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WORLD AIRNEWS

AFRICA'S OLDEST AVIATION MAGAZINE

AIRPORTS OF THE FUTURE

MEGA AIRSHIPS

FUTURE FLIGHT

AI IN AVIATION

BELL FLIGHT 2024

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DIAMOND LIL

We start the year with this iconic photo of the B-24A, Diamond Lil . This is currently the only flying example of US Military history's most widely produced aircraft, the Liberator. Including all variants, 20,000 B-24s were produced, and more military service members served on these aircraft than any other in World War II. Each year the Commemorative Air Force (CAF) holds a fundraiser to help highlight aircraft in the fleet needing support for restoration, maintenance, or repair projects. They are calling on donors world-wide, who have an affinity for a specific aircraft or want to acknowledge a veteran's service. The non-profit organisation's mission is to educate, inspire and honour through flight and living history experiences.
For more information go to : https://commemorativeairforce.org/

FRONT COVER: The use of Artificial Intelligence, machine learning and computer vision is on the rise across all sectors of the aviation world. New data from SITA shows 97% of airlines are planning a programme to develop this technology. Airports are already using them. It's a megatrend for 2024.

In light of this World Airnews took the initiative to put this AI image generating technology Designs.ai and Imagine. art to use. We 'created' an aircraft of the future using a text prompt. The images were then combined and enhanced using Photoshop and our 'aircraft' is presented here on our first cover for 2024. Send your comments about our experiment to joan@airnews.co.za or heidi@airnews.co.za. Happy New Year.

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THE FUTURE IS NOW

By Heidi Gibson

As we enter 2024, let us be mindful of the fact that this year - for the first time since 2019 -passenger numbers globally will exceed that of the pre-Covid years. It's quite a comforting thought.

Consider too the forecast that GDP globally should hover around the 2.8 to 3% level and you are starting to see a better picture for aviation.

And then, thirdly, according to the International Air Transport Association (IATA), inflation has peaked and should around mid-year 2024 start to come down.

A leading aviation market intelligence and consultancy company IBA however, provided sobering analysis in their 2024 market outlook.

"The dislocated nature of the central banks will maintain a difference between relative inflation. We therefore see a strong dollar persisting throughout 2024, which won't help non-US operators balance their budgets.

While demand is expected to grow, fare compression and costs will squeeze the market whereby the industry can expect defaults to rise above the current low levels."

"Trading will improve to the extent that even asset-backed securities will be back on the agenda. Finally, OEM performance will align with the GTF engine fallout in early 2024 which, at this point, continues to remain an unknown to the industry. Deliveries will continue to improve but remain south of OEM predictions. IBA believe the GTF issues have more to offer in addition to Boeing's quality issues. At this point, we don't see 2018 delivery levels being surpassed until mid-way through 2025."

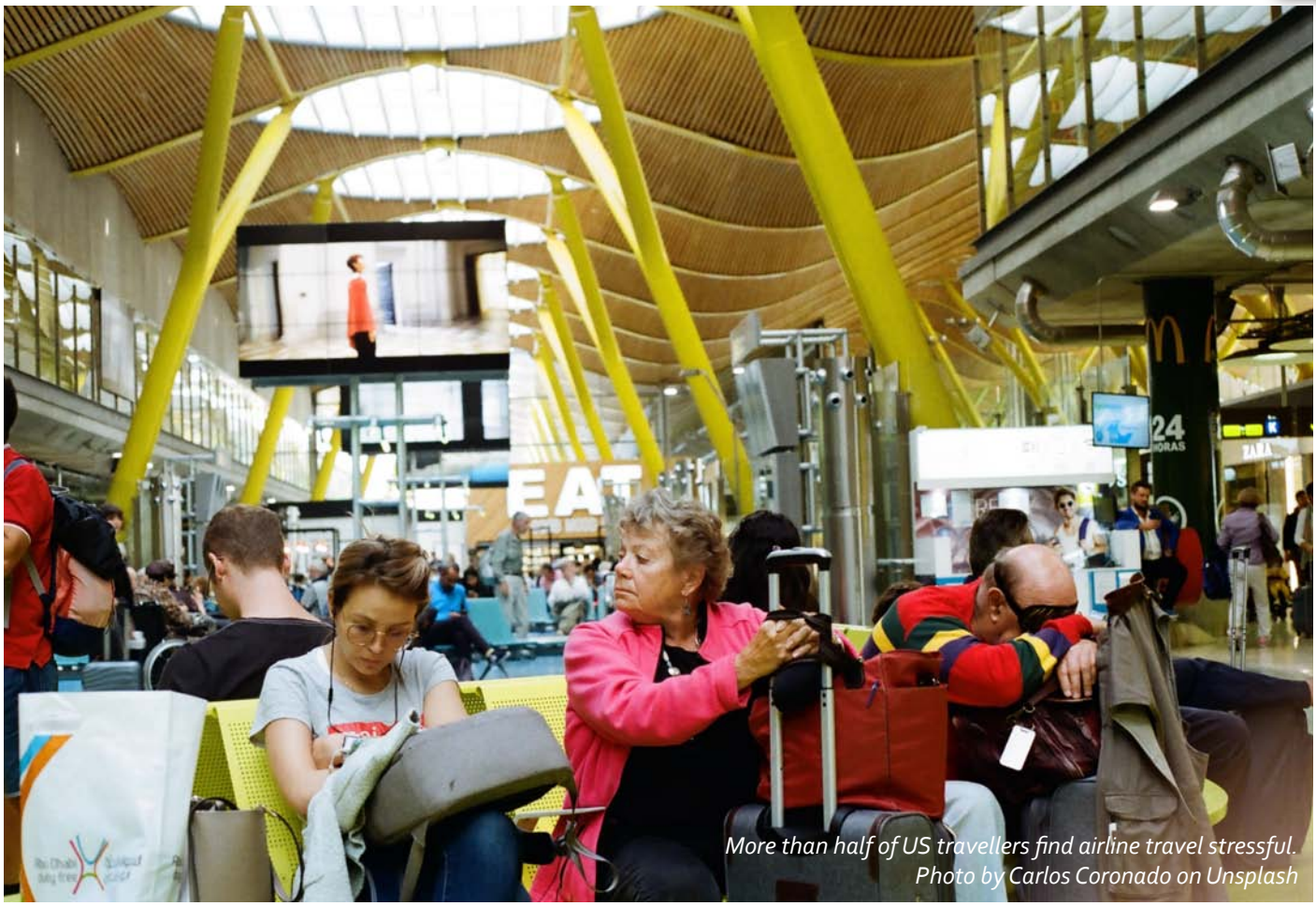
The company expects to see an undersupply of aircraft throughout 2024, as OEM production and MRO capacity remain under pressure. It's a bit of a mixed picture then.

As I look to the future, here are my top seven aviation trends for 2024. In no specific order:

1. The rise of green travel - airlines actively embrace the use of SAF, find innovative ways to reduce carbon emissions and improve air traffic management that minimises fuel consumption.
2. The emergence of Hydrogen Aircraft with liquid ammonia turbofan combustion engines that provide a greener alternative for air mobility.
3. Autonomous flight, Urban Air Mobility, Unmanned Aircraft Systems
4. The fascinating world of 3D Printing or additive manufacturing that enables the production of complex and lightweight components. It's unbelievable – the creation of three-dimensional objects from digital models by layering materials, allowing for intricate designs that were difficult to achieve with traditional manufacturing methods.
5. Blockchain Security introduces greater transparency, security, and efficiency offering a decentralised ledger for recording transactions. This system also enables automated and secure execution of agreements, benefiting areas like ticketing and baggage handling. The technology facilitates quicker and more reliable sharing of information between different stakeholders, including airlines, airports, and regulatory authorities.
6. Virtual reality (VR) and augmented reality (AR) are already in use in pilot training, maintenance procedures, and passenger entertainment.
7. On the air traffic side, there is an Austrian startup company called Aeroficial Intelligence that offers smart air traffic analytics that empowers air traffic management institutions and airports with operational insights and situational awareness. The company offers what they call Performance Cockpit, a digital platform that offers a range of software modules to save emissions and generate new insights on air traffic operations.

There is no doubt about it, the air transport industry is undergoing a significant transformation. New technologies, innovative business models, and an ever-changing and improving customer experience.

What I have just identified doesn't even begin to scratch the surface of the advancement and innovation out there. It's going to be an exciting year.



More than half of US travellers find airline travel stressful. Photo by Carlos Coronado on Unsplash

AIRPORTS OF THE FUTURE

By Emine Zerrin Sakir, CEO of Mangodo, a software and digital company based in Istanbul, Turkiye.

The number of passengers being transported by airlines around the world has more than doubled in the last six years with recent estimations indicating that demand for air transport will increase by around 4.3% on average per annum for the next 20 years.

It's expected that in a little more than a decade, 200 000 flights will be taking off and landing each day, around the world, meeting the need for rapid transportation and facilitating the need for increased volumes of air cargo and tourism. Management consultants Oliver Wyman forecast that the global commercial aviation fleet will expand by 33% to more than 36,000 aircraft in the next decade.

However, this rapid growth will not be without challenges for airport infrastructure and human resources. Competition between airlines and hubs will increase. To accommodate the growing demand for airline travel from passengers, and to address an overwhelmed supply chain and predicted labour shortages, airports will be required to rapidly evolve in the years to come. The biggest changes will be in terms of technological innovation and the passenger experience.

There is no question that technology will play an important role in the future where airport operating models will be impacted by advances in biometrics, artificial intelligence, machine learning, 3D printing, and automation. In addition to enhancing efficiencies, these technological innovations will also enhance the passenger experience.

Nearly half of the air travel passengers are in favour of replacing physical paper passports with digital identities and 73% (up from 46% in 2019) are prepared to share their biometric data in order to benefit from more efficient and seamless airport processes. That, however, means airports need to have the necessary technologies in place to recognise digital identities which will require investments in biometrics and digital identity management solutions. The benefit for passengers is a safer, seamless, and contactless end-to-end passenger experience.

More than half of US travellers find airline travel stressful, according to new research. Expedia's 2024 Air Travel Hacks Report revealed that 55% of Americans find airline travel more daunting than filing taxes or visiting the dentist. The airports of the future understand the need to provide a positive experience for passengers: prioritising convenience and removing as much stress and anxiety as possible.

As the world embraces digitisation, so too will the airport environment need to digitise across both passenger and

cargo operations. Even the internal layout of airports will need to take cognisance of the deployment of technology and processing of on-the-move passengers to ensure they reach their gate in time.

According to a virtual private server, improving the airport experience for passengers boils down to three things: easy navigation, cleanliness, and customer service. Encouragingly, there are relatively simple solutions to each of the challenges faced by passengers within the airport environment.

The last thing passengers want is to struggle to find where they are supposed to be with challenges navigating maze-like airport terminals adding significantly to their stress levels.

Easily visible signage is imperative. Digital signage systems are even more useful, both to direct passengers and provide up-to-date, real-time information updates. Software and digital signage company Mangodo has used the Designage programme that allows for easy management of and content creation for digital screens in the airport environment, providing passengers with real-time information updates. At Istanbul Airport, Mangodo's digital signage system manages more than 400 screens located in different parts of the airport including security gates, lounges, and ad-spaces, amongst others. A public transportation screen shows departing public transportation, including details such as the destination, bus company, platform number, and departure date while a traffic density map shows traffic density as well as real-time, estimated time of arrivals to popular destinations from the airport.

Increased traveller numbers passing through airports will put additional pressure on airport facilities such as restrooms. Dirty bathrooms leave passengers with a negative overall impression of the airport. Here too technology is already starting to play a role. The company's restroom cleaning and technical monitoring systems allow passengers to report their opinions related to cleanliness and problem areas in multiple languages to both restroom cleaners and airport management and records how long it takes to solve the related problem. The VPS said airports need to understand good customer service traits and components, rethinking airports as consumer hubs. In addition to focusing on ambiance and atmosphere, airports also need to offer a good mix of restaurant facilities, retail outlets, and even children's entertainment areas. Airports are increasingly looking at how new technologies can deliver more customised and on-demand services to passengers to ensure a more efficient airport experience. Services such as virtual queuing and duty-free online shopping to be delivered at the passenger's destination, are all aimed at enhancing the passenger experience.

It's expected that e-commerce platforms to deliver food and beverages in time for the passenger's flight will also become more mainstream. The company's digital restaurant management system, YumMyMenus, is a good example of this: a contactless ordering and payment platform that offers a multi-language selection, allowing passengers to order online with a customised and interactive digital menu and the ability to make a mobile payment.

By 2050, many processes within the environment will be fully autonomous, according to Oliver Wyman. Singapore's Changi Airport Terminal 4 is already autonomous as far as check-in, baggage drop, immigration, and boarding are concerned as a result of facial recognition technology. Dutch airport operator Royal Schiphol Group plans to implement fully autonomous airports by 2050. Many of the technologies to achieve this are already in place. Mangodo, for example, has developed a customised scaler solution for airports which allows software to receive the baggage weight information, connect to the passenger's details, and informs the traveller both in writing and verbally if the weight is acceptable or exceeds permissible limits for the airline in question.

There is no question that those airports which prioritise the passenger experience will have the competitive edge.

Covid-19 required passengers to wear masks. Today this is no longer necessary. Image by Freepik

BELL FLIGHT: NAVIGATING THE SKIES OF 2024

At the end of 2023, Bell Textron Inc, the 88-year-old pioneer of VTOL, had much to celebrate, recording strong sales activity across all regions and segments which the company is optimistic will continue into 2024.

Up to and including Q3, the company delivered 80 commercial aircraft across six continents - and saw widespread interest in its products from African customers.

Successes on the continent in 2023 included two Bell 429 deliveries - one to an undisclosed customer for HEMS missions in March, and a second in an oil-and-gas configuration to Caverton Helicopters Limited in November.

There are two also operating in South Africa, with further purchase agreements and deliveries in progress. The 429 is a popular choice for the African market and continues to excel across the many market segments for which it was designed.

The Bell 505, the next generation single engine light helicopter building on the world-renowned Bell 206 JetRanger, also enjoyed success in Africa with platforms operating across Uganda, Ethiopia, Kenya and South Africa and performing a variety of missions – including a commercial and military trainer to corporate/VIP transportation and tourism.

Meanwhile the longstanding African workhorse, the Bell 407, with more than 6 million global fleet hours under its belt, is also operating all over the continent, more recently in corporate and VIP configuration on the latest Bell 407GXi, in South Africa.

Throughout the year, Bell saw strong demand and solid order activity from domestic and international corporate, private, utility and HEMS operators. It is anticipated that this will continue into 2024, along with its major stake in the flight training market.

Back on the commercial side, the Bell 525 received immense interest from oil and gas operators. Once in operation as its initial utility/oil-and-gas configuration, Bell will introduce kits to facilitate further missions. The company has had great engagement with prospective customers at its 525 Customer Experience Centre in Stavanger, Norway.

In June last year, Bell hosted industry professionals in Nairobi, Kenya, to collaborate and share best practices relating to Helicopter Emergency Medical Services, customer support and services, training and Bell's number one priority, safety.

The symposium included Bell customers, advocates and industry sector experts, with presentations and discussions around how vertical flight solutions lead to better patient outcomes, cut response times and help to ensure valuable healthcare is accessible to people wherever they are located - a critical and essential factor in the vast continent of Africa.

In July, Bell attended AERO South Africa where it featured 11 aircraft on static display, including the Bell 505, and the Bell 407GXi. The three-day event provided an excellent opportunity to meet with customers and delegations to discuss latest programme updates, exchange industry information and get valuable feedback.

It's this feedback from customers that really steers Bell and its offerings in each of the markets in which it operates. By listening to customers and their requirements, Bell is able to support them with payment plans and packages that fit their needs and help spread costs efficiently.

Over the course of 2023, Bell has continued expanding its support capabilities and coverage as customers' flight hours have increased.

Looking forward into 2024, Bell is optimistic and anticipates sustained growth on the dynamic African continent - an extremely important market, both by further developing its raft of generation-spanning client relationships and by building new ones.

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AIRTEC GLOBAL

Changi international airport in Singapore recently re-opened their terminal 2 with a digital waterfall.

BUY BEFORE YOU FLY

For many people, a leisurely wander round an airport shopping mall is as much a part of the journey as the flight itself. For retailers, a captive audience in a holiday mood is likely to be the kind of customer they want. Time and routine are thrown out of the window; people drink beer for breakfast, buy hats they are unlikely ever to wear again and are generally much more receptive to the idea of spending. On the other hand, some airports have very little in the way of retail opportunities. It can be rather disappointing to find limited purchasing prospects. Larger airports, offering shopping malls rather like glittering temples to merchandising with high end brands tempting the passer-by to indulge. In this article, Artemis Aerospace investigates some of the best airports in which to buy before you fly.

LONDON HEATHROW AIRPORT

Placed fourth in the Skytrax Best Airport Shopping Award 2023, Heathrow, with 62 outlets, promises an exciting few hours of browsing. You can check out Aspinal of London or Bulgari for designer bags, buy a watch at Cartier, Rolex or Tiffany or boost your holiday wardrobe with a little number from Prada. There are branches of Harrods and Fortnum & Mason should you require some upmarket refreshment, and even a Harry Potter shop in case your wand requires an upgrade. If you want to make the most of every minute, you can pre-book a personal shopping service.

HONG KONG INTERNATIONAL AIRPORT

If you feel stressed when you arrive at HKIA, you can head for one of the two Waterfall Gardens, an interactive multimedia ecosystem with plant life, ponds, and waterfalls. Once recharged, among the 280 shops, Versace, Ferragamo and Jimmy Choo beckon, along with Hong Kong jewellery brand Chow Tai Fook. If you're exhausted after all this and need a little pick-me-up, you can head to the Oriental Massage Centre for a relaxing head, shoulder and foot massage. The ideal way to begin a long journey!

DUBAI INTERNATIONAL AIRPORT

The UAE is globally renowned for its designer shopping, and the airport is particularly known for its duty-free electronics and technology retail opportunities. Dubai Duty Free store will sell you a laptop or mobile, a power bank if you forgot your charger, or even a drone, should you feel the need to undertake some aviation of your own! Cosmetics are also a canny purchase here, and you can customise a bottle of perfume at the Guerlain pop-up in Terminal 3 for a perfect present. As an extra bonus, if you've been sitting in a plane for hours, all passengers passing through Dubai are entitled to use of the swimming pool at the Dubai International Hotel.

AMSTERDAM SCHIPHOL AIRPORT

Schiphol is another airport which tries to de-stress the travelling experience; you can seat yourself in one of seven Massage-O-Matic chairs for a five-minute Shiatsu massage, while listening to calming music and watching relaxing images on a screen.

Re-energised, you can find good prices on beauty and fashion products from retailers such as Gucci, Burberry and Bottega Veneta. Visit Old Amsterdam for a wide selection of Dutch cheeses, which are vacuum-packed ready to go in your

hand luggage. And, of course, you shouldn't leave without buying a chocolate windmill - the ultimate in edible souvenirs!

JFK INTERNATIONAL AIRPORT

The eight terminals at JFK offer a multitude of shops including Brooks Brothers, Hermes and Victoria's Secret. You can also browse an eclectic selection of items from the Metropolitan Museum of Art outlet, or stock up for a beach break at Ron Jon's Surf Shop.

If the lure of the open road attracts you, you can hire a Harley Davison from the airport concession and head off or make your way to the Be Relax Spa for a quick boost; choose from a hot stone massage, special oxygen treatment or even an 'anti-jet-lag' facial.

CHANGI INTERNATIONAL AIRPORT, SINGAPORE

Named World's Best Airport in the 2023 Skytrax World Airport Awards, and also scooping third place in the Best Airport Shopping category, Changi Airport is a retail paradise.

With more than 350 shops, Changi has an enterprising approach to retail and has a regular selection of pop-ups, such as last year's partnership between the House of Suntory and Lotte Duty Free which showcased the art of Japanese whisky and craftsmanship. This year Disney-themed retail experiences paid tribute to nearly 100 years of Walt Disney. For relaxation, Changi's Terminal 4 features 20,000 plant species in a vast green wall, which is said to help improve air quality in the terminal and lower the temperature - a peaceful way to unwind before embarking an aircraft.

Even a short stopover at any of these airports is likely to make a dent in your wallet, so as you saunter through, be prepared to buy till you board!

CESSNA SKYHAWK AIRCRAFT

ATP Flight School has signed an agreement with Textron for the purchase of an additional 40 Cessna Skyhawk aircraft to be delivered beginning in 2026.

This addition to ATP's existing fleet of nearly 225 Skyhawks, deployed across more than 85 training centre across the US will provide students with access to a modern and advanced fleet in support of their pilot career aspirations.

The Cessna Skyhawk is designed and manufactured by Textron Aviation and the agreement marks the fourth fleet purchase, amounting to a total of 135 of Cessna Skyhawks, for ATP's Airline Career Pilot Programme in just over a year, as the flight school scales to train 20,000 airline pilots by 2030.

"For over six decades, the legendary Cessna Skyhawk has inspired the next generation of pilots and served as the world's leading flight trainer," said Chris Crow, vice president, piston sales.

"We are delighted to continue our long-standing relationship with ATP and provide their students access to the most produced single-engine aircraft globally."

The Cessna Skyhawk is renowned as the go-to training aircraft in the industry. Its steady flight dynamics, cutting-edge avionics and reliable dispatch history have made it ATP's trusted training platform for the past three decades.

"With already one of the youngest, most modern fleets at scale, the firm orders for 135 Skyhawks are for direct fleet growth, not replacement. Over the next three years, ATP will be expanding its Cessna fleet by 60% and delivering over 40 new state-of-art planes to ATP students each year through 2026," said Michael Arnold, vice president of marketing, ATP Flight School.

"ATP's fleet expansion has been responsibly paired with an investment in its Florida-based flight operations centre. Dedicated safety, tech ops, and quality assurance departments promote a high level of safety across the ATP network with real-time monitoring, risk mitigation, and safety trend analysis as they orchestrate 800 daily flights. This structured airline-based approach to flight operations provides students with a safety-focused environment from the onset of their professional careers as they become airline pilots on the most efficient path possible."

TRANSFORMING SKIES

Artificial Intelligence-powered aircraft maintenance is a crucial area of interest in the aviation industry because it has the potential to significantly improve the safety and reliability of aircraft while also reducing costs and minimising downtime.

Moreover, AI-powered predictive maintenance can improve safety by detecting potential issues before they can cause harm to passengers or crew. This can lead to fewer flight cancellations and delays and a more positive passenger experience.

ELEVATING SAFETY MEASURES AND REDUCING DOWNTIME

Artificial intelligence stands poised to thwart unscheduled maintenance, a notorious culprit behind grounded planes and delayed flights. By harnessing real-time data from a fleet of aircraft, AI not only anticipates potential issues but also mitigates them before they escalate into safety hazards.

The implementation of predictive maintenance, powered by AI algorithms, not only slashes maintenance costs but also detects and rectifies problems at their inception, preventing unwarranted disruptions.

PRECISION IN COST-EFFECTIVE MAINTENANCE MANAGEMENT

AI's precision in identifying even the minutest faults eliminates the need for unnecessary preventative maintenance checks, translating into substantial cost savings. The seamless integration of AI-backed maintenance tools into existing systems further contributes to cost-effectiveness. By analysing historical usage patterns and supply chain data, AI optimises inventory management, predicting spare part demand and minimizing costs while ensuring the availability of critical components.

EMPOWERING FLEET MANAGEMENT FOR OPTIMAL PERFORMANCE

Ideal for managing and optimising aircraft fleets, AI empowers maintenance teams with real-time performance data, ensuring extended aircraft life expectancy. Enhanced fleet management not only reduces cancellations and minimises disruptions but also streamlines turnaround times, ultimately bolstering revenue. AI's computer vision technology facilitates automated visual inspections, swiftly detecting defects, corrosion, and maintenance issues, expediting the inspection process and improving accuracy.

STREAMLINED DECISION-MAKING AND WORKLOAD OPTIMISATION

AI equips aviation maintenance teams to predict and prevent issues, enabling quick and efficient decision-making on repairs. Real-time data alerts ensure proactive responses, significantly reducing workload. The result is a well-coordinated and timely approach to maintenance issues, preventing downtime and ensuring operational continuity.

COMPREHENSIVE ANALYSIS AND REPORTING

Continuous 24/7 monitoring of aircraft systems, facilitated by AI, surpasses human capabilities in data collection and analysis. Complex algorithms and extensive databases generate detailed insights for the aviation industry, improving safety, efficiency, and overall operations. AI-driven machine learning and data analysis techniques offer maintenance managers and engineers invaluable insights for optimal resource allocation and fleet performance.

EMBRACING THE FUTURE OF AVIATION MAINTENANCE

As the aviation industry steadily embraces AI technology in maintenance and safety procedures, the benefits extend to airlines, aviation teams, and passengers alike. The collective goal is to make aviation maintenance safer, more efficient, and cost-effective. With the undeniable potential of AI in aviation maintenance, it is evident that technology is steering the industry toward a future characterised by safety, modernisation, and operational efficiency. The integration of AI into aviation maintenance emerges as the pivotal step toward shaping a secure, contemporary, and efficient aviation sector.

Predictive maintenance can improve safety by detecting potential issues before they break or cause harm. Photo by Rafael Drück on Unsplash

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ARTIFICIAL INTELLIGENCE IN INTER-STELLAR EXPLORATION

Artificial Intelligence (AI) has transcended various industries, from healthcare to finance, and now, it stands at the forefront of revolutionising interstellar travel. The once-distant dream of exploring the cosmos is now within reach, thanks to the transformative capabilities of AI.

AI IN SPACECRAFT DESIGN AND CONSTRUCTION

The vast challenges of space demand innovative solutions, and AI emerges as a key player in designing and constructing spacecraft. AI-powered software optimises efficiency, predicts and mitigates potential issues, and automates manufacturing processes, ensuring precision and reliability while saving valuable time and resources.

AUTONOMOUS NAVIGATION

Traditional navigation methods fall short in interstellar travel due to vast distances and unpredictable space conditions. AI's real-time data analysis enables spacecraft to autonomously adjust their course, avoiding obstacles and utilising gravitational assists. This adaptability is crucial for the success of long-duration missions.

AI IN SPACECRAFT MAINTENANCE

AI takes centre stage in spacecraft maintenance by monitoring systems, identifying issues, and even conducting repairs through robotic arms. This autonomy not only extends the spacecraft's lifespan but also reduces dependence on human intervention, vital in missions where communication delays are significant.

SEARCH FOR HABITABLE PLANETS

AI analyses data from telescopes to identify potential habitable exoplanets swiftly, accelerating the search for extraterrestrial life. This advancement marks a significant leap in our ability to find new homes among the stars.

ADAPTABILITY TO THE UNKNOWN

Space is full of uncertainties, and AI's machine-learning capabilities enable it to adapt to unforeseen challenges.

This flexibility positions AI as a key player in overcoming unexpected obstacles during interstellar missions.

CURRENT APPLICATIONS OF AI IN SPACE

The present landscape of space exploration sees AI contributing to autonomous navigation, resource management, data analysis, enhanced satellite imagery, exoplanet discovery, risk assessment, fault detection, and decision-making. These applications showcase AI's versatility and potential in shaping the future of space exploration.

INITIATIVES AND PROGRAMMES

NASA's AI Exploration Initiative and ESA's ARTES programme highlight ongoing efforts to advance AI technologies in space exploration. These initiatives focus on autonomous systems, data science, human-AI collaboration, and risk evaluation.

EXAMPLES TODAY

Autonomous navigation systems, resource management, data analysis, enhanced satellite imagery, exoplanet discovery, risk assessment, fault detection, and decision-making showcase AI's current impact on space exploration.

POTENTIAL FUTURE APPLICATIONS OF AI IN SPACE

AI holds promise in exploring the solar system more efficiently, searching for extra-terrestrial life, developing new space technologies, managing health on space missions, creating a spacefaring civilisation, implementing GPS-like systems in space, facilitating interstellar travel and communication, and utilising swarm robotics for celestial exploration.

CHALLENGES AND ETHICAL CONSIDERATIONS

Despite its potential, AI in space exploration poses challenges such as complexity, biases, ethical implications, and decision-making protocols. Addressing these issues collaboratively will ensure responsible and ethical use of AI in cosmic exploration.

The integration of AI technologies into space exploration has redefined our approach to understanding the universe. From optimising spacecraft capabilities to enabling autonomous decision-making, AI promises a future of discoveries, improved efficiency, and a deeper connection to the cosmos.

Collaborative efforts are essential to overcome challenges and ensure AI enhances space exploration responsibly and ethically.

Space exploration is now within reach thanks to AI. Photo by SpaceX on Unsplash

ELEVATING AEROSPACE

In the ever-evolving world of aerospace engineering, Artificial Intelligence (AI) has emerged as a transformative force, reshaping the industry's landscape. From autonomous aircraft to revolutionary maintenance processes, AI is propelling aerospace engineering into new frontiers.

AI's influence is pervasive, enhancing fuel efficiency, streamlining part design, optimising inspection procedures, and revolutionising maintenance, repair, and overhaul (MRO) practices.

The American Institute of Aeronautics and Astronautics has recognised AI's pivotal role, held dedicated conferences and is calling for papers on machine learning to explore its diverse impacts on an industry grappling with heightened demands post-extended COVID-19 lockdowns.

As we enter 2024, aerospace engineers are not just embracing AI but aiming to elevate it further. Multiple conferences this year will spotlight intelligent and autonomous systems, reflecting the industry's collective push towards innovation.

The frontier of AI in the aerospace sector extends to autonomous aircraft, where manufacturers invest significantly in vision systems and leverage AI in sensors and feedback mechanisms.

At the Georgia Institute for Technology Daniel Guggenheim School of Aerospace Engineering in Atlanta (USA), professor Kyriakos Vamvoudakis is leading projects focused on enhancing AI's role in operating flying craft. Their work on autonomous land-based vehicles, learning from human-driven counterparts, is shaping a future where AI-driven decisions streamline aircraft operations, from handling turbulence to managing emergency landings.

Aerospace companies like EHang, Wisk, and Reliable Robotics are actively developing self-flying air taxis, exploring the potential of AI to redefine urban air mobility. In Virginia, Aurora Flight Sciences, a Boeing subsidiary, is pushing the boundaries with projects like Centaur and MIDAS, showcasing AI's role in autonomous take-offs, landings, and counter-unmanned aircraft systems.

AI's impact goes beyond physical aircraft, extending to advanced simulators such as Aurora's Advanced Teaming Integration Lab (ATIL). Bridging the gap between simulation and flight tests, ATIL accelerates the design-build-test cycle, exemplifying the industry's commitment to cutting-edge technology.

Collaboration between industry leaders and academic institutions, exemplified by Aurora's partnership with MIT, underscores the commitment to refining AI applications. Projects focusing on scalable statistical models and AI agent learning methodologies showcase the industry's dedication to harnessing AI's potential for innovation.

AI is not just changing aerospace engineering; it's transforming the role of engineers themselves. By automating

The EHang 216-S, a two passenger eVTOL multicopter production model aircraft made for advanced air mobility (AAM), was awarded the 'type certification' last year by the Civil Aviation Administration of China last year – making it the first in the world.

certain design processes and enhancing decision-making capabilities, AI allows engineers to focus on innovation rather than routine tasks. This shift is evident in projects like Vamvoudakis' drone situational awareness system, where AI provides fast decision-making capabilities in response to cyber-physical attacks.

The digital revolution extends to jet engine servicing, where General Electric employs AI to efficiently manage its vast fleet. The concept of "human-machine teaming" emerges as a critical focus, emphasizing the symbiotic relationship between AI and human expertise to enhance safety and foster trust in autonomous vehicles.

ARTIFICAL INTELLIGENCE & DEFENCE

Looking toward the future, the integration of AI and machine learning in aerospace and defence promises transformative advancements. Here are some points about the impact and potential of these technologies:

ENHANCING SAFETY AND COMPLIANCE

The utilisation of AI models for understanding human behaviour and automating checklist processes contributes significantly to increased safety and compliance. By minimising human error, aerospace companies can create a more reliable and secure environment for both passengers and crew.

AUTONOMOUS AIR TRAFFIC CONTROL

While autonomous flight is not a new concept, the application of AI to automate air traffic control systems is a groundbreaking development. Overcoming complexities in these systems, AI and machine learning pave the way for safer and more efficient air travel, marking a crucial step toward broader acceptance of autonomy in the aerospace industry.

ADDRESSING PILOT SHORTAGES

AI presents a viable solution to the ongoing pilot shortages by offering redundancy comparable to human copilots. Additionally, the gradual acceptance of fully autonomous flight in certain sectors, such as freight transportation, provides relief to the industry's labour pressures. This strategic combination allows human pilots to focus on delivering a personalised experience to passengers.

ACCELERATING AIRCRAFT DEVELOPMENT AND TESTING

In the realm of aircraft development, AI's role in system modelling and simulation environments streamlines processes, reduces time to delivery, and enhances accuracy. The transition to virtual testing environments mitigates risks associated with physical prototyping, ensuring a higher chance of success for new aircraft systems. This innovation is particularly crucial in an industry where mistakes can have significant financial and safety implications.

GENERATIVE AI AND CODING

The emergence of generative AI platforms, exemplified by technologies like ChatGPT, revolutionises coding practices in aerospace engineering. The ability to generate code in languages like C or C++ without solely relying on specialised talent not only saves time but also allocates resources more efficiently. This democratisation of coding has the potential to drive further innovation in embedded software development.

CONCLUSION

AI and machine learning have firmly entrenched themselves as indispensable tools in the aerospace and defence sectors. From optimising fuel efficiency to revolutionising customer experiences and addressing critical industry challenges, these technologies continue to reshape the way companies operate.

As the Department of Defence and military entities explore AI applications, the future promises even greater advancements, marking an era where intelligent technologies play a pivotal role in shaping the future of aerospace and defence. The journey has just begun, and the possibilities are limitless.

The F-35's sensor fusion capabilities are powered by AI algorithms that combine, correlate, and analyse data from radar, electronic warfare systems, and other sensors to create a comprehensive view of the battlespace. This gives pilots unparalleled situational awareness and allows for quicker, more informed decisions

WORLD'S BIGGEST AIRCRAFT UNVEILED

THE world's biggest aircraft has been unveiled and could be ready to take the skies soon as it begins its first round of flight tests.

Pathfinder 1's 400ft airship is twice the size of a Boeing 747-8 - the world's longest aircraft - and there are plans for an even bigger one.

The enormous aircraft was created by billionaire Google co-founder Sergey Brin, who aims to turn these sky-giants into cargo vessels. Brin's company LTA Research created the "lighter than air" blimp-like vehicle, which is kitted out with 12 electric motors and four rudders, has a frame built from carbon fibres and titanium.

The Pathfinder 1 has been in development since 2016, and LTA Research said it is currently working to develop an even larger aircraft named the Pathfinder 3. LTA Research's goal is to have a fleet of various airships that can be used to transport cargo or passengers, as well as to deliver emergency humanitarian aid.

Pathfinder 1's landing gear features a "strong damper and wheels proven for heavy loads such as water or machinery for aid relief," according to the company's website. It reads: "This landing gear is ready for humanitarian missions."

Once it flies, the Pathfinder 1 will be the largest aircraft to take to the skies since the tragic Hindenberg disaster in 1937.

On the second of its scheduled 1937 transatlantic crossings, the Hindenburg burst into flames over Lakehurst, New Jersey, killing 35 out of 96 passengers and one member of ground crew.

The incident triggered a reflexive fear of hydrogen-based vehicles, in what has come to be known as 'Hindenberg syndrome'.

To combat this paranoia, the Pathfinder 1 will use only non-flammable helium, as opposed to explosive hydrogen.

The US Federal Aviation Administration officially cleared Pathfinder 1 for take-off last month, IEEE Spectrum reported. It has been given authority to fly no higher than 1,500 feet.

According to IEEE, the inflatable aircraft is allowed to fly over the south side of the San Fransisco Bay, where it won't interfere with any planes "flying into or out of San Jose and San Francisco International commercial airports."

While Brin might look like the latest tech billionaire to make his claim of the skies - it appears the Russian-American businessman anticipates Pathfinder 1 to be a humanitarian project. The airship aims to be incredibly light but with a lot of space for cargo, making it an efficient means of delivering large amounts of aid and relief workers to difficult-to-access disaster zones.

"We believe lighter than air technology has the capacity to speed up humanitarian aid by reaching remote locations with little infrastructure, and to lower carbon emissions for air and cargo transportation," LTA's CEO Alan Weston said last year.

These airships could one day carry up to 200 tons of cargo each, Weston said. That is nearly ten times the amount a Boeing 737 can carry.

These aircrafts also require little infrastructure for take-off and landing, such as a runway, which is why LTA hopes they will play a role in disaster relief.

"If runways, roads, and ports are damaged, LTA's airships can still deliver what communities need," the company states on its website.

"If cellphone towers are knocked out, airships can hover and provide service."

However, the aircraft was once nicknamed an "air yacht" by The Guardian newspaper, due mostly to Brin's billionaire status.

So, there is some concern that the humanitarian moonshoot may eventually be watered down to be an airborne addition to Brin's collection of luxury yachts and water-sports vehicles.

Once the Pathfinder 1's California test flights are complete, the aircraft will reportedly head to the Goodyear Airdock hangar located in Akron, Ohio, where it's bigger, nearly 600-foot sibling, is being constructed.

AFRICAN AIR EXPO 2024

The first ever African Air Expo will kick off next month in Cape Town, South Africa and is collaboration between organisers of the event and the City of Cape Town.

It is set to be a three-day commercial and general aviation, air cargo, business tourism and human capital development exhibition and conference.

Organisers claim it "promises to reshape the aviation and tourism landscape, offering a dynamic platform for the industry's global and regional players to converge, network, and explore exciting opportunities on the African continent".

"We welcome the organisers, delegates and visitors to the African Air Expo 2024 to Cape Town for what promises to be a wonderful convention and expo. Cape Town is proud to host - and also to support - this important event".

"We appreciate just how crucial the commercial aviation industry and various strands of tourism are for our local economy, and any efforts to boost these industries and explore new possibilities carries our full endorsement and encouragement. The City of Cape Town's collaboration on this event is yet another way for us to enhance our reputation not only as a premier global tourist destination, but also as a gateway to South Africa and the Southern African region, said Mayor of Cape Town Geordin Hill-Lewis.

The African Air Expo- Exhibition and Conference event features exhibitions, conferences, networking opportunities, and knowledge-sharing sessions for professionals in the aviation industry.

With a focus on the evolution and integration of all the aviation sectors, the expo is poised to serve as a launchpad for innovation, collaboration, and sustainable growth.

Meanwhile national carrier South African Airways has come on board as an airline partner. Organisers have reached out to other regional airlines to encourage them to participate in a special exhibition in a dedicated Cape Town airlines pavilion.

This pavilion will provide a unique platform for regional carriers to showcase their innovations, connect with industry experts, and promote their services to a global audience.

And the Commercial Aerospace Manufacturing Association of South Africa or CAMASA, a non-profit organisation formed in 2016, has been named an official partner.

The Air Expo is aiming to attract more than 15,000 attendees, host an exhibition for more than 300 companies and feature a static display with more than 40 aircraft at the Cape Town International Airport (CTIA).

"It is a great honour for the African Air Expo to welcome a prestigious association such as CAMASA on board which is why we are confident that all the members and partners of CAMASA will play an essential role in the African Air Expo and Convention and bring knowledge and expertise during the 3 days of the event to create a fantastic atmosphere and unique trade show in the beautiful City of Cape Town during February 2024", said Mobeen Motara, Air Expo spokesperson.

The African Air Expo SA is organised by Adone Events (based in France) in collaboration with Global Centre of Excellence, a local broad based black economic empowerment (BBBEE) level 1 company. Adone is the only event management company to have created and organised prestigious aviation events in four different continents, including the France Air Expo since 2006 (Europe), the Abu Dhabi Air Expo (UAE), the Air Expo India (New Delhi), and now African Air Expo SA in Cape Town.

Delegates are expected to include OEMS, aircraft owners, operators, pilots, aviation enthusiasts, trainees, aviation executives from across the sector, industry experts, and regulatory bodies.

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AFRICAN NETWORK EXPANDS

Saudi Arabian airline flynas will begin operations to Eritrea, a northeast African country situated on the Red Sea coast this month.

Starting on January 17, the carrier will establish a connection between Jeddah and Eritrea's capital, Asmara, with two weekly flights on Wednesdays and Sundays utilising their Airbus A320neo aircraft. This 383-nm route marks the sole nonstop service between Saudi Arabia and Eritrea.

With this expansion, flynas will bolster its African network to eight destinations, including Addis Ababa, Ethiopia; Algiers and Constantine in Algeria; Cairo, Giza and Sohag in Egypt; and Casablanca in Morocco.

This compares to the three cities served in 2019 when the LCC operated flights to Algiers, Cairo and Khartoum, Sudan.

Eritrea, with a population of approximately 3.7 million, currently has five international routes serving Asmara.

Ethiopian Airlines operates three daily flights from Addis Ababa, flydubai provides a nine time-weekly connections from Dubai and Turkish Airlines offers three flights per week from Istanbul.

Egyptair and Tarco Aviation also connect Asmara with Cairo and Port Sudan twice a week and once a week, respectively, according to data from OAG Schedules Analyser.

The Port Sudan-Asmara route was launched in November last year. flynas opened a daily service between Riyadh, Saudia Arabia, and Bahrain and started a Jeddah-Bahrain flight in December. The latter route is served twice a week by A320neos.

The airline's expansion to Eritrea comes despite IATA lamenting the amount of blocked funds in the country. The global organisation estimated that about (US) $79 million was blocked in 2022 and called on the government to expedite the release of the funds.

AT YOUR FINGERTIPS

Airbus successfully tested a new simplified human machine interface (HMI) along with advanced autonomous features through a project code-named Vertex.

These technologies, developed by Airbus UpNext, are controlled by a touchscreen tablet and aim to simplify mission preparation and management, reduce helicopter pilot workload, and further increase safety.

The Airbus Helicopters' FlightLab flew fully automated from lift-off, taxi, takeoff, cruise, approach and then landing during a one hour test flight by following a predefined route.

During this flight, the pilot monitored the system which is able to detect unforeseen obstacles and automatically recalculate a safe flight path. Whenever necessary the pilot can easily override the controls through the tablet and resume the mission afterwards.

"This successful demonstration of a fully autonomous flight from takeoff to landing is a great step towards the reduced pilot workload and simplified HMI that the Airbus Urban Air Mobility team intends to implement on CityAirbus NextGen. It could also have immediate applications for helicopters in low level flights close to obstacles thanks to the information provided by the lidars* on board," said Michael Augello, CEO of Airbus UpNext.

Airbus Helicopters will continue to mature the different technologies that comprise Vertex: vision based sensors and algorithms for situational awareness and obstacle detection; fly-by-wire for enhanced auto-pilot; and an advanced human-machine-interface - in the form of a touchscreen and head worn display for inflight monitoring and control.

HIGH DATA RATE

A new milestone has been reached by the a4ESSOR consortium.

NATO has adopted the ESSOR High Data Rate Waveform (HDRWF) developed by the consortium as the STANAG 5651 interoperability standard for tactical communications with radio platforms.

This result recognises the high performance and advanced features already demonstrated by a4ESSOR throughout the development and qualification of the ESSOR HDR Base Waveform.

Following the ratification of the standard, the waveform will be available for all NATO member countries, enabling them to communicate in a faster and more secure manner in national and coalition operational scenarios.

The ESSOR HDRWF is a broadband waveform operating in the UHF (Ultra High Frequency) band between 225 MHz and 400 MHz.

It can handle data rates up to one megabit per second - real time automatic adaptation capability - and maintain voice and IP (Internet Protocol) data in MANET (Mobile Ad-hoc Network) mode.

The ESSOR HDRWF network maintains full operations even when global navigation satellite signals are unavailable. "The adoption of the ESSOR HDRWF waveform is a source of great satisfaction for our international team, which is proud to see its work recognised by the most important military organisation in the world.

"NATO's ratification concludes a development cycle that was conceived according to a visionary approach to interoperability that remains unique worldwide. The development cycle was performed by an exceptional team that was able to operate in a cohesive and supportive manner, despite comprising professionals from six different companies in six different countries," said Lino Laganà, president and general manager of a4ESSOR.

"This achievement," he said, "is a further incentive for us to continue to develop new narrowband and air-ground-air waveforms, an area in which a4ESSOR has been engaged since 2021, with the same winning approach to interoperability and in the interest of European countries and NATO".

The HDRWF waveform, already integrated into the radios of a4ESSOR industrial partners of Finland, France, Germany, Italy, Poland, and Spain, achieved validation by passing interoperability tests last year. This demonstrated the high performance of the ESSOR HDRWF including new multi-hop push-to-talk, radio silence mode and cohabitation (spectrum sharing) features.

These capabilities were also demonstrated during the 2022 and 2023 Coalition Warrior Interoperability Exercise (CWIX), NATO's largest interoperability event.

ORANGE PRIDE

This Boeing 777-306 (ER) is seen proudly displaying its new coat. The widebody was photographed on the ACM Apron and subsequently on departure. The original "Orange Pride Livery" was introduced in June 2016 after KLM put up a post on its social media on King's Day in 2015. Photo credit - Marcel Mantaj / MAviO News.

. AFRAA secretary general Abderahmane Berthé and executive vice-president Intra-African Trade Bank at Afreximbank Kanayo Awani signed a memorandum of understanding in Cairo. Egypt.

ENHANCING COLLABORATION

The African Airlines Association (AFRAA) and the African Export-Import Bank (Afreximbank) have signed a memorandum of understanding to tighten co-operation toward the development of a safe, reliable, efficient and environmentally sustainable air transport system in Africa.

Under the framework of the MoU, signed by the two parties will co-ordinate activities, joint projects and programmess, exchange information and data, and best practices to facilitate the achievement of shared objectives.

Key areas of collaboration include: aviation safety and security, environmental sustainability initiatives, air transport liberalisation - implementation of SAATM Joint Prioritised Action Plan, economic sustainability of air transport - cost reduction, taxes and charges, airline consolidation, human capital development and capacity building, facilitation of trade, business and tourism and the exchange of statistical data, information and best practices.

"AFRAA and Afreximbank share a common goal to support a sustainable air transport system in Africa and thereby effectively contribute to the continent's socio-economic development, trade and integration. Signing this MoU will facilitate the mobilisation of necessary financial resources to undertake projects that will benefit African airlines," said Berthé.

"Traction on collaborative actions is on-course. For the first time in Africa, trials for the free routing flights became a reality in November last year, thanks to the funding by Afreximbank and technical support by aviation experts. Flights ET935 and KQ 508 operated safely outside the existing routes, directly from Addis Ababa to Abidjan and Nairobi to Accra, respectively. Implementing the Free Route Airspace (FRA) will annually bring significant cost savings to airlines, shorten travel times for passengers and put less CO_2 emissions into the environment. The trials will continue to provide critical data to accelerate the FRA implementation in the entire African Airspace, improving air navigation efficiency," he said.

Meanwhile Awani noted that AFRAA and Afreximbank share a common goal to promote the development of a safe, reliable and environmentally sustainable air transport system in Africa that will effectively contribute to the continent's socio-economic development, trade and integration.

She said the free routing trials will contribute towards ensuring an efficient aviation market in support of intra-African trade and tourism which is critical to the full realisation of the objectives of the AfCFTA.

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A SOUTH AFRICAN AIR PIONEER

Lieutenant-Colonel Allister Miller DSO OBE (1892–1951) was a South African aviation pioneer, who was not only a war hero but was instrumental in the creation of a civilian aviation industry in South Africa.

By all objective measures, he can claim to be the father of this industry. Due to his record-breaking flight from Cape Town to Port Elizabeth, he was accorded recognition in Port Elizabeth by naming the street past the airport, Allister Miller Drive.

Born in 1892, in Schombeni, what was once called Swaziland (now Eswatini), Allister, was named Alexander Mitchell Miller, but gave himself the name Allister. He went to the South African College School (SACS), and later pursued studies at Rhodes University. After spending one year there he went to the City & Guilds Engineering College in London to study electrical engineering before the outbreak of World War I.

Responding to the call of duty, Miller enlisted in the British Army in 1914 and joined the Royal Flying Corps (RFC) in 1915. As a Flight Commander in No. 3 Squadron RFC, he returned to South Africa and played a vital role in recruiting soldiers, signing up a remarkable 450 recruits during his first campaign in 1916.

It was during his second recruiting tour that Miller made an indelible mark with the residents of Port Elizabeth. He had undertaken to fly from Cape Town to Port Elizabeth. Residents of the town were very excited and the day, November 7, 1917 was declared an unofficial public holiday. The two B.E.2 or British Experimental aircraft were offloaded in Cape Town and assembled there with serial numbers A3109 and A3110.

Major Miller, accompanied by Sgt-Mechanic Way, took off from Young's field, Cape Town. Five hours 18 minutes later, flying at an average speed of 70 mph, the plane touched down at the PE Golf Club - the first plane ever to land at the City.

An estimated 5,000 people were waiting at the Club to witness the arrival, but they pressed so close when the plane touched down that Major Miller was forced to crash his craft into a fairway bunker to avoid the over-eager spectators. His action prevented what could have been a major tragedy.

Coupled with this feat was the fact that Miller carried 80 copies of the Cape Times newspaper together with some mail. As such, this mail can then rightfully claim to be the first airmail from Cape Town to Port Elizabeth.

It was during the second recruiting tour of the Union that Allister met a young woman by the name of Marion Mercy Bagshaw in Port Elizabeth. Marion was a member of the well-known Bagshaw family in Port Elizabeth which were partners in the prominent shoe manufacturing company, Bagshaw &

Gibaud. Before Allister could return to France, there was a more pressing personal deed that he would have to perform: marry his sweetheart in June 1918.

On completion of the recruiting tour in October 1918, Miller was sent back to France as OC 45 Squadron of the Independent Air force. The IAF was a First World War strategic bombing force. part of the British Royal Air Force and was used to strike against German railways, aerodromes, and industrial centres without co-ordination with the Army or Navy. When the war ended on 11th November 1918, Miller elected to remain with the British Expeditionary Force until January 1919.

After World War I, Miller tried to pursue a career in civil aviation as there were no opportunities with the South African Air Force. He started the South African Aerial Navigation Company along with two partners, and purchased four Avro 504Ks which could each carry two passengers in the large rear cabin. The idea being to entice audiences to pay for a ride but the timing was terrible. Economic times meant people simply could not afford this experience.

Now without work, in 1920, Miller turned to politics. He contested the election standing for the South African Party, or the SAPS as they were called, for the Springs constituency. He was unsuccessful. A year later Miller stood again as a SAPS candidate, this time for the Salt River constituency - again he was unsuccessful.

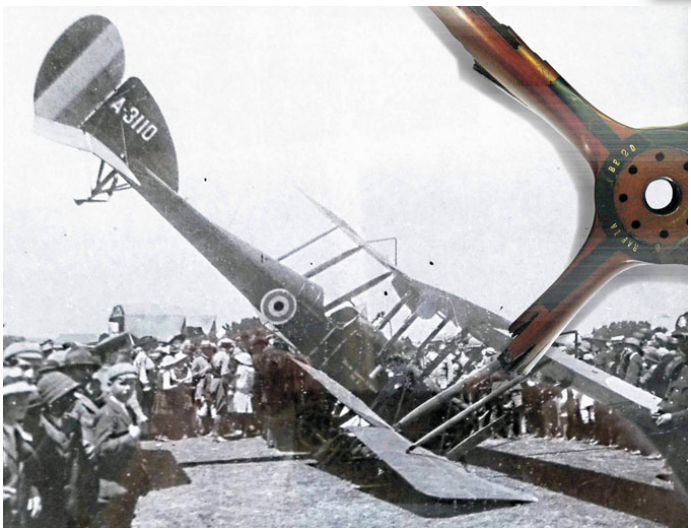
He then left the country after being offered a job in Rhodesia with an insurance company. While he was there, he again, started the Rhodesian Aerial Tours company with one of the Avro 504ks. But This business ceased operations in less than two months. On August 13, 1922 an Avro was caught in a major crosswind on take-off at Rusape and crashed into a thorn tree. The incident spooked the other financial partners who withdrew their financial support.

He then returned to the country and finally in 1924, successfully campaigned for the Point constituency in Durban and was elected. As a Member of Parliament he never missed a chance to promote his ideas on civil aviation in the country.

In 1929 he realised his dream of establishing an airmail service. Founding Union Airways in Port Elizabeth, he secured a government contract to operate airmail services connecting Cape Town with major South African centres. The venture was financially supported by the Atlantic Refining Company. The company was registered on 24 July 1929 and began airmail operations with five de Havilland DH 60 Gipsy Moth bi-planes and a small staff of experienced pilots from the Fairview Flying Field in First Avenue Port Elizabeth. Mail was carried weekly to their headquarters in Port Elizabeth from Cape Town, Durban and the Rand, via Bloemfontein.

Mail was also collected from the Union Castle steamships from Britain that docked at Cape Town harbour on Monday mornings and flown to Port Elizabeth by a single Gypsy Moth. There two more Gipsy Moths were waiting to continue the service, one to fly mail to Bloemfontein and Johannesburg and the other to East London and Durban. On Thursdays, the return service reached Cape Town in time for the departing United Kingdom bound steamship.

Miller bought a Fokker Super Universal NC98K in the USA and registered it as ZS-ABR. This aircraft became the first passenger carrying machine used on regular services but was not noted for its longevity. On December 31 1931it crashed at



Kayser's Beach with three people on board. The plane had to be written off but all three survived.

So despite initial successes, the service suffered many challenges and further crashes which led to the withdrawal of financial support. South West African Airways then stepped in and merged with Union Airways in 1932. Later on the South African government took over in 1934 – and formed the South African Airways company that went onto to later become a globally renowned airline.

During World War II, Miller once again served in the South African Air Force. Following the war, he contributed to the aviation industry as chief publicity officer for South African Airways. Lieutenant-Colonel Allister Miller, widely remembered as "Major" Miller, passed away on October 14, 1951, leaving

EASA DOA FOR LILIUM

German electric vertical takeoff and landing (eVTOL) air taxi developer Lilium has been steadily clearing obstructions on its runway to achieve type certification.

The manufacturer of the six-passenger Lilium Jet received its Design Organisation Approval (DOA) from the European Union Aviation Safety Agency (EASA) late last year – the primary regulatory authority.

The DOA is a required step in the type certification process for companies developing EASA Part 21 commercial aircraft.

The Lilium Jet is expected to enter that class through a certification basis awarded by EASA in 2020, under the regulator's special condition for vertical take-off and landing (SC-VTOL) rules.

The prototype's first manned flights are expected in late this year, with type certification following in late 2025.

The fixed-wing design is powered by small, electric ducted fans embedded in the wings, contrasting with the 'tiltrotor' thrust architecture common among US competitors.

Initially, the Jet will fly regional air mobility routes, ferrying passengers between towns and inner cities on 25 to 125 sm or 22 to 109 nm trips. Eventually, Lilium envisions flights beyond 300 sm (260 nm).

The air taxi will cruise at 162 knots at about 10,000 feet, the altitude at which helicopters typically fly.

The DOA award establishes that a manufacturer is qualified to design and hold a type certificate for aircraft developed under the SC-VTOL rules.

Those requirements are designed to enable safe market entry globally and have been adopted by other regulators, including the UK's civil aviation authority.

The award builds on the German firm's recent progress toward certifying the Lilium Jet in Europe.

In September last year, it began assembling the first fuselage for a type-conforming Jet prototype, which it will use for flight testing with EASA.

According to a company update in July last year, about 80 percent of Lilium's means of compliance proposal - which outlines how the manufacturer will adhere to the requirements laid out in its certification basis - has been approved by EASA.

ALSO IN THE US

Meanwhile on the other side of the Atlantic, Lilium has also been working to certify its air taxi with the FAA.

In June last year, it became the first eVTOL manufacturer to obtain certification bases from both EASA and the American regulator.

The company said its DOA should aid its progress on both sides of the Atlantic.

"In addition to European oversight, EASA's DOA brings significant benefits to our FAA certification process in the US by utilising the Bilateral Aviation Safety Agreements to validate the technology and aircraft," said Bhavesh Mandalia, chief airworthiness officer and deputy CTO of Lilium.

Last month, the German firm laid the groundwork for unlocking the US market with the start of private sales of its Pioneer Edition Jet, the four-seat launch edition of its flagship, seven-seat model.

Working with EMCJET, a full-service aircraft brokerage and management firm based in Houston, Lilium will sell the Pioneer Edition - billed at a hefty (US) $10 million - to 'premium' customers.

Deliveries will begin once FAA type certification is obtained, which is expected in late 2025 or early 2026.

EMCJET intends to sell the Pioneer Edition nationwide beginning with the Texas metropolises of Houston, Dallas, Austin, and San Antonio.

This followed several agreements with eVolare in the UK, Air-Dynamic in Switzerland and Italy, and ASL Group in Benelux (Belgium, Netherlands, and Luxembourg) and Germany.

Combined, the three firms have committed to order 31 aircraft. Earlier this month, Lilium added a fifth global dealer, Dubai-based ArcosJet, to open Pioneer Edition sales to the United Arab Emirates, Israel, and Cyprus.

GLOBAL FOOTPRINT

In addition to Europe, Lilium plans to launch commercial air taxi services in the US with the help of several partners.

It's working with Tavistock Development Company and the city of Orlando, Florida, to build a 56,000- foot² vertiport within the Lake Nona Aerotropolis, a master-planned community with direct access to Orlando International Airport (KMCO).

In 2022 fractional aircraft ownership company NetJets agreed to purchase up to 150 Lilium Jets and will operate air taxi routes out of the facility and plans to ferry passengers as far as Miami (about 185 sm away).

Houston-based helicopter operator Bristow Group - which may purchase up to 50 air taxis - will provide maintenance services in Florida and other Lilium markets, while FlightSafety International will train pilots to fly the aircraft.

"Multiple US operators remain extremely interested in Florida, and we think it makes a great entry market for a Lilium operator," Broffman said.

Outside the US, the manufacturer's largest agreement is with Brazil's Azul for the delivery of 220 Jets.

It also has 100 aircraft orders apiece from Saudi Arabia national airline Saudia and Chinese helicopter operator Heli-Eastern, with plans to establish a footprint in both countries. And in the East, the company has agreed to build an eVTOL network across China in partnership with Citic Offshore Helicopter Co, beginning with the country's Greater Bay Area.

Photos supplied by Lilium Jets

FIRST UAE SAF-POWERED ROTORCRAFT FLIGHT

Abu Dhabi Aviation (ADA) company's AW139 intermediate twin-engine helicopter accomplished two flights powered by blended sustainable aviation fuel late last year.

These flights marked a first in the UAE and Middle East and demonstrated a joint commitment by both ADA and Leonardo to reduce the impact that aviation has on global carbon missions.

Chairman of Abu Dhabi Aviation, Nader Ahmed Al Hammadi, said that the company is keen to collaborate with its strategic partners to expedite carbon removal from the aviation sector and contribute to achieve the country's climate targets, among others.

"We reaffirm ADA's commitment to supporting the UAE's efforts in the aviation sector to ensure sustainable growth and its adoption in the future," said Al Hammadi.

"The SAF flights in the UAE performed by ADA's AW139 have shown what's possible in support of the rapid evolution of sustainability requirements in aviation. This technology can deliver real benefits in the region and widely across geographies, for all missions and can be readily available. We're committed to joining forces with authorities, energy industry leaders and rotorcraft service providers to incentivise the use of SAF to sustain carbon footprint reduction," said Gian Piero Cutillo, Leonardo Helicopters MD.

Meanwhile the director general of the general Civil Aviation Authority Mohammed Al Suwaidi said that the civil aviation sector in the UAE is making significant strides towards enhancing the use of sustainable aviation fuel (SAF).

He said, "At the conclusion of the third ICAO Conference on Aviation and Alternative Fuels last year, which was hosted by the UAE, the world witnessed the launch of the Dubai Framework for Sustainable Aviation Fuel, which represents the beginning of the path towards a more sustainable future in aviation, aiming to achieve our ambitious goal of reaching zero emissions by 2050."

ADA and Leonardo have been collaborating for over 15 years with the operator acquiring a total of 33 aircraft to date, most of which are AW139s. Recently, ADA set a 100, 000 flight hour milestone with its Leonardo helicopter fleet.

The ADA's fleet of Leonardo helicopters was extended to comprehensive localised support, maintenance, and overhaul services in the UAE around ten years ago with the establishment of the AgustaWestland Aviation Services Joint Venture and subsequent training and simulation capabilities.

The helicopter programme was certified in 2004 and is the bestselling type in its category. The AW139 has logged orders for over 1,300 units from more than 290 operators in over 80 countries to date for all missions.

The global AW139 fleet has nearly 4 million flight hours logged to date.

The type features state-of-the-art avionics with advanced navigation and collision avoidance systems to enhance situational awareness and reduce pilots' workload, unmatched speed, power margins and overall performance.

It has the widest cabin in its category featuring high modularity for rapid reconfiguration, a unique 60+ min run-dry capable main gear box for enhanced reliability and safety and up to 1,000 certified kits.

The AW139 is powered by two Pratt & Whitney Canada PT6C-67C engines that provide exceptional power capability with each engine producing 1,700 shaft horsepower (shp) thermodynamic.

The AW139 is supported by advanced digital capabilities for maintenance and training, both in terms of fleet flight data management and simulation for pilots, cabin crews and technicians.

Last year the AW139 helicopter carried out demonstration flights with SAF in Japan and Malaysia.

Abu Dhabi Aviation accomplished two flights with a Leonardo AW139 helicopter powered by SAF - marking a first in the country and the region.

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Virgin Atlantic crew members and Sir Richard Branson in front of the Boeing 787 Rolls-Royce Trent 1000 engines. History was made when Flight 100 made the trans-Atlantic crossing powered by SAF.

AN AVIATION MILESTONE

Last month, for the first time ever, a commercial plane flew across the Atlantic Ocean without using fossil fuels.

While the Virgin Atlantic test flight from London to New York has been described as a milestone, aviation experts are warning there is much still to be done.

The historic flight was powered only by sustainable aviation fuel - a broad category of jet fuel that creates fewer carbon emissions than standard kerosene blends.

The fuel on this flight was made from waste fats and plant sugars and emits 70% less carbon than petroleum-based jet fuel, according to a press release.

The problem today is that the production of SAF is minuscule and accounts for about 0.1% of airlines' current fuel consumption.

"SAF is a major aspect of the transition for aviation [to zero carbon emissions], and it's especially critical this decade," said Andrew Chen, principal for aviation decarbonisation at the Rocky Mountain Institute, a clean-energy think tank. "But, our big issue is we don't make enough SAF."

Some are saying Virgin Atlantic's 100% SAF flight a one-time stunt because the airline won't be offering regular all-SAF flights in the near future.

The main advantage of SAF is that they are "drop-in" fuels, meaning they can have an impact right away because they can be blended with standard jet fuel and poured into engines.

But there's a limit on how much sustainable fuel a standard jet engine can take, according to Chen.
Petroleum-based jet fuel contains aromatic compounds that keep jet engines running properly. Many versions of SAF don't have these compounds.

To operate the flight powered only by SAF, Virgin Atlantic mixed a fat-based biofuel with a bit of plant-based "synthetic aromatic kerosene," a form of sustainable aviation fuel made from plant sugars that has the aromatic compounds needed to keep a jet engine running smoothly.

The absence of aromatics is an obstacle for a 100% SAF flight, but Chen said that this is a "champagne problem." First, he said, the industry has to figure out how to ramp up sustainable fuel production so that it makes up more than 0.1% of jet fuel.

"I would love it if we were talking about the fact that we're bumping up against blending limits," he said. "But we're not there yet. We still have a lot of work to do."

To get to zero carbon emissions, aviation must develop new technologies that will allow planes to run on electric batteries, liquid hydrogen or some other as-yet-unproven fuel source. It will take years of research to fully develop these technologies, and decades more for airlines to fully replace their existing fleets with planes that can run on new fuels.

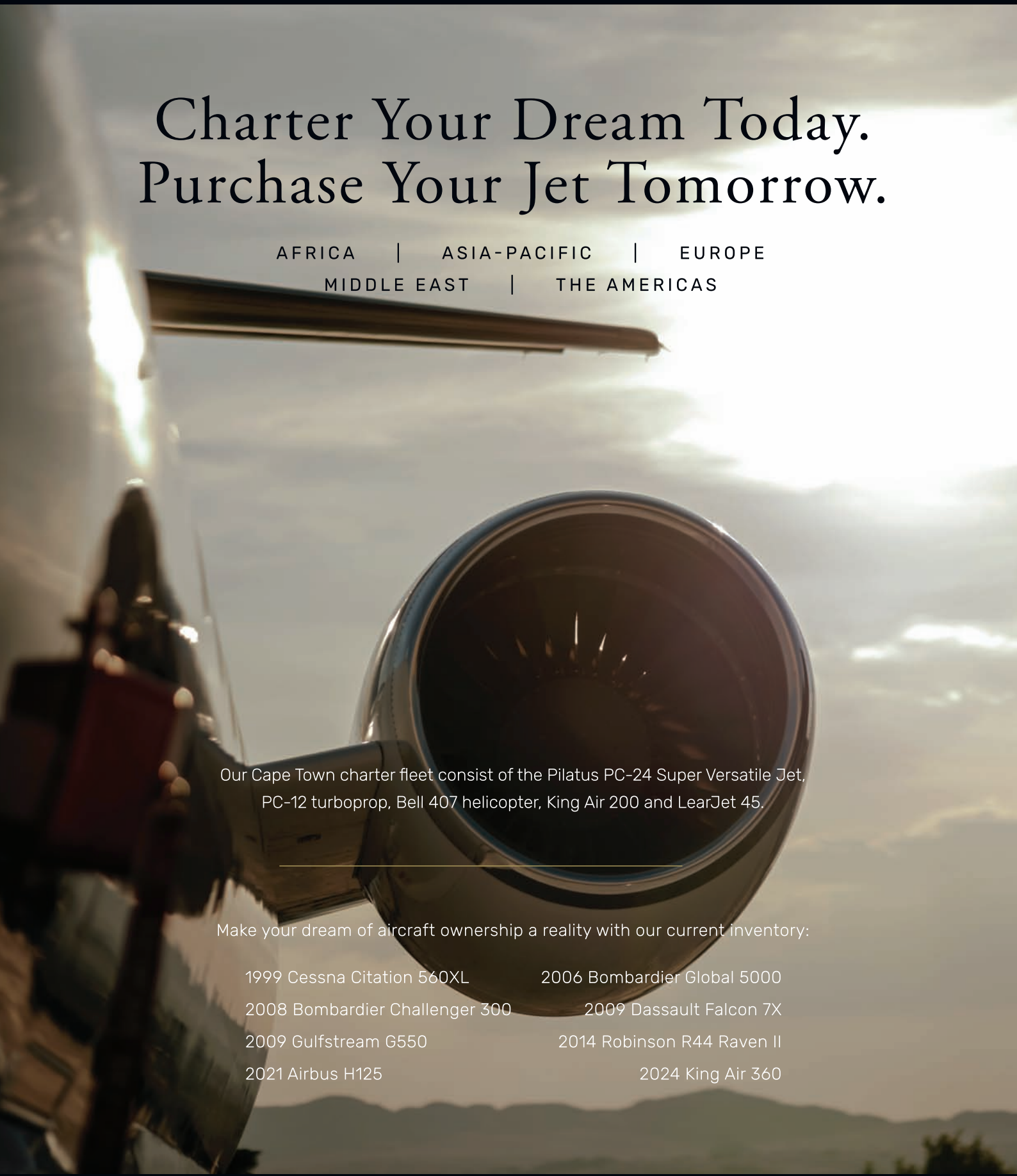
Chen said the SAF market is rather like a chicken-and-egg problem.

On one hand airlines don't want to buy SAF because it is currently several times more expensive than standard aviation fuel. And on the other fuel refiners don't want to invest in new manufacturing facilities - which could bring down the cost of sustainable fuels - because there isn't enough demand from airlines.

Governments and industry groups are trying to break that impasse and jump-start the growth of the SAF market.
In the United States, the Inflation Reduction Act offers tax credits to airlines that buy SAF, while the European Union has passed laws requiring airlines to use them. In Europe, airlines must use 70% SAF by 2050.

Meanwhile, the World Economic Forum has led an industry push to create carbon credits based on SAF sales. Through an elaborate accounting framework, airlines can calculate how many carbon emissions they're avoiding through their use of sustainable fuels and sell those credits to companies or passengers who want to offset the emissions they generate by flying.

"We see a lot more attention, a lot more activity and investment and announcements around SAF partnerships, joint ventures and long-term off-take agreements," Chen said.



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