

No. 129 - MARCH 2023

ROTOR

BY

AIRBUS HELICOPTERS

IN THEIR WORDS

**Camping 101: take a flashlight
and an H145**

FEATURED ARTICLES

Planning to be disruptive

OFF THE BEATEN TRACK

**Meet the first all-female
crew to fly Airbus' NH90
in New Zealand**

Preparing the Future



STUDIES BEGIN FOR NEXT GENERATION EUROPEAN ROTORCRAFT

Airbus Helicopters is coordinating the European Union's Next Generation Rotorcraft Technologies Project (ENGRT), as part of the 2021 European Defence Fund (EDF). The EDF promotes cooperation among European companies and research institutes of different sizes and geographical origin in the EU, strengthening the resiliency and strategic autonomy of Europe. ENGRT will focus on analysing and understanding the needs of European armed forces for rotorcraft operations beyond 2030. The project's partners will study military rotorcraft concepts of operations and define key technologies needed for future military rotorcraft. Alternative rotorcraft concepts and architectures will be explored. This project will pave the way for the next generation of military rotorcraft in Europe. The contract for this project was signed in December 2022.

AIRBUS-LED LARGE-SCALE FLIGHT DEMO TEAMS UP FIGHTERS, A HELICOPTER AND DRONES

In Europe's first large-scale multi-domain flight demo, led by Airbus, two fighter jets, one H145 helicopter and five unmanned remote carriers teamed up and accomplished a mission that could occur in real-life situations. The Future Combat Air System (FCAS) Manned-Unmanned Teaming Demonstrator project will now move to the next phase: further paving the way for FCAS by developing a flying remote carrier (RC) demonstrator in the coming years.



A CHILEAN 'DOLPHIN' IN ANTARCTICA

During the month of January, as part of its Antarctic campaign, for the first time, the Chilean Navy used a Dauphin AS365 to carry out logistical support tasks, in the world's southernmost region. 3,000kg of basic necessities were transported to the bases in a resupply manoeuvre with the cargo hook, transporting 600kg of cargo from the ship to land on each of the trips in the most extreme conditions. At the same time, a Dauphin was used to support rescue training in Antarctica, for the first time in history. With a water temperature of -3°C , swimmers could only spend 25 to 30 minutes submerged in the coldest water on Earth.

SWISS AIR-RESCUE SERVICE REGA ORDERS 12 ADDITIONAL FIVE-BLADED H145s FOR ITS MOUNTAIN BASES

The Swiss Air-Rescue Service Rega has ordered a second batch of 12 five-bladed H145 helicopters to be operated from its mountain bases. They will replace the current fleet of AW109SP helicopters. This new order follows an initial contract for nine H145s, announced in March 2022. By 2026, Rega will operate an all-Airbus fleet consisting of 21 five-bladed H145s.

CITYAIRBUS NEXTGEN'S CUTTING-EDGE SUBSYSTEMS

Airbus has announced the selection of Eaton and Crouzet to provide the Electrical Power Distribution System and the human-machine interface of CityAirbus NextGen, respectively. The providers' valuable experience in electrical power management and flight deck controls will ensure the seamless integration of the two subsystems into the prototype's architecture. Additionally, as key contributors to the aircraft's performance levels, reliability, and safety, the two parts will have an important impact on the vehicle's capabilities.

Innovating
and supporting
our customers



AIRBUS GETS MORE MRO

Airbus Helicopters is broadening its range of MRO capabilities, following its acquisition of ZF Luftfahrttechnik GmbH, in a move which also secures additional competencies in the area of dynamic systems. With over 100 years of experience in the aviation industry, the company will now operate under the name Airbus Helicopters Technik GmbH as a wholly-owned subsidiary located in Kassel-Calden. The world-leading manufacturer of dynamic components for light and medium helicopters including related services with a global customer base is also a national leader with regards to the MRO for dynamic components of military helicopters.

THC CHOOSES HCARE

The Helicopter Company (THC), established by the Public Investment Fund (PIF) as the first helicopter services provider licensed to operate commercial flights in the Kingdom of Saudi Arabia, has signed an HCare In-Service contract to cover its future fleet of six ACH160 helicopters. When delivered, the ACH160s will be deployed across the Kingdom of Saudi Arabia for corporate transportation services. The HCare In-Service package has been tailored to THC's planned operational needs, providing parts availability services to optimise maintenance planning and service delivery.



RACER POWER ON

Airbus Helicopters' high speed demonstrator switched on for the first time, passing a significant technical milestone which validates the readiness of the aircraft's core avionic systems, software integration compatibility, and electrical harnesses. It is also a symbolic milestone, which illustrates progress and paves the way towards the first flight later this year. Assembly of the aircraft began in 2021 in Donauwörth with the installation of several major components, such as the canopy, box wings, fuel system and cowings, before then being transferred to Marignane for final assembly. Developed within the framework of the European Research Clean Sky 2 project, which involves 40 partners from 13 European countries, the high-speed demonstrator will be optimised for a cruising speed of more than 400km/h and aims to achieve the best compromise between speed, cost-effectiveness and mission performance.

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Communication Director: Yves Barillé (Publication Director). Editor in Chief: Ben Peggie (stephenbenjamin.peggie@airbus.com). Director of photography: Jérôme Deulin. Photo credit: Airbus; Renee Altrov; Dusan Atlagic; Stefanie Aumiller; Diane Bond; Buggs' Photography; Ned Dawson; Jérôme Deulin; Lorette Fabre; Fuerzas Armadas de Ecuador; Hélicoptères de France/J.-M. Geneschi; Christian Keller; Alejandro Marentes; Christian Marxen; Neste; Kim Ohman; Ken Oja; Anthony Pecchi; Eric Raz; Kristi Sits; Olivier Tomas; Vik; Cara-Irina Wagner Foto Hirsch; DR. Translation: Airbus Translation Services; Amplexor. Published by: **la nouvelle**. (Copyright Airbus Helicopters 2023, all rights reserved). Airbus Helicopters' logo and the names of its products and services are registered trademarks.



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Bruno Even, CEO of Airbus Helicopters

“Innovations that were once merely on the horizon are beginning to arrive.”

Here we are, with the dust barely settled on a 2022 that was filled with challenges and accomplishments. With 2023 already offering a similarly uncertain context, at Airbus Helicopters we can find comfort in the proven dedication and ingenuity of our colleagues, who, like our products, continue to go above and beyond. The helicopter market is recovering but it is a recovery that requires nurturing and support. Hearing the stories of our helicopters flying rescue missions in the United States and Ecuador should be a source of pride for us. Their contributions make the difference between life and death. These operators need us more than ever and we have to be ready to deliver on all fronts.

Even in this fluid context, one challenge that is absolutely not fluctuating and remains a consistent priority is the aviation industry's need to reduce its carbon emissions. Airbus has a multifaceted strategy to reach IATA's goal of net zero flying by 2050 and we are delivering the bricks that form the foundations. Innovations that were once merely on the horizon are beginning to arrive. The Airbus Summit at the end of 2022 introduced the DisruptiveLab. Our latest demonstrator will test technology designed to bring significant reductions of carbon emissions. We also shared a vision of

how the CityAirbus NextGen can deliver medical services in a range of scenarios and we launched LifeSaver, an initiative that will support stakeholders in the assimilation of the new technology to respond to the needs of a world that will continue to change.

A message that we also heard loud and clear from our operators during the Summit is that reducing carbon emissions is a priority for them. Thinking about the many essential operations our products deliver and considering helicopters' relatively modest contribution to global emissions, people may think that decarbonisation might not be their priority – but this is absolutely not the case. Sustainable aviation fuel can deliver a net reduction in carbon emissions of 80% and this is a first step in reducing carbon emissions but we are aiming higher. Everyone has the right to live in a safe and united world. As a leader in aviation, our mission is to deliver security and prosperity to communities everywhere. Our world is constantly evolving and of course this brings challenges but it is also a beautiful thing. The future arrives with new opportunities and our continued transformation is important as it allows us to provide our operators with the solutions they need to make a difference to the lives of the people they fly.

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18th

AND FINAL
NH90 Sea Lion
delivered to
the German Navy

20,839

total
helicopters
built

12,228

HELICOPTERS
in operation
today

374

gross orders
in 2022

40 partners
in **13 European**
countries are
working together
on the RACER
high speed
demonstrator

3,170

OPERATORS
at the end
of 2022

344

DELIVERIES
in 2022

52%

MARKET SHARE
civil and parapublic
in 2022

3,031,000

total flight hours
in 2022

2,650

HELICOPTERS
covered by
Flight Hour
contracts

Preparing the Future



Helicopters fly essential missions and can literally make life-saving interventions. With such an important role, there might be an assumption that their environmental impact might be less of a priority. Yet, in increasing numbers helicopter operators are committing themselves to reducing their emissions in a variety of ways.

Articles: Alexandre Marchand and Ben Peggie

Protecting the environment for future generations forms a key part of Airbus' mission to make the world a safer and more united place. Exploring this commitment to preparing the future, *Rotor* takes a look at the exciting innovations and cooperation that are creating more efficient products and ways of flying that will emit less CO₂ and ensure future generations can benefit from the vital connectivity that helicopters deliver.

Planning to be disruptive

Designed to test technology that will significantly reduce carbon emissions, Airbus' DisruptiveLab concept helicopter flew for the first time in January. Tomasz Kryszinski, Head of Research and Innovation at Airbus Helicopters, explains the innovations inside.



1: The DisruptiveLab flying for the first time, 13 January 2023.

2: 40 fuselage configurations were tested in a wind tunnel to reduce drag by 20%.

3: The DisruptiveLab's rotor hub offers a reduction of drag of 40% compared to previous helicopters.

4: A look inside the DisruptiveLab's cabin.

5: The FlightLab was Airbus' first flying laboratory.

Helicopters currently represent less than 1% of aviation CO₂ emissions, yet to try to protect the planet for future generations, Airbus has made reducing the carbon emissions of its products an absolute priority. "At Airbus Helicopters, we are committed to the IATA target of flying net zero by 2050," states Tomasz Kryszinski, Head of Research and Innovation at Airbus Helicopters. "This is a key driver for our innovation strategy. We have a strong roadmap to meet IATA's target, which includes different solutions: starting with the use of alternative fuels and further developing hybridisation and electrification – like the CityAirbus NextGen, our Advanced Air Mobility prototype." However, this new age of vertical lift will not happen overnight. That's why a key part of Airbus' innovation strategy focuses on introducing innovations that will reduce carbon emissions.

DON'T BE A DRAG

In order to develop the next generation of innovations, Airbus relies on several flying laboratories as a way to quickly mature new technologies. The DisruptiveLab is a brand new demonstrator that flew for the first time on 13 January, with a totally new architecture. This latest flying laboratory will evaluate an efficient propulsion system by testing a fully parallel hybrid propulsion system that enables batteries to be recharged in-flight. Its new aerodynamic architecture is intended to reduce fuel consumption, by reducing mass and drag. With a target of reducing carbon emissions by 50%, many an innovation will be tested and featured on the DisruptiveLab. *Rotor* is taking a look at the top five which Tomasz is most excited about:

1. "A helicopter's rotor hub is responsible for roughly 40% of the drag in a flight. The DisruptiveLab's hub includes our entire blade concept with integrated dampers, which is completely compacted. Compared to previous helicopters, it offers a reduction of 40% of drag. It is really an enormous step forward."
2. Whilst it might not immediately be apparent as a source of drag, the landing gear can also have an impact on aerodynamic performance. "On every helicopter, there is always a compromise between the rotor and the landing gear, due to ground resonance. Here we are testing a completely new concept, it is highly



integrated and allows us to significantly reduce the drag."

3. The shape of the fuselage is also designed to improve efficiency. "We tested 40 configurations of the fuselage in a wind tunnel. The one we selected enables us to reduce drag by 20% compared to the previous version," notes Kryszinski. "We also simplified the tail to reduce maintenance."

4. The Fenestron has also been redesigned to reduce the number of mechanical parts. "It has 40% fewer compared to the previous version. The best mechanical part is the part you don't have – as it will never need to be maintained. This modulated Fenestron is even quieter, easier to maintain and the diameter of the hub has also been reduced. This reduces a global part of the tail, so consequently it reduces drag."

5. With the DisruptiveLab, Airbus will also introduce reversible hybridisation, which allows transmission of power from the turbine to the batteries and vice versa. This will allow a huge reduction of CO₂ emissions.



FLIGHTLAB

Airbus started work on its first demonstrator, the FlightLab, in 2020. The FlightLab uses an existing H130 platform and is mainly dedicated to researching and developing technologies related to enhanced autonomy and safety technological bricks.



Fuel for thought

The aviation industry recognises sustainable aviation fuel (SAF) as a key pillar in its decarbonisation strategy. Neste's Vice President Europe of Renewable Aviation, Jonathan Wood, explains what the company is putting in the pipeline to meet the surge in demand for renewable fuels.



HOW IS SAF DIFFERENT AND WHAT ARE THE ADVANTAGES FOR OPERATORS?

Jonathan Wood: SAF is a direct replacement for regular fossil jet fuel but rather than bringing more carbon out of the earth and putting it into the ecosystem, we are instead recycling carbon by using waste biomaterials. Firstly, it delivers a net carbon emission reduction versus fossil jet fuel, amounting to roughly 80% over the fuel's life cycle. Another advantage of SAF is that it is approved as a normal jet fuel that can be used in any aircraft or helicopter once blended with regular jet fuel, so there is no need for new infrastructure. Our ambition is to grow the renewable fuel market as quickly as possible. That means not just the physical production and supply, but also making it as easy as possible for people to choose to fly with SAF.

HAS THE SAF TOPIC CHANGED IN RECENT YEARS?

J.W.: The topic of SAF has taken off massively. We're supplying SAF on an ongoing basis in three major regions: Europe, the Americas and Asia Pacific. Now the debate [within the industry] has changed from 'do we need to do decarbonisation?' to 'we have to'. SAF is going to be the means that delivers the majority of the decarbonisation that we, as an industry, need to achieve. It's massively different to how it was three or five years ago.

Multi-year contracts have been signed and there are many production projects in the pipeline. Interest from helicopter operators has also grown. We're seeing an interest from air ambulance work as well as offshore work servicing wind farms in the North Sea.

HOW MUCH SAF IS BEING USED RIGHT NOW? WHAT IS NESTE'S TARGET TO SCALE UP PRODUCTION?

J.W.: In 2022, Neste produced around 100,000 tonnes of product. We cannot be sure how much product from other suppliers is out there but it's safe to say that if you consider the overall jet fuel demand, which pre-Covid was over 300 million tonnes, SAF met about 0.1% of total demand. Neste will grow its production capacity to 1.5 million tonnes by the end of 2023. A massive increase. There are also many other projects advancing worldwide. Many independent studies suggest that we could achieve 10% SAF provision by 2030.

WHAT ARE THE CHALLENGES TO INCREASING SAF USAGE?

J.W.: Investing in SAF production requires significant investment. To achieve the industry decarbonisation target, we need to invest hundreds of billions of dollars. Projects need to be de-risked to get financed and there needs



to be as much certainty as possible on demand and revenue. Governmental policy is important because it has an impact on creating the necessary demand certainty. Supportive policy like mandates would lead to an increase in projects being given the green light.

AIRBUS AND NESTE SIGNED A MEMORANDUM OF UNDERSTANDING TO WORK TOGETHER IN 2022. WHAT ARE THE BENEFITS TO WORKING TOGETHER ON PROJECTS SUCH AS THESE?

J.W.: As one of the top two aircraft manufacturers in the world, Airbus has enormous credibility and is key to the decarbonisation of the industry. The benefits include working together on product specification issues, with the aim of getting approval for an increase in the SAF ratio permitted, meaning it can be used as a pure fuel. For example, currently Airbus helicopters can all fly with as much as 50% SAF but we are working together to increase the ratio to 100%. We also want to work together when speaking to key policy makers about ways to promote usage of SAF, as well as better understanding the non CO₂ benefits from flying with SAF. We are also exploring ways to work together with key industry stakeholders when selling our products - so that we can stimulate further the voluntary demand for SAF.

1: An ACH130 on a runway standing by for refueling with Neste SAF.

2: A vial of SAF – every Airbus helicopter can currently fly with a 50% blend of SAF.

3: A ground crew member gets ready to refuel an aircraft.

FLIGHT PATHS TO REDUCED EMISSIONS

Pioneers for the greater good

With 1.2 million missions in over 50 years of saving lives, air rescue operator ADAC Luftrettung is a true pioneer of helicopter emergency medical services (HEMS). However, as a non-profit organisation, it also wants to break new ground in reducing CO₂ emissions. CEO Frédéric Bruder explains why the company takes the responsibility for protecting the environment equally seriously.



WHAT ARE THE MISSIONS THAT ADAC LUFTRETTUNG PERFORMS?

Frédéric Bruder: As pioneers of air rescue, we have been helping people in acute health emergencies for more than 50 years. With more than 50 rescue helicopters and 37 air rescue bases, the non-profit ADAC Luftrettung is one of the largest air rescue organisations in Europe, with more than 1.2 million dedicated HEMS missions to-date. Our life-saving work during the 2021 Ahrtal (Ahr Valley) flood was particularly prominent. Up to six ADAC rescue helicopters were active in the flooded areas. In total, our flying “Yellow Angels” (Gelbe Engel) completed more than 200 rescue missions in the disaster area in July and August 2021, including 111 winch rescues. The dedicated ADAC helicopter “Christoph 23 Bravo”, which was specially deployed to the Ahr Valley, flew 36 special missions with rescue winches in the first few hours at dawn to save people from roofs or balconies of houses trapped by water.

WHEN DID ADAC LUFTRETTUNG FIRST USE SUSTAINABLE AVIATION FUEL?

F.B.: On 7 June 2021, an ADAC Luftrettung rescue helicopter flew on sustainable aviation fuel (SAF) for the first time, setting a new milestone in international aviation. The Airbus H145 rescue helicopter, with its Arriel 2E engines, was ceremonially refuelled with biofuel, a type of SAF, at the air rescue base



at Munich’s Harlaching Hospital. The H145 used a second-generation biofuel for the first rescue helicopter flight worldwide. We subsequently expanded our commitment and have initiated two scientific research projects. Since December 2021, we have been testing the use of SAF at our “Christoph Rheinland” air rescue base at Cologne/Bonn Airport. In cooperation with Safran Helicopter Engines, Airbus Helicopters and the National German Aerospace Centre (DLR), we are investigating the long-term effects of bio-kerosene on the technology and engines of the Airbus H145 helicopter. In September 2022, we went into trial operation with another site. In Aachen, “Christoph Europa 1” is also flying rescue missions with bio-kerosene. An Airbus H135 with Pratt & Whitney engines is used there. The HEFA blend is currently between 31% and 35%, which means that a CO₂ reduction of 25% can already be achieved by using SAF. With an increase in the proportion of biofuel, potential CO₂ savings of 80% and more will be possible in the future. The goal is to accumulate 1,000 flight hours with SAF in each of the two research projects.

WHY DID YOU MAKE THIS A PRIORITY?

F.B.: We have always been pioneers at ADAC Luftrettung. Although our primary mission is to save lives with our rescue helicopters, we are of course aware of the impact our type of operation has on the environment. By the way, not only in terms of emissions, but also in terms of noise



and many other aspects. Based on our by-laws and our statute as a non-profit organisation paired with our will to be pioneers for the greater good, we want to play an active part in achieving the ambitious climate targets in Germany and Europe. Sustainability is a central issue for ADAC Luftrettung, and we are increasingly aligning our company and our actions to it. We have set ourselves the ambitious goal of being a pioneer in CO₂ reduction in air rescue on a global scale.

1: ADAC Luftrettung set a new milestone in international aviation when its H145 flew with SAF for the first time on 7 June 2021.

2: Its current blend of SAF offers emissions reductions of 25%.

3: With more than 50 rescue helicopters, ADAC Luftrettung is one of the largest air rescue operations in Europe.

FLIGHT PATHS TO REDUCED EMISSIONS

Investing and offsetting

Sustainable aviation fuel is not the only method operators can use to achieve a net reduction in emissions.

Rotor caught up with Tim Boyle, General Manager and Accountable Executive of Blackcomb Helicopters, who fly an array of missions in British Columbia, Canada, and Jaspal Jandu, CEO of the aviation leasing company LCI – they filled us in on their strategies to minimise and offset their CO₂ emissions.

HOW DO YOU MEASURE THE CO₂ OUTPUT OF EACH HELICOPTER IN YOUR FLEET? WHAT KIND OF MECHANISMS ARE YOU USING?

Tim Boyle: In order to do the best job of deciding how much, and how to, offset, we work with a partner out of Victoria. They apply a proven auditing system to our company and they look at all aspects of operations. Obviously, the consumption of kerosene is our number one contributor to our carbon footprint. However, we also look at commercial flights that our crews take, repositioning, transport, ground transport and all aspects of our business from how we handle recycling to electric, providing charging for electric vehicles for our employees at our facilities and modernising our own fleet towards electric as well. So, with that process, we establish as close as possible how many tonnes of carbon we're emitting. We just completed an audit here in the last few weeks and our organisation consumed 4,600 tonnes of CO₂. And we will offset 100% of that. We work with the Nature Conservancy of Canada on a project in the West Kootenay Mountains, where a large area is referred to as the Dark Woods Conservancy, and it is setting aside this forest for the next 100 years minimum. This would have been logged. It is pristine forest the logging industry was very interested in. The Nature Conservancy took the steps of protecting that and managing that. So, for now, it's the first step. We all know offsetting isn't perfect, but it's what's available to us at this time. Of course, we're looking forward to the availability of sustainable aviation fuel as our next step.

AS A LESSOR, WHAT DIFFERENT SUSTAINABILITY ELEMENTS DO LCI CONSIDER WHEN DECIDING ON NEW HELICOPTERS?

Jaspal Jandu: LCI is an aviation leasing company and we are actively addressing sustainability challenges in three key areas. Number one, at a business level, we are running our products, business and leasing platform as efficiently as we possibly can. Number two, we are investing a significant amount of capital in new-technology aircraft and promoting the use of SAF and SAF-like fuels in such products. Number three, we are raising awareness and engaging at a broader level to ensure that financiers and investors



3

understand how important sustainability is – I think as a leasing company, we are uniquely positioned to drive that message home. In terms of asset investing, we have a broad range of assessment criteria. Of course, any near-term improvements in operating performance, particularly in payload or range, are attractive. However, we also take a longer-term view on how attractive an asset may or may not be in 25 or 30 years' time. Over such horizons, it can be said that sustainability arguments will only get louder from their current volume and, therefore, they become even more important to us. For example, we have just recently made an order with Airbus Helicopters for the H175, which incorporates modern and incredibly fuel-efficient technology, and the helicopter can perform missions that older technology simply can't match. In addition, we are part of Airbus Helicopters' Sustainable Aviation Forum, which looks to provide feedback on how we're going to use SAF in the technology products and what it means for a long-term residual value. I can only speak from experience by saying sustainability and general social consciousness is becoming a very important factor in how we allocate capital in this sector.

- 1: Tim Boyle, General Manager and Accountable Executive of Blackcomb Helicopters.
- 2: Jaspal Jandu, CEO of the aviation leasing company LCI.
- 3: Blackcomb Helicopters fly an array of missions in British Columbia.
- 4: Boyle (left) and Jandu (second right) discussed the importance of reducing emissions with Airbus Helicopters CEO Bruno Even (second left) and Head of Innovation Tomasz Krynski (right) moderated by Airbus' Alex Lepa.



1



2



4

The Grand Départ: SAF on Tour

Helicopters play an essential role in the live broadcasting of major sporting events. The use of sustainable aviation fuel (SAF) is a powerful lever for reducing their carbon footprint. The Tour de France and HBG group's helicopters are a case in point.



HBG is a family-owned group with various brands, including Mont Blanc Hélicoptères and Hélicoptères de France. Each of these two companies has its own area of excellence: the former for EMS, the latter for aerial work, fire fighting and support for world-class events. Examples include the Dakar Rally in winter and cycling races the rest of the year, culminating in the Tour de France in July. "We use seven to nine helicopters for this big race," explains Jean-Marc Genechesi, pilot, instructor and director of Hélicoptères de France. "Our helicopters are in fact used by two clients: ASO, the organiser of the Tour, and Euromedia (for France Télévisions), which provides the images that are broadcast around the world."

PERFECTION AND FLUIDITY

Needs vary from one to the other: ASO uses helicopters to move VIPs or organisers and single-engine H125s are sufficient. The case is different for France Télévisions, which only works with twin-engine H125s for filming. "A motorisation required for all low-level flights," explains Jean-Marc Genechesi. "The perfection and fluidity of the images provided throughout the different stages of the Tour cleverly conceal the complexity of the organisation, with, for example, strict routing requirements and the need to set up numerous temporary helipads to refuel the aircraft."



Furthermore, since last year, the use of biofuel (sustainable aviation fuel, or SAF) has become a requirement.

ENVIRONMENTAL TOUR

"Reducing the carbon footprint has been one of the Tour's main concerns for several years," says Jean-Marc Genechesi. "Just as electric cars have been introduced to the convoy, last year ASO asked us to cover a third of all stages with SAF fuel, which we did." Technically, this is a non-event: the Arriel engines from Safran Helicopter Engines are certified to run on fuel supplied by Total, which can contain up to 50% biofuel. With this level of SAF, the carbon footprint of the helicopters is reduced by a third, with no change in consumption or power output compared with traditional fuel. "Last year, we had a logistical problem with SAF," Genechesi explains, "because Total only had one storage and delivery point in the south of France. For the 2023 Tour, SAF will be available at several airports, which will help us achieve even more ambitious consumption objectives." Hélicoptères de France plans to use SAF for 50% of the stages for ASO and 30% for France Télévisions. A small breakthrough for a major event.



1: Jean-Marc Genechesi, pilot, instructor and director of Hélicoptères de France.

2: Helicopters play an essential role in relaying the images from the Tour de France to millions of spectators every year.

3: High above the French countryside.

4: A fleet of helicopters ready to fly into action.

5: The best way to get a view of the Viaduc de Millau during the Tour de France.



Aid first

In December 2022, Airbus announced that one of the initial use cases for its electric vertical take off and landing (eVTOL) prototype would be medical operations.

Airbus' Head of UAM Balkiz Sarihan explains how CityAirbus NextGen's unique capabilities will support medical operators and, more importantly, their patients.



1

WHAT WILL CITYAIRBUS NEXTGEN OFFER TO HEALTHCARE OPERATIONS THAT TRADITIONAL ROTORCRAFT CANNOT?

Balkiz Sarihan: We are analysing specific missions, working hand-in-hand with our operators and looking at their various mission profiles in order to understand their requirements. For operators seeking to integrate the CityAirbus NextGen into operations, their key drivers might be patient or equipment transfers, or doctor drop-off. It is a question of using the right asset for the right mission in the rescue chain, to have the best possible patient outcome. We're focusing on what is really unique and what really is different about the eVTOL and that is the 'e'. Electrification opens up new possibilities, centred on reducing carbon emission and lowering sound levels. With the arrival of the CityAirbus NextGen, operators will be able to decide whether they need the capabilities of a traditional rotorcraft, such as a helicopter's power and range, and where an electric aircraft capable of operating in urban environments with reduced sound might be complementary.

ARE THERE PARTICULAR AREAS, CITIES OR COUNTRIES WHERE



2

THIS KIND OF TECHNOLOGY WILL BRING ADDED VALUE?

B.S.: For medical services, there are two environments where the CityAirbus NextGen could be particularly useful. Firstly, the city archetypes with highly dense, urban populations where reducing sound levels is a priority. Secondly, distributed communities, spread over large areas where the capacity to send medical aid and first response to remote areas quickly, is currently challenging. This is confirmed by operators; we're speaking to some of the most advanced and reputable medical services carriers around and their only mandate is to respond to the needs of the communities and people that they serve. We are in constant dialogue with specific experts in the field, allowing us to feed a multitude of perspectives into our pre-design team, which we then use to push the specific capabilities of the product that we are designing to match the needs of our operators.

HOW WILL THE ARRIVAL OF ADVANCED AIR MOBILITY AND EVTOL TECHNOLOGY AFFECT THE HEMS MISSIONS FLOWN BY 'TRADITIONAL' HELICOPTERS?

B.S.: This is where the idea of complementarity

comes into play with UAM. Ultimately, operators have various, often differing, needs dependent on a range of factors, but they will certainly want to have the advantageous option of being able to choose from a variety of trusted Airbus products for their fleets. In the future, we would like CityAirbus NextGen to be part of this choice. The ultimate goal is to have a rapid response time and to further increase the efficiency of an overall EMS system, which we can complement with increasingly efficient products in our offering.

HOW LONG WILL IT BE UNTIL WE SEE THE CITYAIRBUS NEXTGEN FLYING MEDICAL MISSIONS?

B.S.: This technology will arrive in the second half of the decade. We are building something that must be sustainable and viable, with the technology sufficiently matured. We must deliver the level of trust that people expect from Airbus products. That is why choosing the first use cases is crucial. Sustainability is also about considering how we add value to citizens and communities. Medical services are an essential human right and our priority is to use technology to improve access to healthcare for everybody.

1: Balkiz Sarihan, Head of UAM at Airbus.

2: CityAirbus NextGen can play a variety of roles in supporting doctors and their work.

Beyond the vehicle

Improving the quality of life for people all over the world, creating social welfare and enhancing healthcare systems is an ongoing and developing priority for almost everyone. That's why Airbus' latest programme is not an aircraft, or anything that flies, but instead responds to the growing medical challenges the world is facing.

- 1: Hubertus Groepper, LifeSaver Programme Manager.
- 2: Nick Peters, International SOS' Government Services CEO.
- 3: Joonas Vanto, Director of Invest Estonia.
- 4: Estonians engaging with another digital innovation – a delivery robot.
- 5: Estonia's geography, with 2,222 islands and vast forests, has emboldened the country's digital innovation.
- 6 & 7: Staying connected outside of large cities is a priority in Estonia.



The technology set to usher in a new era of aviation not dependent on fossil fuels will certainly create opportunities in many fields. While the arrival of drones and electric vertical take off and landing (eVTOL) aircraft could improve the provision of healthcare, effectively integrating it into the existing ecosystem requires careful planning. Enter Airbus, with its new LifeSaver solution.

NEW WORLD, NEW NEEDS

Planning and building a robust medical ecosystem is a challenge. Governments and healthcare providers must plan for a range of factors, such as increasingly ageing populations and recruiting and retaining sufficient numbers of medical professionals. Today's context introduces new complexity such as greater health impacts from the effects of climate change, managing volatile economic markets and enhancing readiness for potential crises, such as global pandemics, as LifeSaver Programme Manager Hubertus Groepper attests: "Organising an effective emergency response is challenging. There are many elements that all have to work together, from alerting and dispatching to medical treatment at the scene all the way to the hospital, and using a variety of transportation means on ground, on water and, of course, in the air." With revolutionary technology promising new opportunities, selecting the tools to build an optimal public health system becomes increasingly complex. As a leader in the aviation industry and a key developer of innovative new eVTOL technology, it is natural that Airbus has been analysing how this technology should be integrated. This is the essence of LifeSaver, a partnership



between Airbus and International SOS. Maximising the input from each partner, the solution combines digital technology and public health expertise and makes that available to a country. "From design to implementation to scaling of concrete improvement initiatives, LifeSaver is really a long-term partnership with a country. It is not about a specific helicopter or vehicle. We're working in the background as a system integrator, not operating emergency services," explains Groepper.

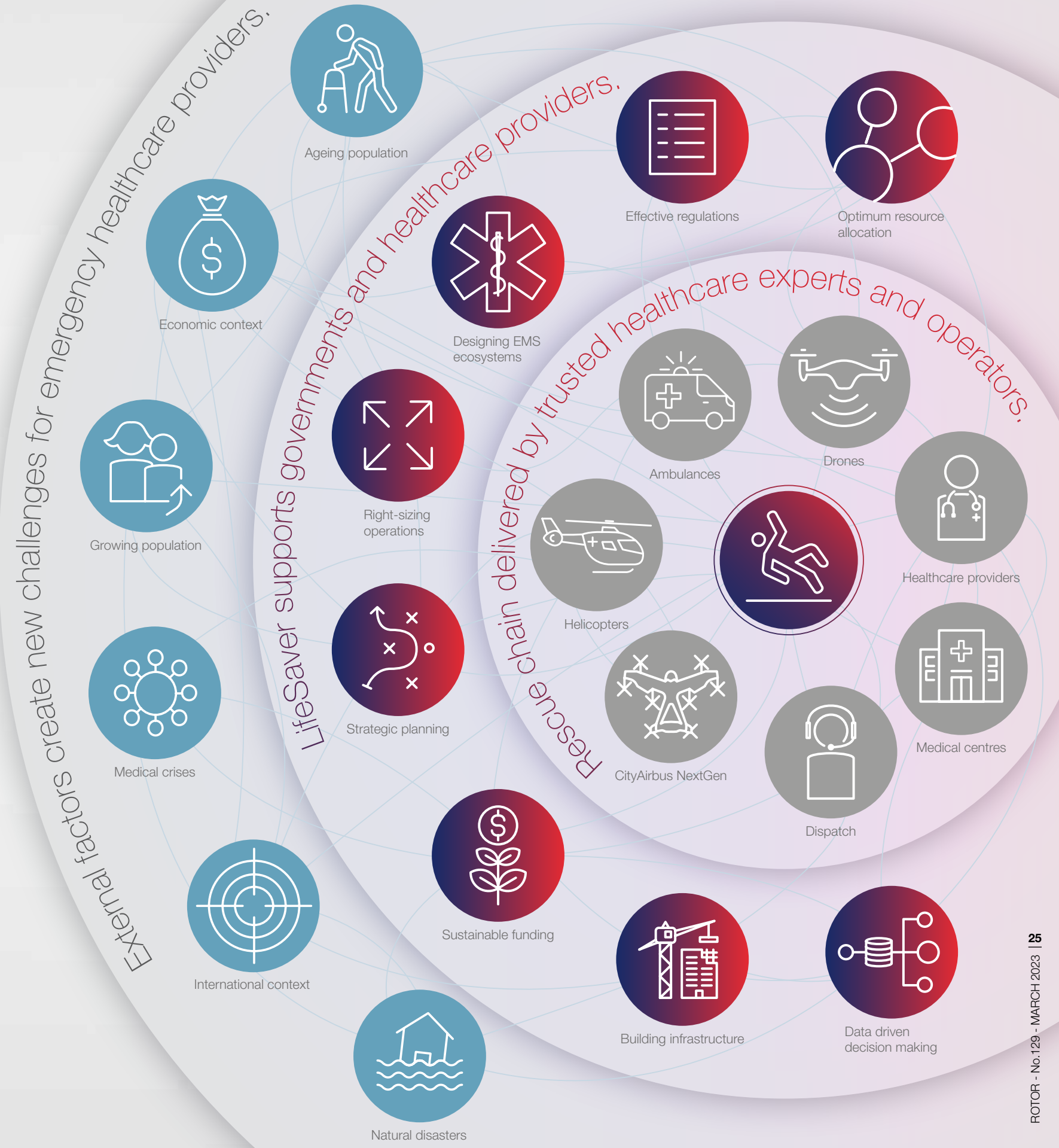
ONE PRIORITY: PATIENTS

The partnership's framework for success places the patient firmly at the heart of the solution. As Nick Peters, International SOS' Government Services CEO, explains: "the one thing that is core to all health care systems, whether you're looking at very sophisticated, developed health care systems or developing health care systems, the primary motivator is about better patient outcomes. Simply: how can you save more lives and how can you have a quality of life after a medical intervention that allows people to continue to be productive within their communities? That's what LifeSaver is fundamentally going to be measured against." One country that sees significant value in LifeSaver is Estonia, with exactly 2,222 islands, vast forests and a reputation for being at the forefront of digital innovation. When it comes to ensuring healthcare access for its citizens, Estonia implicitly understands the value disruptive technologies offer, as well as recognising the challenges of adopting them. "Our principal aim is to use this innovation for better patient outcomes, with direct social benefit for Estonians. We are developing our emergency medical services but as Estonia is already recognised as a key innovation incubator, we see LifeSaver as another example of our success in applying modern approaches to overcome challenges. We are proud when other countries benefit from solutions developed here in Estonia," says Joonas Vanto, Director of Invest Estonia.

LifeSaver

Preparing the future of emergency healthcare systems

Through sophisticated data analysis and consistent operating standards, LifeSaver supports governments with the design and evolution of integrated emergency medical systems to save more lives.



Paris Dakar Rally



ECUADOR THE ALL-TERRAIN GUARDIAN ANGEL OF THE ANDES

Ever since the Ecuadorian Air Force (FAE) received its first H145 helicopter one and a half years ago, they have been in constant action to provide vital services for citizens. From assistance during natural disasters to anti-drug trafficking missions and evacuations, the H145 brings out the best it has to offer in the heights of the Andes.

Article: Belén Morant

Ecuador suffered devastating floods in July of 2022: 10 rivers burst their banks, with slips affecting roads and trapping thousands of people. Known as the Cobra in Ecuador, the H145 helicopters of the FAE sprang into action to airlift stranded inhabitants located following reconnaissance flights over the most severely affected areas. "The Ecuadorian winter was particularly wild in the ranges and on the eastern coast," explains Major Luis Armas of the FAE. "We used our H145 helicopters to perform essential SAR and medevac missions and airlifting of supplies to places where

the roads had been washed out." The Cobras have clocked more than 2,000 flight hours since the first H145s entered into service in May 2021, mostly consisting of operations of vital importance to the local population such as those described above.

THE H145 FLEET: SERVING THEIR COUNTRY

The Ecuadorian Air Force received the last three of a total of six H145 helicopters in April 2022. These helicopters are configured for combat search and rescue (CSAR), medevac, fire fighting, humanitarian

THE COBRAS: KEY FIGURES

- 12 medical evacuation (medevac) missions
- 30 support missions during natural disasters
- 35 surveillance missions for the national oil and gas pipeline industry
- 18 anti-drug trafficking missions
- 25 public security operations
- 25 reconnaissance operations
- 92 transport missions for government and military authorities
- 42 troop and cargo transport missions to support military operations

aid and tactical troop transport missions, among others. They are incredibly versatile due to their extensive range of special features, including a rescue crane, jungle penetrators, external cargo hook, weapon mountings, armour plating, night vision goggles, electro-optical systems, fast-roping and rappelling systems and emergency floatation gear. "One of the factors that led us to choose the H145 was its excellent performance in the hot and high-altitude conditions typical of the city of Cuzco in Peru. That was where we carried out the capability assessment flight as members of the technical committee during the project development phase," said Major Luis Armas. "Compared with the competitors we analysed, the H145 met all our requirements, but the most decisive factor was its performance in hot and high-altitude conditions." Indeed, the H145 has proven itself to be perfectly adapted to the conditions of the Andes. In recent years, it has achieved a number of feats, including landing where no other twin-engine helicopter has ever landed before: the summit of Aconcagua at a height of 6,962m.

READY FOR THE MOST DEMANDING MILITARY MISSIONS

While the FAE's H145 fleet is mainly used to provide assistance for the civilian population on vital SAR, medevac and support missions during natural disasters, over recent months they have also proven their worth for military and law enforcement operations. "In the month of June, there were significant protests in Ecuador and many parts of the country were cut off. During this period of civil unrest, the H145s carried out various public security operations across the country along with



life-saving medevac missions for both military personnel and civilians," explains the Major.

A LONG HISTORY OF MUTUAL TRUST

The Ecuadorian Air Force is the main military customer for the H145 in Latin America. Its contract consists of a complete package embracing the helicopters themselves, special mission equipment and logistical support. It also includes full training for 12 pilots and 15 technicians covering everything from basic instruction to specific training for special operations, as well as an operational exchange with members of the French National Gendarmerie to share knowledge on public security operations. "Airbus Helicopters has provided full support for the programme to purchase these six H145s in each of the execution stages, including training, logistical support and knowledge transfer; they have even gone above and beyond the terms agreed in the contract. In doing so, Airbus Helicopters is supporting the Ecuadorian Ministry of National Defence in its efforts to develop new operational capabilities with the H145," concludes Major Luis Armas.

1: The H145s of the FAE are equipped with oxygen systems developed specifically by Airbus for this programme in Ecuador to allow operations in areas with limited oxygen due to the high altitude.

2: The relationship between the FAE and Airbus Helicopters began 50 years ago following the purchase of the first Alouette helicopters in 1972.

3: The FAE's H145 fleet is mainly used to provide assistance for the civilian population on vital SAR, medevac and support missions during natural disasters. Over recent months they have also proven their worth for military and law enforcement operations.

4: An H145 Cobra.

NEW MEXICO CAMPING 101: TAKE A FLASHLIGHT AND AN H145

A grateful troop of Boy Scouts owe their rescue to the New Mexico State Police and an H145. *Rotor* takes a closer look.

Article: H. Couthaud

“The only way to get to the scene was via helicopter.”

Sgt. Kevin Killpack, pilot with the New Mexico State Police



In early October 2022, 27 Boy Scouts and adults set out from the visitor centre in New Mexico’s Gila National Forest to camp amid its stunning cliffs. Heavy rain caused the river to rise and split around their site, cutting them off. Responding to a call, the Santa Fe National Guard and New Mexico State Police (NMSP) initiated a rescue, the latter with their hoist-equipped H145. All 27 campers were located and hoisted out, thanks to old-fashioned smoke signals and a very modern helicopter.

A TORTUOUS FLIGHT PATH

Launching from Double Eagle airport in Albuquerque, Sgt. Kevin Killpack, pilot with the NMSP, was joined by hoist operator Kurtus Tenorio, tactical EMS medic Jodie Esquibel and rescue specialist Steve Montano. Rain and low cloud ceilings forced Killpack to divert course to avoid storm cells. The 10,000-foot-high mountains also impeded a straight route in, so he refuelled sixty miles east of where the Boy Scouts were camped. Another shot: this time from the north and staying at 100 feet, Killpack tortuously worked his way around higher terrain. “We had determined the night before that the only way to get to the scene was via helicopter,” he says. “We were never sure we were going to make it until we were only about five miles away.”

TWO AT A TIME TO SAFETY

Once on scene, they had to maximise time and fuel. While Killpack kept the H145 in a stable 100- to 200-foot hover, Tenorio lowered Esquibel and Montano to the waiting campers.



There, they harnessed two Scouts at a time to the hoist’s hook; Tenorio winched them up and into the H145’s cabin. “There were a lot of high fives and smiles. Those kids were definitely brave,” says Tenorio. The team were acutely conscious of their helicopter’s gross weight. Calculating in real time, Killpack was able to tell Tenorio how many more children they could carry, who then relayed that to his ground team so they could pack up the most passengers. “We train for this,” says Killpack. “But the aircraft is easy to work with. The computer system gives me information about our weight and how much power I have.”

THE MISSING FOUR

Any thought of landing was ruled out due to trees and cliffs, leaving only two hoist-equipped helicopters to fly people to safety. Halfway through the mission, the NMSP learned about a smaller group of campers who had set off down the river. Fortunately, the small party of four lit a fire and sent up a smoke signal. “We flew over them multiple times coming in and out of there. We never would have seen them if we hadn’t seen the smoke,” Tenorio says. Besides the hoist, the NMSP helicopter carries a forward-looking infrared, search light, loudspeakers and satellite antennae, plus a tactical flight operator station—overall, 1,500lbs of mission equipment. With just a single helicopter for the state, they use the H145 for



everything from assisting tactical law enforcement squads, to working with the FBI and Homeland Security. And of course, doing search and rescue. Seventeen hours after starting out, the mission ended. Such was the intensity of the rotorcraft’s activity – six roundtrips from the Boy Scouts’ site to the visitor centre – that their refuelling runs had exhausted gas reserves at the town of Truth or Consequences, grounding Killpack and his crew while they waited for a fuel truck. Killpack is unfazed. “You just do your job like you’re trained for. We were all happy with the way this mission went.”

1: The New Mexico State Police rescued 20 children and adults, helped by the National Guard who rescued 7.

2: The H145 of the New Mexico State Police was the only civilian asset in the state of New Mexico able to carry out this mission, thanks to its hoist and power reserves.

3: Heavy rain and flooding trapped a troop of Boy Scouts in New Mexico on 8 October 2022.

THE ALOUETTE III RETIRES

After 60 years of service and 330,000 flight hours, the last Alouette III helicopters operated by the French Navy were withdrawn from service at the end of 2022. The end of an amazing era, but also the beginning of a new one, with the upcoming arrival of the first H160s.

Article: Alexandre Marchand



Often compared to a moped with a large luggage rack, the Alouette appealed because it was easy to maintain and operate, versatile and available. Its technical success meant that the French Navy's 37 Alouette IIIs were constantly in action. On land or aboard frigates and aircraft carriers, the Alouette was always ready for any mission. Search and rescue, surveillance, light transport, anti-submarine or anti-narcotics, liaison, training, etc. Overseas, the aircraft's robustness was praised everywhere, from New Caledonia to the West Indies, Polynesia and Reunion Island. There was a time when Alouettes could be found in all four corners of the globe. Its availability was legendary: "During my last deployment in Martinique, only one flight was cancelled in two and a half months of operation," one pilot recalls. "And despite its age, the Alouette played its role well: we did a lot of anti-narcotics work alongside a Panther. The Panther dealt with fast ships, but we were able to deal with the 'slow movers'."

'SILENT WOLVERINE'

A few weeks before its final retirement, one of the last three remaining operational helicopters was loaded onto the BCR (Command and Supply Ship) *Somme* as part of Exercise Silent Wolverine. In the twilight of its career, the Alouette was given the opportunity to work shoulder to shoulder with the battle group of the USS Ford, the US Navy's newest aircraft carrier. Earlier in the year, another Alouette carried out the last long term embarkation on the anti-submarine frigate (FASM, Frégate Anti Sous-Marine) *Latouche Tréville*. Until the end of 2022, the last three Alouettes continued to serve the French Navy by monitoring



AT A GLANCE

- March 1959:** first flight of the first prototype, flown by Jean Boulet
- June 1961:** first flight of the first production series
- 1962:** First delivery to the French Navy
- 48 Alouette III** remain in service with 19 operators
- 52 Alouette III** served in the French Navy
- More than **7 million flight hours**
- More than **1,400 helicopters** produced

the Goulet de Brest to protect the nuclear-powered ballistic missile submarines, the SSBN (Sub Surface Ballistic Nuclear) of the French nuclear deterrent.

A CHERISHED ANTIQUE

Of course, the performance level was nowhere near the level expected from a modern military helicopter. The Alouette did not exceed 110kts and, at that speed, its range was limited to 290NM. Above all, its equipment was extremely basic and outdated, as were its canvas and tube seats. On the SA316B, the very first model, the joystick had no anchor, and the aircraft had no trim. It was impossible to let go of the flight controls! "In recent years, when we landed on a field, people would rush to see the antique," says one pilot. What remains today is the image of an intelligently designed aircraft with exceptional visibility that never let its crews down. These are all characteristics that define the H160, the first of which has recently been delivered to the Lanvéoc-Poulmic base as part of the interim fleet. More powerful, faster, with better endurance and latest generation avionics, the H160 offers all the qualities required to open a new and exciting chapter in the history of the Naval Air Force.



1: A French Navy Alouette – a pioneering aircraft that paved the way for many helicopters to follow.

2: The Alouette performed a variety of missions for the French Navy.

3: Flying in formation.

MEET THE FIRST ALL-FEMALE CREW TO FLY AIRBUS' NH90 IN NEW ZEALAND

Flying missions ranging from Army battlefield support, to search and rescue and amphibious operations, the Royal New Zealand Air Force's No. 3 Squadron truly demonstrates the essential role helicopters have, but one crew in particular is blazing a trail in military aviation.

Article: Isis Franceschetti

“There has been a shift in the aviation industry to showcase the role for both females and males.”

Flight Lieutenant Nicole Brooke

Flight Lieutenant (FLTLT) Nicole Brooke, Flying Officer (FGOFF) Hayley Vincent and Flight Sergeant (F/S) Jen Hart are part of the all-female No. 3 Squadron crew of the Royal New Zealand Air Force. In operational theatres where every second counts, agility is their motto. “Crews operate in a dynamic environment, with training flights often encompassing multiple disciplines and flight regimes,” said FLTLT Brooke. In these conditions, solidarity is a necessity. F/S Hart explains: “We are very lucky that we have a close-knit unit who are all friends, so we know how each of us operates.”

INNUMERABLE MISSIONS SUPPORTED BY THE NH90

3 Squadron gathers skilled and passionate aviators, who are able to operate in environments where crews are given a high level of trust and flexibility with a strong safety culture that underpins airborne decision making. “What I find most thrilling about this job is the variety of our work and people we work with,” says FLTLT Brooke. Mountain flying during a search and rescue mission, amphibious operations in the Tokelau’s or Sub-Antarctic region and operating with Army and police units in a battlefield or counter terrorism capacity are

all part of the team’s day-to-day missions. They can also depend on a considerable ally: the fleet’s eight NH90 helicopters. With a unique blend of capabilities, the rotorcraft excels at the diverse range of 3 Squadron’s missions. Its large cabin, twin-engine power output, tactical self-protection capability and a complete anti-icing system make the NH90 a trusty workhorse: “A key NH90 output is National Contingency (NATCON), where an aircraft and crew are on short notice to move, ready to react to any sort of domestic crisis or emergency event. This typically takes the form of a search and rescue, or domestic natural disaster response,” says FLTLT Brooke. The Christchurch Floods in 2021 were one of the most challenging missions, where the NH90 once again proved its reliability and versatility. FLTLT Brooke recalls: “The aircraft’s range, speed and weather protection meant the crew could rapidly deploy to Christchurch. We used the aircraft’s hoist system, pilot automation and power output to successfully extract multiple survivors from floodwaters in a night vision environment.”

PIONEERING MILITARY AVIATION IN THE ROYAL NEW ZEALAND AIR FORCE

For 3 Squadron, the NH90 has also become the emblem of a trailblazing milestone: FLTLT Brooke, FGOFF Vincent and F/S Hart form the first all-female crew that flies the NH90 in New Zealand. The team actually came together by chance: “We were programmed to fly together almost accidentally for a deployment on a mountain flying exercise and it



1: Left to right: Flight Lieutenant Nicole Brooke, Flying Officer Hayley Vincent and Flight Sergeant Jen Hart.

2: Left to right: FGOFF Vincent, F/S Hart and FLTLT Brooke in the cockpit of the NH90.

3: FLTLT Brooke (l) finds the variety of the work and people the most thrilling aspect of the job, next to FGOFF Vincent in the cockpit.

4: One of the New Zealand Air Force’s eight NH90 helicopters.

was our friend, photographer Ned Dawson, who put two and two together and realised this was probably the first female crew on the NH90 in New Zealand,” says FGOFF Vincent. This marks an important step for aviation, but most significantly it demonstrates the necessity of considering all fleet members equally, regardless of gender. FLTLT Brooke explains: “I have been incredibly lucky to have a fantastic wings course and workplace that never treated me differently. In 3 Squadron, we are treated exactly the same as our male colleagues.” Displaying the career opportunities that await men and women in the Royal New Zealand Air Force, and most of all, showcasing men and women working together in these roles are crucial elements to inspire future generations. Brooke continues: “There has been a shift in the aviation industry to showcase the role for both females and males. The job really sells itself, we just need to show women what the job actually is.”



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Helping to keep the world a beautiful place, Airbus HCare portfolio offers the best combination of support and services for every customer. Starting the moment an Airbus helicopter is delivered, we'll make sure your operations are carried out efficiently, safely and cost-effectively. Because when your focus is on the mission, our focus is on you.

AIRBUS