, exploration and monitoring: Earth observation is becoming increasingly fine-grained, both for scientific, commercial and defense purposes. The satcom domain is evolving rapidly to cater to the connectivity demands for IoT, M2M and various mobility applications. Satellite navigation is evolving into an indispensable tool for many purposes and an integral part of various autonomy solutions. On top of all that, space exploration is still on the agenda, not least utilizing space resources like rare minerals on the Moon.

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Space Engineering is Adapting Accordingly

For increased competitiveness, development time is shortened, and cost reduction is high on the agenda. A way to achieve both is by moving towards large series production and from "hand built" to industrial manufacturing.

Payload systems are growing more sophisticated, with remote sensing technologies for Earth observation, sat-nav etc. evolving, together with new generations of radio technology able to cope with the steady increase in data rates.

Digital technology is indispensable, for the development of new applications and services as well as in optimizing the tools for system engineering, testing, simulation and more. Technologies like cloud and machine learning are giving rise to scalable and innovative business models lowering the threshold to the space sector.

And needless to say, security and safety are top priority, whether it's mission safety, cyber security or data processing and analysis.

Arguably the most fundamental change in satellite technology is the advent of the Software Defined Satellite. By moving an increasing number of properties from hardware to software new satellites have the capability of getting their payload redefined from the ground system, instead of being statically configured.

The payload, which is the equipment the satellite carries to carry out its mission, can be reconfigured remotely. In this way, instead of launching a new satellite, operators could take a telecom satellite and give it another mission.

This capability is a game changer in the industry, allowing new generations of satellites to adapt to new roles in a much more agile manner than before. Satellites can be reconfigured and thus change their mission throughout their lifetime based on changing demand. The next-generation software-defined network from the ground to space promises more flexibility, such as providing coverage for moving targets or for temporary purposes like natural disasters.

Akkodis is involved in the design and simulation of Attitude and Orbit Control System (AOCS), and Satellite Operation definition and testing activities for the Space Inspire™ product line of Thales Alenia Space. The solution, which is software-defined and thus reprogrammable in orbit, allows satellite operators unprecedented flexibility in how they allocate capacity to adapt to changing demand.

In recent years, the Akkodis Space Software Service Center, has grown significantly, to address customer demand for software development. The center is developing software for mission control, satellite navigation, image analysis etc., for on-board segments as well as integration, verification and validation related to the ground segments.

Akkodis has contributed to the design and development of the Spacebus Neo geostationary satellite platform. Spacebus Neo features all-electric propulsion, a flexible, modular system architecture and highly configurable software, making the platform easily adaptable to different payload types.
Akkodis teams in Toulouse, Cannes and Bucharest were actively engaged in various aspects of the platform's design and development including the definition of payload configuration strategy, the development, validation and testing of Platform On-Board Software as well as the development of the satellite configuration database. In addition to the platform-related activities, Akkodis worked on software tuning and configuration for each satellite.

OneWeb is a constellation of 648 Low Earth Orbit satellites which aims to provide high-speed Internet access in areas not served by terrestrial links. Akkodis experts were involved in multiple areas of the project, predominantly operations engineering activities leading up to the first launch, as well as in orbit support such as in-flight anomaly analysis and technical follow-up. The team also provided support on functional validation activities.

The Copernicus Marine Service implemented by Mercator Ocean International, is the European Union's Earth observation programme, which monitors the health of the ocean. The programme offers information services that draw from satellite Earth Observation and non-space data to provide regular and systematic baseline information on the physical and biogeochemical state, variability and dynamics of the ocean and marine ecosystems. Akkodis tech experts supported Mercator in the implementation of hardware and software infrastructure of the Copernicus Marine Environment Monitoring Service (CMEMS), integration of new operation chains, and the realization of Front and Back-office specifications.

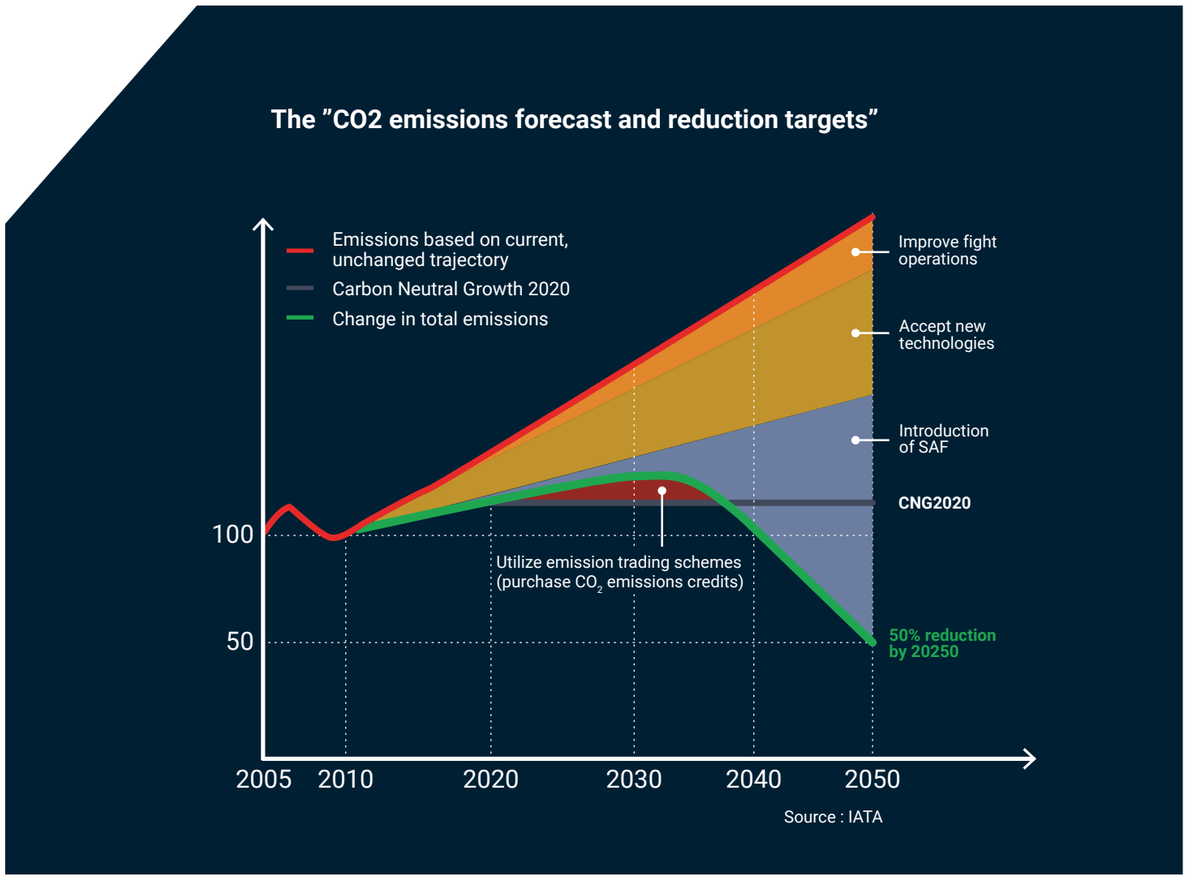
Rethinking Aviation Towards a Net Zero Future

Akkodis Showcase: Green&Fly

Aviation is recovering strongly from its biggest ever crisis, the COVID-19 pandemic. But with impressive growth rates comes a huge and growing climate impact. In 2021 aviation accounted for over 2% of global energy-related CO2 emissions, having grown faster in recent decades than road, rail or shipping. Aviation emissions will continue to grow rapidly in the decades to come, as the number of global air passengers is expected to double over the next 20 years.

Immediate action to reduce the carbon footprint of flying is needed, and both regulators and the aviation industry are joining in.

Air transport is headed towards becoming 100% green. Underscoring this, AIA, the American Aerospace Industries Association, has committed itself to achieving net-zero carbon emissions by 2050. And the EU has launched Destination 2050, a broad industry initiative to design a roadmap to reach that same goal.



Multi-Strategy Approach

Improvements within design and manufacturing, fuel-efficiency, air traffic management and economic measures (see diagram) will all have their role to play.

From new ways to design airframes and the development of new composite materials to more sustainable manufacturing methods, the whole process of building new aircraft is getting an overhaul. In manufacturing, Smart Industry concepts such as digital twins, AI-based quality prediction and control, robotics and the Internet of Things (IoT) are being developed and implemented.

When it comes to energy, new propulsion systems with lower fuel consumption are on their way. And new types of fuel are already making a difference: Sustainable Aviation Fuel, (SAF), made from bio resources can be blended with conventional fuel to reduce emissions. Scaling of SAF production is a hot topic. Further ahead, hydrogen-powered aircraft, hybrid-electric and fully electric propulsion technologies are on the horizon, although the significant extra weight that comes with incorporating batteries means that only short-range flights are feasible for the foreseeable future.

Making air traffic operations smarter can also lead to carbon reduction, through improved flight planning, weight reduction and the promotion of energy-efficiency in airports.

Finally, economic mechanisms such as emissions trading and offsetting schemes are needed to rapidly reduce the sector’s carbon footprint.

Green&Fly

As a tech frontrunner within aviation, Akkodis is deeply committed to the green shift, and in 2021 Akkodis revealed a zero-emission concept for regional flights, named Green&Fly. The 100% electric hydrogen-powered concept aircraft Green&Fly demonstrates a strong commitment to scaling up renewable energy and contributing to the decarbonization of the aviation industry, through technology and innovation.

The aircraft is based around a rhombohedral wing shape and designed to carry up to 30 passengers, with a range of 500km. Green&Fly is a zero-emission concept for a regional transport alternative, which aims to enhance mobility in mid-sized cities where there are no large hubs. Able to cope with runways of any length, the Short TakeOff And Landing (STOL) Green&Fly can operate on existing networks of aerodromes, making use of underused infrastructures.

The concept combines the latest technologies and explores various configurations to optimize the aerodynamic performance and energy consumption of the aircraft, as well as its electrification potential. Green&Fly is a light and small aircraft (classification CS25) with a futuristic design and a sophisticated mechanism powered by hydrogen fuel cell batteries and supercapacitors.

The rhombohedral wing shape, compared to a classic wing shape, generates less turbulence at wing extremity allowing a significant reduction in drag, opening up new possibilities for a highly efficient propulsion system. The stiffening of its structures is inspired by biomimicry based on the growth process of a leaf's veins to improve stiffening efficiency, reducing the mass of the aircraft. To maximize the utilization rate, the cabin design is flexible allowing the aircraft to be easily converted from passenger to freighter. The cockpit integrates digital applications and AI to facilitate single-pilot operations. The aircraft design also incorporates energy recovery landing gear, with electric extension/retraction, with the aim of steadily replacing all hydraulic components with electric ones to reduce emissions.

The Green&Fly concept is meant to inspire the industry, as well as serving as a challenge to Akkodis' own engineers to radically rethink personal air transport. And they've risen to the challenge, presenting a truly disruptive design.

Innovation initiatives such as Green&Fly serve not only as an inspiration to the industry and to Akkodis' own tech experts but also emphasize that the aerospace industry is a talent destination. That is an important message, as the race to attract, retain and develop tech talent is intensifying both within and beyond the aerospace sector. Advanced engineering and digital skills are in high demand.

At the same time, turnover in the sector is high, and an aging workforce contributes to the shortage of skilled workers.

At Akkodis we want to play a major role in addressing these challenges, so we take pride in encouraging a culture of innovation and building digital skills, internally and externally. For us, Green&Fly is an important building block in shaping the aerospace industry of the future.

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Green&Fly - Sustainable Aircraft Concept

Flexible Cabin

To maximize the utilization rate, the cabin design is flexible allowing the aircraft to easily be converted from Passenger to Freighter.

Hydrogen

Hydrogen is the main power source for the aircraft's fuel cells, with back-up batteries and an ultra-capacitor for optimized distribution.

New Shapes

The rhombohedral wing shape, compared to a classic wing shape, generates less turbulence at wing extremity allowing a significant reduction in drag. It also enlarges the wing surface area, opening up new possibilities for a significant increase in drag to lift ratio.

Energy Management System

The EMS of Green&Fly supervises the different energy sources available (fuel cell, battery and supercapacitor). These sources are different in their dynamic behavior but are complementary, making it possible to respond optimally to the energy needs of the system in real time.

Next-gen Cockpit

The cockpit integrates digital applications and AI to facilitate single-pilot operations.

Energy Recovery Landing Gear

The aircraft design also incorporates energy recovery landing gear, featuring electric extension/retraction, with the aim of progressively replacing all hydraulic components with electric ones to reduce emissions.

Novel Materials

The stiffening of its structures is driven by an algorithm developed by Akkodis. Inspired by biomimicry, the structure design is based on the growth process of a leaf's veins to improve stiffening efficiency, thus, reducing the mass of the aircraft.

Defense: The Internet of Military Things

With the growing “softwarization” of military operations, and with the fast-growing number of connected devices on the battlefield, comes new capabilities as well as great risk. Everything has to be connected and aligned from the inside, yet impenetrable from the outside.

So-called net-centric warfare is a high-stakes affair, in which situational information from land, sea, air and space is processed in a fifth domain – the cyber domain. Information is processed and shared in near real-time between all actors on the battlefield, all the way from HQ to the single soldier out there in the mud.

Across the complete chain of command, state-of-the-art technology from other sectors is being adapted to the extreme demands of the military world.

Across the complete chain of command, state-of-the-art technology from other sectors is being adapted to the extreme demands of the military world. One could liken the development of modern defense technology could be compared to building race cars fitted with caterpillar drive: powerful and hi-tech yet designed to work under battlefield conditions.

As an example, sophisticated command & control systems are utilizing cloud technology without access to the cloud. Also, engineers have found clever ways to secure a soldier's smartphone, and at the same time giving her functionality and interface like on her civilian phone. For instance, giving her access to advanced map services, usually requiring an internet connection, on an air-gapped phone communicating only via military radio frequencies.

Furthermore, as some military equipment is built to last for decades, engineers find new ways to tweak freshly developed software to be able to run on 20-year-old computers mounted in armored vehicles.

Four Innovation Trends

The concept of net-centric warfare is founded on four key innovation trends: the modern tsunami of small, connected terminals, the vast increase in data processing power, the rising ability to transmit large amounts of data via radio communication, and lastly and maybe most importantly, the increasing importance of the software tying it all together.

Just as in the civilian domain, software is king. The role of hardware development is decreasing, compared to the importance of software.

For instance, the F-35 fighter jet has more than 8 million lines of code, compared to just 2 million in the F-22 Raptor. Underlining the importance of software in the military domain, the US Navy is considered the largest software provider in the world. The blade servers on its most advanced ship, the USS Zumwalt, run 7 million lines of code.

Unified Combat

Today's militaries require complex and interconnected software systems for unified combat. These C4I applications (Command, Control, Computers, Communications and Intelligence) give commanders the overview they need to perform their troops' operations faster, safer, and more efficiently.

The systems receive sensor data from a wealth of sources, like satellite, radar, smartphone, drones etc., merging and processing the data and running it through algorithms to provide improved intelligence, situational awareness, and decision taking support to military leaders.

At the same time, they facilitate transparency across the military hierarchy, from headquarters all the way to the single soldier, who is functioning as an edge node in a sprawling network. Experts have suggested that advances in technology might even flatten the military hierarchy, empowering the individual soldier and bridging the "digital divide" between high-ranking military commanders in their "back offices" and the platoons and squads deployed on the battlefield. At least, the potential is there, although the strict rules of safe communication challenge the flow of data from the edge to HQ and vice versa, forcing the development of solutions like using cloud tech without access to the cloud and using smartphones in an air-gapped environment.

The Internet of Military Things is changing the rules of warfare in so many ways, connecting everything and giving military leaders and the single soldiers out there on the battlefield new capabilities. Connectivity, transparency and real-time data are powerful indeed.

Cyberspace - Contested at All Times

All of this means that cyber security never has been more important than now.

As societies become increasingly networked, they become exposed to risk. It even seems as if modern interconnectedness is blurring the lines between war and peace, and between civilian and defense infrastructure. Both below and above the threshold of war, the cyber domain is a battlefield, and always active. Or as NATO puts it in a recent threat assessment report: “Cyberspace is contested at all times”.

Cyber-attacks can do great damage to not only individuals and companies. They can also potentially destabilize financial markets, political systems, and societal structures.

Therefore, in Western countries public, private, and defense actors often work closely together to defend themselves against cyber-attacks. That close collaboration makes good sense, as public-private partnerships help strengthen both the passive and the active aspects of cyber defense.

And needless to say, the armed forces themselves require the strictest cyber security measures. Command & Control systems rely heavily on data and intelligence from sensors, radars, satellites, drones etc. Also, the share of networked components in weaponry is steadily increasing. If the advantages of networking are not properly protected, vulnerabilities appear and whole systems can be compromised. This trend towards “net-centric warfare” and the vulnerabilities coming with it, calls for the strongest possible focus on the cyber domain.

Akkodis subsidiary Data Respons is an expert in data communication for harsh environments. Data Respons is upgrading its entire range of tactical IP networking routers to include 5G as the Norwegian Armed Forces are currently testing out 5G private networks as part of their tactical Communication and Information Systems (CIS).

5G allows for network slicing, which is a private slice on top of the provider's public 5G network. A private network is self-contained and has its own spectrum. Therefore, a private network is considered by many to be more secure as it offers full ownership of security protocols, access and customization. It is referred to by the Armed Forces as Tactical 5G, while networking slicing is referred to as Strategic 5G.

With mobile 5G small cells (aka COW: Cell-on-Wheels), mobile communication units of the military can establish a fully autonomous 5G network for the troops on the battlefield, and they can use Data Respons’ tactical 5G IP-networking units to communicate. This has already been piloted through the 5G-FUDGE program where Data Respons also supported the Norwegian Armed Forces during their pilot testing.

Akkodis has developed “Offensive Defence” concepts to counteract cyber-attacks by deploying “honeypots” in the cloud. Honeypots are servers that mimic vulnerable services to attract viruses. They monitor all interactions from an attacker, and once these are collected, data visualization techniques are used to get more insights and sometimes even allow the organization to prevent attacks that have not yet happened. The collected data contains valuable information, such as the top attacking countries or IP addresses, the most-used passwords for attempted attacks, a world map of the attacks, number of attacks per protocol and much more.

About Akkodis

Akkodis is a global digital engineering company and Smart Industry leader. We enable clients to advance in their digital transformation with Consulting, Solutions, Talent, and Academy services. Headquartered in Switzerland and part of the Adecco Group, Akkodis is a trusted tech partner to the world's industries. We co-create and pioneer solutions that help to solve major challenges, from accelerating the clean energy transition and green mobility, to improving user and patient centricity. Empowered by a culture of inclusion and diversity, our 50,000 tech experts in 30 countries across North America, EMEA and APAC, combine best-in-class technologies and cross industry knowledge to drive purposeful innovation for a more sustainable tomorrow.
We are passionate about Engineering a Smarter Future Together.