

# Rotor

BY AIRBUS HELICOPTERS

**MISSION**

H175: faster than the speed of storms

**NO LIMITS**

Thermal versus electric propulsion: Start your engines!

**LOGBOOK**

Flying at night over the City of Tech

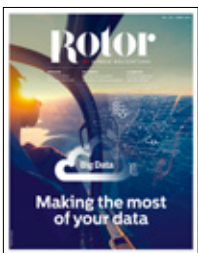


# Making the most of your data

# 08

## FEATURED ARTICLES Making the most of your data

© Nicolas Gouhier



Communication Director: Yves Barillé (Publication Director), Editor in Chief: Belén Morant (contact.rotor-magazine.ah@airbus.com), Director of photography: Jérôme Deulin, Translation: Klein Wolf Peters GmbH, Burton, Van Iersel & Whitney, Munich; Amplexor. Published by: **because.** Printed by: SPI, N° ISSN 1169-9515 (Copyright Airbus Helicopters 2019, all rights reserved). Airbus



Helicopters' logo and the names of its products and services are registered trademarks. Magazine printed on Triple Star, paper originating from sustainable forests.

### IN THE SPOTLIGHT

4/ French Ministry of the Armed Forces brings development of future Joint Light Helicopter forward

### 360°

5/ Events at Airbus Helicopters

### UP ABOVE

16/ Family Flight

### LOGBOOK

18/ Flying at night over the City of Tech

### MISSION

20/ ADAC: One million missions

22/ H175: Faster than the speed of storms

24/ Rough and beautiful: in western Canada with the H135

### NO LIMITS

26/ Thermal versus electric propulsion: Start your engines!

### AROUND THE WORLD

28/ The ARH Tiger: Delivering on its promise

### OFF THE BEATEN TRACK

30/ Chile: A rescue to be remembered



For more information  
[www.airbus.com/Helicopters](http://www.airbus.com/Helicopters)



Follow us on  
[twitter/AirbusHeli](https://twitter.com/AirbusHeli)



Join us on  
[facebook/AirbusHelicopters](https://facebook.com/AirbusHelicopters)



Follow us on  
[youtube/AirbusHelicopters](https://youtube.com/AirbusHelicopters)





© Lorette Fabre

Innovation is part and parcel of Airbus Helicopters' DNA. It is our constant drive to innovate that has made us the world's leading manufacturer of civil helicopters, with an untiring focus on improving the safety, availability and competitiveness of your operations. That selfsame objective also guides us when it comes to renewing the range of services we offer.

Our mission extends far beyond the sale of helicopters. It involves making sure you can continue to use your helicopters to save lives, protect people, and reach the places you need to be, where and when they need you. We want to offer you services that help you get the

**“We want to offer you services that help you get the most out of your aircraft, an objective that now hinges on digitalisation.”**

**Bruno Even**

most out of your aircraft, an objective that now hinges on digitalisation.

Our range of digital services continues to grow. Some of them are revolutionising the way data is read and recorded, such as our new digital log cards for aircraft components. Other solutions, among them FlyScan, use sophisticated algorithms that allow you to do predictive maintenance. You can find all the details in this latest issue of *Rotor*.

The digital revolution is already under way and is having an impact on all of us, manufacturers and operators alike. This is why we strive to support you throughout the whole process, so that no one gets left behind and so you take care of your mission.

IN THE SPOTLIGHT



FRANCE

27 May 2019

**The French Ministry of the Armed Forces brings development of the future Joint Light Helicopter forward.**





© Anthony Pecchi

## FRANCE FRENCH AIR FORCE BOLSTERS ITS FLEET OF H225Ms

The French Defence Procurement Agency DGA has signed an order to purchase an additional H225M, which will be operated by the French Air Force. The aircraft will be delivered in a configuration that allows it to be interoperable with the existing fleet of 10 H225Ms in the French Air Force and in particular, it will be capable of in-flight refuelling, an essential operational advantage that this helicopter offers. The aircraft will be based in Cazaux and will be used for special forces and search and rescue missions.



© Airbus Helicopters

## JAPAN NAKANIHON AIR SERVICE TAKES DELIVERY OF 20<sup>TH</sup> H135

This new helicopter will join Nakanihon Air Service's growing fleet of H135s to support emergency medical service (EMS) missions throughout the country. One of the largest aircraft operators in Japan, Nakanihon operates 45 Airbus helicopters – about two-thirds of its rotorcraft fleet – for a wide spectrum of activities including EMS, electronic news gathering, as well as passenger transport and goods transportation. Nakanihon Air Service also operates an Airbus-approved maintenance centre for H135 helicopters.



© Airbus Helicopters Design Studio

## FRANCE TEAM UP FOR GREENER VERTICAL FLIGHT

A Letter of Intent (LoI) was signed at the Paris Air Show between Airbus Helicopters and Safran Helicopter Engines which formalised their willingness to jointly demonstrate future technologies that will significantly contribute to the reduction of CO<sub>2</sub> emissions and sound levels for future vertical take-off and landing (VTOL) platforms. A number of technological streams will be investigated, including various levels of electrification, higher-efficiency gas turbines or alternative fuels, as well as advanced engine architectures to further reduce the acoustic footprint of turbines. Airbus Helicopters and Safran Helicopter Engines have worked for many years on the development of advanced propulsion solutions, including most recently an innovative electrically-powered “eco mode” enabling the pausing and restarting of a gas turbine in flight on twin-engine helicopters. This technology, which will generate fuel savings and increase range, will be tested on the Racer high-speed demonstrator, developed in the frame of the Clean Sky 2 European research programme.



© Thierry Rostang

## UKRAINE MODERNISATION OF TRAINING CENTRE

Airbus Helicopters has accelerated the set-up of new pilot and technician training capabilities in Ukraine. The company will be delivering an H225 Full Flight Simulator (FFS) that will be based in Kremenchuk, as well as delivering the first two H125s for pilot training purposes by the end of December 2019. Following the Intergovernmental Agreement signed between France and Ukraine for 55 helicopters mid-2018, Airbus Helicopters has already delivered four out of the 21 repurposed H225s on order. The deal also included 10 brand new H145s, eight of which will be equipped with the five-bladed rotor, and 24 H125s for border surveillance, search and rescue (SAR), and emergency medical service (EMS) missions in the country.



© Cara Irina Wagner

**WORLDWIDE**  
**AN ACH145 HELICOPTER FOR USE ON SUPER YACHTS**

Airbus Corporate Helicopters (ACH) has delivered the first of two ACH145 helicopters to a private customer as the first step in a fleet renewal programme.

The two aircraft will be primarily flown from super yachts in the Mediterranean and Caribbean regions on behalf of the owner, who is a long-time user of Airbus helicopters. Isle of Man-based helicopter management and operation specialist, Luvair, will manage the ACH145s as well as an ACH160 that has been acquired. The three aircraft will replace another three currently in service.

Luvair has operated a fleet of VIP Airbus helicopters for almost 20 years, managing every aspect of its clients' operations from operational bases in London, the Mediterranean, the Caribbean and on board some of the largest super yachts in the world.

**CHINA**  
**CHINA'S FIRST H215 DELIVERED TO SGGAC FOR UTILITY MISSIONS**

China's State Grid General Aviation Company (SGGAC) has taken delivery of one H215 – a member of the Super Puma family – becoming the launch customer for this aircraft in China.

A subsidiary of the State Grid Corporation of China (SGCC), the world's largest utility company, SGGAC performs aerial construction and maintenance work along China's network of high and very-high voltage power lines.

The H215 will join the company's existing fleet of 15 Airbus helicopters, comprised of H125s, an H120 and an H225. This addition will enable SGGAC to perform new missions such as cable repair, cable laying, cargo transportation, and power line pylon construction in difficult-to-reach areas.

The helicopter comes equipped with a 4.5-tonne cargo sling, hoists, weather radar, and a wire-strike protection system. The configuration features 17 comfortable seats equipped with oxygen jackets for high altitude missions.



© DR

**CHINA**  
**CHINA'S AIRBUS H135 FINAL ASSEMBLY LINE STARTS OPERATIONS**

Airbus Helicopters has expanded its industrial footprint and partnership with China with the opening of the H135 final assembly line (FAL) in Qingdao. The factory is the first helicopter FAL built by a foreign manufacturer in China, as well as the first H135 FAL outside of Europe.

The opening of this FAL follows a cooperation agreement signed between Airbus Helicopters and China in 2016 for the purchase of 100 H135s destined for the Chinese market. Ninety-five of these 100 helicopters will be assembled on this FAL from 2019 onwards.

The 6,500 m<sup>2</sup> Qingdao plant is composed of four working stations, a paint booth, ground and flight test areas, and a delivery centre. The site will employ around 40 people, 23 of whom received on-the-job training in Donauwörth, Germany.



© DR





© Jonny Carroll

GERMANY

## THE H135 FAMILY REACHES FIVE MILLION FLIGHT HOURS

Airbus Helicopters' light twin H135 family has reached the milestone of five million flight hours recently. This year also marks another anniversary for the H135 family: 25 years ago, the first helicopter took to the sky in Ottobrunn, Germany. Since then, more than 1,300 helicopters have been delivered to customers all around the world, 1,268 of which are still in service today, highlighting the maturity of the family.

The H135 is the unbeaten market leader in light twin-engine multi-purpose helicopters. Traditional missions for this class of helicopters include emergency medical services, law enforcement, VIP and business passenger transport as well as maintenance of industrial wind parks. More than 130 helicopters of the H135 family are in service all around the world for military training missions, where they've clocked up more than 300,000 flight hours.

UNITED KINGDOM

## ACH160: MARKET CONFIDENCE IN THE NEW MODEL

Airbus Corporate Helicopters (ACH) has secured an additional sale for its latest ACH160 helicopter just days before the EBACE 2019 business aviation show in Geneva, Switzerland.

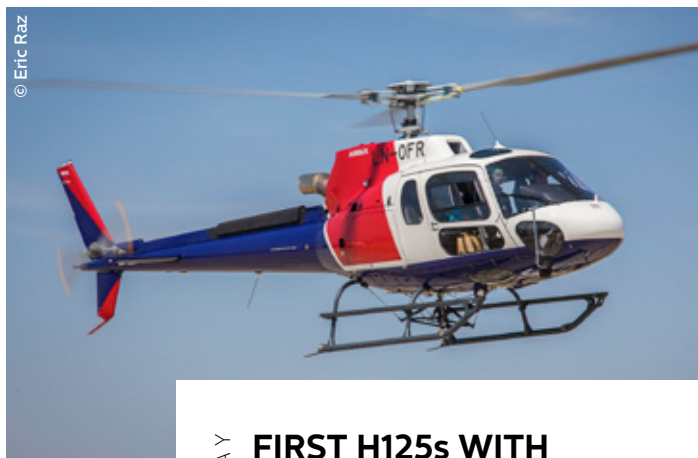
This new order, from an experienced UK helicopter operator which will use it for general corporate purposes, takes the ACH160 orderbook to 11 aircraft, of which four have been ordered in the UK.

Two other ACH160s have been ordered by a privately owned UK company which is also a long-time corporate helicopter user, and a fourth UK aircraft has been ordered by an existing private Airbus Helicopters VIP customer to be managed by Isle of Man-based Luvair.

The H160 medium helicopter programme remains on-track for certification at the end of 2019, to be followed by the first ACH deliveries about one year later.



© Lloyd Horgan



© Eric Raz

NORWAY

## FIRST H125s WITH DIGITAL LOGCARDS

Norwegian helicopter operator, Helitrans, has taken delivery of two Airbus H125 helicopters with digital logcards, becoming the first H125 operator able to manage the maintenance history of its aircraft components digitally, resulting in better data quality, time savings, and simpler processes, thereby reinforcing flight safety. These helicopters are the first two in a series of seven H125s ordered by Helitrans to be delivered with fully digital logcards. They will be used for a wide range of missions that cover powerline construction and firefighting, as well as sightseeing trips, passenger transport, photography and telecom network development.

*More information about digital logcards on page 12.*





© Nicolas Gauthier





# MAKING THE MOST OF YOUR DATA

Ninety percent of the world's data was generated in the last two years alone. This fact from a 2018 Forbes report is on the one hand, mind-boggling, and on the other, full of more power and promise than we ever could have imagined. The same can be said about data generation in the rotorcraft industry. Thanks to advances in helicopter technology, more data is being collected from each individual flight or maintenance procedure than ever before. This capacity brings up a myriad of questions. How do we gather this data? Where do we store it? How do we analyse it? What can we learn from it?

Airbus Helicopters' Connected Services is trying to answer those questions by developing solutions that help customers collect and make sense of their data. Benefits range from a better understanding of day-to-day operations, to predicting what unplanned maintenance issues might happen months from now. When data drives decision making, the result is more time flying, in the safest conditions, and cost-effectively. *Rotor* magazine takes a look.

# THE POWER OF DIGITAL

Amid changes overtaking the world of technology, Matthieu Louvot, Executive Vice President Support & Services at Airbus Helicopters, answers *Rotor's* questions about the course of digitalisation in the services domain.

Article: Heather Couthaud – Photos: Airbus Helicopters / Eric Raz

## Why is digitalisation such an important topic for helicopter Support and Services?

**Matthieu Louvot:** We live in an increasingly digitalised world, where data has enormous potential to revolutionise the way we support and maintain our helicopter fleet. But in reality, many things are still done as they were 60 years ago: you fill out paper log books after every flight, or flip through paper logcards to learn the history of your main components. The paper trails are long and can lead to mistakes, potential safety issues, and loss of efficiency. By digitising these processes – and any number of tasks that make up the daily life of operators – you get greater accuracy, traceability, and safety. And you gain the ability to gather these disparate sources of data in one centralised place, where you can analyse and learn from them thanks to powerful analytics – leading to services that positively affect the safety and competitiveness of customer operations. These are the things we are trying to do at Airbus Helicopters for our customers.

## What is the company's strategy for Connected Services?

**M.L.:** Our strategy is, first, to help customers digitise their operations – a step toward running a paperless operation. We started with Fleet Keeper, which replaces hardcopy log books, and digital logcards are the latest in this offering. What does this bring? Besides ensuring accuracy and traceability because everything is registered, it provides a lot of data with which you can do analytics to develop predictive maintenance algorithms.

That is the next step: to collect and connect all this data to a global database, which is searchable

and where we can provide analytics services. And our third goal is to make sense of this data with analytics, enabling us to offer better and more trenchant products and services to customers. We have different levels of analysis. Often we find that simple analytics can provide great value, while more sophisticated algorithms are already giving us real predictive maintenance programmes such as FlyScan (*see sidebar*). To make sense of everything and to connect the dots, you need analytics.

Finally, we want to improve e-commerce and deliver the maximum number of services through our customer portal. We already have online technical manuals. You can also order and manage your training online, and your spare parts. This year we're adding the ability to order your component repairs and – going back to my first example – we have been the first helicopter manufacturer to offer digital logcards.

## What are the next steps in Airbus Helicopters' digital services?

**M.L.:** Today, almost 700 helicopters are connected and sharing their data with Airbus Helicopters. We want that number to be 1,000 by the end of the year and by 2023, to have 3,000 aircraft connected, a number that represents a significant portion of our modern fleet. The more helicopters we connect, the richer the database becomes and the smarter and more precise our analytics. We have introduced a number of connected services in the last 12 months, and three new ones at Heli-Expo in March. We intend to add more services every year, with improvements to make the existing offerings more productive. ■



“By digitising processes and analysing data, we gain the ability to positively affect the safety and competitiveness of our customers' operations.”

**Matthieu Louvot,**  
Executive Vice President  
Support & Services.



**Learn more about Connected Services for civil helicopters (Skywise) in Rotor Online**



**Learn more about Connected Services for military helicopters (SmartForce) in Rotor Online**





**Fleet Keeper replaces the paper technical logbook**, allowing real-time data transfers between maintenance and operational teams.



## **FlyScan predictive maintenance**

**Through Airbus' predictive maintenance service, FlyScan, Airbus analyses an operator's HUMS vibration data, which provides valuable information about a helicopter's current condition, its behaviour in flight, and the health of its components.** After a flight, HUMS data recorded over the course of the flight is transmitted to Airbus, where it is uploaded, cleaned, crunched and then used to generate proactive recommendations. For example, FlyScan could predict that a particular component might need to be replaced within the next 50 hours, and therefore proactively recommend that the component be replaced now, before a fault actually occurs. Thanks to FlyScan, operators can anticipate formerly unscheduled maintenance events (reducing their maintenance burden), avoid operational disruptions (enhancing safety), and reach a new level of dispatch reliability and fleet availability. Today, nearly 70 aircraft representing 13 customers are using FlyScan.



# DATA IN ACTION

Airbus Helicopters' portfolio of digital tools and data analytics services is growing. *Rotor* takes a look at some of the newest members, along with some feedback from the field.

Article: Courtney Woo – Photos: Airbus Helicopters



## RELIABILITY ANALYTICS

**Reliability analytics allow operators to improve parts reliability by analysing events and the root causes of the removal of components or equipment.**

Such analysis helps operators anticipate unscheduled maintenance, make better parts forecasts, understand the root causes of failures, and build action plans to increase parts availability. The software uses collected maintenance data to generate easy-to-use dashboards. ■

“We are entirely satisfied with Fleet Keeper. The digitisation of data has saved us around 90 minutes per day of operation for our fleet of nine aircraft. We no longer pass a technical logbook between pilots and mechanics, and we’ve saved a considerable amount of paper too! Fleet Keeper has really transformed our internal working methods. Invoice management has been optimised – there’s no chance of things being forgotten any more, and every piece of data is recorded.”

**Fabrice Lourme**, CEO Corail Hélicoptères.





## DIGITAL LOGCARDS

**Airbus Helicopters has paved the way by being the first helicopter manufacturer to transform paper-based logcards into easy-to-use digital data – a critical step in the digitisation journey.**

A logcard is a document that tracks the entire maintenance history of critical helicopter parts, from manufacture all along their in-service lives. There are around 2.5 million logcards already in circulation throughout the world today, with some 80,000 new ones being produced each year.

Over time the paper logcard ages, gets misplaced, becomes hard to read and more difficult to use. This digital version stores the content in a secured cloud while preserving the existing template, using the same process and stakeholder roles and responsibilities (such as external repair stations, Airbus repair shops and material suppliers) as the paper version, meaning no additional workload.

Digitising logcards results in better data quality, time savings, and simpler processes, thereby reinforcing flight safety. ■

“The digital logcards allow us to take better care of ourselves and our customers. Thanks to them we can better ensure overall compliance, while our staff improves productivity as our logcards are updated in real time.”

**Sean Toth**, Director of Global Maintenance and Engineering at CHC Helicopter, launch customer for the H175 with digital logcards.



## FLIGHT ANALYSER

**This new analytics service supports operational safety by analysing aircraft data post-flight to identify risks before they lead to incidents.**

Flight Analyser helicopter flight data monitoring (HFDM) analyses the data generated by a number of on-board sources, such as flight data recorders, to automatically detect situations that could have been safer or could have potentially led to an incident or accident.

Data types analysed include altitude, ground speed, vertical speed and engine parameters, among others. The system then augments this data with weather data and environmental context, such as sky coverage and obstacles present at the time of the potential event, to provide the user with the most complete picture possible. It also performs a confidence check for each event, assessing the reliability of the data. Flight Analyser users are given access to dashboards that are updated post-flight. The output can be used by an organisation’s safety management system to support future decision making. ■



“We welcome this innovative approach to logcard management, which is fully in line with Helitrans’s vision of digitising and simplifying processes within the company.”

**Per Erik Nesvold**, director of maintenance at Helitrans. Helitrans is receiving seven H125s with digital logcards.

# A connected ecosystem for data-driven helicopter operations

Data has enormous potential to revolutionise the way we support and maintain our helicopter fleet. It all starts with digitising operations and then creating a connected ecosystem in which data from disparate sources is shared and analysed. Airbus Helicopters has developed solutions to help customers achieve this, with the aim of turning data into added value for operators, thereby reducing their cost of operations, increasing fleet availability and enhancing safety.

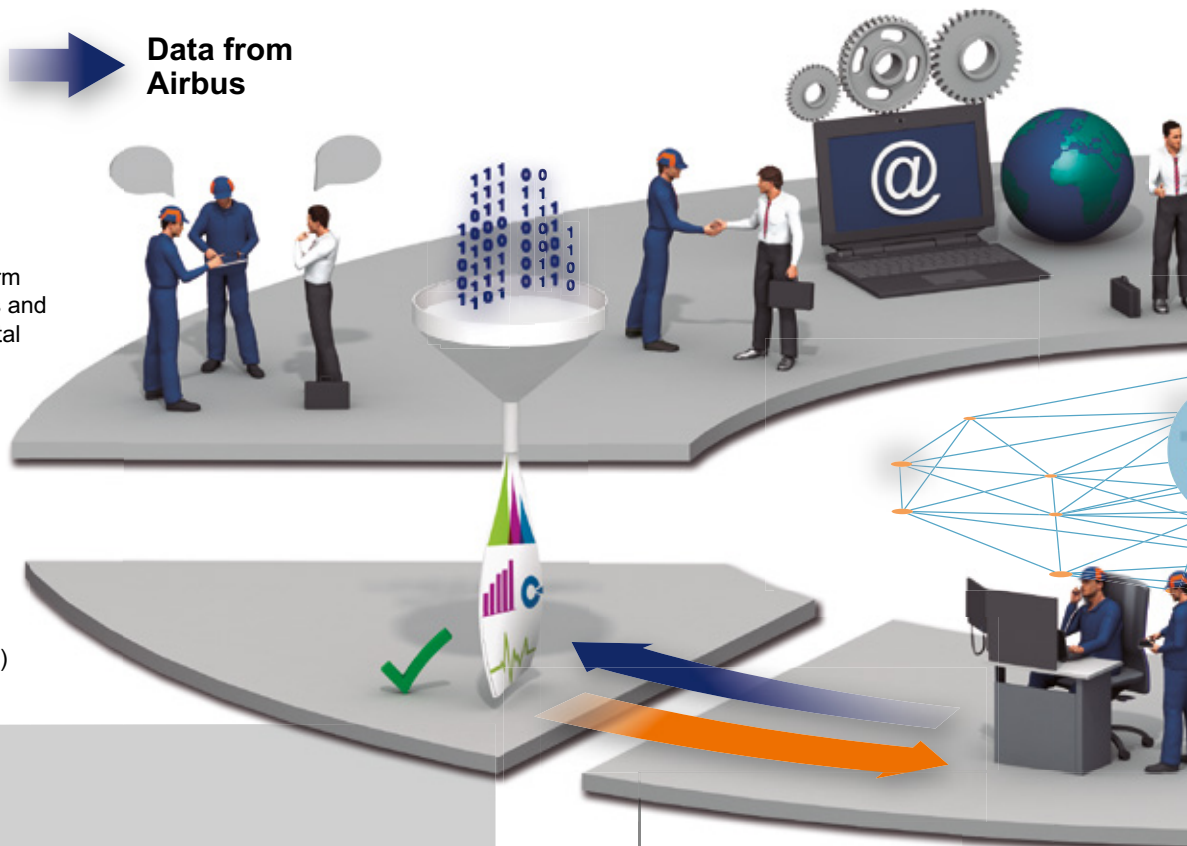


## 1. Go Digital

The first step is to transform outdated paper processes and tools into easy-to-use digital data. This results in better data quality, time savings and simpler processes. Airbus' digital solutions include:



- Digital logcards
- Fleet Keeper
- Digital logbook
- Envision and Fleet Master Maintenance Information Systems (MIS)



## 4. Analytics

Airbus then builds analytics powered by this rich database, supporting data-driven decision making. Sample analytics available include Flight Analyser HFDM analysis, Flyscan predictive maintenance, Last Journey Log, Data Quality, Fleet Availability Monitoring, Flight Operation, Reliability Reporting, Materials Demand and Supply, and Next Maintenance Due.




### Helicopters sharing data with Airbus:


	Today	Almost 700
	<hr/>	<hr/>
	By end 2019	1,000
	<hr/>	<hr/>
	By 2023	3,000



**SAFETY**



**AVAILABILITY**



**COMPETITIVENESS**



# 2.1. Collection of Flight Data



Rich data is generated and captured from on-board sources all throughout a helicopter flight.



Upon landing, this flight data is transferred to Airbus and customer servers.

In-flight data sources for Airbus Helicopters' latest generation aircraft include Helionix, Health and Usage Monitoring Systems (HUMS), and Fleet Keeper.



Airbus Helicopters' legacy aircraft can be outfitted with supplemental type certificates (STCs) that record in-flight data. These include flight data recorders such as ISEI Helicom, Appareo Vision 1000, and Outerlink's IRIS and Skytrac's ISAT 200A.



Infographic: © BeatrizSantacruz.com

Source: Airbus

# 3. Global Database

These data sources (flight, aircraft and maintenance data) are then gathered in a global database where the data is cleaned and crunched to help Airbus learn more about its global fleet.



# 2.2. Collection of Maintenance Data

Valuable data is generated from each MRO procedure and can be fed to Airbus databases. Sources of maintenance data include:

- Digital logcards
- Third-party Maintenance Information Systems (MIS)\* in which many operators store MRO data
- Airbus' own Fleet Master MIS is available for smaller operators
- Rusada's Envision MIS for operators with large and mixed fleets



\* Rusada, Ramco, Aircraft Maintenance Systems, Lundin Software and Traxxal.



UP ABOVE





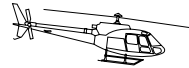


© Anthony Pecchi / The Airbus Helicopters civil range flying over the Camargue in southern France.





H125



- Capacity: 1 pilot and up to 6 passengers
- Maximum range: 631 km/341 NM
- Fast cruise speed: 251 km/h - 136 kts
- Endurance: 4h 28m
- Engine: 1 Safran HE Arriel 2D turboshaft engine with FADEC





- 1 – Officers Kris Kubasta and Andy Lacayo returning from a night mission.
- 2 – Officer Kris Kubasta fits on the Night Vision Googles (NVG).
- 3 – Inside the cockpit, preparing for the night mission.
- 4 – San Jose at night, viewed from the cockpit.

UNITED STATES

# Flying at night over the City of Tech

**The San Jose Police Department’s new H125 comes with night vision goggles and camera equipment,** opening a new world for officers patrolling Silicon Valley’s southernmost city.

Article: Heather Couthaud – Photos: Jonny Caroll

Buckle up for a quick tour of Silicon Valley and San Jose: three major airports dot the length of the Peninsula – San Jose, San Francisco, and Moffet Field – not to mention the ever-busier Palo Alto and San Carlos airports. On the freeways, don’t be surprised to see self-driving cars emblazoned with adds for apps and start-ups. And while the air space over its major cities is lit by a white glow of light, the region’s mountain ranges and prized public parks present limitations to night-time visibility.

Policing the vast sprawl that is San Jose, California is challenging at the best of times. “We’re in the middle of a valley,” says Officer Andy Lacayo of the San Jose Police Department. “We have a ridge line that we’re surrounded by. There are public parks nearby. Just last night, there was a missing person in the mountains. If it wasn’t for the fact that we had night vision goggles, we wouldn’t have been able to look for this person, because it’s completely dark.”

## “A BIG JUMP FORWARD”

The San Jose Police took delivery of a new H125 in July 2018 and with it, a serious increase in the force’s public safety capabilities. In addition to a night vision-goggle compatible cockpit, the helicopter can handle a load of mission equipment that was less adapted to the department’s previous H120. In supporting ground patrol units during searches and suspect pursuits, and supporting the fire and sheriff’s departments, “flying the H125 was a big jump forward for what we do,” says Lacayo. “We have more equipment: the camera system, the lighting system, police radios. And we hope to help in rescue missions—that’s more weight, but the H125 is capable of expanding to that mission.”

Despite the area’s kilometres of jam-packed freeways – or perhaps because of it – the police department’s air support unit plays a starring role in suspect pursuits. A chat with one of Lacayo’s fellow officers sounds

like something out of a Hollywood movie. “We had a shootout with officers,” says Officer Kris Kubasta. “The sheriff’s department tried to stop a stolen car with two suspects. They started shooting at the deputies. We picked up the vehicle just as it started driving the wrong way at speeds of 80 miles per hour on the freeway. We followed until the suspects ditched that vehicle and fled on foot with the shotgun until they came upon a UPS driver. They took him hostage at gunpoint, forced him into the UPS truck, and then fled.” Happy ending: after a hostage standoff, both suspects were taken into custody, and no officers were hurt. “The suspects would have been in the wind, had we not been overhead and without the capabilities of the H125, its camera system, and its advanced electronics.”

## “A WHOLE NEW WORLD”

Whether it be following lawbreakers down neighborhood streets or apprehending criminals (the H125 was integral in finding a bank robber the first day the helicopter was put into operation), its pilots laud the greater mission capability the helicopter provides. “We can fly longer, we can fly higher,” says Kubasta. “The equipment that it can carry is phenomenal. The space in the cockpit is great, enough to have a larger screen, more room to look around, and visibility. Plus with the night vision cockpit upgrade that we have—we’re in a whole new world.” ■

“We have more equipment: the camera system, the lighting system, police radios.”

**Officer Andy Lacayo** of the San Jose Police Department.

## San Jose Police Department

**Founded:** 1849

**Headquarters:** San Jose, California

**Personnel:** 1,035

**Jurisdiction:** 462 km<sup>2</sup> (178.2 sq mi)

**Helicopter fleet:** 1 H125

# On call day and night in the skies over Brandenburg

At the end of March, ADAC Luftrettung, a non-profit air rescue organisation that has been in operation in Germany and its neighbouring countries for almost half a century, reached the impressive milestone of 1,000,000 missions. *Rotor* paid a visit to one of the service's air rescue centres.

Article: Jörg Michel – Photos: Airbus Helicopters / Célian Bauduin, Maria Lynam



It is 4 am in the south of Berlin and two teenagers are driving home after spending the evening in a club. A momentary lapse of concentration is enough for the driver to drift out of his lane, into the path of an oncoming vehicle. The car then overturns. The emergency call centre immediately alerts the rescue services. In this case, in addition to an ambulance, the call also goes out to the Christoph Brandenburg, an H145 operated by ADAC Luftrettung, which is stationed in Senftenberg, southern Brandenburg. Swen Burdack, an emergency doctor with ADAC Luftrettung, is also on board. When the helicopter lands at the scene of the accident, an ambulance stationed nearby is already there. Burdack starts giving emergency medical care with the paramedic on the ground. It soon becomes clear that one of the two occupants is more seriously injured. The H145 then transports the young casualty

to a trauma centre in Berlin. "The patient was bleeding heavily, with internal injuries and a traumatic brain injury," Burdack explains. "Thanks to the H145, we were able to transfer him to the trauma centre in Berlin in just eight minutes. By road, the transport would have taken at least half an hour."

## AROUND THE CLOCK, 365 DAYS A YEAR

"We fly the H145 day and night, 24 hours a day, 365 days a year," says Mirza Kaufmann, an ADAC Luftrettung pilot in Senftenberg with 25 years of service under his belt. "During the day, we fly with a pilot, an emergency doctor and a Helicopter Emergency Medical Services Technical Crew Member (HEMS TC). At night, there is a second pilot on board and we also have night vision goggles to help us during approaches

## Air rescue centre in Senftenberg

### Stationed helicopters:

EC135 (Christoph 33) and H145 (Christoph Brandenburg)

### Annual missions:

some 3,000

### Total missions:

some 60,000





1



2

**ADAC Luftrettung GmbH**

---

**1 million** rescue flights since 1970

---

**Fleet:** 50 helicopters of the H135 and the H145 family

---

**35 rescue centres** in Germany, one in Austria, three of which operate around the clock

---

**Missions:** primary rescue services (H135 and H145), patient transportation with intensive care helicopters (H145)



3

and landings in dark terrain.” The other equipment on board the H145 is specially adapted for flying after dark, too. “For example, we can dim the screens of our medical devices on board the H145, which makes them compatible with the night vision instrumentation of our pilots,” Burdack adds. “Day or night, as a doctor, it is vital that I have full access to the patient during transportation so I can provide proper medical care. The H145’s spacious cabin means that this is never an issue.”

**36 RESCUE CENTRES – 1 MILLION MISSIONS**

At the end of March, ADAC Luftrettung, one of Europe’s biggest air rescue organisations, carried out its 1,000,000th mission – and the Senftenberg rescue centre in eastern Germany has done its fair share of that, clocking up approximately 60,000 flights with its

two helicopters. From day one, here in Senftenberg and throughout Germany, ADAC Luftrettung has set great store by products from Airbus and its predecessors. After launching its service with the BO105 in Munich in 1970, the air rescue organisation regularly grew its fleet to include the BK117, the EC135 and the EC145. Since 2015 these aircraft have been joined by the H135 and the H145. Meanwhile, ADAC Luftrettung has grown steadily, emerging as a service provider that merges the disciplines involved in air rescue, namely aviation and medicine, and training them together. “Our priority is maximum patient and operational safety,” says Frédéric Bruder, CEO of ADAC Luftrettung. “To meet this requirement, our crews undergo interdisciplinary training in seminars and by using simulators. This ensures that our operational experience is passed on systematically throughout our organisation.” ■

- 1 - The H135 and the H145 are deployed for primary and secondary missions.
- 2 - The H145 stationed in Senftenberg, Christoph Brandenburg, operates around the clock.
- 3 - Mirza Kaufmann has been an ADAC Luftrettung pilot for 25 years, flying both the H135 and the H145.



Watch the video of ADAC

# Faster than the speed of storms

**How do you reach offshore platforms the other side of 10,000-foot-high mountains in the middle of the cyclone season?** Babcock's two H175s do just that on every journey, expertly negotiating the rugged terrain of East Timor. They have chalked up an amazing 1,847 flight hours since contract commencement in January 2018.

Article: Belén Morant – Photos: Ned Dawson

The shortest and most safely navigable route from Dili, the capital of East Timor, to ConocoPhillips's two platforms in the Timor Sea is 170 nautical miles long and takes around an hour and ten minutes to complete. The tricky part is that it passes through the mountains that cover the island, which soar up to 10,000 feet high. Although they are often shrouded in cloud and thunderstorms, the H175 has reduced flying time by 30 minutes compared to previous helicopter models, which were slower at the same altitudes.

Since the two H175s entered service in January 2018, Babcock has been using the same route for passenger transport, mostly oil industry workers from East Timor, Australia and the Philippines. Each of the helicopters perform three to four round trips a week, during which they have to contend with both the tropical temperatures of Dili, close to 32 degrees, and the altogether chillier 16 degrees up in the mountains. In view of these climatic conditions, the helicopter's air conditioning system is more than just a luxury; it is a key ally in the battle against humidity.

## THE STORMY SEASON

Whatever the weather, the aircraft are never sitting idle for long. When the helicopters aren't flying for ConocoPhillips, they are utilised by ENI, another oil and gas company operating in the area. While the dual operations translate to high productivity, it also means that availability and reliability of the aircrafts is critical.

"We've become experts in avoiding storms," says Ian Henning, Babcock's H175 Fleet Manager. "During the cyclone season we try to fly in the morning, when there's less thunderstorm activity. And if we do have to fly at night or through cloud, we use the weather radar to re-calculate the flight-path. It makes things a whole lot safer."

Whenever a cyclone approaches, the oil company protects its personnel by evacuating the platforms and transporting everyone to dry land. In situations such as these, response times are crucial and the speed of the H175 is an

important asset, as Henning explains: "There are around 120 people on the platforms; each H175 has a capacity of 16 passengers. Given that the maximum flight time for each pilot is ten hours, we put on an extra team so that we can make all the round trips before the cyclone arrives. So, as you can imagine, aircraft availability is an absolute must for us. In fact, our H175s have the highest availability rate in the world—because if they are grounded, we pull out all the stops to get them airborne again."

## MEDEVAC OPERATIONS

In addition to transferring passengers, one of the two Babcock H175s is on call 24 hours a day, seven days a week for emergency medical evacuations from the platforms. Boasting enough capacity for two stretchers, oxygen cylinders and paramedic equipment, the H175s have already performed 16 medical evacuations, which are even more complex missions than the normal runs. "Statistically, most medical evacuations take place at night," Ian says. "In such cases we transport patients directly to Darwin, Australia, filling the tanks up to maximum for the return to Dili. It's a return journey of 1,540 km, the equivalent of flying from Paris to Barcelona and back again in the same night. I'm not going to deny that it's a massive undertaking, but neither we nor our client want to run the slightest risk - the patient's health takes priority." ■

"The performance offered by the H175's engines gives us a bigger payload than we had with our previous helicopters in the same circumstances."

**Ian Henning**, Babcock's H175 Fleet Manager.

**1 – No sooner do the helicopters take off from Dili than they have to negotiate mountains that are almost 6,000 feet high. On a typical offshore flight they then descend to sea level.**

**2 – Ian Henning, Babcock's H175 Fleet Manager.**

**3 – Babcock's passengers value the speed of the aircraft and the comfort of the cabin, especially the air conditioning and the large windows.**







### Babcock H175

- **Entry into operations:** January 2018
- **Fleet:** 2 H175
- **Pilots:** 20
- **Number of flights:** 597
- **Hours flown:** 1,847
- **Passengers flown:** 10,570
- **Freight weight carried:** 10,250 kg





CANADA

# Rough and beautiful: in western Canada with the H135

**HEMS provider TEAAM serves some of Canada’s most rugged areas** with their fleet of H135s and AS355s, bringing lifesaving care to patients far from metropolitan trauma centres.

Article: Heather Couthaud – Photos: TEAAM

- 1 – Left to right. Paul Windsor, Miles Randall, Jordan Lawrence. Rob Monday is the hoist operator.
- 2 – H135 with Goodrich hoist.
- 3 – The small footprint of the H135 allows TEAAM to land in small landing zones while still having enough cabin space to provide EMS services.
- 4 – Litter Kit ingress/egress training for medical evacuation missions.

The Sea to Sky corridor. A beautiful name for a region in western Canada that is not only stunningly beautiful, but home to some of the world’s most stunningly difficult jobs. Forestry operations, natural resource mining, logging, and ocean fishing are just a few. Out here, you don’t want to get hurt. But if you do, there’s a team with the resources to airlift you out—providing advanced life support along the way.

### A CRITICAL NEED

Technical Evacuation Advanced Air Medical (TEAAM) started in 2017 to provide the region with much-needed helicopter emergency medical services (HEMS). In collaboration with Blackcomb Helicopters – who have operated H135s and AS355s for sightseeing, utility, medevac and SAR services for 30 years – the non-profit air medical company brings critical care to remote work sites and hard-to-access regions between the extreme northern edge of Vancouver, to Whistler and the Pemberton Valley. “A few years ago, I was sent on an ambulance call to respond to my Paramedic Chief, SAR team leader and friend. We were unable to get to him in time because of his remote mountainous location. It was these pivotal moments that made us realise that our region needed

a different type of HEMS capability,” says Miles Randell, President of TEAAM.

### SPECIALISTS ON THE JOB

To this end, Blackcomb uses medically-equipped H135 and AS355s to respond to calls. Depending on the mission, the aircraft may be fitted with a hoist and long line. This is especially the case in technical rescues involving mountain climbers or swift water and avalanche rescues. Indeed, TEAAM’s roster of specialists is long, from HEMS-trained nurses to auto extrication experts. A typical crew comprises two medical attendants (paramedic, nurse and/or doctor) and, as the case requires, a hoist operator and a technical rescue specialist. “The TEAAM rescue programme brings qualified technicians into the region’s austere settings to ensure a patient receives both cutting edge medical care and top tier rescue capability,” says Randell.

This was undoubtedly the case for their first mission in October 2018. “That mission saw us rescue a seriously injured logger who had been hit in the back and chest by a massive falling tree. TEAAM was able to access and treat him, and then transport him to a trauma centre in one-tenth of the traditional timeframe,” says Randell.

### “PATIENT CARE, ANYWHERE”

The organisation’s missions can take them from the Pacific Ocean to the snow-capped peaks of the Coastal Range. “Weather can be a challenge on the Pacific Coast, but our pilots and aircraft are well suited for the challenges that may come our way,” says Geoff Doran, Chief Pilot of Blackcomb Helicopters.

“The H135 is an excellent platform for the work we are performing,” adds Randell. “The small footprint allows us to land in small landing zones while still having enough cabin space to provide ongoing patient care. The twin engine CAT-A one-engine inoperative performance allows us both an excellent safety profile while hoisting in remote mountainous terrain, and the ability to land at metropolitan trauma centre rooftop landing pads. The rear clamshell doors also allow us the ability to safely and efficiently unload the patient at hospitals.” ■



1

## TEAAM

**Founded:** 2017

**Base:** Whistler, BC (Canada)

**Fleet:** 1 H135, 3 AS355 (operated by Blackcomb)

**Patients transported:** 31 in the first year





2

## H135



- Capacity: 1 or 2 pilots + up to 6 passengers
- Max speed: 259 km/h
- Max range: 633 km
- MTOW: 2,980 kg
- Engine: 2 x Safran ARRIUS 2B2plus or Pratt & Whitney PW206B3



# Thermal versus electric propulsion: Start your engines!

From hybrid and electric cars to electric drones, the transition to electric propulsion is already underway. But can batteries fully replace fossil fuel in our aerial vehicles of the future?

Article: Luca Cossetti and Heather Couthaud

## COMBUSTION ENGINE OR ELECTRIC MOTOR?

Currently, there are two kinds of propulsion systems: thermal and electric. Internal combustion engines are powered by fossil fuels, such as diesel or gas. Electric motors are powered by electrical energy supplied by a battery pack or hydrogen fuel cell.

In large planes and helicopters, the combustion engine is a turbine, in which fuel (kerosene) burns in an oxygen-rich environment, creates hot air and high pressure in a confined chamber, and employs that energy to power the aircraft. In electric vehicles, the stator – using pulses of electricity from a power electronics device – produces a magnetic field around the rotor, which rotates and turns a vehicle's drive train, rotor shaft, etc. ■



## THE LIMITS OF THERMAL-PROPULSION TECHNOLOGY

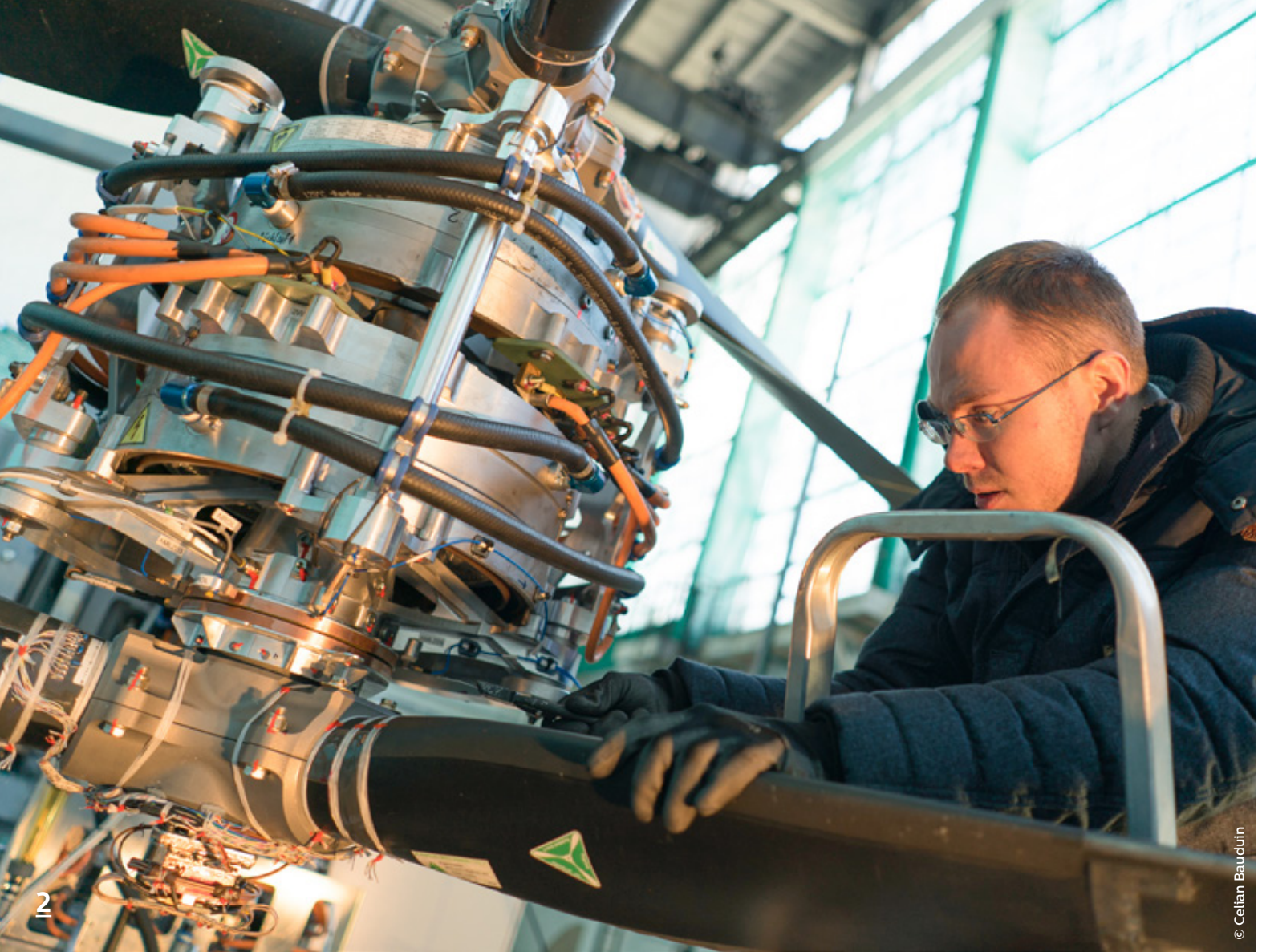
Combustion engines are ideal for long-range travel because fossil fuels produce a lot of power and energy per kilogram of fuel (power and energy density, respectively). The main drawback is the emissions they produce (NO<sub>x</sub>, CO<sub>2</sub>, particles, etc.).

Is electric propulsion the answer? The performance of electric motors and power electronics has vastly improved: today, they achieve a better degree of power density than that of combustion engines. In addition to their light weight, electric motors

have a greater range of speed than combustion engines, which reduces the need for gearboxes.

However, electric energy cannot be stored efficiently (in both mass and volume), at least not today. In the simplest terms, a large quantity of batteries is required to equal the performance of fuel. And as for hydrogen, it must be stored at high pressure, as in a gas state, or as saturated liquid hydrogen – which needs to be kept at around -253°C and requires heavily insulated tanks. ■





© Célian Bauquín

## THE MIDDLE GROUND: HYBRID

Another option is to combine the best of both worlds. Hybrid-electric propulsion uses a combination of conventional internal combustion engine with an electric-propulsion system.

“Hybridisation enables us to optimise,” says Luca Cossetti, Innovative Power Solutions at Airbus Helicopters, who is a part of a team developing a hybrid propulsion solution for air vehicles. “You could use the thermal engine in certain phases of flight, and compensate with electrical power when the power demand is higher [such as during take-off and landing for rotorcraft].” ■

## THE FUTURE IS BRIGHT

So what might propulsion look like in future aircraft? For commercial planes and helicopters, combustion engines powered by cleaner, more sustainable fuels are already possible. In parallel, hybrid-electric propulsion systems are showing great potential for mid-sized aircraft.

But what about fully electric? This is in development for urban transport, where the journey from an airport to a city centre is short and the payload is comparable to the needs of a taxi. Today, more than 150 urban air mobility (UAM) vehicles are in development worldwide. These future urban air vehicles are designed to be fully electric and zero-emission. Airbus is addressing this market by developing the Vahana and CityAirbus, both of which are advancing electric vertical take-off and landing (eVTOL) flight ideally suited for intra-city transport. ■

**1 – The CityAirbus made its first take off on 1 May in Donauwörth, Germany.**

**2 – In electric vehicles, the stator produces a magnetic field around the rotor, which rotates and turns a vehicle’s drive train, rotor shaft, etc.**

## A COMPARISON, IN FIGURES

The current usable energy density of rechargeable batteries is approximately 120 Wh/kg, compared to fossil fuel’s 12,000 Wh/kg\*. In other words, considering the average efficiency of a motor and thermal engine: 1 kg of fuel equals 25 to 30 kg of batteries. ■

\*Wh/kg: watt hour per kilogram.



# AROUND THE WORLD





1 - Andrew Mathewson, Airbus Australia Pacific's Managing Director.

2 - The ARH Tiger can fire both missiles and cannons.

3 - The Australian Army now operates 17 aircraft through the 1st Aviation Regiment, based in Darwin, for aerial reconnaissance and fire support missions, and five aircraft for training in Oakey (Queensland).

AUSTRALIA

# The ARH Tiger: Delivering on its promise

When it comes to availability, operational capabilities and reliability, the Australian Tiger has taken a decisive step forward. And as Airbus Australia Pacific Managing Director Andrew Mathewson explains, the helicopter's outstanding success wouldn't have been possible without the joint efforts of the Australian Army, Airbus and Defence's Capability Acquisition and Sustainment Group (CASG).

Article: Belén Morant

Last year the helicopter registered 65% availability and 90% spare-parts availability. But, most importantly of all, it fuelled the optimism of a customer with complete faith in the operational capabilities and reliability of its combat helicopter.

In 2001, the Australian Army ordered 22 ARHs, with the first of the deliveries being made in December 2004. The Australian Tiger was a somewhat different animal to its European brothers, however, on account of its increased armament capability and its resulting complexity, a response to Australia's desire for a platform capable of firing both missiles and cannons.

## A TURNING POINT

"The ARH Tiger is an extraordinary machine that outperforms anything in its class," says Andrew Mathewson, Airbus Australia Pacific's Managing Director. "But in the first few years the complexity of both the system and the supply process made it an aircraft that was difficult to maintain. The Tiger was unable to show everything it was capable of and, as you might expect, there was quite a lot of discontent in the Army, with some calling for it to be replaced by another helicopter.

"Since 2014 with the agreement of a new performance based contract, we devoted all our efforts, both in Australia and Europe, to simplifying supply chain performance, improving the design, the reliability, and to optimising our interaction with the CASG and end customer in the Army. Above all, though, we took the crucially important step of focusing all our attention and energy on the end user rather than wasting time and effort on contractual engagements that didn't really deliver capability to the customer."

An example of this new collaboration is the way in which operational maintenance and deeper maintenance is carried out. Thanks to the close relationship that Airbus' experts, who know the product inside out, now enjoy with the customer's maintenance teams, who have a perfect command of operational needs, the maintenance process is optimised, bringing the best out of both teams.

## A NEW ERA

The improvements made in fleet availability and the aircraft's capabilities were quickly demonstrated in military exercises. The Tiger's latest notable success came with its deployment of four ARH Tiger aboard HMAS Canberra, which contributes to the Australian Defence Force aim of establishing an Amphibious Task Force with the enhanced security provided by the Tiger.

"Last April, Airbus was awarded an extension of the Tiger through-life support contract until 2025 by the Australian Department of Defence," says Andrew Mathewson, looking resolutely to the future. "It's a show of faith on the part of the customer and it lets us know we're on the right path. Our next major challenge now is to prove that we're able to keep the Tiger updated and operational through to 2040 by addressing obsolescence problems. The Tiger still has a lot to offer. It's the most effective and efficient option for the government, and we're going to prove that to them." ■

"Everybody knows the Tiger had a difficult introduction into service, but importantly, the message people miss is that in the past two to three years, we've really turned a corner with the ARH. The ARH is ready today; the pilots are trained today to go and to support our troops in operation. And we can do that by day, night, all weather conditions, quite effectively."

Major Matt Subbs, senior instructor ARH wing, School of Army Aviation.

"The Tiger sits in a niche in between light attack or observational helicopter and heavy attack. It's a lighter helicopter, sitting at about six tonnes, which makes it very agile, but it also has the full weapons systems you would find on one of the heavier attack aircraft."

Capt Jim Flawith, qualified Flying Instructor.



Watch the video of the ARH Tiger

CHILE

# A rescue to be remembered

**A Chilean Navy AS365 Dauphin and AS332 F1 Super Puma** were at the centre of the successful night-time rescue of a windsurfer, who was minutes away from suffering fatal hypothermia after spending eight long hours in the chilly waters of the Pacific.

Article: Carlos Ramos – Photos: Airbus Helicopters and Armada de Chile

Saturday 18 May 2019 is a date that Verónica Blanco will never forget. The 29-year-old was windsurfing in Pichidangui Bay, off the Chilean coast, when her equipment malfunctioned, leaving her marooned in the water without any hope of getting back to dry land and at the mercy of strong winds and the currents and chilly waters of the South Pacific.

Nor will she ever forget the sound of the AS332 F1 piloted by Lieutenant Commander Carlos Schaidt, or the rescue swimmer, Staff Sergeant Manuel Pizarro, who freed her from her equipment and took her safely aboard, by which time her body temperature had dropped to below 35 °C.

## A HIGHLY COMPLEX MISSION

Verónica’s family had reported her missing at around 5pm, at which point the Coquimbo Maritime Authority deployed search and rescue teams on land and sea. Unfortunately, due to the heavy swell, current, strong winds and poor visibility, these resources were

**1 – A nightmare for any water sports lover, the incident had a happy ending thanks to the professionalism of the Chilean Navy and to its helicopters.**

**2 – Working in tandem, the two aircraft and the expertise of the 14-strong crew proved a winning combination.**



## SEARCH AND RESCUE PATTERNS



**Search pattern in the form of a creeping line**, generally used to cover large areas while making few turns.



**Search pattern in the form of an expanding square**, starting from the last known coordinates and with the same distance being kept between lines.

insufficient, with the decision then being made to activate the air response. Two helicopters were assigned to the mission: a Dauphin from the Naval Helicopter Squadron, and a Super Puma usually operated by the Attack Squadron.

“Given the complexity of the mission, we tried to get the helicopters in the air as soon as possible,” Schaidt explains.

The Dauphin was deployed in advance and was the first to reach the last known coordinates, conducting an initial search in the form of an expanding square (see sidebar). In the meantime, preparations were made for the AS332 and its crew to replace the Dauphin when it came in to refuel.

“The Super Puma carried out a search with a more comprehensive range of equipment, which made things easier for us, thanks to the infrared night-vision camera and the optronic sensor,” Schaidt says.





“Verónica was able to hang on for so long because she was well equipped, had a good wetsuit, stayed on top of the board, and had a very strong will to live, which I think was a very important factor.”

**Lieutenant Commander Carlos Schaidt**



## TIMELINE

- 5.00PM:** Alarm raised and resources deployed on sea and land
- 7.30PM:** Duty commander notified by telephone
- 8.15PM:** Crew briefing prior to the mission
- 8.50PM:** Dauphin helicopter takes off from its base in Viña del Mar
- 9.15PM:** Dauphin arrives in the rescue zone
- 10.00PM:** Super Puma helicopter takes off
- 10.30PM:** Super Puma arrives in the rescue zone
- 11.02PM:** Victim sighted
- 11.20PM:** Victim boards the Super Puma helicopter
- 12 MIDNIGHT:** Victim lands at the Hospital Naval in Viña del Mar

### SIGHTED AT LAST

The Super Puma traced a creeping line (see sidebar) search pattern and, after flying over the area for a little more than an hour, the infrared camera operator spotted a shape floating in the sea.

Taking up the story, Schaidt says: “When we spotted the person, the pressure on the team was huge because we knew that there was someone in danger and that every second counted. We then marked a point close to the position with a lighted distress signal and began the approach manoeuvre. We used the 4-axis autopilot to keep the aircraft stable so that we could lower the rescue swimmer and recover the victim.

“In addition to the training and experience of the crew, we wouldn’t have been able to complete the rescue if the helicopter hadn’t had the equipment we needed to maintain a secure and stable position while hovering,

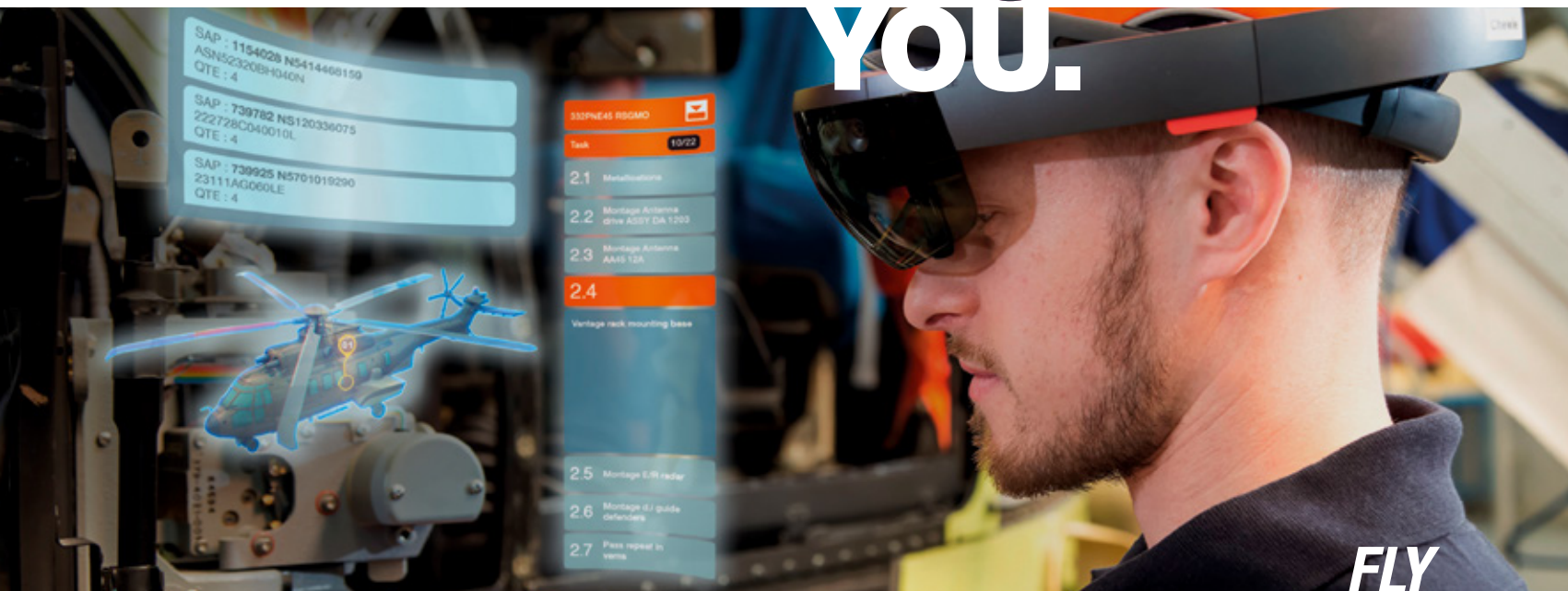
with no points of reference, at night and out at sea. Nor would we have been able to spot her without the help of the optronic sensor.”

The lieutenant commander and the rest of the crew received recognition for their efforts a few days later, at a ceremony held on Chile’s Navy Day, where they met with Verónica’s family. ■

“For us and for me personally, it humanises the technical aspects of a rescue mission and it makes you aware just how beautiful and important this job that we have to do is.”

**Lieutenant Commander Carlos Schaidt**

# H*Care* SERVICES. DESIGNED BY A UNIQUE TEAM OF EXPERTS. YOU.



**FLY**  
**WE MAKE IT**

Continuous customer feedback means we're able to constantly re-engineer and improve our service. It's just one of the reasons we're the helicopter industry's biggest service network, providing 24/7 assistance to 150 countries around the world.

Collaboration. We make it fly.