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LOW-COST & REGIONAL

Bringing the industry together

Airline Business

GROUNDED DREAMS

Is Australia's regional system unfixable?

p.26

GENERATIVE AI
Use cases for the new tech must be tested
P.17

LOOKING AHEAD
Regional Industry Outlook for 2025
P.32

LEAP YEAR
Engine focus on popular CFM option
P.40

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RADICAL OPTIMISM

GETTING ANY PRODUCT READY FOR PRODUCTION AT SCALE IS DIFFICULT

Unless you've been hiding under a rock for the past few years, you must have heard about some of the eVTOL concepts that are currently under development.

Investors are drawn to the futurism of 'flying cars' and, despite the market for such vehicles being very niche, there are scores of proposals for new designs of propulsion systems and avionics as well as cabin and cockpit designs. I met representatives from a number of the companies promoting them at Farnborough earlier in the year, and even though the journey to bringing production-ready vehicles to market will be long, everyone I spoke to was excited by the prospect.

Electric propulsion isn't just limited to vertical take-off though. At the recent ERA General Assembly, I heard four presentations about different types of conventional aircraft powered either solely by electricity, or by some type of hybrid arrangement. There was also a firm there providing information about a different type of 'hybrid air vehicle', an airship as they used to be known, but featuring twenty-first century technology.

These visions of the future are different in their approach, but they have two things in common. The first is the laudable desire to reduce emissions from regional aviation. The second is that none of the products exist beyond a prototype.

Getting any new product ready for production at scale is difficult and expensive, requiring facilities, tooling and certifications that require significant amounts of money. This can be multiplied by a thousand for the number of sign-offs required to get an aircraft into service. However, this shouldn't deter innovators from producing exceptional things.

It is promising that there are so many creative designs that are in the pipeline. Currently, regional operators in the market for brand new aircraft have a limited choice of jets, and an even more limited choice of turboprops. I'm inpatient for the future.

Greg Whitaker
Editor
greg.whitaker@realresponsemedia.com

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Contents

VOLUME 26 • ISSUE 04 • DEC 2024

LOW-COST & REGIONAL Airline Business

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Business Briefing.

News from across the industry

BUSINESS

180 JOBS LOST AS AERQ SHUTS DOWN OPERATIONS

Hamburg-based IFE start-up AERQ has announced that it will discontinue its business activities. In line with the decision, the company will immediately stop offering and development of its platform-based in-flight entertainment system Aerena. This decision affects around 180 employees at its Hamburg headquarters and the closure will be concluded as part of a wind-down procedure.

The company was founded in 2019 by Lufthansa Technik and LG Electronics. Aimed at low-cost carriers and holiday airlines, the brand had a plan to launch a digital cabin that integrated methods of increasing passenger revenue.

Crucially, the system was cloud-based which would have allowed airlines to adjust the content and presentation quickly. Although the product met expectations AERQ faced significant obstacles to enter a very sensitive market for IFE systems.

In a statement authored by Verena Bintaro, director of marketing, communications & partnerships at the company, she said: "The shareholders have mutually agreed to conclude AERQ's journey here and part ways."

> **"The shareholders have agreed to conclude AERQ's journey and part ways**

TRAINING

Ryanair opens Training Academy at Prestwick Airport

Ryanair has opened an engineering training academy at Prestwick Airport, following an investment of £5m, creating 500 highly skilled jobs in the locality, including licenced engineers, mechanics and support staff.

This investment sees the addition of state-of-the-art classrooms and workshops and installation of a training aircraft on site, for the delivery of highly qualified engineers and mechanics to support the maintenance of Ryanair's fleet as it is set to grow to 800 aircraft by 2034.

The investment underpins Ryanair's commitment to the UK and Scotland as it further drives connectivity, inbound tourism & employment.

CEO of Ryanair, Eddie Wilson, said: "The upgrade includes new classrooms, workshops and training facilities, including a training aircraft on site, and we look forward to investing in Ayrshire with state-of-the-art training facilities to support our six-bay heavy maintenance facility."

SUB-REGIONAL AIRCRAFT

FOUR BRITTEN-NORMAN ISLANDERS FOR FALKLAND FLEET RENEWAL

The Falkland Islands Government has signed a Letter of Intent with Britten-Norman with a view to ordering four new BN2B-26 Islander aircraft at a total value of $9.75 million.

The new aircraft project is part of a plan to further modernise the fleet operated by the Falkland Islands Government Aviation Service (FIGAS) as it marks 75 years of operations. The order is in addition to two aircraft that FIGAS has already contracted Britten-Norman to build, the first of which is now in service. All of the new aircraft will be delivered from Britten-Norman's UK-based manufacturing line on the Isle of Wight, which the company launched in late 2023 after re-shoring from overseas.

FIGAS has been an integral part of Falkland life since 1948. Their existing fleet of five Islanders serve in a variety of roles and are essential in keeping the Falklands and its more remote communities connected. In addition to commuting flights, regular missions include air ambulance, postal carrier, freight, veterinary transport, environmental monitoring and increasingly popular scenic flights.

> **The Islanders are essential in keeping the Falklands connected**

The decision to select new Islanders as a replacement for FIGAS's existing, older Islander fleet is in part down to an assessment by the team as to what aircraft best suits the tough operating conditions in the Falkland Islands, where durability and reliability are key factors in the operator's long-term success. Refinements in the aircraft in recent years also played a part in the decision.

This order is of great importance to Britten-Norman, which came close to shuttering operations last year, but was saved by private equity investment.

William Hynett, chief executive at Britten-Norman, commented: "We are so pleased to have such an incredible opportunity to build a new chapter in our long-standing relationship with the Falkland Islands Government and to continue to support the communities of these important islands."

BRIEFS

› Loganair has been named Domestic Airline of the Year for the fourth year in a row by the Scottish Passenger Agent's Association.

›France-based VoltAero has inaugurated a 2,400 square metre facility in the Nouvelle-Aquitaine Region. It will be the primary production facility for the Cassio hybrid/electric aircraft once certification has been achieved.

› Deutsche Aircraft has appointed Reinhard Schwaiger and Carlos Castro as its new sales directors for the global sales team as the manufacturer readies itself to put the D328eco turboprop into production.

› LCC Eurowings has added lounge access for premium passengers at four international airports. BIZclass passengers will gain access to the waiting rooms in Palma de Mallorca, Cairo, Dunai and Jeddah.

› Regional start-up Isla Air has flown test fights in the Mediterranean using a 44-year-old Twin Otter seaplane. The plan is to offer scheduled and charter services around the Med.

› Aircraft vendor Savback is to partner with cabin supplier Bucher Leichtbau to provide interiors for helicopters that will likely be used in a variety of roles.

IN NUMBERS

180
jobs lost at AERQ as the IFE provider shuts down

$9.75M
Order value of sub-regional Islander aircraft for the Falkland Islands

800
Ryanair plans to significantly grow its fleet by 2034

REGIONAL AIRCRAFT

RISE AIR SIGNS ORDER FOR THREE NEW ATR 72-600s

Saskatoon-based Rise Air has placed firm orders for three 68-seat ATR 72-600 aircraft, making it the launch customer for the type in Canada.

The aircraft are expected to be delivered by the end of 2025. The company plans to lease two others for delivery in 2026.

The latest ATR 72-600 is fitted with new PW127XT engines produced by Pratt & Whitney Canada in Montreal, which offer high reliability, lower maintenance costs and a remarkable 45% reduction in CO_2 emissions compared to similar-sized regional jets. The ATR 72-600 also improves passenger experience due to its cabin with large overhead bins, 18-inch-wide seats and upgraded air conditioning and heating system.

Rise Air currently operates a mixed fleet of turboprops that includes older variants of ATR aircraft as well as a number of Saab 340s, four Beechcraft 1990s and seven Twin Otters.

Derek Nice, president and CEO at Rise Air, said: "We are thrilled to be introducing the ATR 72-600 to Canada, bringing our customers more comfortable, more reliable air service at remote work sites and communities across the north.

"The ATR 72-600's outstanding performance and low environmental footprint make it the perfect choice for operating in the diverse and challenging conditions where we operate."

> **"We are thrilled to be introducing the ATR 72-600 to Canada**

CABIN

Finnair completes first cabin refit of Embraer

Finnair is embarking on an ambitious plan to increase passenger comfort by renewing the cabins of its entire fleet of 12 Embraer aircraft by spring 2026. Seven aircraft will be renewed during the winter season 2024–2025, and the remaining aircraft will be renewed during the following winter season.

The colour scheme and atmosphere of the new cabins have been designed to match that of Finnair's recently refurbished wide-body fleet and Finnair's new Schengen lounge at Helsinki Airport.

"We wanted to create a harmonious, fresh and inviting travel environment for our customers," said Eerika Enne, head of inflight customer experience.

One of the targets of the renewal has been to reduce the weight of the aircraft, meaning lower fuel consumption and, thus, lower CO_2 emissions. "Both the business class and economy class seats are lighter than their predecessors, and also the carpet is made of a lighter material than before. With these changes, we aim to reduce the total weight by approximately 150kg per aircraft," Enne noted.

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LOOKING EAST

Training provider Simaero plans expansion in new Asian markets. CEO **Nicolas Mouté** explains the strategy

Talk to just about anybody in the aviation industry about the pressing issues of the day and it won't be long before you get on to the subject of the shortage of trained staff.

While this has been a challenge for aviation in general, it has provided a boon for those involved in the upskilling business. One company that has an eye on expansion is pilot training provider Simaero. In 2018 the company received funding from Rive Private Investment and Nicolas Mouté was appointed CEO with a brief to scale-up operations, with a particular focus on new markets, such as China.

A lot has happened in the world of aviation since 2018, but the expansion eastwards remain important to Simaero. "We are focusing on the growth of the entire Asia continent at the moment," explains Mouté. "Obviously, China is a key part of that, but we are also very focused on other geographies such as India, the Middle East and countries in Southeast Asia."

> **"IN THE CASE OF CHINA, WE ARE IN A SITUATION WHERE THERE'S OVERCAPACITY AND HIGH COMPETITION"**
>
> **NICOLAS MOUTÉ**
> CEO
> Simaero

CHINA AND BEYOND

Describing China as a "very specific market with significant potential", Mouté points out that while the potential is significant, so are the challenges.

The company has been active in mainland China since 2019, although had trained Chinese pilots at its headquarters in France for some years before that.

"Initially we were focused in China on technical services to simulator operators, and we have a branch of our company that provides this," explains Mouté.

The branch that Mouté is referring to is a joint venture launched in 2021 with state-owned HNCA Aviation Training. Headquartered in Zhengzhou, the venture utilises a team of engineers to provide support for all aspects of full-flight simulators. This partnership has worked well, and the two companies are investigating further collaboration.

"HNCA has been a very loyal partner in China," confirms Mouté. "We've had a number of discussions with them, beginning in 2021 partnering on the engineering side. More recently, another partnership has been formed around simulator financing. Now we jointly own a simulator financing vehicle that we are ramping up in terms of activity and we are investigating more development."

The financing project will see simulators being leased to clients. Leasing in its various forms is quite common for aircraft, but it is rare for simulators to be offered with such a proposition.

"In the aviation industry, you have lots of aircraft lessors, but you don't have this with simulators. So we ended up creating one with HMCA", explains Mouté.

Establishing the engineering part of the business in China was the first step. The second is to develop the pilot training capacity in that country. This has been started with the establishment of the Changsha Training Centre, one of 'many' projects in the pipeline.

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For more information on Simaero, visit:
linkedin.com/company/simaero/

The Changsha centre represents a significant investment. More than $70m has been spent on the facility, which opened in March 2024 at a site near the busy Changsha Huanghua International Airport in Hunan province. The first full flight simulator, an A320 neo/ceo sim manufactured by China Simulation Sciences was available on opening day, and the plan is to host six full-flight training simulators. There are also briefing rooms, rest areas and all the other spaces you might expect in a modern training facility.

However, international business always comes with challenges. "In the case of China, we are in a situation where there's overcapacity and high competition," says Mouté, explaining that smaller start-up companies, coupled with the existing training centres owned and operated by the major airlines, is what has led to these issues. "So we need to be careful to develop the business on a sound basis, focusing on bringing the highest quality and safety and therefore making sure that we manage to do that in an efficient manner in the context of a relatively high competition in China."

Mouté believes that this drive to open in new locations is a key differentiator for Simaero. "If you think about it, only a handful of companies in the world are multinational. Most of the training providers are local companies in terms of numbers.

"A few of them might also have a base in a neighbouring country, but in general they only have one location. Very few companies have the capacity to provide training on a global level with multiple training centres in different continents, but we are one of a few that can do that."

FURTHER AFIELD

Competition or not, the superiority of a full flight simulator versus any other type remains a selling point. "The full flight simulator is and remains the staple of the practical training," says Mouté. "When the pilot gets into a full flight simulator he needs to feel as if he is actually flying the real aircraft and the requirements, if anything, are increasing step by step."

That isn't to say that there isn't innovation around the simulators themselves. "Where we see major transformation is around the full flight simulator itself – the way the training is performed and also all the theoretical training before entering the simulator.

1 A new simulator installation
2 The Changsha facility in China

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"Here, we have a major trend around what we call the 'digitalisation' of training. That includes everything from using new technologies, such as virtual reality (VR). While VR is a bit overhyped, there are definitely new technologies. For example, there's the whole transformative topic of EBT-CBTA (evidence and competency-based training), which requires a complete transformation of the tools that we use."

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> **"SIMULATORS CAN LAST AS LONG AS THE AIRCRAFT THAT THEY'RE SUPPOSED TO SIMULATE"**

One of these tools is a 'learning management system', under which pilots spend less time in a physical classroom and more time on a computer system learning theory. Mouté also explains that work has been done with aviation technology firm Thales to further advance the digitalisation of training outside of the simulator.

"All of these change the way that we are training around the full-flight simulator, which itself remains a very stable staple," says Mouté.

ENGINEERING

Finally, there's the question of the age of equipment. As a company that maintains simulators as well as providing training on them, the challenge is to source the parts to keep machines that replicate older aircraft types running alongside their more modern counterparts.

"Simulators can last as long as the aircraft that they're supposed to simulate, so this is a big challenge because obviously technology changes quite a bit. At Simaero, we address both ends of the spectrum," Mouté explains.

"Our newest purchase is an A350 simulator that's going to be up and running in the coming months, technology which can simulate the latest aircraft.

"On the other hand, we have a few devices that simulate older aircraft that are still flying. However, these are old machines where obsolescence and the technical challenge is completely different to the maintenance of a brand-new simulator."

Whatever the hardware, the demand for the services of this company are set to remain high as it expands into the future.

1 A new simulator receives certification
2 FFS training in action

For more information on Pem-Air, visit: **pem-air.com**

VERTICAL HOLD

There will be benefits for operators when engine leasing goes vertical

A lessor's function is to provide assets to the end user at the lowest possible cost with the maximum flexibility in utilisation of the asset. Some lessors are only providing financing. This is known as 'dry' leasing, and the lessor does not take an active part in the maintenance of the engine during the term of the lease. The technical status and condition of the engine upon the return of the engine at the end of lease are negotiated and agreed by the lessor and lessee at the lease commencement date. It is the responsibility of the lessee to select how and by whom servicing upon the engine shall be accomplished and the lessee must only ensure that the engine is in the condition agreed upon the date of return of the engine to the lessor.

Other lessors provide varying degrees of maintenance management and technical responsibilities during the term of the lease. This is known as 'wet' leasing and can even include operational/liability insurance for the engine. A wet lessee simply operates the engine and all other responsibilities for the engine lay with the lessor. The lessee is allowed to return the engine to the lessor at any time the engine may not be able to operate on-wing safely. In such circumstances the lessor and lessee must coordinate with each other for required on-wing or off-wing maintenance during the term of the lease and the responsibility for the engine and its technical condition lay solely with the lessor at the date of return at completion of the lease term.

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> "ONLY THE LARGEST AIRLINES CAN MAINTAIN AN EFFICIENT MRO INFRASTRUCTURE WITHOUT AN IMPACT ON TICKET PRICING"

SIMON BENFORD
chief operating officer at component repair organisation Pem-Air

Both dry and wet lessors must both consider the scheduled maintenance cycle of their engines under either leasing arrangement – scheduled heavy maintenance at completion of the lease term prior to being leased out to the next lessee or lighter maintenance during the term of the lease. Of course, unscheduled maintenance required during the term of the lease is less predictable and therefore poses the greatest financial risk to both, but more so to the wet lessor.

COSTLY EVENTS

Any planned or unplanned maintenance event is costly to the lessor or the lessee. The cost of such maintenance can vary greatly. Toward that end, a lessor may benefit greatly by partnering with, owning and operating its own MRO facilities capable of repairing all its engines at the lowest possible cost, allowing it to offer the engine into the marketplace at a competitive price. However, given the diverse portfolios of engine model types and usage this is impractical for most engine lessors.

Legacy airlines followed this model by building out an MRO infrastructure that could ensure flight dispatch reliability near 100%. However, this infrastructure at an extremely high cost resulted in higher ticket prices than those of its competitors following deregulation in the 1970s.

Only the largest airlines can maintain an efficient MRO infrastructure without a negative impact on ticket pricing. Mid-level and small airlines benefit from relationships with engine MRO partners that can spread the cost of such infrastructure across its customer base comprised of numerous smaller airlines, aircraft lessors or trading companies.

An analogous situation exists in respect of engine leasing companies; the largest have entered formal partnerships with MRO providers and smaller leasing

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companies have a need to secure reliable repair partnerships with MROs like our company, Pem-Air Turbine Engine Services, to secure what we call 'the three Ps', namely priority, price and product reliability.

Let me explain what I mean by the three Ps with an analogy. Imagine having a neighbour that has a vehicle repair shop. Your wife breaks down, your neighbour stops working on other cars and repairs yours and gets your wife back on the road as a priority.

She asks how much for the repair service? He adds a smaller handling charge to the cost for the parts and provides a 'sharp pencil' labour rate to compete on price.

She then drives the car for the next three years without unscheduled maintenance related to the repairs accomplished, and so proving the product quality.

> "SMALLER LEASING COMPANIES NEED TO SECURE RELIABLE REPAIR PARTNERSHIPS WITH MROS LIKE US"

Lessors benefit greatly from the three Ps by being able to forecast or project maintenance costs during the term of a lease, focusing on acquisition pricing and residual value assumptions.

THIN MARGINS

To all lessors, margins are thin and shop visits can be the most unpredictable expense, impacting the bottom line, so having a trusted MRO partner can truly be priceless. Pursuing adjacencies such as MRO partnerships are becoming more common in the industry.

Pem-Air can be that partner for a few more select mid-level lessor groups, to join the already existing group of lessor partners working with us to maintain their engines under several highly specialised programmes crafted for their needs from our full offering of MRO services, ranging from full power restoration to worldwide AOG services.

Perhaps the greatest benefit of all to a lessor partner is knowing to a high degree of certainty what its MRO costs are going to be for all its engines during any given year it is retained within portfolio. The company also has programmes for partner lessors to maximise their return on engines when they reach the end of their useful lives.

1 Pem-Air's Florida headquarters
2 Shop visits can be the most unpredictable expense for lessors

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CAUTIONING AGAINST THE RUSH FOR AI

Generative AI be used to please passengers and enhance airline operations, but its use must be tested first, advises **Danielle Harvey**

> **“IT’S CRUCIAL THAT BUSINESS LEADERS UNDERSTAND THESE DANGERS. ONLY THEN CAN AIRLINES REAP THE BENEFITS OF AI”**

DANIELLE HARVEY
Global VP and head of travel & hospitality at Quantum Metric

The adoption of generative artificial intelligence (Gen AI) in the airline industry offers numerous opportunities for businesses to enhance operational efficiency, strengthen customer service and boost competitiveness. As such, it’s no surprise that 91% of travel brands are planning to implement Gen AI into their booking experience.

However, rushing to implement Gen AI tools without a strategic approach can lead to significant risks. It’s crucial that business leaders understand these dangers and how they can be avoided. Only then can airlines truly reap the benefits of the technology.

CLEAR OBJECTIVES

Implementing Gen AI tools requires careful planning and a strategic approach. Racing to deploy, particularly within customer-facing functions, can lead to data privacy concerns, operational disruptions and bias or ethical issues.

These risks can be avoided by ensuring that the introduction of AI is driven by a clear objective and measured by a key performance indicator (KPI). For instance, the goal may be to enhance the customer booking experience, revenue management or improve operational efficiency. Defining clear AI objectives and KPIs will strategically align overall business goals, focusing the prioritisation of resources and

▲ Rushing to implement AI is risky

measurable outcomes which can be used to track success. Additionally, setting up a framework for monitoring and evaluating KPIs will ensure that progress is continually assessed and adjustments are made, as needed, based on performance data.

HUMAN COLLABORATION

Airlines must also foster a culture of unified human-AI collaboration during the early stages of AI implementation. Building AI into internal processes before passing the information along to a customer is a great way to mitigate risk while still realising benefits like operational efficiencies. Providing training programmes and workshops to employees will also ensure they have the expertise required to correctly apply the technology. With a detailed understanding of AI systems, employees will be able to better support customers and therefore improve the customer experience (CX).

It is also important to note that the overall effectiveness of AI depends on

86%

86% of customers will abandon a brand they were previously loyal to after just one or two bad experiences

the quality of the data it processes. Incorrect data can lead to damaging outcomes – such as AI chatbots providing incorrect information – which can lead to customer dissatisfaction and reputational damage.

For example, AI chatbots have the potential to incorrectly answer customer questions, which can result in penalties for the business if found responsible for negligent misrepresentation. Situations like this emphasise the importance of ensuring AI accuracy and reliability.

So, before full-scale deployment, airlines must invest in rigorous testing of AI tools in controlled environments, to identify potential issues and ensure that the datasets are comprehensive and accurate. Additionally, in the early days, while data and models are continuing to evolve, brands may also want to provide human reviews of any content that is customer-facing to further mitigate any misinformation risks.

THE RIGHT TOOLS

Quantum Metric research has revealed that a staggering 98% of business leaders are overwhelmed by the number of Gen AI tools available today. Airlines can approach this challenge by ruling out tools that are not appropriate for their specific business goals, do not address their unique challenges and cannot integrate with their technological processes. For many airlines, focusing on improving CX should be a key priority. In an often-commoditised space, where travellers frequently prioritise the best price, differentiation through superior digital experiences has become essential.

Because of this, airlines need to ensure that every interaction, from booking to boarding, is seamless and satisfying. Customer loyalty is fragile. In fact, 86% of customers will abandon a brand they were previously loyal to after just one or two bad experiences. Considering the importance of CX, airlines should select AI tools that add tangible value to customers, so that they choose to return in the future.

> **“CONSIDERING THE IMPORTANCE OF CX, AIRLINES SHOULD SELECT AI TOOLS THAT ADD TANGIBLE VALUE TO CUSTOMERS”**

An example of an AI tool that does this is self-service chatbots. Self-service has become a critical component of the travel experience – meeting customer expectations for convenience while driving operational efficiencies and cost savings for airlines. These chatbots can provide quick and effective customer support during the booking experience, saving customers time that may have otherwise been spent trying to fix the issue over the phone.

However, not every customer is comfortable using new technology to seek support, particularly the older generation. It is important that airlines strike a balance between self-service offerings and personalised support to meet a range of customer needs.

FRICTION POINTS

Some AI tools can also add value to airlines' customer understanding, and this clearer appreciation of what drives customers can help them determine their business goals and objectives. For example, technology such as automated session summarisation can equip airlines with complete visibility into the customer journey and how passengers interact with the airline at every touchpoint. These insights can then help address friction points and highlight where tangible improvements to an airline's operations can be made. Technological changes like this can be the difference between making a one-off purchase or becoming a regular customer.

The integration of Gen AI presents a significant opportunity for airlines to enhance their operations and customer experience. By investing time to understand the risks involved, follow best practices, evaluate the customer journey and carefully select the right tools and data to feed the model and evaluate your success criteria, airlines can approach AI adoption strategically. This will lead to mitigated risks and ensure that AI investments deliver tangible value for both individual airlines and the wider airline industry.

▲ Implemented well, AI should help both airlines and passengers

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REGIONAL PARITY

Alex Preston takes a look at the landscape of inflight connectivity as next-gen ATG and ESAs compete to be the pipe of choice

It could be argued that regional aircraft have been the overlooked sibling when it comes to the availability of onboard connectivity. However, changing market economics, lower data costs and advances in satellite technology have rendered this no longer the case.

According to Valour Consultancy's *The Future of In-Flight Connectivity 2023* report more than a third of all regional jets are equipped with inflight Wi-Fi, with the bulk of this connected fleet being in North America.

LEGACY TECHNOLOGY

Traditionally, regional aircraft have relied upon air-to-ground (ATG) hardware and cell tower infrastructure to provide the most efficient pipe for delivering inflight connectivity on short- to medium-haul flights.

For example, Gogo continues to build out its next-gen 5G ATG network across both the contiguous US and Canada, with the promise of mean speeds of ~25 Mbps, with peak speeds of 75-80 Mbps for business aviation aircraft.

But the attractiveness of ATG is waning. In August, long-time Gogo rival Smartsky Networks cited: "While our products were groundbreaking and we were growing our market share, we ultimately could not secure the necessary financing to continue our mission." In spite of this, in late October, the company was rescued as Apcela, a provider of specialised, high-performance networks, announced it had signed an agreement to acquire the SmartSky ATG Network, subject to customary closing conditions and

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"WE CAN NOW EXTEND ADVANCED NETWORKING AND APPLICATION ACCELERATION CAPABILITIES TO THE SKIES"

regulatory approvals which are expected to be completed by the end of the year.

According to Mark Casey, CEO of Apcela: "The acquisition of the SmartSky ATG Network is a game changer. With SmartSky's innovative air-to-ground technology, we can now extend advanced networking and application acceleration capabilities to the skies, ensuring passengers, crew and operations teams benefit from the same level of performance they experience on the ground. Together, and with our partners, we'll redefine in-flight connectivity and set a new standard for the aviation industry."

To do so, it will need to compete with the emergence and introduction of electronically steered antennas (ESAs), which offer a smaller and lighter footprint and are quick, easy and relatively inexpensive to install.

As Dave Whelan, senior research analyst at Valour Consultancy observes, "The trend we are seeing is the shift from ATG to satcom. Delta and American have already made announcements to that effect."

To ensure fleet harmonisation and an enhanced connectivity experience for all, Delta is rolling out free Wi-Fi and Delta Sync in conjunction with Hughes Network Systems. Some 330 regional jets, such as its CRJ200 aircraft, will be kitted out with the Hughes IFC solution which combines a multi-orbit antenna and Hughes Jupiter Ka-band satellite capacity.

"Delta is committed to delivering a reliable Wi-Fi experience to all our passengers, including those flying on our regional carriers," says Glenn Latta, managing director, in-flight entertainment and connectivity, Delta. Initial installations began in mid-2024.

American Airlines is converting the current ATG system on its CRJ700, CRJ900, E-170 and E-175 aircraft – a total of nearly 500 regional jet aircraft – operated on its behalf to Intelsat's new ESA solution. The process of installing the technology to bring these regional aircraft to match fast Wi-Fi speeds that are currently available on American's mainline aircraft is expected to take two years.

NEXT GENERATION

Intelsat's ESA antenna is less than three inches tall and operates on both Intelsat's family of geo-stationary satellites and on Low-Earth Orbit (LEO) satellites. The Intelsat product consortium includes Ball Aerospace, Stellar Blu Systems and OneWeb.

As part of a US$25 million investment in the travel experience, Alaska Airlines is replacing its ATG solution with Intelsat's ESA solution, to bring high-speed connectivity to the airline's regional fleet of E-175 aircraft.

The new system has already debuted on Alaska's sister airline Horizon Air, and be rolled out across the regional jet fleet, including on partner SkyWest, over a two-year period, providing consistent streaming-fast Wi-Fi across the entire fleet by 2026.

With Intelsat making inroads into the regional aviation market, significant momentum is also being enjoyed by Starlink, the LEO IFC solution engineered and operated by SpaceX.

Having reportedly missed out on the custom of Delta, Starlink has been selected by United Airlines for deployment on all its aircraft, including regional – more than 1,000 planes in total – over a number of years. Testing begins in early 2025 with the first passenger flights expected later that year.

In Europe, Latvian airline airBaltic has conducted an initial test of SpaceX's Starlink internet connectivity system onboard its Airbus A220-300 aircraft. The ground test was conducted at the airline's home base in Riga, and the inflight connectivity system was tested with a full cabin comprising airBaltic and SpaceX's Starlink employees.

1. United Airlines is bringing Starlink connectivity to all its aircraft
2. Gogo is transitioning from its ATG network to a new 5G LTE system

40%

According to Gogo, upgrading to Avance L3 will provide an immediate performance improvement over the Classic ATG system today, with customers gaining a 40% performance boost in 2026 with the new LTE network

2

Speaking at the time, Martin Gauss, President and CEO of airBaltic stated, "We are excited to lead the way in Europe by offering high-speed, unlimited and complimentary inflight connectivity onboard our flights. This first test brings good insights and moves us closer to enhancing our service for passengers travelling within the airBaltic network in Europe and beyond."

airBaltic is working with SpaceX on achieving the required STC approval and is expected to begin installing the product on the airBaltic Airbus A220-300 fleet by the end of this year.

For Whelan, despite all the hyperbole around ESAs and satcoms, ATG still has a home. "I think there is still a use case for ATG and SkyFive are building a strong service in the Middle East at the moment, but in North America we'd certainly be expecting the number of ATG-equipped aircraft to be declining pretty quickly as these aircraft are transitioned over," he says.

The countdown is on towards Gogo's shut down of its classic ATG network in 2026, in favour of its new 5G LTE network. "At that time, anyone with a legacy ATG system [1000, 2000, 4000, 5000, 8000] who hasn't upgraded to Avance will lose their Gogo connectivity," the company has warned.

Certain customers with early-era Avance hardware will also need to exchange their system to newer, LTE-capable Avance hardware.

The company is advising customers to complete their upgrade/exchange by 31 December 2025, to take advantage of rebate promotions and to ensure continued connectivity when the transition to the LTE network is made.

According to Gogo, upgrading to Avance L3 will provide an immediate performance improvement over the Classic ATG system today, with customers gaining a 40% performance boost in 2026 with the new LTE network.

Operators can also upgrade to Avance L5, which is claimed to provide an experience three times more powerful than the Classic ATG system today, and an additional 10% improvement in the experience once the new network is online.

Avance LX5 will operate on the Gogo 5G network, which has been designed with the goal of delivering high throughput with very low latency, addressing the increased demand in data-heavy services and applications in use today, such as video conferencing, cloud computing and social media, as well as emerging technologies in the future.

"THE REGION AS A WHOLE IS SET TO BENEFIT FROM SKYFIVE'S UPCOMING NETWORKS IN THE MIDDLE EAST"

In the case of SkyFive, its Middle Eastern subsidiary SkyFive Arabia has been contracted by low-cost carrier flynas to provide ATG internet on its current fleet of 64 aircraft, and a further 56 aircraft on order.

According to Sheikh Saad Al Otaibi, Chairman of SkyFive Arabia and SCIT Group, "As we embark on this journey with Saudi Telekom, we are confident that air-to-ground will redefine the in-flight connectivity landscape in Saudi Arabia." The service was set to debut on domestic services in the fourth quarter of 2024.

The region as a whole is set to benefit from SkyFive's upcoming networks in the Middle East, as the company has signed a roaming agreement with the European Aviation Network (EAN) to facilitate continuous inflight connectivity coverage from all of Europe to Saudi Arabia and beyond. Approximately over 500,000 flights serve between Europe and the Middle East annually.

Whether it's ATG or satcoms, a subpar inflight connectivity experience is set to be consigned to the past, as high-speed Wi-Fi comes to all.

1

1. The Hughes HL1120W ESA Terminal
2. Alaska Airlines is using Intelsat's ESA for onboard Wi-Fi

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— Chief Operating Officer of Riyadh Air

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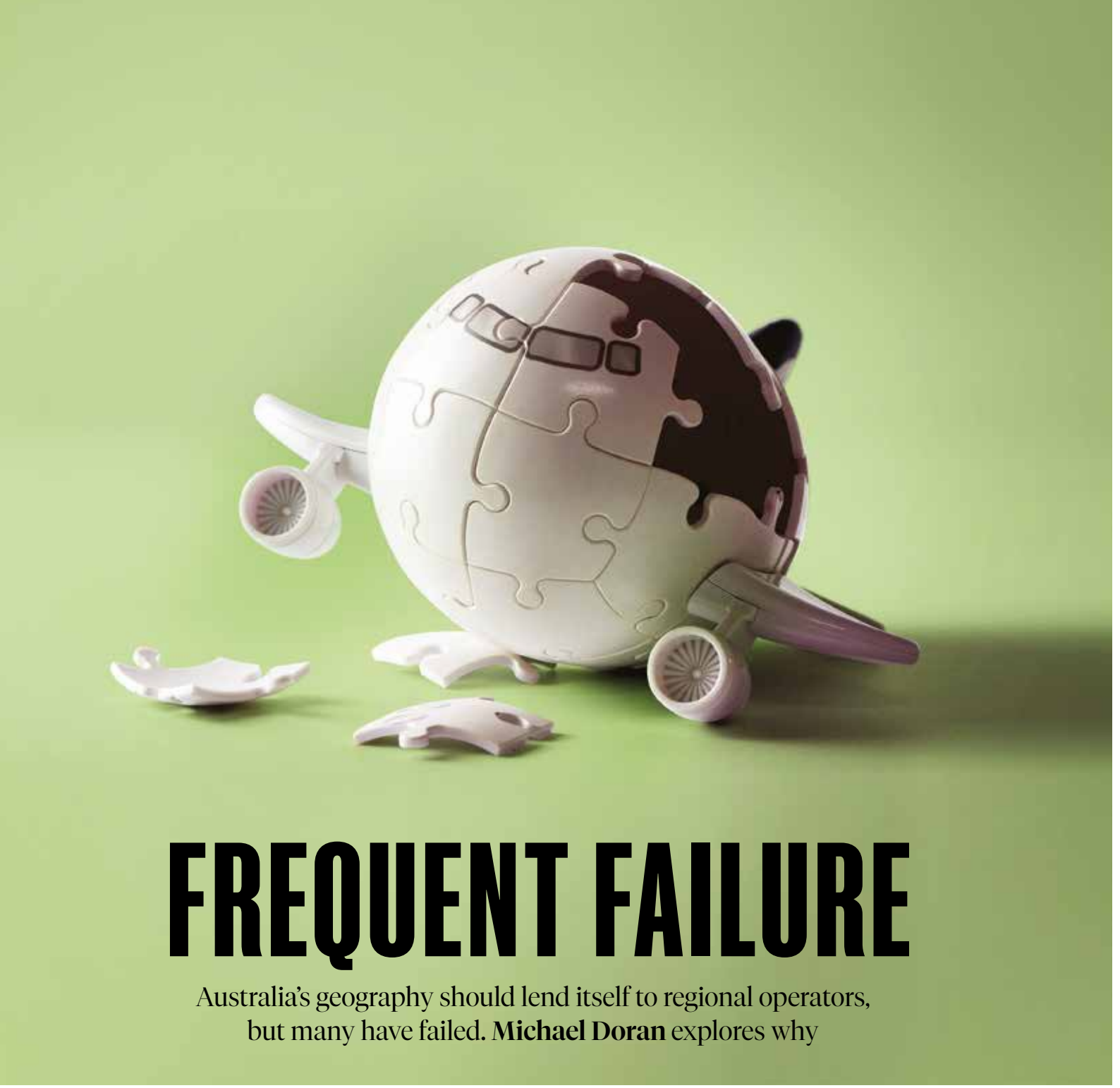

FREQUENT FAILURE

Australia's geography should lend itself to regional operators, but many have failed. **Michael Doran** explores why

For more than 40 years, Australia's domestic aviation sector was tightly regulated with government owned Trans Australia Airlines and privately held Ansett Airlines of Australia sharing the market. To stimulate competition the Federal Government deregulated the industry in 1990 but, 33 years later, two airline groups still dominate the market.

Since deregulation in October 1990, there have been nine domestic airline startups but by mid-2024 just two airlines, the Qantas Group and Virgin Australia, remained with a combined 98% of the market. So while there have been several attempts to break the duopoly the status quo has prevailed, and the events of 2024 make it unlikely another attempt will happen anytime soon.

The hopeful new entrants included Compass Airlines (1990); Virgin Blue (2000); Rex Regional (2002); Alliance Airlines (2002); Jetstar (2004); OzJet (2005); Tiger Airways (2007) later acquired by Virgin Australia and rebranded as Tigerair in 2015; Rex Domestic (2021); and Bonza (2023). The survivors are Virgin Australia, Alliance Airlines, Rex Regional and the Qantas Group, which includes Jetstar.

SINCE THE FAILURE OF REX IN JULY, DOMESTIC AIRFARES HAVE INCREASED BY 13.3%

DEREGULATION HAS NOT DELIVERED

Compass Airlines failed in 1993, OzJet in 2006, Tigerair in 2020, with Bonza and Rex Domestic collapsing this year. Virgin Blue became Virgin Australia in 2011 but subsequently failed with debts of £3.6 billion in 2020, later emerging from administration under the control of US private investment firm Bain Capital.

In November, Rex Regional was given a £41 million subsidy from the Australian government to continue flying on regional routes. Despite all this upheaval the market has returned to a two airline situation, with the Qantas Group serving 64%, Virgin Australia 34% and Rex Regional 2% of the national domestic market.

In pre-pandemic 2019, 64.1 million travellers were carried by domestic airlines, falling to 22.6 million in 2020 and recovering to 61.3 million in 2023. This year it has stalled somewhat due to high fares and reduced business travel but, as the year closes, passenger numbers are at 99% of pre-Covid levels.

Australia's competition regulator monitors the domestic airline market and last year it highlighted the impact low-cost carrier Bonza and Rex were having on fares with a report showing that when three or more airlines operate on the same route, fares fall by more than 30%.

Since the failure of Rex in July, domestic airfares have increased by 13.3% and there are no longer any routes on Australia's domestic network serviced by more than two major airline groups. The regulator said that "it may be some time before a new airline emerges as a serious third competitor, which is likely to result in higher airfares and reduced choice for consumers".

BONZA

In late 2021, news filtered out that Australia was about to get a new, ultra-low-cost carrier with a radical plan to connect unserved destinations outside of the major domestic cities. The airline was the dream of industry veteran Tim Jordan and was formed with the backing of US venture capital firm 777 Partners.

Bonza, an Australian nickname for something great, received its first Boeing 737 MAX in August 2022, followed by the second in October that year and the third in December. The airline struggled to obtain its air operator certificate (AOC) throughout much of 2022 and the expensive new aircraft earned no revenue, while public perception was damaged by missed launch dates.

Bonza finally gained its AOC in January 2023 and within weeks had launched its first flight. In March, it opened a second base in Melbourne and announced a third would soon follow on the Gold Coast (Queensland), one of Australia's premier holiday destinations. It progressed rapidly from there; by the end of May 2023, it had rolled out its initial network of 27 routes to 17 destinations with a fleet of four 737 MAX 8s.

In August, Tim Jordan said it was exciting to be part of the furniture of Australian domestic aviation, and that Bonza was "delivering on that vision and now we can start looking over the horizon a little bit to what comes next".

£41 MILLION

In November, Rex Regional was given a £41 million subsidy from the Australian government to continue flying on regional routes

1. Bonza was an ambitious but short-lived concept

1

2

"UNFORTUNATELY, THE SEEDS OF BONZA'S DEMISE WERE SOWN WITH THE OPENING OF THE GOLD COAST BASE"

▲ Industry veteran Tim Jordan had high hopes for Bonza

Unfortunately, the seeds of Bonza's demise were sown with the opening of the Gold Coast base, where it planned to position two wet-leased 737 MAX 8s from Canadian airline Flair, an affiliate of 777 Partners, for the Australian summer. Bonza had announced some attractive routes from the Gold Coast but was unable to get the jets into service, leading to mass cancellations and a mountain of ill will and bad publicity.

The airline had again struggled to get the necessary approvals for the aircraft and crews to operate in Australia and did not have enough capacity to fly the proposed new services. More new 737s were expected to arrive via 777 Partners in early 2024 but when that did not happen Bonza was in a difficult position with limited capacity to stay reliably competitive.

Bonza was owned by 777 Partners and when they fell into a dispute with their leasing partners the wheels fell off the struggling airline. In April this year, with no warning, the airline's lessor seized the four Bonza 737s and it was placed in voluntary administration on the same day. Bonza collapsed with debts of around £70 million, of which around £40 million was reportedly owed to aircraft lessors and its backers.

QATAR CONNECTION

Qatar Airways (Qatar) has long been a supporter of Australian aviation and in October 2023 it applied to add an additional 28 weekly flights to the 42 it was operating. The application was rejected by the government regulator on the grounds it was not in the overall best interests of the market and travellers. Qantas had vigorously lobbied against the extra flights and their pressure was later seen to have influenced the political decision.

The Qantas interest stems from its partnership with Emirates on routes to Dubai and onwards, as well as the traffic connecting into the Qantas domestic network. Qatar was bitterly disappointed in the outcome and in October this year it announced its intention to acquire a 25% minority stake in Virgin Australia.

Virgin Australia and Qatar started a codeshare agreement in 2022 and Virgin Australia CEO Jayne Hrdlicka said the proposed equity stake "allows the airline to put its 'toe in the water' regarding long-haul international, as well as the ability to deepen other areas of existing cooperation".

The deal is subject to government approval and in the meantime Virgin Australia and Qatar have lodged a submission with the competition regulator for a deeper partnership on the route between Qatar and Australia. The proposal is for Virgin Australia to wet-lease Qatar Boeing 777-300ER aircraft, including pilots and crews, to operate more flights on the route.

No Australian airlines flies between the two countries so Virgin Australia is taking up the Australian rights to operate up to 28 weekly services from Australia to Qatar, overcoming the obstacle of Qatar Airways not having enough bilateral rights to operate more flights.

The applicants have asked for interim authorisation by the end of November to give them sufficient time for Virgin Australia to commence flying its new Australia-Doha service by June 2025. With Qantas raising no objection, it is likely to gain approval and set the scene for more shake-ups in both the international and domestic Australian markets.

1. Virgin is one of the few dominant carriers in Australia
2. Jetstar entered the market in 2004

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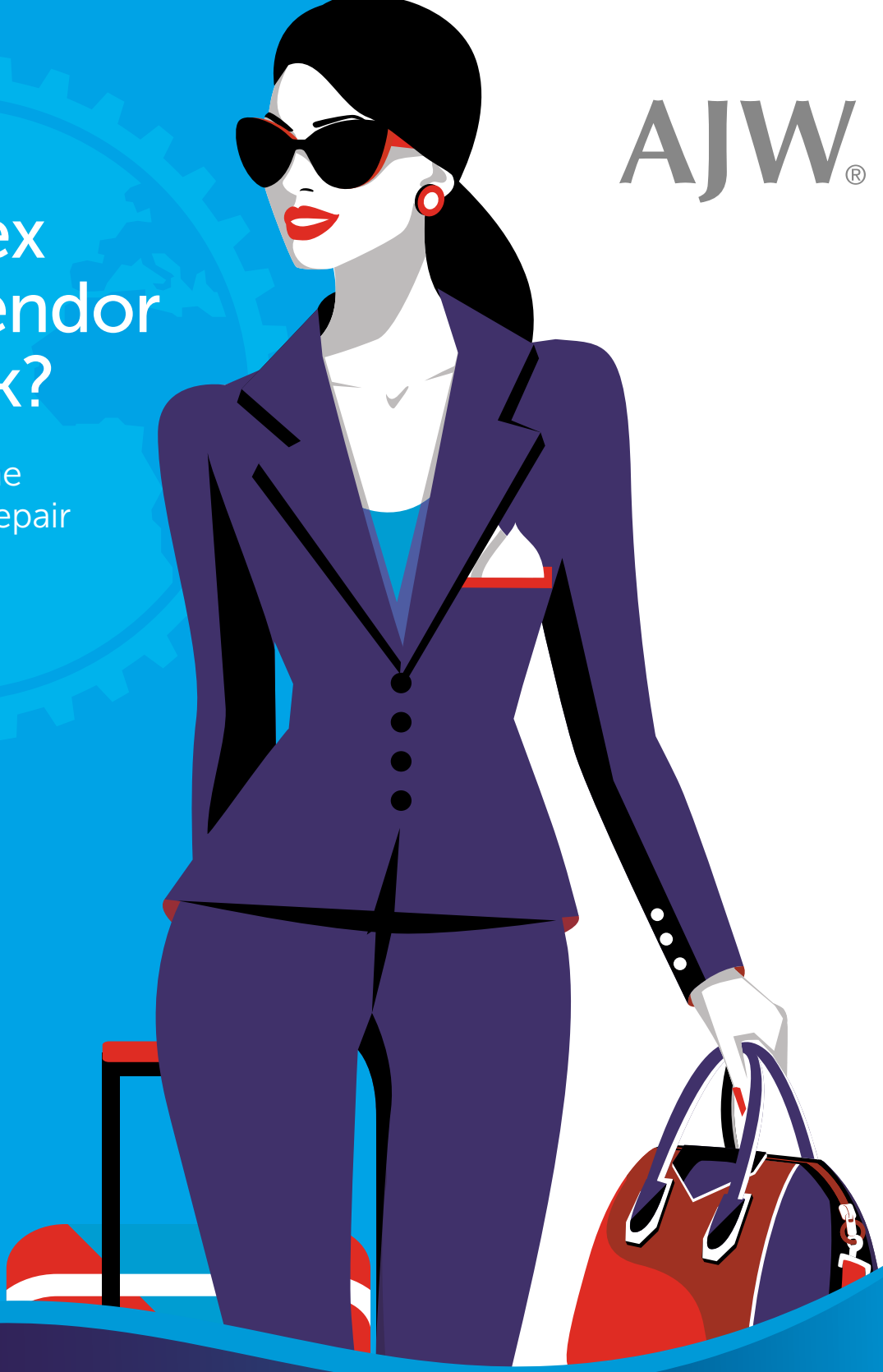

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MORE LOW COST & REGIONAL AIRLINE BUSINESS FOR 2025

We have several exciting projects planned for the New Year. Here's an exclusive look

January is a time for new beginnings. From the start of 2025, *Low Cost & Regional Airline Business* will increase frequency from quarterly to six issues per year.

This increase frequency means that we'll be able to bring you more of the discussions that matter to you. We have plenty of fresh ideas coming up in the New Year. For example, we will be looking at cybersecurity and the havoc that poor data management can wreak on airline systems. We've got articles on eVTOLs, intermodal transport, propeller manufacturing and everything in between.

WE'LL LOOK AT SPACE TOURISM, AIRSHIPS, PROP MANUFACTURING AND MORE...

We'll also be looking further into the future with an article about how some regional airports are investing in space tourism, as well as a focus on how 'hybrid air vehicles' (or airships as they were once known) can provide a more relaxed solution to low-carbon regional connectivity.

Our hard-hitting investigations will continue, with a report on so-called 'bleed air' in aircraft cabins and the issues surrounding it. We'll also be addressing perennial issues such as leasing and fleet optimisation, all while including ever more industry voices.

DIGITAL

As if all of this wasn't enough, we have also increased our online product. Our digital version of the magazine will be complemented by ever-more stories relevant to the regional sector in a revamped section of our Aviation Business News website, which in recent months has been rebuilt to make it easier to navigate and find the most job-relevant articles to you.

In addition, we've introduced a YouTube channel, featuring interviews with experts from across the aviation industry. This is a new and exciting extension to our existing business, and one which we will be building on throughout 2025.

Finally, our ever-popular newsletters now carry the editor's selection of the most interesting stories from the week. *The Low Cost & Regional Airline Business* edition is sent every Friday but you can also subscribe to our other newsletters, covering the whole civilian aviation industry. There's one for every day of the week and, best of all, these essential insights are free of charge.

All said, this will be the largest revamp in *Low Cost & Regional Airline Business*'s 20-year history. We look forward to turning over a new leaf with you in 2025.

2025: CHANGE IS AFOOT

Alex Preston looks at some of the events that could shape regional aviation in the coming year

According to the Chinese New Year, the forthcoming Year of the Snake in 2025 brings a promise of prosperity. That will be welcome news for beleaguered low-cost carrier Spirit Airlines which is still fending off rumours of impending bankruptcy.

A federal court decision to block its proposed merger with JetBlue, the ongoing impact of the PW110G engine recall for the A320neo and the "continued intense competitive battle for the price-sensitive leisure traveller" have all contributed to the airline's woes during 2024. Looking towards improving its financial performance, the airline submitted an 8-K filing to the US Securities and Exchange Commission (SEC) in mid-October, which sought to clarify its ongoing liquidity.

IN THE SPIRIT OF THINGS

Per the filing, Spirit has once again extended the deadline on its existing debt refinancing plan with credit card processors Visa and Mastercard, this time until 23 December 2024. The Early Maturity Date has also been extended from 31 December 2024 to 3 March 2025.

In addition, the document confirmed that the airline had borrowed the entire available amount of US$300 million under the Revolving Credit Facility, maturing on 30 September 2026. As previously disclosed, Spirit reiterated it remains in active and constructive discussions with holders of its senior secured notes due 2025 and convertible senior notes due 2026 with respect to their respective maturities.

◀ Spirit is hoping to reverse its fortunes with additional investment and a transformation programme

"SPIRIT HAS INITIATED THE TEMPORARY SUSPENSION OF THE RECRUITMENT OF PILOTS AND FLIGHT ATTENDANTS AND RELATED TRAINING COSTS"

To better meet its financial obligations, and ensure it remains an attractive proposition to investors, Spirit has already initiated the temporary suspension of the recruitment of pilots and flight attendants and related training costs, furloughed approximately 240 pilots and downgraded approximately 100 captains, and exited 42 markets while adding 77 new ones.

In addition to other liquidity-enhancing initiatives, the airline deferred all aircraft on order with Airbus scheduled to be delivered in the second quarter of 2025 through the end of 2026 to 2030-2031. Spirit will be hoping its plans bear fruit in a year, that, as Chinese culture attests, also has the capacity for mystery.

SAF INITIATIVES

What is known however, is that further articles from The Regulation (EU) 2023/2405 of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation), come into force on 1 January.

The ReFuelEU Aviation initiative lays down harmonised rules on the uptake and supply of sustainable aviation fuels (SAF) and is part of the 'Fit for 55' package, which endeavours to reduce the EU's emissions by at least 55% by 2030 relative to 1990 levels. It was published in the Official Journal on 31 October 2023 and applied from 1 January 2024. However, Articles 4, 5, 6, 8 and 10 will come into effect as of the new year.

According to the agreed text, from this time, aviation fuel suppliers must ensure that all fuel made available to aircraft operators at EU airports contains a progressively increasing minimum share of SAF (at least 2% of aviation fuel by 2025, 6% by 2030, 20% by 2035, 34% by 2040, 42% by 2045 and 70% by 2050 (Article 4)).

Synthetic fuels should constitute a progressively increasing proportion of the fuel mix, which is to reach 35% by 2050. The text also introduces a 10-year transitional period during which aviation fuel suppliers may supply the minimum share of SAF as a weighted average over all the aviation fuel it supplies to EU airports in that year.

It also includes the obligation for aircraft operators to ensure that the yearly quantity of aviation fuel uplifted at a given EU airport is at least 90% of the yearly aviation fuel required (Article 5), to avoid emissions relating to extra weight caused by tankering practices (refuelling the aircraft with more jet fuel than necessary for the flight so as to avoid refuelling partially or fully at a destination airport where aviation fuel is more expensive). Nonetheless, authorities in EU countries are allowed to grant an exemption from the tankering provisions for certain flights in the event of serious and recurrent operational difficulties or structural difficulties in the supply of fuel.

REPORTS AND LABELS

A cornerstone of the legislation is new reporting obligations for both airlines (Article 8) and aviation fuel suppliers (Article 10). By 31 March of each year, the parties must show SAF usage and supply (including number of flights and flight hours) as well as aggregated levels of fossil fuel usage at each airport within the EU.

35%

Synthetic fuels should constitute a progressively increasing proportion of the fuel mix, which is to reach 35% by 2050

1

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According to EASA sustainable aviation programme manager Dietmar Bloemen, the reporting will be used by the member states to verify whether airlines and airports under their oversight are complying with the regulatory elements, and importantly, verify whether the elements adopted in the ReFuelEU legislation are effective.

The regulation also establishes a voluntary labelling scheme to enable the comparison of the environmental performance of flights on the same routes. The aircraft operator must make the request to EASA, which issues the labels after the payment of a charge. Notably, a flight's environmental performance level will be based on the average environmental performance of the flights carried out by an aircraft operator on a specific route for the previous corresponding scheduling period.

EASA will provide the expected O_2 footprints per passenger for those flights as well as the expected CO_2 efficiency per kilometre. It is also envisaged that the labels issued under this scheme would be valid only for a limited period not exceeding one year, which must be made visible by the aircraft operator in the label. By 1 January 2025, the Commission will adopt an implementing act laying down detailed provisions regarding the duration of validity and other details of the label.

"It's an information tool but can also act as an incentivisation tool for airlines to try to offer the [greenest] flights possible," Bloemen believes.

GERMAN WOES

In an action that was designed to make Germany a pioneer in CO_2-neutral flying, the German coalition government increased aviation tax by 25%, effective 1 May 2024, adding between €15.53 and €70.83 per passenger depending on the route. The coalition agreement was that revenue from the air transport tax would be used for the production and use of CO_2-neutral fuels, but it now appears that the tax is being earmarked for other purposes.

The German Aviation Association (BDL) and airlines are calling for the tax to be abolished. "Flying has to remain affordable," BDL president Jens Bischof said in remarks published by the *Frankfurter Allgemeine Zeitung* newspaper. "The air transport tax must be abolished. Sweden has shown the way."

In August, Ryanair CEO Eddie Wilson added the airline's weight behind the call. In addition to scrapping the aviation tax, the airline also called on the German government to urgently reduce its soaring air traffic control (ATC) charges, which have doubled since 2019, and defer the 50% increase in security fees, scheduled for January 2025.

"FLYING HAS TO REMAIN AFFORDABLE. THE AIR TRANSPORT TAX MUST BE ABOLISHED. SWEDEN HAS SHOWN THE WAY"

▲ BDL president Jens Bischof

60%

Ryanair is cutting German traffic for summer 2025 by 12% (1.8 million seats and 22 routes) and completely closing its bases in Dortmund, Dresden and Leipzig, while traffic in Hamburg will be reduced by 60%

1. Eurowings is one of several airlines reducing capacity across its German network
2. From January, SAF suppliers will have to report factors such as pricing, quality and quantity

"EUROWINGS IS CONSIDERING ROUTE CLOSURES AT GERMAN AIRPORTS IN FAVOUR OF FLIGHTS TO OTHER EU COUNTRIES"

In response to "the German government's failure to reduce these very high access costs," Ryanair announced that it would be cutting its German traffic for summer 2025 by 12% (amounting to 1.8 million seats and 22 routes) and completely closing its bases in Dortmund, Dresden and Leipzig, while traffic in Hamburg would be reduced by 60%.

Citing the constantly rising infrastructure and location costs for airlines in the country, Germany's second-largest airline Eurowings will also be reducing capacity at Hamburg Airport for 2025, removing more than 1,000 flights to and from Hamburg from its programme and transferring them to other locations. In addition to these domestic German cancellations, the airline is also expected to remove six other destinations in Europe and North Africa from its programme from Hamburg.

"The reduced offer will significantly weaken the direct connection to Hamburg and make flying from the Hanseatic city noticeably more expensive," says Eurowings CEO Jens Bischof. "This development could have been avoided, but the airport's plans for a completely disproportionate increase in charges leave us no choice. It is regrettable that no viable solutions have been offered here. The ones suffering are leisure and business travellers from the region."

In a statement in October, Eurowings announced it is also considering further route closures at other German airports in favour of flights to other EU countries. "This is because the sum of all German and European cost burdens is making flying to and from Germany increasingly expensive and unprofitable on many routes," the airline said.

It seems the Year of the Snake also comes with a bite.

▲ EASA's Dietmar Bloemen

WIND OF CHANGE

Kazakhstan's Air Astana has made the decision to bring maintenance and training in-house

"WE'D TALK TO THEM ABOUT THE VALUE OF THE ENGINEER'S LICENCE AND EXPLAIN HOW IT WAS VALID OUTSIDE OF KAZAKHSTAN"

Runways are very often windswept places, but that is even more so here in Nursultan Nazarbayev International Airport on the edge of the Ural Plains, outside Astana, Kazakhstan. The outside temperature when we stepped off the plane was a fresh -8°C, which we're assured is positively balmy when compared to the depths of winter to come.

We've come a way off the beaten track to look at EI-KDB, an A321 undergoing a heavy maintenance C-Check by Air Astana. What makes this particular C-Check special is that it is the first 12-year maintenance check to be carried out on an aircraft by a Kazakh carrier.

On arrival at the hangar, we are greeted by Robert Dando, director of the Astana Technical Centre and C-Check maintenance.

"This heavy maintenance check will take about 48 days," he explains, adding that they are already 30 days into the process at the time of our visit. "At any one time there are around 35 people working on it. We do everything ourselves, and, apart from me, all the personnel are Kazakh."

Our first look at the EI-KDB, which was delivered brand new to the airline in 2012, comes as it is approximately two-thirds of the way through the C-Check and still in a state of disassembly.

The seats and cabin equipment have been removed and lined up alongside the airliner, while much of the vehicle is covered in scaffolding to allow access. Climbing into the aircraft, the first point to note is that much of the floor is missing. This is partly to allow access, and partly because some of it is being replaced due to corrosion, notably around the lavatory areas where the floor has been subjected to damp.

TRAINING

Although this is the first 12-year check to be carried out by the airline, it is by no means the first MRO operation, as the airline has been able to offer C-checks and line maintenance for years. However, Dando admits that finding qualified technicians and engineers has been a challenge. This led the airline to introduce an apprenticeship programme.

"We started [the apprenticeship scheme] two years ago. Before that, there was a cadetship where we'd take people from university, but the problem was that they wanted to be managers, not technicians," explains Dando.

"As I'd come from British Airways, I recalled how we would take school leavers. So we went into schools to tell the pupils about becoming maintenance technicians. The issue there was that locally the education system is geared towards sending students to university, so people would want to do the apprenticeship, but their parents would be focused on them continuing on into higher education."

Dando's team overcame this concern by setting up introductory sessions that explained the benefits of an apprenticeship, as well as the prestige of being a qualified engineer. "We'd talk to them about the value of the Engineer's licence and explain how it was valid outside of Kazakhstan, and was equivalent to a university degree," he explains.

Training people to become engineers with responsibility for critical systems isn't something that can be done overnight. "The process takes five years," clarifies Dando.

CLOCKWISE FROM ABOVE LEFT
The multiple stages involved during heavy maintenance on an A321LR

750

There's only one aviation college in the country, which is in Almaty, approximately 750 miles from Astana. The centre is working closely with the college, which wants to gain its 147 approval and be able to teach the Part 66

2

"There's only one aviation college in the country, which is in Almaty [approximately 750 miles from Astana, where the MRO operations are]. We are working closely with the college, as it wants to gain its own 147 approval and be able to teach the Part 66.

"Some of the guys are doing a day release for Part 66, so when they finish our programme the end up as engineers. Once they finish, they apply to the Irish Authority (as that is the authority that we operate under)."

Apart from the MRO engineer training, the airline (along with the Fly Arystan subsidiary) has also invested a substantial amount in developing its training programmes for both flight deck and cabin crews. In an adjacent building, a brand-new L3Harris full flight simulator works around the clock to train pilots, while two cabin simulators allow flight attendants to train on any number of emergency procedures.

These include full-size emergency evacuation slides and life rafts as well as how to deal with a fire onboard (one of the simulators blazes real fires in random locations for the trainees to deal with). As with the MRO training, keeping such a facility in-house enables the company to hire locally, retain staff and ultimately save costs.

Plans are afoot to develop the training facilities still further, with the possible addition of a second full flight simulator and more on-the-ground training.

FACILITIES

The hangar itself is relatively new and can accommodate three A320 family aircraft at any time. The airline (again, with the Fly Arystan subsidiary) has invested in a substantial number of tools and equipment for MRO. This investment allows for the possibility to offer MRO services to other airlines in the future, if capacity and demand allows.

"TRAINING PEOPLE TO BECOME CRITICAL SYSTEM ENGINEERS DOESN'T HAPPEN OVERNIGHT"

1

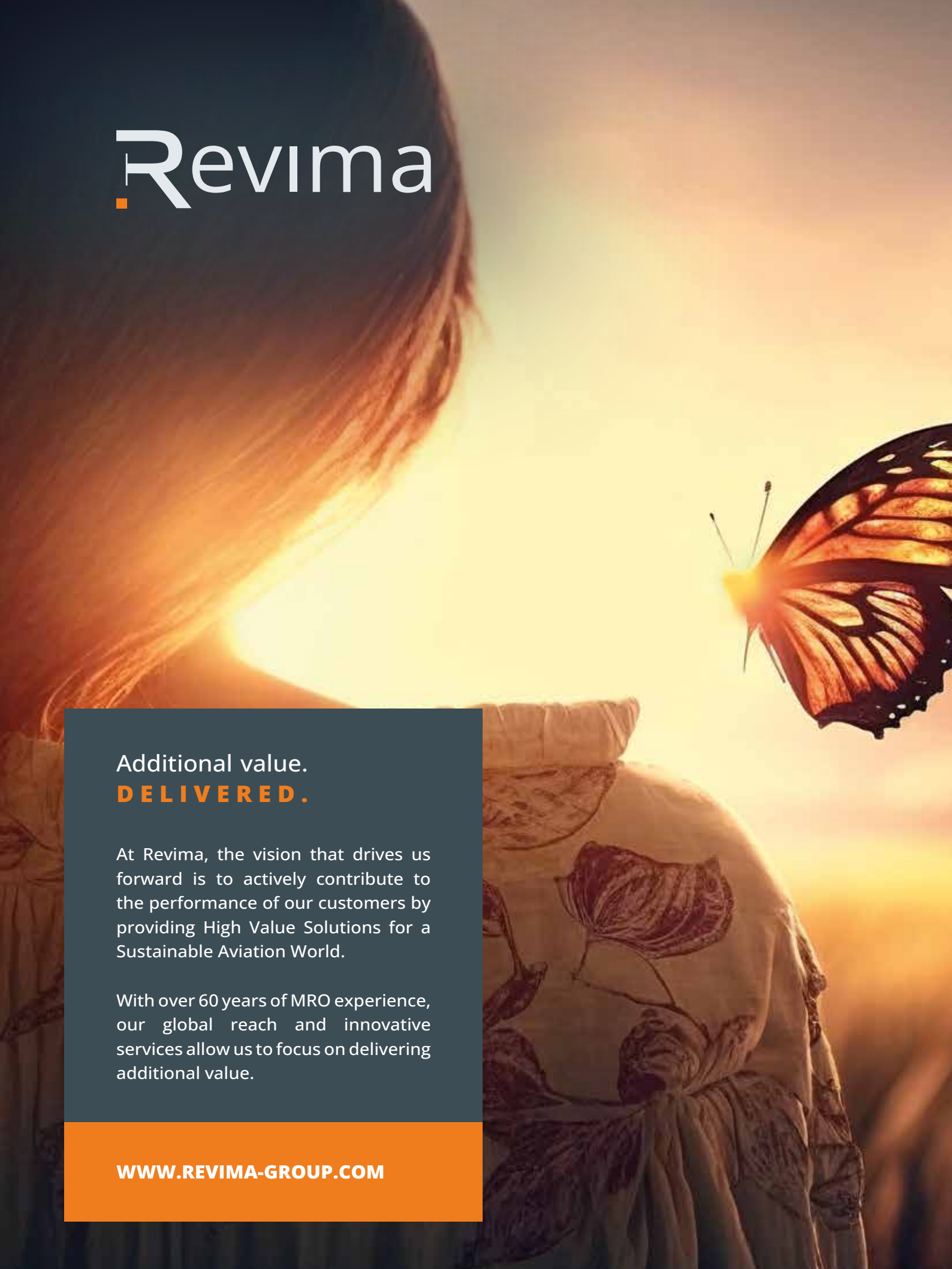
Back at the aircraft, Dando points out some issues that had been uncovered during the check, the most notable of which were the 'pylon' pins that hold the engines in place. "When we took the pin out of the pylon it was discoloured, which shows there has been some interference and heat transfer," explains Dando. "We reported it to Airbus and they reported back for us to change the pins."

Another repair being made that we witnessed during our visit concerned parts of the fuselage skin panels. As we understood it, plates larger than the removed areas are cut to fill holes in the skin. The doublers will possibly be on both sides or at least thicker than the surrounding skin. This follows the practice outlined in the structural repair manual.

In addition, one of the fuel tanks was in the process of being refitted after having been removed for an internal inspection. This particular aircraft will retain the tanks in the same configuration, but several other long-range A321s on the Air Astana fleet are being converted with an extra tank to give them yet further range. Having been given the go-ahead by Airbus, the modified planes will be able to fly a useful amount of extra distance. For example, a flight from Almaty to London Heathrow will now be able to fly directly without refuelling.

Overall, the aircraft had a clean bill of health, and reassembly was on schedule, thanks to the in-house MRO team. "The ongoing commitment to develop in-house maintenance strength has significantly reduced costs previously incurred when heavy maintenance tasks were undertaken outside Kazakhstan," concludes Dando.

1. Technical director Robert Dando
2. Components stored while removed from the airframe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LEAP Year

While not without problems, the CFM LEAP engine offers high efficiency for narrow body operators

The party balloons are out at CFM International as it celebrates 50 years of the technical and commercial partnership between GE Aviation and Safran Aircraft Engines.

While the arrangement has been highly successful, it might come as a surprise to learn that in the half century of its existence, CFM International has only produced two separate product ranges. These are the ubiquitous CFM56 family and the subject of today's article, the LEAP range of engines.

Originally announced as LEAP-X (Leading Edge Aviation Propulsion-X) back in 2008, the engine makes greater use of composite materials and runs at a higher pressure than its CFM56 predecessor. Indeed, it was the first engine to make use of some 3D-printed parts. These and other technical factors made the engine significantly more economical than what had gone before.

Unlike its forbear, which remained unsold for a few years before becoming popular, airframe manufacturers and airlines alike were keen to take advantage of the new engine. LCCs in the US were

2

1 The 'Open MRO' system in effect
2 The LEAP in its various forms is a popular choice for airlines

quick to place orders, with Southwest being the first through the gate with a firm order for 150 Boeing 737 MAX jets, with other carriers quick to follow suit. By the end of 2021, CFM claimed a 72% share of the narrowbody market.

The engine has not been without issues. Earlier this year, the FAA proposed that operators with LEAP-1A engines should replace potentially unsafe high-pressure turbine (HPT) rotor interstage seals with serviceable parts. The FAA issued the notice of proposed rulemaking (NPRM) after the engine manufacturer notified the regulator about sub-surface anomalies that developed during the manufacturing process of the HPT's billets.

Meanwhile, a fuel-nozzle-related fix has been developed by GE after carriers – particularly those with bases in hot and dusty climates – complained about the reliability. There have also been issues with the high-pressure turbine blades. Testing has shown that flying in dusty climates causes 'wrinkles'. The blades have now been redesigned and tests simulating extreme desert conditions have been run, so far successfully.

As the LEAP in its various forms is a popular choice for airlines, having the units maintained is not strenuous for operators as there are several companies offering MRO services as part of an 'open MRO ecosystem', as CFM refers to it.

This ecosystem includes CFM's internal network and a diverse range of service providers, including airline shops and independent MROs. This structure ensures that customers have the flexibility to choose the best service options to meet their needs – whether specific work scopes, component repair or full restoration overhauls.

SERVICE AGREEMENT

In March of this year, StandardAero signed a CFM branded service agreement (known as a CBSA and referred to by CFM as a 'Premier MRO' provider) to support the LEAP-1A and LEAP-1B engines, becoming the newest member of CFM's authorised MRO network for this group of engines. Under the agreement, StandardAero will provide a full range of engine maintenance and repair services to Airbus and Boeing operators around the globe. The firm will support the engines from 2024, with its large facility in San Antonio featuring large test cell complex for performance and pass-off testing.

One airline that will benefit from this new certification is Icelandic LCC Play Airlines. These services – which include MRO support, work scoping/forecasting, engine testing, programme management, component repair development, lease engine support and module swaps – are offered under StandardAero's services portfolio.

"We know how important on-time performance is to Play Airlines and its passengers. We look forward to providing them with reliable, high-quality services from our San Antonio-based LEAP facility for many years to come," said Will Pitcher, senior vice president of sales at StandardAero.

CFM International LEAP variants

Model	Application	Thrust range	Introduction
-1A	Airbus A320neo family	24,500–35,000 lbf (109–156 kN)	2 August 2016
-1B	Boeing 737 MAX	23,000–29,000 lbf (100–130 kN)	22 May 2017
-1C	Comac C919	27,980–30,000 lbf (124.5–133.4 kN)	28 May 2023

▲ CFM has selected several 'Premier MRO' providers

"WITH PLENTY OF DEMAND, THE FUTURE LOOKS BRIGHT FOR THE LEAP FAMILY OF ENGINES"

INDEPENDENT MRO

StandardAero is not the only MRO company to have a CBSA for the LEAP engine. There are currently five CFM LEAP Premier MRO shops: Air France Industries KLM Engineering & Maintenance, Delta TechOps, Lufthansa Technik, ST Engineering and StandardAero.

Recent announcements from airlines validate the value of the open MRO ecosystem model. In the past few months, Avianca, Corendon Airlines, Guangxi Beibu Gulf Airlines and KM Malta Airlines have selected CFM Premier MRO providers to support LEAP-1A and LEAP-1B fleets. In addition, Akasa Air recently selected ST Engineering for performance restoration shop visits (PRSVs) for LEAP-1B engines.

Lufthansa Technik achieved its CBSA licence in 2018 for the LEAP-1A, becoming the first independent MRO provider to do so. This was followed in 2022 with certification to work on the 1B as well. The company offers full in-house test capabilities in Hamburg.

Speaking at the time that the licence was issued, Dietmar Focke, head of engine services at Lufthansa Technik said: "With the new licence, we have now taken a decisive step forward in the portfolio of our engine business. We are now able to overhaul, repair and offer mobile engine services on all relevant narrowbody engine types.

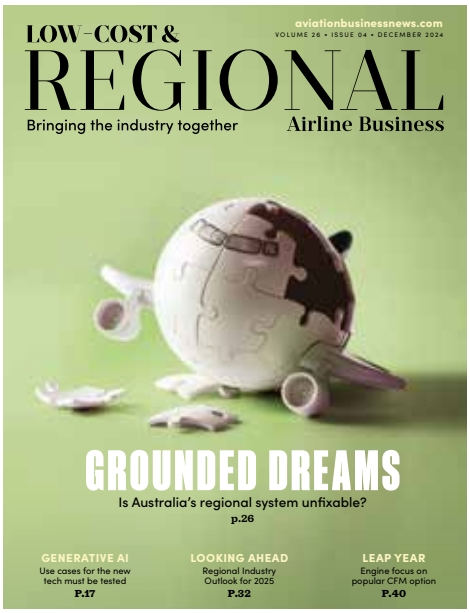
"We are very proud to extend our existing, very successful partnership and collaboration with CFM and to add this state-of-the-art engine type to our existing capabilities for the CFM56 family and the LEAP-1A engines. I also would like to thank our partner CFM for the ramp-up support they give us, so that we can offer our services for this great engine."

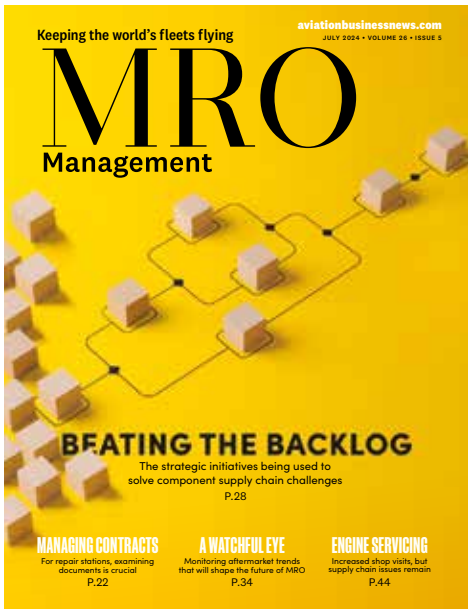
Most recently the company signed an agreement with Safran for the maintenance of the A320neo's LEAP-1A nacelles. Andreas Drosdowski, vice president aircraft component services at Lufthansa Technik, said: "We are delighted to extend our long-standing partnership with Safran Nacelles through this MRO licence.

"The LEAP-1A engine type represents a major part of the future of Lufthansa Technik's nacelle portfolio and the long-term commitment to providing top level spare availability and MRO services to our valued customers."

So, with plenty of demand, thousands of satisfied customers and a burgeoning third-party MRO operation, the future looks bright for the LEAP family of engines. However, technology never stands still and in 2021 CFM announced that is was developing an all-new engine design.

The new engine, known as 'Rise', isn't a jet at all, but a contra-rotating open rotor that does not require nacelles. The design means that it can support hydrogen or 100% SAF and the goal is to achieve a 20% reduction in fuel burn compared with its predecessor. CFM says that the design, while radical, is a realistic production prospect and could be in production in the 2030s. We are keen to see it.





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PRICED OUT OF PARTICIPATION

Vito Gomes questions if the cost of industry events is excluding upstarts

Aviation exhibitions have long been the heartbeat of our industry, where innovations are born, connections are made and the future of aviation takes shape.

These events are not just about showcasing the latest technologies; they are where businesses – big or small – come together to explore new opportunities and strengthen the industry.

But lately, there's a growing concern that threatens to overshadow this essential gathering: the increasing cost of participation.

It's no secret that the financial demands of exhibiting at these events are becoming a significant hurdle, particularly for smaller and medium-sized companies.

These businesses are often at the forefront of driving innovation, and their absence at these events is starting to be felt.

Aviation thrives on diversity of ideas, participants and partnerships. If we don't make these exhibitions more accessible, we risk losing the very dynamism that makes our industry special.

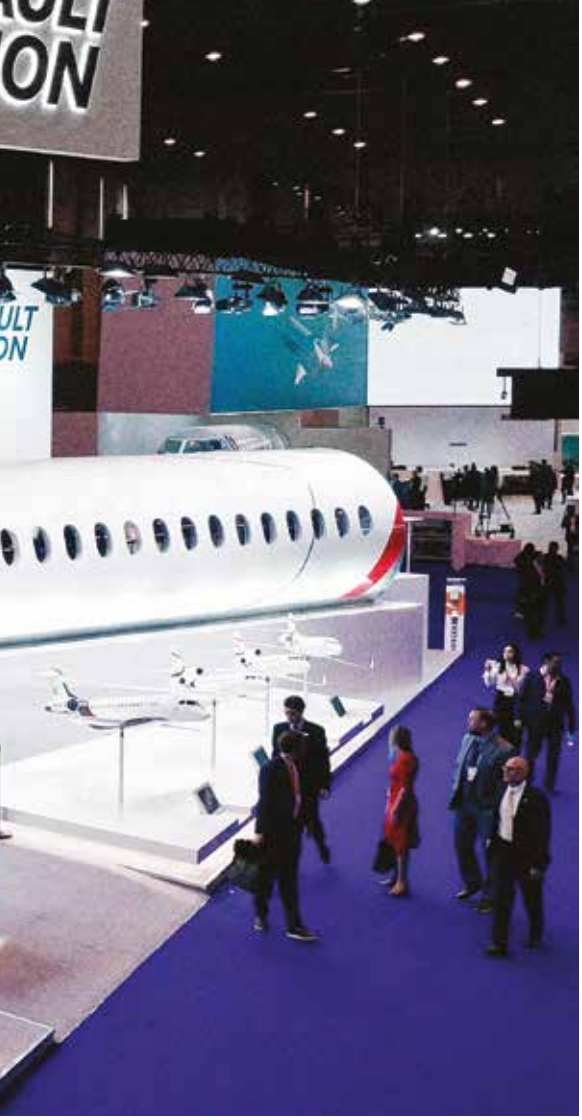
This issue is not limited to a specific region or event. The rising costs of aviation exhibitions are a growing concern on a global scale.

For instance, at the upcoming Middle East and North Africa Business Aviation Association (MEBAA) show this December, the increase in stand fees, sponsorship costs and other charges such as material handling, electricity and stand audits have been widely noted. However, this is not an isolated case.

Similar concerns are being raised at major events worldwide, including the European Business Aviation Convention & Exhibition (EBACE).

In May 2024 at EBACE, we observed a noticeable drop in attendance. While environmental demonstrations contributed to the withdrawal of some key manufacturers, rising costs for participants played an equally substantial role.

Along with the increasing cost of exhibiting, delegate registration fees have also risen exponentially at some events, further burdening participants who already bear significant expenses for travel and accommodation.



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Unfortunately, this is a trend we are witnessing more frequently across aviation events globally. When we price out smaller players, we strip away the diversity that fuels growth and innovation in aviation.

WHAT'S AT STAKE?

If this trend continues, we risk turning these exhibitions into exclusive arenas dominated by the biggest players. Historically, aviation has flourished because it welcomed ideas from companies of all sizes.

But as these events become more about who can afford to be there, we lose the competition, the creativity and, ultimately, the innovation that drives us forward.

It's not just about money; it's about preserving the spirit of openness and collaboration that has always been the backbone of our industry.

Rising costs are putting up barriers to entry that prevent smaller companies – the ones often responsible for the most groundbreaking ideas – from getting the visibility they need.

Innovation thrives when opportunities are available to everyone. So, what happens when those opportunities are closed off?

At ASM, we've already initiated conversations with key event organisers, including MEBAA, about these concerns and we appreciate their willingness to listen.

But this isn't just a regional problem – it's something the whole industry needs to come together to address.

TIME FOR CHANGE

As an industry, we need to ask ourselves some tough questions. Are we okay with letting rising costs determine who gets to participate in shaping the future of aviation? Or will we come together to create a more inclusive, fair environment?

There is a way forward. By pushing for greater transparency and fairness in pricing, we can ensure that exhibitions remain accessible to businesses of all sizes.

Event organisers have the power to keep their platforms open to everyone.

By structuring fees that reflect the diversity of our industry, we can maintain the vibrancy and innovation that make these events so critical.

A FUTURE BUILT ON COLLABORATION

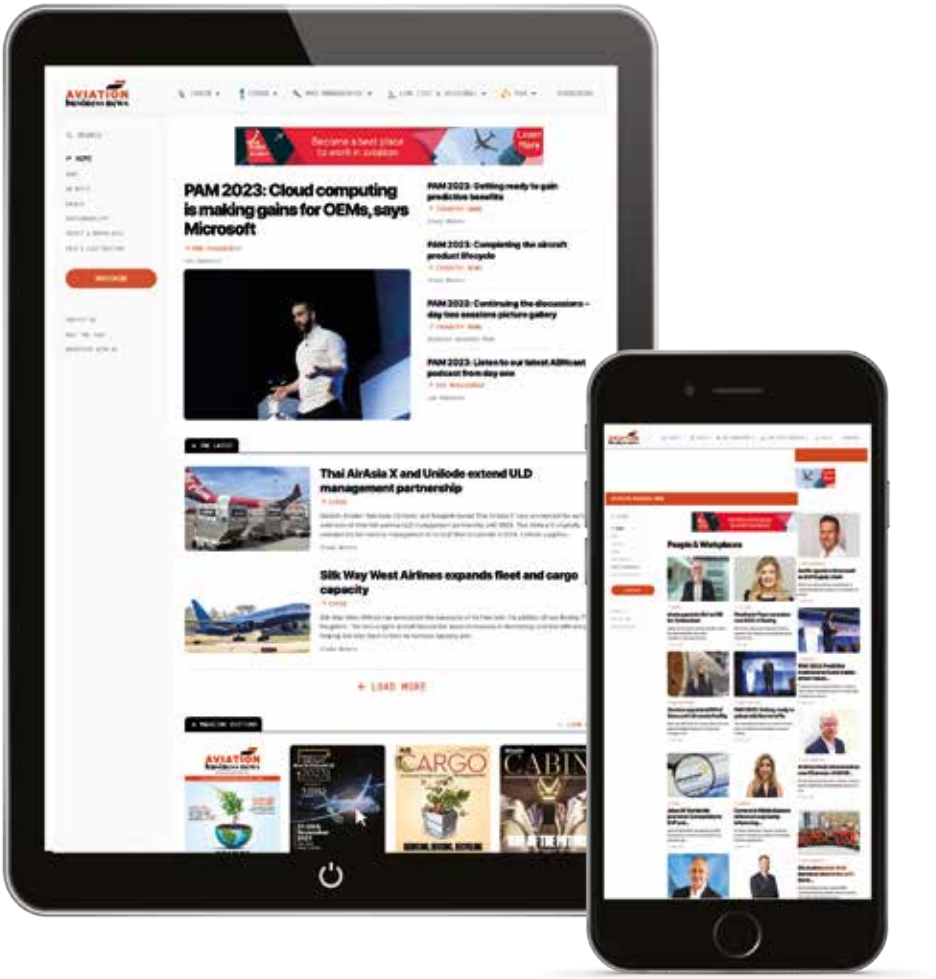
The future of aviation isn't just about the latest tech – it's about collaboration, inclusion, and ensuring new ideas can emerge and thrive.

We must protect the diversity of our exhibitions to keep our industry healthy and resilient. Now is the time for change. There are trade shows in other industries that have 'Innovation Rooms' – dedicated sections for startups and SMEs. There's surely no reason why our industry can't do the same.

I'd welcome the chance to work with the exhibition promoters together with other smaller businesses to find a future that will be satisfactory for us, them and the whole trade-show visiting aviation industry.

▲ Vito Gomes, founder and chief executive of Aviation Services Management

1. EBACE appeals to a specific market segment
2. Better events benefit all concerned



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THE ICE CRYSTAL MAZE

An SAF test flight shows that biofuel can also reduce pollution from contrails

Ice crystals in the upper atmosphere from aircraft contrails have been shown to be a non-CO_2 contributor to the greenhouse effect. However, there's new evidence that a few relatively small changes can help reduce this.

As a plane passes through humid, cold air the vapour from the unburnt fuel from the engines condenses and creates an artificial cloud. This traps heat that would otherwise be allowed to escape into the atmosphere.

While the global warming effects of contrails have been known about for some time, it is only relatively recently that the scale of the problem has become apparent. As such, it featured on the agenda of this year's COP29 UN Climate conference in Azerbaijan for the first time.

According to a study by the Transport and Environment campaign group, 80% of the warming by contrails is generated by just 3% of flights. Simple rerouting, projected to increase the cost of a ticket by less than $5 per passenger, can reduce most of the problem.

"Planes are already flying around thunderstorms and turbulence areas," says Carlos López de la Osa, sustainable aviation manager at Transport and Environment.

"We will need to add one more constraint to flight planning, which is avoiding areas of contrail formation. Of the climate solutions discussed at COP29, it's arguably one of the simplest ones."

"WE NOW KNOW THAT SAF CAN ALSO REDUCE SOOT EMISSIONS AND ICE PARTICULATE FORMATION THAT WE SEE AS CONTRAILS"

Rerouting is one possibly answer, but preventing contrails from forming is an even better one. SAF has been proven to be effective in reducing the formation of contrails in the first place. Results from an in-flight study of the impact of using 100% SAF on both engines of a commercial aircraft showed a reduction in soot particles and formation of contrail ice crystals compared to using conventional Jet A-1 fuel.

The ECLIF3 study, in which Rolls-Royce, Airbus, the German Aerospace Centre (DLR) and SAF producer Neste collaborated, was the first to measure the impact of 100% SAF use to emissions from both engines of an Airbus A350 powered by Rolls-Royce Trent XWB engines, followed by a DLR chase plane.

Compared to a reference Jet A-1 fuel, the number of contrail ice crystals per mass of unblended SAF consumed was reduced by 56%, which could significantly reduce the climate-warming effect of contrails.

PROMISING RESULTS

Mark Bentall, head of Research & Technology Programme, Airbus, says: "We already knew that sustainable aviation fuels could reduce the carbon footprint of aviation.

"Thanks to ECLIF studies, we now know that SAF can also reduce soot emissions and ice particulate formation that we see as contrails. This is a very encouraging result, based on science, which shows just how crucial sustainable aviation fuels are for decarbonising air transport."

The results of both reports show that while there's no easy solution to reducing aviation emissions, there are steps that can be taken now that will make a real difference. Let's hope they are acted on.

80%

According to a study by the Transport and Environment campaign group, 80 percent of the warming by contrails is generated by just 3% of flights

◀ Tackling contrails may represent an 'easy win' for reducing climate impact from aviation

CLEARING SAF HURDLES

Cost and supply is hampering SAF roll-out according to **Bruce Andrews** and **Connor Bernard** from Alderman & Co

Sustainable aviation fuel (SAF) was first developed in 2008 and has been available commercially since 2016. However, despite all the talk and the development in chemistry, it still only accounts for approximately 0.1% of all worldwide jet fuel, and the portion has not changed much over the past five years.

In 2021, we saw a strong commitment to increase the use of SAFs, with major airlines including British Airways, Delta Airlines, KLM, United Airlines and Virgin Atlantic all committing to work toward having SAF comprise more than 10% of fuel consumption by 2030. However, two major hurdles are slowing the pace of SAF market share.

QUESTION OF COST

The first hurdle is cost: feedstock-based fuels cost approximately 50% more to produce than Jet-A. In an industry with extremely thin margins and where fuel is the largest component of cost, individual airlines cannot afford to incur higher fuel prices than their competitors.

To lower emissions while maintaining a level playing field, in July 2022, Alaska Airlines, American Airlines, British Airways, Finnair, Japan Airlines and Qatar Airways announced their collective plans to purchase up to 50 million gallons of ethanol-based SAF annually from renewable fuels producer Gevo.

The second hurdle is supply: there currently are not sufficient feedstocks to facilitate the production of sufficient SAF to meet the demand from the airlines for jet fuel.

Current production technologies require substantial raw stock to be processed to produce SAF. For example, using agriculture feedstock, some analysts estimate it would require up to 80% of US farmland to meet annual global jet fuel demand. This crowding-out of resources for the food supply would be unacceptable.

SCALE-UP ISSUE

The current scientific hurdle is that, while SAF aims to support sustainability, the current production technology does not enable large-scale adoption without compromising

▲ Airlines all want to run SAF, but take-up hes been slow due to production issues

"INVESTMENTS IN SAF TECH WILL RESULT IN HIGHER YIELDS FROM FEEDSTOCKS"

land resources needed for food production. In the future, investments in SAF technology will hopefully result in substantially higher yields from feedstocks.

What impact will SAFs have on mergers and acquisitions in the middle market of the aerospace and defence industry? First, we expect to see some direct M&A activity in the SAF supply chain, as companies and private equity firms look to make strategic moves in the sector.

For example, in April, Southwest Airlines acquired the SAF start-up SAFFiRE, focusing on converting corn stover, a plant material that remains after the harvesting of corn and which is an abundant agricultural by-product, into ethanol as a feedstock for SAF.

The US produces roughly 400 million tons of corn stover each year, with each ton capable of yielding approximately 50 gallons of jet fuel.

This acquisition supports Southwest's goal to replace 10% of its jet fuel with SAF by 2030, moving the airline closer to achieving net-zero emissions by 2050.

The airline further strengthened its SAF portfolio with a $30 million investment in February in Lanzajet, an innovator in ethanol-to-SAF technology, which now operates the first commercial plant dedicated to this production process, producing 10 million gallons of SAF per year.

Meanwhile, Airbus and partners such as Air France-KLM and Mitsubishi HC Capital have also committed to advancing SAF through a $200 million fund launched in July.

Its first investment went to Crysalis Biosciences, a company that has converted an existing ethanol plant in Illinois for SAF production, highlighting the industry-wide push toward scalable SAF solutions.

SAF AND BIZJETS

In terms of indirect impacts, we believe the growth of SAFs will have a positive impact on business aviation, as owners have been coming under attack from ESG advocates due to their carbon footprints. By using SAFs, business jet owners can more successfully defend their use by showing they have lowered their carbon footprint.

We also believe SAFs will have an indirect positive impact on the airline industry by enabling the airlines to continue to grow without expanding their impact on the environment and potentially reducing their impact even as they grow, which is important to the regulators of many nations and important to many of the customers of the global airlines.

All in all, while SAFs face difficult hurdles, we believe that production rates and airline use will expand, and we believe that will bode well for aviation and defence mergers and acquisitions in the years ahead.

SAF IN A NUTSHELL

Sustainable aviation fuel (SAF) is an alternative to Jet-A, the worldwide standard for the commercial aviation industry.

Jet-A is a petroleum product made from crude oil. SAFs are made from feedstocks other than crude oil.

SAFs are designed so they can be a full replacement for Jet-A (used independently) or blended with Jet-A.

They can be blended at different levels with limits between 10% and 50%, depending on the feedstock and how the fuel is produced.

To date, the International Civil Aviation Organisation (ICAO) reports that there have been more than 350,000 commercial flights using SAF at 46 different airports, largely concentrated in the United States and Europe.

0.1%

SAF still only makes up a tiny percentage of the market

Green Sky

Sucking carbon out of the sky

There's a way of capturing carbon directly from the air, but it comes at a cost

The annual Aviation Carbon event took place in London in November, and among the usual mix of arguments over SAF availability and thinly disguised sales pitches, one topic caught our ear, namely carbon sequestration.

The idea of sequestration is that carbon dioxide can be captured and stored, and there are two ways of doing it: biological and geological. While it is possible to capture carbon in sinks by using biological methods such as reforestation or kelp beds, this might only be temporary and be subject to disease or a change in political will.

For this reason, the preferred method is geological, where industrial plants 'vacuum' carbon dioxide out of the sky using devices modelled on industrial cooling towers. The air passes over thin plastic surfaces with a non-toxic potassium hydroxide solution flowing over them to trap the CO_2 molecules as a carbonate salt.

The carbonate salt is separated from the solution using a pellet reactor. The carbon pellets are then heated in a calciner to release the CO_2 as pure gas. Lastly, the processed pellets are hydrated in a device called a "slaker" and recycled for use in the original capture solution.

The carbon dioxide is then sent it into porous rock in the earth, which 'soaks' it up, something like a sponge.

"Capturing carbon dioxide, ultimately, is a waste disposal problem," explains Myles Allen, professor of Geosystem Science at Oxford University. "We're generating carbon dioxide. It's a waste. What matters is where it goes and guaranteeing that it stays there."

Allen makes the point that the issues surrounding carbon capture are bureaucratic and complex.

"WE GENERATE CARBON DIOXIDE. IT'S A WASTE. WHAT MATTERS IS WHERE IT GOES AND GUARANTEEING THAT IT STAYS THERE"

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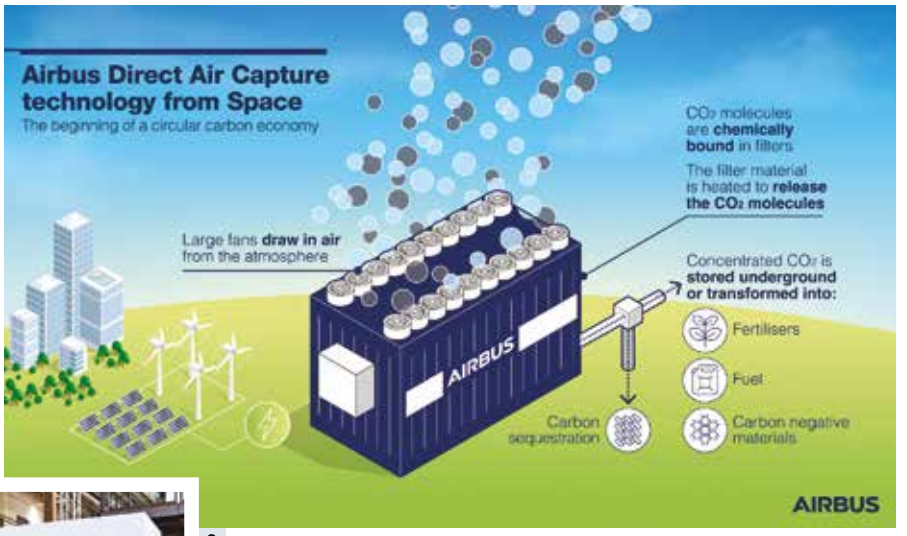

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Simply put, a company funding carbon capture schemes can't just use carbon credits in the normal way. However, Allen is clear that this shouldn't be a barrier to adoption. "It's very easy to get lost in the maze of exactly where it's captured and how it's captured. And the accounting systems get fiendishly complicated at that point," he says. He adds that, paperwork aside, geological carbon capture is a highly efficient and, he believes, relatively simple way of permanently removing carbon dioxide from the atmosphere.

The plants are not a theoretical concept either. The event panel discussed a project spearheaded by Airbus and built by technology firms Carbon Engineering and 1PointFive in Texas. This plant, which has just been brought into commission, will remove a million tonnes of carbon from the skies every year, approximately equivalent to 40 million trees.

Such technology doesn't come for free, and the costs per tonne are currently high. However, Allen makes the point that if the aviation industry was to build a thousand plants, it could legitimately claim to be near net zero.

"It's actually not that complicated. We've got to get rid of carbon dioxide and get rid of it permanently," Allen concludes.

40 MILLION

The plant will remove a million tonnes of carbon from the skies every year, approximately equivalent to 40 million trees

1. Hardware comes at a cost
2. Airbus's direct air capture technology explained

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