



ASIAN Aviation

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ASIA'S ONLY COMPREHENSIVE INDEPENDENT INDUSTRY PUBLICATION



CROWDED SKIES

ASIA-PACIFIC COUNTRIES NEED TO WORK TOGETHER TO SAFELY MANAGE AIR TRAFFIC

ASIA REOPENS

The APAC region has reopened but lags other markets in a full return to pre-COVID levels

MRO IN INDIA

The subcontinent hopes to keep MRO work at home instead of overseas

SUSTAINABILITY

Everyone agrees SAF can work now, so what's stopping the industry?

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On the cover: Singapore, April 13, 2019. Jewel Changi and Changi airport control tower. View from skytrain. (Shutterstock)

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Over the last four decades the centre of the commercial aviation world has shifted away from the US and Europe to the Middle East and Asia. India too is becoming a regional powerhouse both in airline operations and in the MRO sector.

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Safety first

THE YEAR STARTED BADLY FOR AVIATION IN ASIA and elsewhere in the world with two accidents coming in the span of one week. Despite the fact that the loss of life was low in the first accident and zero in the second, both incidents are a stark reminder that, as has been said, aviation safety is paid for with the blood of dead passengers.

In the first case, a Japan Airlines (JAL) plane landing at Tokyo's Haneda Airport on 2 January collided with a Japan Coast Guard aircraft that had incorrectly entered the runway being used by the JAL plane. While no one on the passenger jet died, five people on the coast guard plane were killed.

Much has been made of the post-COVID retraining being required for nearly everyone in the aviation industry because the pandemic shutdown of the business saw a decrease in the skills of pilots, aircrew, air traffic controllers and many others. In other words, everyone got a little "rusty" when it came to doing even routine parts of their jobs.

The runway incursion in Japan was, unfortunately, not "that" unusual. The US Department of Transportation said in fiscal 2023 in the US, there were 1,756 total runway incursions with 60 percent of those attributable to pilot deviations, 20 percent caused by air traffic controller action or inaction, and the remaining 20 percent caused by vehicle or pedestrian deviations. Japanese safety authorities reported at least 23 "serious incidents" on runways over 10 years through 2023 where investigators judged there was a risk of collision between aircraft or with other vehicles.

In the JAL case, air traffic controllers at Tokyo's Haneda Airport did not notice the Japan Coast Guard aircraft entering the runway before the collision and controllers apparently did not see a "visual" warning system that should have alerted them. The system, however, does not provide an audio alert, a shortcoming that should be rectified.

CAN BOEING BE TRUSTED?

In the new year's second accident, a so-called "door plug" on a Boeing 737-9 MAX operated by Alaska Airlines tore off as the plane was ascending out of Portland, Oregon, on 5 January, forcing the US Federal Aviation Administration (FAA) to ground 171 MAX -9 models.

Fortunately, no one died as a result of the incident, but the failure has again shown that Boeing has still not resolved its manufacturing problems that have affected its MAX aircraft, its 787 model and even

...Boeing has still not resolved its manufacturing problems that have affected its MAX aircraft, its 787 model and even its military planes.

its military planes. Boeing's main supplier, Spirit AeroSystems, has also come under scrutiny since it produces the fuselages for Boeing. A lawsuit filed last year alleges Spirit AeroSystems had experienced "sustained quality failures" in its products. The lawsuit alleges that Spirit's problems were "widespread," including "the routine presence of foreign object debris (FOD) in Spirit products, missing fasteners, peeling paint, and poor skin quality."

"Such constant quality failures resulted in part from Spirit's culture which prioritised production numbers and short-term financial outcomes over product quality," the complaint claims.

Boeing too has its own history of problems with its MAX model that includes two crashes of the 737-8 model that killed 346 people. Boeing's MCAS system was proven to be at fault and Boeing was accused of putting profits over people because it tried to downplay the importance of the MCAS system so that no additional training would be required for pilots transitioning to the -8 model.

The FAA said it is investigating whether Boeing failed to ensure that its 737-9 MAX was safe and manufactured to match the design approved by the agency. "This incident should have never happened, and it cannot happen again," the agency said.

Alaska and United Airlines said they had discovered loose hardware on the door plug panel when conducting preliminary inspections on their planes. Dave Calhoun, Boeing's CEO, said the company was "acknowledging our mistake" without explaining what he was referring to.

In 2020 at the sparsely attended Singapore Airshow, Boeing officials held a media briefing that discussed the 2019 grounding of the MAX-8 model due to its faulty MCAS system. I asked the assembled Boeing executives then "why should anyone trust a word that Boeing says?" The officials mumbled something about Boeing's storied history in aviation, its commercial record, etc., etc.

But given that safety is paid for with the blood of dead passengers, the question is still valid. Given its past problems and its present ones, can Boeing be trusted? Let's hope the answer comes before anyone has to pay the ultimate price.

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NEXT ISSUE

INDIA RISING

The subcontinent is seeing a revival of its domestic and international air sectors.

WIDEBODIES REVIVAL

With billions worth of orders, widebody planes are back on the wish lists of airlines.

ARTIFICIAL INTELLIGENCE

The aviation industry is pushing AI in areas like design, ATC and route planning.



LEAP

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LEAP-powered aircraft are achieving the highest days flown ratio* for their thrust class. That means fewer spare aircraft and more flights, which helps profitability climb. Another reason to say **LEAP. By example.**

*Compared to 83% for competition, per third-party data.

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92% asset availability

**LEADERS
AREN'T BORN.
THEY'RE
ENGINEERED.**



ExecuJet Haite signs deal for new MRO Facility at Beijing Daxing International Airport

ExecuJet Haite Aviation Services China Co. Ltd (ExecuJet Haite) has signed an agreement with Capital Airport Holding Business Aviation Management Co. Ltd (CBM) to operate the new MRO facility at Beijing Daxing International Airport. The binding agreement allows ExecuJet Haite to operate the 5,000 square metre state-of-the-art large-scale maintenance hangar with extensive back shops and offices at Beijing Daxing International Airport. The MRO facility, which is already built, is co-located within the airport's business aviation area; some 300,000 square metres, making it the largest business aviation centre in Asia Pacific. ExecuJet Haite's MRO facility at Beijing Daxing International Airport will support various original aircraft manufacturers (OEMs) and aircraft types under Civil Aviation Administration of China (CAAC) and certifications from overseas national aviation authorities as it currently does at its Tianjin MRO facility. ExecuJet Haite in Tianjin is certified by the CAAC, European Aviation Safety Agency (EASA) and the US Federal Aviation Administration (FAA). It is also certified by the authorities of Cayman Islands, Bermuda, Aruba, and others. CBM already provides FBO services to business jets and travellers at Beijing Daxing International Airport and Beijing Capital International Airport and will work in alliance with ExecuJet Haite, a leader in MRO activities in Greater China, to further develop Beijing Daxing International Airport as an industry leading business jet base and entry point into the Chinese market.

DASSAULT AVIATION'S FALCON 6X ENTERS SERVICE

Dassault Aviation's Falcon 6X entered service late last year. Type certification was granted last August by both EASA and the FAA. Since that time, post-certification upgrades that were applied required EASA approval. "Dassault Aviation shares this remarkable occasion with its customers, who are sure to receive an exceptional aircraft," said Dassault Aviation Chairman and CEO Éric Trappier.



IS CHINA LOSING OUT ON BUSINESS AVIATION?

At the Corporate Jet Investor conference last year in Singapore, the topic was when is China coming back? Now one of the key topics is that India is on the way. Attendees, according to the group organising the event, said

China is still an important market, but strong demand from buyers in Southeast Asia and Australia have shifted the focus away. They also reported that the mainland Chinese fleet has fallen from more than 300 aircraft to



EXECUJET MRO SERVICES MIDDLE EAST COMPLETES CHECK, REFURBISHMENT ON GLOBAL 6000

ExecuJet MRO Services Middle East, a Dassault Aviation subsidiary, has completed work on a Global 6000 that included an extensive cabin interior refurbishment, installation of a new satcom system and an airframe heavy maintenance check. This particular airframe maintenance check — which comes due once every 120 months — is one of the heaviest one can do on a Global 6000, as it also includes a full landing gear overhaul. "A few years ago, clients in the Middle East would send these projects — a very heavy maintenance check coupled with a major cabin refurbishment — to MRO companies in Europe, but these projects are now coming here to Dubai," says Nick Weber, regional vice president Middle East at ExecuJet MRO Services. This particular Global 6000 also required some airframe specific work. The aircraft's inboard flaps were subject to a service bulletin, from the aircraft manufacturer, requiring upper skin removal and rib replacement. ExecuJet has performed more than 38 such flap repairs and owns the specialized tooling required to perform this service bulletin. The MRO's engineers and technicians are also very experienced at sheet-metal and composite structural repairs.

about 200 now. It had already started falling before COVID because some owners were nervous about ownership. Attendees said business was still good, but the post-COVID rush of first-time buyers in Asia is over with.



NEW HELICOPTERS SET FOR SOUTH AUSTRALIA

Two new helicopters will be added to South Australia's police and ambulance services to boost response time and operational capacity. A state government commitment of A\$150 million will see two new State Rescue Helicopter Service (SRHS) helicopters online before the end of 2024, four new dedicated pilots and an extra available line of flying for emergency response. The SRHS is shared between SA Police (SAPOL) and SA Ambulance Service (SAAS) to provide critical emergency response across the state. The SRHS operates 24/7 every day of the year and specialises in aeromedical retrievals from rural hospitals and accident scenes, search and rescue missions on-land and at sea and airborne law enforcement. The government has extended its contract with current provider Babcock Australasia for a further four years, as well as investing in a brand-new SAPOL helicopter and an additional aircraft for SAAS. The existing 30-year-old SAPOL helicopter will be replaced by a new twin-engine SAPOL Airbus H145 D3. The new helicopter is quieter, faster, and lighter. It will arrive by July 2024. SAAS will welcome a Bell 412 EP to be configured for medical operations like the current aircraft. Due to its contract, it will arrive in December 2024, however other interim Bell 412 aircraft will be available for use. The investment will also see four additional pilots hired to provide a third line of flying for 24/7 operations, meaning three helicopters can be airborne at once if required.

SAUDIA TECHNIC TO SET UP REGIONAL SERVICE CENTRE

Saudia Technic and Airbus Helicopters have signed a memorandum of agreement for the creation of an authorised service centre in the Kingdom of Saudi Arabia to support the civil helicopters in operation in the re-



Airbus flies automated helicopter with a tablet

Airbus has successfully tested a new simplified human machine interface (HMI) along with advanced autonomous features through a project code-named Vertex. These technologies, developed by Airbus UpNext, are controlled by a touchscreen tablet and aim to simplify mission preparation and management, reduce helicopter pilot workload, and further increase safety.

TEAL GROUP FORECASTS CIVIL UAS SPENDING TO HIT US\$150 BILLION OVER NEXT DECADE

The dynamic growth in Civil Unmanned Aerial Systems (UAS) over the next decade will create significant rewards for smart investment as nations open their airspace, commercial applications take off, and civil governments adopt systems for new roles in border security and public safety. At the same time, some sectors of the market are reaching maturity faster than anticipated, requiring caution and careful research from investors and potential market entrants. "UAS has been a boom market with possibilities that appeared limitless. It's entered the shakeout phase, particularly since some markets have become saturated, and others so dominated by a single company that competition is difficult," said Jeremiah Gertler, Teal Group's senior analyst and author of the

study. "In much of the world, growth markets are turning to commodity replacement markets where producers compete with the local used drone lot, and some companies see that as their cue to exit." By contrast, the United States market is expected to grow when other global markets are already beginning to level off. "The FAA has raised the starter pistol to the sky; we're just waiting for it to fire," Gertler said. "U.S. markets will be the second great UAV wave." Teal Group's 2023/2024 World Civil UAS Market Profile and Forecast forecasts that non-military UAS production will jump from US\$8.2 billion market (value of air vehicles) in 2023 to US\$19.5 billion by 2032, a 10.1 percent compound annual growth rate in constant dollars. Over the next 10 years the market will total US\$149.8 billion.





Asia Digital Engineering racks up 100 C-checks in record time

Asia Digital Engineering (ADE) recently announced it has completed its 100th C-Check in under two and a half years, a record timeframe since inception in September 2020. Recognised as heavy checks involving maintenance procedures for critical aircraft components and systems, a C-Check is a comprehensive maintenance inspection that ensures the airworthiness and safety of an aircraft and demands extensive tooling, test equipment, and special skill levels. CEO of Asia Digital Engineering, Mahesh Kumar said, "I want to thank all of my engineers, technicians and the rest of the team at ADE for this milestone achieved in a short period of time. Our team has demonstrated exceptional skill, professionalism, and resilience in accomplishing this remarkable feat. I am proud of their steadfast dedication, relentless efforts, and unyielding commitment to the pursuit of excellence in aircraft maintenance, and truly believe we are on the path to cementing our position as the leading MRO service provider in ASEAN, delivering the best value at lowest cost with high efficiency across the Asia Pacific region and beyond."

MTU MAINTENANCE SIGNS LEAP-1A WITH SRILANKAN AIRLINES

MTU Maintenance said it has signed a five-year LEAP-1A maintenance, repair and overhaul (MRO) contract with SriLankan Airlines, building on the two companies' existing relationship that has also covered V2500 engines and leasing support. The work will be carried out at MTU Maintenance

Zhuhai, the 50/50 joint venture with China Southern Airlines, which, among other models, specializes in MRO services for LEAP engines and has completed almost 100 shop visits on this engine type since 2018. "We are delighted to be expanding our long-standing and successful partnership,"



SIA ENGINEERING SIGNS LEASE FOR HANGARS IN MALAYSIA

SIA Engineering Company said its Base Maintenance Malaysia unit has entered into an agreement with IVP for the lease of the two hangars located within Complex A of Sultan Abdul Aziz Airport in Subang for a period of 15 years, with an option to renew for a further term of 15 years. The entry into this lease agreement is a significant milestone for SIAEC as it establishes the company's third base maintenance hub in the Asia-Pacific region. The addition of the Subang Hangars, each being able to accommodate two widebody aircraft, will boost SIAEC's airframe check capacity in providing comprehensive maintenance, repair and overhaul (MRO) of current and next-generation aircraft for SIAEC's expanding portfolio of airline customers. Chin Yau Seng, Chief Executive Officer of SIAEC said, "We believe that our investment in the Subang hangars complements our component and line maintenance joint ventures in Malaysia, allowing us to augment our extensive MRO offerings to our customers globally. With the expansion of our MRO network, this will further solidify our position as a leading provider of MRO services."

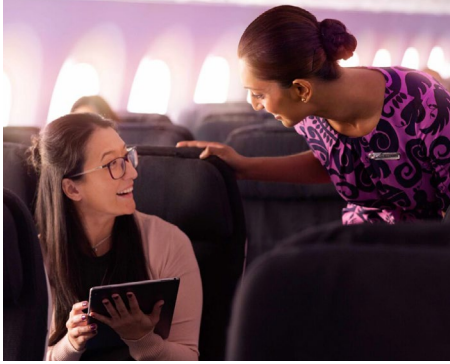
says Richard Nuttall, CEO of SriLankan Airlines. "We trust in MTU Maintenance's technical expertise and look forward to their fast, reliable and cost-efficient support for our growing fleet." The national carrier currently operates a fleet of 22 Airbus A330 and A320/A321 aircraft.

TAG AVIATION EXPANDS MAINTENANCE CAPABILITIES

TAG Aviation announced it has obtained OTAR-145 approval from the Bermuda Civil Aviation Authority (BCAA) for its maintenance stations in Hong Kong, Macau, and Subang, Malaysia. The new approval authorises TAG Aviation to perform maintenance, repair, and overhaul services on Bombardier Global Express/5000/6000/6500/7500 air-

craft, Dassault Falcon 7X/8X aircraft, and Gulfstream G450/550/600/650 aircraft registered in Bermuda. "We've noticed an uptick in transit traffic and upcoming aircraft deliveries in Asia among Bermuda-registered operators," said Phil Balmer, Director of Maintenance for TAG Aviation. "Obtaining this approval demonstrates our commitment

to adapt our services based on changing customer needs in the marketplace." TAG Aviation has provided comprehensive maintenance support under EASA and Hong Kong CAD Part-145 certifications for over a decade. The company also holds Bombardier ASF and Dassault ASC authorizations in Hong Kong and Macau.



AIR NEW ZEALAND USING STARLINK FOR ONBOARD INTERNET

Air New Zealand is working with satellite internet service provider Starlink to introduce free internet onboard domestic aircraft. Starlink will be installed on a domestic jet and, in a world first, on an ATR in late 2024. After a successful trial, Air New Zealand will look to roll out Starlink internet on other aircraft in its domestic fleet in 2025. Starlink offers reliable high-speed, low latency in-flight internet, according to Air New Zealand. With latency as low as 30ms, all passengers will be able to use internet like never before. From streaming video content to working while onboard, and instantly messaging friends and family with multiple devices connected, Air New Zealand customers will be able to access internet as if they were in their lounge at home. Air New Zealand Chief Digital Officer Nikhil Ravishankar says the partnership demonstrates the airline's commitment to delivering exceptional customer experiences at every point of their journey. "We're always looking at how new and innovative technology can deliver improved customer experiences and with the world's largest satellite constellation, exploring in-motion connectivity on our aircraft with Starlink was a no brainer. Whether travelling for work or leisure, we know maintaining seamless internet connectivity is something that will transform the travel experience for customers. Our free and accessible WiFi onboard international flights has proved incredibly popular among customers, so we can't wait to bring connectivity to domestic flights."

JETMS COMPLETIONS ACQUIRES WAYPOINT AEROTEC

JETMS Completions, an aircraft interior and exterior completions company, has acquired Waypoint Aerotec, a certified Design Organisation. With this latest acquisition, JETMS Completions will now possess UK CAA Part 21J Approval. This



Emirates goes vegan

Emirates has noted a surge of 40 percent in customer demand for plant-based meals. To meet this demand in 2024, Emirates will introduce an array of new vegan dishes onboard and in lounges later this year, adding even more dishes to its 'vegan vault' of more than 300 curated plant-based recipes. In Economy class, Emirates customers can enjoy dishes like chickpea crepe stuffed with carrot, peppers, mushroom and tomato concasse, experience a textured pumpkin frittata, tuck into a tofu tikka masala or enjoy a hearty chickpea kale stew with parsley pilaf rice and baby spinach. Scrumptious vegan desserts in Economy include a coconut mousse with mango compote, moist banana cake with chocolate crumble or luscious chocolate pudding with cocoa soil. In Premium Economy class, customers choosing vegan cuisine will be served nutritiously delicious dishes like jackfruit curry with basmati rice, or a rich squash chestnut stew followed by a light chocolate tofu cheesecake or a smooth and satisfying raspberry parfait with a pot of orange compote. In Business class, a range of elegant and creatively curated dishes are offered including roasted cauliflower with ancient grains, caramelised pear and lovage pesto or a warming ragout of Asian tofu and shitake mushroom with glass noodles. Customers who have room for dessert can feast on a tropical coconut pineapple cake or indulge in a chocolate cheesecake accented by a dark chocolate cigar and strawberry compote. In First class, customers will be treated to exceptionally elevated vegan cuisine like creamy polenta cake with thyme mushroom ragout, sautéed spinach drizzled in a rich root vegetable jus.

system upgrades. Waypoint STC 10073186 enables JETMS completions to offer an Off-The-Shelf solution for all EMBRAER Phenom 300 (EMB-505) Operators & Owners — Replacement of Passenger Seat Cushion Covers and Foams.

People on the Move



AERO NORWAY has appointed Neil Russell to the position of Chief Executive Officer.



AIRASIA MOVE has named Nadia Omer as its new chief executive officer, taking the helm from Mohamad Hafidz Mohd Fadzil.



AJW CAPITAL announced the appointment of Erlendur Svavarsson as its chief executive officer.



ALTON AVIATION CONSULTANCY has appointed Denis Hogan as a managing director, based in Dublin, Ireland.



The **CIVIL AVIATION SAFETY AUTHORITY BOARD OF AUSTRALIA** has named Dr Tarryn Kille as its newest member. Kille is an experienced aviation professional with extensive experience across aviation research, regulatory policy and operations.



MARIE-LOUISE PHILIPPE



GUILHERME PAIVA

EMBRAER COMMERCIAL AVIATION has appointed Marie-Louise Philippe vice president for sales and marketing and head of region for Europe and Central Asia. Embraer also announced the appointment of Guilherme Paiva as the new director of investor relations and mergers and acquisitions.



ETIHAD CARGO has promoted Soufyan Mouaniss to the role of director West Cargo Commercial.



FACC has named Martina Hamedinger as head of human resources. She will take over from Georg Horacek, who has retired. Hamedinger will play a leading role in the company's increase in personnel.



FINNAIR has appointed Turkka Kuusisto as CEO. Kuusisto joins Finnair from Posti Group Corporation, where he has served as the CEO since 2020.



FLYDOCS has named Matt Freier as chief financial officer and a member of the flydocs leadership team. Freier joins flydocs with over 23 years of corporate finance, finance leadership and operational performance experience.



FRANKFURT CARGO SERVICES (FCS) has appointed Federico Mosqueira as its new director of operations. The 45-year-old started the job on January 1, 2024. Mosqueira succeeds Christoph Cyranek, who took over the position from Markus Schneefuss on an interim basis in August 2023.



KELLSTROM AEROSPACE GROUP announced that it has named John McKirdy as chief commercial officer. McKirdy most recently served as senior vice president of the Technical Services Group for Kellstrom.



QATAR AIRWAYS Group Chief Executive Officer Badr Mohammed Al-Meer has been elected to the International Air Transport Association's Board of Governors.



SITA announced the appointments of Stefan Schaffner as senior vice president of SITA AT AIRPORTS and Sergiy Nevstruyev as senior vice president of SITA Global Services (SGS). Nevstruyev will oversee the daily management of SITA's critical infrastructure for around 2,500 customers. Schaffner is responsible for transforming SITA's Airport portfolio to meet a growing demand for digitalisation and automation.



SR TECHNICS has named Vincent Metz as vice president for business development in Europe. Metz has held key roles at Air France — KLM, including vice president of strategy, marketing, and communications. Metz holds a master's degree in industrial engineering and management science, along with a bachelor's in aeronautical engineering.

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Offering the ultimate passenger experience even on the longest of flights, the A350's innovative design delivers an enhanced passenger experience, a smooth ride and increased efficiency for operators. With cutting-edge aerodynamics and 70% advanced materials, the A350 has been a cost-effective and durable addition to the widebody market since 2015.

AIRBUS



For China, 2024 could be year of record profits

International travel recovery the key theme for 2024 for China, according to a report from HSBC. China's biggest three airlines have seen international flights recover to 73-76 percent of 2019 levels in the first week of January. However, at the national level in China, flights to the US recovered to only 18 percent of the 2019 level, the report said. "We expect the recovery in international capacity to accelerate in 2024, propelled by the easing of external bottlenecks such as visa policies and air rights negotiations," HSBC reported. "On 1 December Malaysia announced 30-day visa-exempt travel for Chinese passport holders, while Thailand and China will permanently waive visas for each other's citizens from March. Also, China and the US are gradually lifting restrictions on direct flights imposed during COVID-19. The Big Three can ramp up international flights quickly, as they have had almost no layoffs in the past four years. HSBC also said China expects air passengers to reach a record 80 million during the Spring Festival Travel rush from 26 January to 5 March), 9.8 percent more than in 2019." HSBC also said 2024 could be a year of record profits and the bank's researchers said they were lifting their earnings forecasts due to fading oil prices and a depreciation of China's currency.

WORLDACD SAYS 'UNCERTAIN START' TO 2024 FOR CARGO INDUSTRY

Worldwide air cargo tonnages dropped further in the first week of 2024 following their typical slump in the second half of December, according to the latest figures from WorldACD Market Data, although the New Year decline most likely reflects the inclusion of 1 January in the week 1 figures. Preliminary figures for week 1 (January 1 to 7) indicated that global air cargo tonnages fell 6 percent compared with the previous week (WoW), based on the more than 400,000 weekly

transactions covered by WorldACD's data, after falling by around 30 percent in the second half of last month, while average worldwide rates dropped by around 2 percent in the first week of 2024 after falling by around 7 percent in the second half of December. The main lanes that contributed to the WoW decline in tonnages of 6 percent, were ex-Asia Pacific to, respectively, North America and Middle East & South Asia (both 17 percent), and intra-Asia Pacific (13 percent). Compared to

S&P SAYS ASIA-PACIFIC AVIATION SET FOR FULL RECOVERY

Passenger air traffic in most of Asia-Pacific should return to pre-pandemic levels over the next 12-18 months, according to a report by S&P Global Ratings. At the same time, industrywide capacity constraints, due to supply-chain issues, should support load factors and ticket fares. "Demand-supply dynamics are favouring aviation-related sectors in Asia-Pacific," said S&P Global Ratings credit analyst Isabel Goh. The ratings company said the forecasts were based on data from 17 listed, but publicly unrated airlines, that make up 75 percent of market capitalisation for airlines in Asia-Pacific. The company said its most recent rating actions on Indian airports have been positive. This follows several negative rating actions during the COVID-19 pandemic, where lower traffic and tariffs collectively weakened cash flow profiles for rated entities. They also affirmed ratings on airports in Australia and New Zealand. S&P said ratings on the aircraft lessors have remained relatively stable over the past year as lease collections from airline customers continue to improve. Airports and lessors depend on airlines, a sector exposed to high cash-flow cyclicity and capital-intensity. Airlines' pricing power could gradually diminish as reopening benefits recede, S&P said. The aviation sector will likely refocus on investing in future growth and sustainability.

AMEX GBT FORECASTS AIR FARES
WILL FLATTEN IN 2024

Airfares look set to stabilise across key routes around the world during 2024, according to new forecasts from the consulting team at American Express Global Business Travel (Amex GBT). The report showed Amex GBT expects marginal price rises, and some falls, on regional and international business travel routes. Across all regions, airfare fluctuations reveal mixed trends — with a broad outlook of increased price stability in 2024. North America is expected to see minor changes in fares within the region (less than 1 percent) and to Europe (+0.3 percent Business Class, -2.5 percent Economy), while airfares to Asia are projected to decline in 2024. Flights within Europe are projected to rise around 1 percent, with declines in prices between Europe and the Middle East (-3.5 percent Business Class, -2.8 percent economy) and South America (-3.9 percent Business Class, -10.4% Economy). All price movements are versus 2023 prices. These trends take account of a range of influencing factors, including airline capacity, local inflation, foreign exchange, and fuel surcharges.

Airlines reported record earnings in 2023 resulting from robust demand, high fares, and a drop in the price of jet fuel. However, leisure

FORECASTS ON KEY ROUTES	BUSINESS CLASS	ECONOMY
Flights within North America	+0.8%	+0.3%
North America <> Europe	+0.3%	-2.5%
North America <> Asia	-3.6%	-6.5%
N. America <> South America	-1.1%	+0.2%
Flights within Europe	+1.1%	+1.0%
Europe <> Asia	-4.0%	-3.4%
Europe <> Middle East	-3.5%	-2.8%
Europe <> South America	-3.9%	-10.4%
Flights within Asia	+3.0%	+3.1%
Australia <> Asia	-5.1%	-3.4%

travel, which boosted 2023 revenues thanks to ‘revenge tourism,’ is expected to slow down in specific areas as consumer preferences fall prey to high interest rates. Simultaneously, rising oil and jet fuel prices since June 2023 are exerting pressure on carriers, and adding to the cost burden, according to Amex GBT. Despite strides in rebuilding balance sheets through 2023, the aviation industry continues to grapple with substantial debt burdens. Increasing labour expenses worldwide are coupled with a scarcity of talent in specific areas. Ongoing supply chain issues are anticipated to persist, potentially delaying new aircraft production and impacting expansion plans. Negotiated corporate discounts are likely to come under pressure as airlines continue to prioritise yield management. During 2024, further adoption of New Distribution Capability (NDC) could impact corporate travel programs as airlines’ pricing strategies evolve and become increasingly dynamic.

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STEVE STRIKE/OUTBACK PHOTOGRAPHICS

SIA Group signs MOU to plan for next health crisis

The Ministry of Health (MOH), Public Service Division (PSD), and the Singapore Airlines (SIA) Group have signed a Memorandum of Understanding (MOU) to formalise the commitment to collaborate on manpower planning and deployment for future national crises, building on the collaboration started in 2020 during the COVID-19 pandemic. This includes training SIA and Scoot cabin crew volunteers in peacetime, so that they are ready to step up and take on various healthcare support roles as part of our national response for future crisis situations. The trilateral MOU strengthens our national collective resilience and agility to respond to future crises. MOH, PSD, and the SIA Group will collaborate in two key areas: (a) peacetime training and volunteer deployment of cabin crew in support care roles; and (b) tabletop exercises to stress test our crisis response protocols. At the height of the COVID-19 pandemic, various public agencies and healthcare institutions in Singapore urgently needed manpower reinforcements to support the national fight against the pandemic. At the same time, SIA and Scoot had significantly reduced their network operations after borders closed around the world, which resulted in surplus manpower within the SIA Group, particularly amongst cabin crew and pilots. Working closely with MOH and PSD, the SIA Group redeployed more than 2,000 staff to frontline roles in various public agencies and healthcare institutions from March 2020. Learning from this experience, MOH, PSD, and the SIA Group have worked together to develop a partnership to expedite and coordinate action in the event of another national crisis. For a start, the SG Healthcare Corps will facilitate the training and deployment of around 50 SIA and Scoot cabin crew, who will volunteer their time as SIA Group Ambassadors at Khoo Teck Puat Hospital and Changi General Hospital from April 2024. These SIA Group Ambassadors will be part of a pool of around 200 trained SG Healthcare Corps care volunteers who will serve alongside the healthcare workforce to meet the needs of patients. Goh Choon Phong, CEO of SIA, said, "While the SIA Group had surplus manpower at the height of the COVID-19 pandemic, many public sector organisations needed more staff on the frontlines. Working closely with MOH and PSD, we successfully transitioned over 2,000 of our people to roles with various public agencies and healthcare institutions. Almost everyone they met in these jobs praised their warm and caring nature, professionalism, and dedication to customer service. Being exposed to different types of support roles also benefitted our people, who used their experience and new skills to enhance our customer service. Today's agreement formalises our partnership with MOH and PSD, establishing a pathway to seamlessly redeploy our people once again, should a similar situation arise."



AIRASIA X TO ACQUIRE CAPITAL A'S AVIATION ASSETS

AirAsia X (AAX) announced that it has entered into a non-binding letter of acceptance with Capital A for the proposed acquisitions of AirAsia Berhad and AirAsia Aviation Group Limited. Capital A Chief Executive Officer Tony Fernandes said the sale of the aviation business would see AirAsia X merging with AirAsia Bhd (AirAsia Malaysia) and AirAsia Aviation Group Ltd (AAGL). AAGL consists of AirAsia subsidiaries in Thailand, Indonesia, the Philippines and Cambodia. "The strategic move positions AAX to become the overarching regional aviation provider for all short and medium-haul routes under the AirAsia brand name. This groundbreaking acquisition is expected to provide unparalleled advantages, including a strengthened market position, increased operational efficiency, and ultimately driving cost savings and enhanced financial performance," AirAsia X said in a statement. Chester Voo will take up the role of deputy chief executive officer in charge of the airline operations, the company said. The company named former banker Farouk Kamal as deputy CEO, whose responsibilities include finance, aircraft leasing, investor relations and strategy, according to media reports. The separation of the airline business from Capital A will also allow investors to better value the non-aviation unit. Fernandes aims to have five listed companies under the group, he said at a briefing in Sepang, Malaysia.

IATA SEES RECORD RECORD REVENUES IN 2024

The International Air Transport Association (IATA) announced strengthened profitability projections for airlines in 2023, which will then largely stabilise in 2024. However, net profitability at the global level is expected to be well below the cost of capital in both years. Very significant regional variations in financial performance remain. Airline industry net profits are expected to reach US\$25.7 billion in 2024 with a 2.7 percent net profit margin. That will be a slight improvement over 2023 which is expected to show a US\$23.3 billion net profit (2.6 percent net profit margin). Total revenues in 2024 are expected to grow 7.6 percent year over year to a record \$964 billion. Some 4.7 billion people are expected to travel in 2024, an historic high that exceeds the pre-pandemic level of 4.5 billion recorded in 2019. Cargo volumes are expected to be 58 and 61 million tonnes in 2023 and 2024, respectively.

"Considering the major losses of recent years, the \$25.7 billion net profit expected in 2024 is a tribute to aviation's resilience. People love to travel and that has helped airlines to come roaring back to pre-pandemic levels of connectivity. The speed of the recovery has been extraordinary; yet it also appears that the pandemic has cost



aviation about four years of growth. From 2024 the outlook indicates that we can expect more normal growth patterns for both passenger and cargo," said Willie Walsh, IATA's director general.

Overall revenues in 2024 are expected to rise faster than expenses (7.6 percent vs. 6.9 percent), strengthening profitability. While operating profits are expected to increase by 21.1 percent (US\$40.7 billion in 2023 to US\$49.3 billion in 2024), net profit margins increased at less than half the pace (10 percent) largely due to increased interest rates expected in 2024.

IATA's said in recent polls that a third of travellers polled say they are travelling more than they did pre-pandemic. Some 49 percent indicate that their travel habits are now similar to pre-pandemic. Only 18 percent said that they were traveling less. Looking ahead, 44 percent said they will travel more in the next 12 months than in the previous 12 months.

But the industry does face risks, including those from China where property markets are in disarray and high youth unemployment is a problem. Wars in Gaza and in Ukraine also represent risks and supply chain issues continue to impact global trade and business.



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Rex Group wins new fly-in, fly-out contact

National Jet Express (NJE), a Rex Group member, announced it had secured a new mining contract in Western Australia for services into Ravensthorpe on behalf of FQM Australia Nickel and Allkem. This new contract sees NJE operating six weekly charter services between Perth and Ravensthorpe in southern WA, using 104-seat Embraer E190 jets. The significant level of demand NJE is seeing for its services across Australia is prompting NJE to add additional aircraft and crew to support both their Dash 8-400NG and E190 operations before the end of this financial year.

AVIA SOLUTIONS GROUP EXPANDING IN ASIA WITH CREATION OF BBN AIRLINES THAILAND

Avia Solutions Group, a provider of Aircraft, Crew, Maintenance, and Insurance, operating a fleet of 197 aircraft, continues expansion into the Asia-Pacific region and the establishment of BBN Airlines Thailand. After recently submitting the necessary documents

and looking forward to receiving the AOL (Air Operator Licence) soon followed by AOC certificate in October 2024, BBN Airlines Thailand is prepared to offer fully customised ACMI solutions in the region. The AOL establishment process and the airline will

VIETJET AND NOVUS AVIATION CAPITAL SIGN MOUS

Vietjet and Novus Aviation Capital, a global aircraft leasing and financing platform headquartered in the United Arab Emirates (UAE), have signed Memorandum of Understandings (MOUs) to explore the establishment of an aircraft financing and leasing vehicle as well as collaborating on the supply of Sustainable Aviation Fuel (SAF) in Vietnam alongside SAF One, Novus's established and dedicated SAF platform. The vehicle will initially provide financing and acquisition of 15 new aircraft ordered by Vietjet from Boeing and Airbus, with deliveries scheduled from 2024. The vehicle is expected to comprehensively scale up to further finance Vietjet's future orderbook.

In addition, Vietjet will join forces with SAF One for the development, supply and usage of sustainable aviation fuel (SAF) in Vietnam.

CHINA AIRLINES SIGNS SERVICE AGREEMENT WITH GE

GE Aerospace announced a TrueChoice services agreement with China Airlines to support their fleet of CF6-powered Boeing 747-400F aircraft. As part of the long-term service agreement, China Airlines is return-

ing to GE's OEM solution for high-pressure compressor airfoils.

GE will manage the repair and replacement of these CF6-80C engine components during shop visits.

GKN AEROSPACE INVESTS IN ADDITIVE FABRICATION CAPABILITY

GKN Aerospace has boosted its commitment to sustainable manufacturing, with a £50 million investment in its cutting-edge additive fabrication technology in Trollhättan, Sweden.

The Swedish Energy Agency's Industriklivet initiative will fund £12 million of this investment, which will help to revolutionise production methods by reducing raw material usage by up to 80 percent.

The technology will be embedded at GKN Aerospace's Trollhättan facility in Sweden, and will be operational later in 2024.

BOEING NAMES SPECIAL ADVISOR FOR QUALITY ISSUES

Boeing said it has named former Admiral Kirkland Donald as special advisor to Boeing President and CEO Dave Calhoun. The appointment is effective immediately and comes as Boeing is searching for a way to rehabilitate its public image in the aftermath of a "door plug" failure on an Alaska Airlines flight recently. Donald and a team of outside

experts will assess Boeing's quality management system for commercial airplanes, including quality programs and practices in Boeing manufacturing facilities and its oversight of commercial supplier quality. His recommendations will be provided to Calhoun and to the Aerospace Safety Committee of Boeing's Board of Directors.

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Same song, second verse

The 2024 edition of the Singapore Airshow should be a step up from 2022 with no COVID restrictions in place, but Singapore is locked in a competition with Dubai. Dubai's focus was squarely on "sustainability", as is Singapore's show. The trouble is, everyone knows about sustainability, so what can Singapore say or do differently? **Matt Driskill** takes a look.



THE BIENNIAL SINGAPORE AIRSHOW gets underway in February and Experia, the show's producer, says trade attendees can expect more than 1,000 participating companies from more than 50 countries/regions. In addition to returning exhibitors such as Airbus, AVIC, Boeing, Bombardier, COMAC, Dassault Aviation, GE Aerospace, Honeywell, L3Harris, Leonardo, Lockheed Martin, RTX, Rolls-Royce, Safran, ST Engineering, Textron Aviation and Thales, attendees can also look out for first-time country pavilions from China, Czech Republic, Japan, and South Korea. Other country pavilions expected at the event include Australia, Belgium, Canada, France, the United Kingdom, and the United States. First-time participants including JetZero and Panasonic Avionics will showcase blended-wing aircraft developments and in-flight passenger experience, respectively.

The Singapore Airshow 2024 is also highlighting the start-up industry in Aviation with its "What's Next@Singapore Airshow", a collaboration with Starburst, which is an aerospace and defence start-up accelerator and strategic advisory practice. It will see 30 start-ups from 12 countries, including India, Japan, Singapore, the United States, and the United Kingdom showcasing their technologies in sustainability, dual-use technologies, air traffic management and digitalisation in aerospace and defence industries to a global network of potential investors, accelerators, and corporate partners.

THE PROBLEM WITH SUSTAINABILITY

The show's theme this year is "sustainability" and Experia said it has partnered with McKinsey & Company to present a Sustainable Aviation Forum as part of its AeroForum series. "A panel of experts will take a deep dive on critical topics such as the challenges and opportunities within sustainable aviation including regulatory regimes, technology innovation and R&D collaborations with the ultimate

▲ *The static display in 2022 was disappointing as many airlines and manufacturers kept their planes elsewhere.*

goal of achieving net-zero emissions," Experia said. "These include exploring strategies for decarbonising the aviation sector and the pivotal role of sustainable aviation fuel in reducing the aviation sector's carbon footprint."

The Singapore Airshow 2024 has partnered with CarbonClick, a leading carbon offsetting platform to enable attendees to offset the carbon emissions associated with their travel by buying carbon credits. CarbonClick said it sources and supports "high-quality, fully certified climate projects such as the Rimba Raya biodiversity reserve in Indonesia and the wind power project in India".

The focus on sustainability is commendable of course but the problem with sustainability is everyone talks about it but nothing seems to really get done, except for a lot of test flights by airlines using sustainable aviation fuel (SAF).

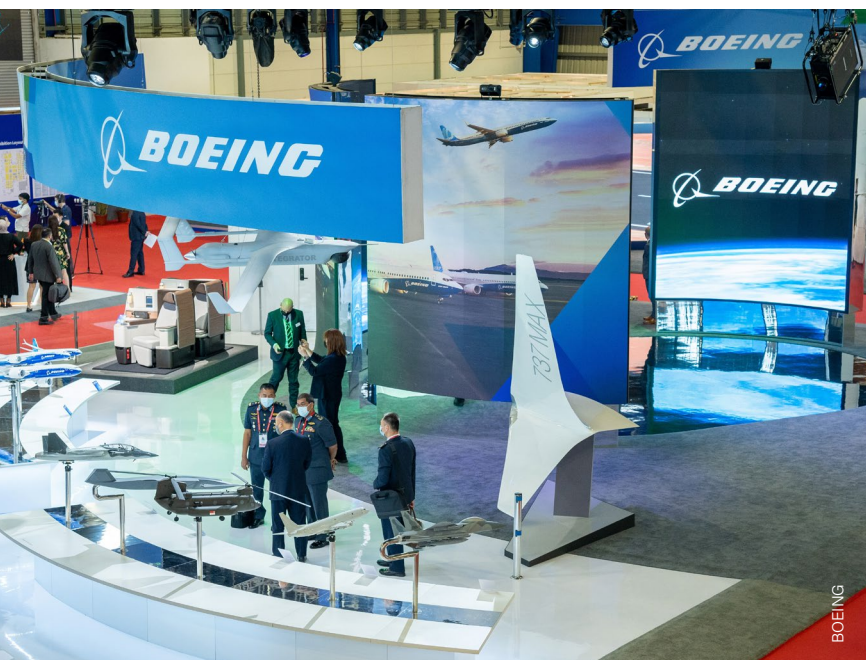
The topic of sustainability is also one that was well covered at Dubai. Mikail Houari, President, Africa and Middle East at Airbus, said in Dubai that "at Airbus, we continue to demonstrate our unwavering commitment to leading the decarbonisation journey in the aerospace industry through our pioneering role in developing disruptive technologies. Whether this is through hydrogen-powered commercial aircraft or other sustainable solutions when it comes to engines and fuels, our goals are a testament to the potential for revolutionising the way we fly. We are relentlessly pursuing ambitions of building a more sustainable future for aviation as we seek to make our commercial fleet capable of flying with 100 percent SAF by 2030".

Honeywell too was in Dubai where it talked about a new technology called UOP eFinishing that produces lower-carbon aviation fuel from green hydrogen and carbon dioxide captured from industry. Mohammed Mohaisen, president and CEO, Honeywell Middle East and North Africa, said "sustainable aviation fuel represents a ready now opportunity to drive the sustainable growth of the aviation

◀ *The 2024 Singapore Airshow will bring back its popular public days for flying demonstrations after cancelling public access in 2022.*

industry, yet it is still barely tapped into. Technologies that can harness readily abundant CO2 to produce SAF are transformational in terms of how we fuel aircraft and will play an important role in the long-term decarbonisation of the sector."

It will be interesting to see what new information will be announced in Singapore at the airshow there or it might be the same song again that was heard in Dubai.



COMPETITION WITH DUBAI

Another interesting thing to watch will be the number of deals announced by plane makers, airlines, MRO companies and other attendees. In recent years Dubai has stolen the limelight from Singapore and COVID didn't help matters at all. The 2020 Singapore Airshow was hobbled by COVID of course with dozens of companies pulling out of that edition. The 2022 show in Singapore was also smaller in scale and limited to trade attendees because of COVID restrictions and the need to test daily for COVID and wear a mask while at the show venue.

Singapore will also be facing some serious numbers that were turned in at the Dubai show. There, Emirates placed an order for a mammoth US\$52 billion for 95 Boeing widebodies, an order for US\$6 billion for 15 Airbus planes, and signed deals with Safran worth more than US\$1.2 billion. Flydubai confirmed an order for 30 Boeing aircraft worth US\$11 billion and Ethiopian Airlines announced an order of 11 Dreamliners and 20 737 MAX 8 aircraft estimated at US\$7 billion. Ethiopian also signed an MOU for 11 additional Airbus planes estimated at US\$2.4 billion. Combined with other announced orders, the total for the Dubai show came

Another interesting thing to watch will be the number of deals announced by plane makers, airlines, MRO companies and other attendees.



◀ Boeing will attend the show this year, but sales could be in short supply given the company's recent spate of bad news and investigations into its manufacturing processes.

▲ Exhibitors like Leonardo will return to Singapore and hope they will see the same success they saw in Dubai.

in at more than US\$101.4 billion, a number that will be hard to beat in Singapore, especially given Boeing's recent problems with its MAX-9 model and other commercial planes that have come under the spotlight due to a door-plug blowout on an Alaska Airlines flight and other manufacturing flaws.

Dubai also reported hosting 493 civil and military delegations and attendees from 97 countries. It also hosted more than 1,400 exhibitors, 20 country pavilions and 192 aircraft on static display. Singapore by comparison, as mentioned above, is expecting 1,000 participating companies from more than 50 countries/regions. Experia did not disclose how many planes would be on static display. ➔

APS sets its sights on Expansion into Asia

Aircraft Propeller Service, LLC (APS) is thrilled to announce the establishment of a world-class facility in Kuala Lumpur, Malaysia. This strategic move is an exciting step towards an Asian presence for APS's unparalleled service and marks a significant milestone in APS's commitment to serving ATR and CASA 295 turboprop operators across the Asia-Pacific region.

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as a testament to our customer dedication, future-ready solutions that align with the evolving needs of the aviation industry.

In conclusion, APS's new facility in Malaysia stands as a beacon of reliability and support for ATR and other turboprop operators in the Asia-Pacific region. By choosing APS, operators gain access to unmatched expertise, localized services, and a commitment to excellence that propels the aviation industry forward. Join us in celebrating this exciting chapter in our global expansion journey!

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Asia lags but is on the upswing

Before the pandemic airlines in Asia-Pacific had an almost unlimited period of growth ahead of them and the centre of commercial aviation had well and truly shifted eastward. The main impetus for that shift was the massive international and domestic expansion in China, supported by rapidly emerging markets in Southeast Asia. **Michael Doran** reports.

RUNNING AN AIRLINE means handling the inevitable shocks that come from time to time but no carrier was ready or able to fully absorb what the pandemic delivered. As nations found their own solutions the most severe and longest travel lockdowns were endured in Asia-Pacific, particularly in China, and that only changed during 2023.

When those restrictions faded away the airlines of Asia-Pacific marshalled their resources in the second half of last year and now enter 2024 with capacity headed for full recovery and demand still running high. Southeast Asia is the region with most ground to

make up but it's likely that will change now that group travel in and out of China is back, so long as the Chinese regain their appetite for international travel.

According to the International Air Transport Association's (IATA) December 2023 Global Outlook all regions were expected to reach their pre-pandemic passenger levels by the end of 2023, except for Asia-Pacific. IATA forecast that would happen in early 2024 as the ramp-up of airline operations and return of tourism drives further growth in the region.



SCOOT

While Asia-Pacific has been slow to get moving IATA believes it will see the most rapid growth in passenger travel globally, forecasting an annual increase of 4.5 percent until 2024. That would bring the regional total to more than 4 billion in 2024, making up more than half of global passenger demand.

According to schedules analyser OAG, global capacity in 2023 will be around 5.543 billion seats, which is 3.7 percent below 2019 capacity and 17.2 percent ahead of 2022. Domestic capacity will be slightly ahead of 2019 at 3.418 billion seats and international 2.125 billion to remain 9.9 percent behind pre-pandemic levels.

OAG segments global capacity into 17 regions, which in Asia-Pacific means reporting on Northeast Asia, Central Asia, South Asia, Southeast Asia and Southwest Pacific. Of those regions Central Asia and South Asia has exceeded 2019 capacity whereas Northeast Asia, Southeast Asia and Southwest Pacific are still offering fewer seats than available pre-pandemic.

The impact of China's reopening was really only felt internationally in the second half of last year, as was the case with airlines in Japan, Taiwan and South Korea, so a more meaningful benchmark is what capacity was available in December in the combined Asia-Pacific region.

Globally in December there were 467.6 million seats available and 181.3 million, or 39 percent, were to, from and within the Asia-Pacific region. There is daylight between Asia-Pacific and the rest of the world, with North America generating capacity of 106.4 million seats, Europe 99.8 million and Latin America 42.8 million.

Northeast Asia, which includes China, Japan, South Korea and Taiwan, had 104.6 million seats on offer, just one percent fewer than in 2019, while Southeast Asia's 38.4 million was 18 percent lower than in 2019. The once thriving aviation markets

◀ LCC Scoot uses the Airbus A320 on short-haul international flights in Asia-Pacific.


in Southeast Asia have stalled without the influx of high-spending tourists from China and the region is now globally the furthest away from post-COVID recovery.

Of the 38.4 million seats available in December 11.4 million were in Indonesia, with the sprawling island nation accounting for around 30% of the region's air capacity. Domestic capacity is the big driver and six of the Top 10 domestic routes in Southeast Asia are internal Indonesian flights.

Asserting its dominance, Indonesia has close to four million more seats than the next largest market, which is Thailand offering capacity of 7.06 million seats, followed by Vietnam (5.7m), Malaysia (5.05m), Philippines (4.8m), Singapore (3.4m) and the rest of the region adding 1.02 million seats.

However, the standout market is Vietnam because it is the only one of the major markets that has exceeded pre-COVID capacity, with the 5.7 million seats on offer in Vietnam five percent ahead of 2019 levels.

A significant amount of that capacity has come from low-cost carrier Vietjet, which started flying from Ho Chi Minh City to Australia in April. Since then it has introduced services to Melbourne,



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Sydney, Brisbane, Adelaide and Perth, with the Melbourne and Sydney Airbus A330 flights now operating daily.

Melbourne has a very large Vietnamese diaspora and the demand for flights between Australia and Vietnam came back stronger than ever once international border restrictions were lifted. At one stage there were four airlines flying from Melbourne Airport to Vietnam, including Vietjet, Vietnam Airlines, Bamboo Airways and Jetstar, before Bamboo Airways withdrew from the market in October.

Vietjet entered the market just as international airfares were reaching record highs in Australia and its \$0 fares and aggressive marketing stimulated competition on the route and fares started falling back to more affordable levels.



The Singapore Airlines Group has done that better than most by taking a disciplined approach but adding in extra capacity where it sees an opportunity, particularly to proven markets such as Australia, where it has operated since 1967. Singapore Airlines was one of the few airlines that maintained flights to Australia during the pandemic and played a vital role in keeping exports moving and repatriating citizens stranded abroad.

In December the Singapore Airlines Group reported year-on-year passenger growth of 24 percent and recovered to 94 percent of 2019 levels, achieving a very high passenger load factor of 89 percent.

Singapore Airlines plotted a strategy to be a 'first-mover' when the travel restrictions allowed and it adopted that approach in Australia, quickly adding more large aircraft just ahead of demand and beating its competitors for market share. By adding so much capacity early in the recovery Singapore Airlines (SIA) gained that first-mover advantage which is now paying off handsomely for both SIA and Scoot.

SIA is starting 2024 with more than 140 weekly flights from Singapore Changi to seven Australian cities, including five daily services to both Sydney and Melbourne. SIA is also flying 25 times weekly to Brisbane and Perth, 11 times weekly to Adelaide and five times to both Cairns and Darwin.

◀ Vietjet has used Airbus A330s to rapidly break into the Australian market.

▼ Singapore Airlines operates the 787-10 Dreamliner on international routes.



The Singapore market, driven largely by Singapore Airlines and low-cost carrier Scoot, has consistently added capacity throughout 2023 and is now within eight percent of 2019 numbers. After the savage losses from COVID-19 airlines throughout Asia-Pacific have been very disciplined in adding back capacity and because of that have pushed passenger load factors higher and higher.

It is almost ironic that many Singapore Airlines' aircraft, including some Airbus A380s, spent most of the pandemic parked under the blazing sun at Alice Springs Airport in Central Australia. The services to Australia use a mix of aircraft, including Airbus A380 and A350 and Boeing 787, 777 and 737 MAX 8 aircraft depending on the destination and time of day.



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The largest airline by departing seat capacity in December in Southeast Asia was Lion Air which had 3.2 million seats available. Among the other major carriers were Vietnam Airlines (2.4 million), AirAsia (2.2 million), Vietjet (2.0 million), Thai AirAsia (1.79 million), Cebu Pacific (1.79 million) and Batik Air (1.77 million).

Northeast Asia offers the most seat capacity of any region in OAG's analysis, with a monstrous 104.6 million seats available in December. Even that number is still one percent lower than in 2019 and with the Lunar New Year celebrations on the horizon that gap will be wiped out soon.

The China market accounted for 72.7 million seats in December, which on its own is around 16 percent of global capacity, with the market changing since the pandemic. In 2019 China had 62.5 million and 8.8 million international seats but in 2023 that had changed to 72 million domestic and five million international seats on offer. Domestic travel had risen by nearly 10 million seats while international fell by close to four million.



▲ The A330 complements other widebodies in the China Eastern fleet.

► JAL is another customer in Asia for the 787.

► Boeing's 787 has been the backbone of many long-haul fleets in Asia-Pacific.

This is one of the significant reasons why Southeast Asia is so far behind pre-COVID numbers because Chinese visitors have shunned international trips, even though the travel restrictions have been removed. Chinese capacity to Thailand, Vietnam, Indonesia and the Philippines is less than 50 percent, with Cambodia having just 48,600 seats compared to 241,000 in 2019.

This is why Southeast Asia is lagging so far behind and until Chinese travellers regain their love of the region little will change. The local carriers don't have the inbound demand to add more seats and do not have enough outbound travellers to put larger aircraft or more frequencies on the China routes.

Japan is bouncing back and in December had 16.8 million seats available, with the gap to full recovery now down to around 8 percent. South Korea is a little further behind at 12 percent but showing



promising signs and adding more international destinations, with December capacity sitting at 6.8 million seats.

Central Asia is the global recovery leader by posting a 47.7 percent growth compared to December 2019 seat capacity. Percentages can be misleading when the numbers are relatively small so it is worth noting that the Central Asia region offered a total capacity of 2.4 million seats.

The majority of this came from Kazakhstan, the home of Air Astana and its low-cost carrier FlyArystan, with 1.23 million seats available in the country. Other nations listed included Uzbekistan (558,000), Kyrgyzstan (239,000) and Tajikistan (222,000).

Similarly South Asia is dominated by India, which has 19.7 million seats available out of the regional total of 23 million. The balance was in Pakistan (1.1m), Bangladesh (962,000) Nepal (733,500) and Sri Lanka (484,000).

The final region is Southwest Pacific which offered capacity of 12.2 million seats in December. There are four countries that account for



◀ The Airbus A321LR has opened new markets for Air Astana.

◀ Qantas has built domestic routes around the Boeing 737.

95 percent of that capacity, led by Australia with 9 million seats and just 3.3 percent behind pre-pandemic levels. Australia is proving a very attractive market for global carriers in Europe, Asia, the Middle East and North America.

The lack of capacity flowing between China and the US means that larger carriers are looking to utilise their widebody aircraft across the Pacific, with Melbourne, Sydney and Brisbane all booking new and resumed routes from the US and Canada.

Australia is also benefitting greatly from the reopening of China and the main gateway airports in Sydney and Melbourne have now welcomed all of the major Chinese airlines, including the likes of China Southern, Air China, China Eastern, Sichuan Airlines and Hainan.

New Zealand is the second major country in the Southwest Pacific region and accounted for 2.1 million seats, many of which are flowing between North America and Auckland to destinations including New York, Chicago, Houston, Los Angeles, San Francisco and Vancouver.

Among the many South Pacific islands are the final two of Fiji with 214,000 seats, mainly operated by Fiji Airways and Papua New Guinea with 242,000 seats, both still behind pre-pandemic capacity. ➔

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Asia-Pacific airspace will not cope with future traffic demand unless collaborative, unified action is taken now, according to a CANSO White Paper. **Emma Kelly** reports.

AIRSPACE IN THE ASIA-PACIFIC REGION does not have the capacity to absorb future traffic demand, and holistic and collaborative action is required to achieve a seamless, efficient, and effective air navigation services (ANS) system-of-systems, warns a new White Paper from the Civil Air Navigation Services Organisation (CANSO).

The APAC ATM Modernisation White Paper, which was scheduled for publication as this issue closed for press, proposes four solutions and six actions that are necessary to ensure the holistic and collaborative modernisation of the region's ANS in order to meet the future air transport demand.

The report points to passenger traffic growth forecasts of around five percent per annum for the region compared to a three percent

global average through to 2040, with APAC traffic set to account for almost half the global total by 2043.

"Current services and infrastructure are unlikely to be capable of supporting the level of traffic expected across the region. The priority to maintain safety would mean that restrictions would be applied, resulting in inefficiency, delays and increased environmental impact," says the White Paper, which was compiled by ATM and airport consultancy Think Research. "The network nature of ANS means that these negative impacts will ripple through across the region constrained by the ANS network, even in areas that are not

▲ *Air traffic will be crowded in APAC, according to the report.*

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capacity constrained," it adds.

While there are non-binding plans to improve the situation, including ICAO's APAC Seamless ANS Plan and the Regional Collaborative Air Traffic Flow Management (ATFM) Framework, progress on delivering these has been mixed. "The ANS system must be treated in a holistic, coordinated, and balanced way, otherwise improvements in one place will be undermined by shortcomings elsewhere and the overall situation will not improve. Coordinated transformation is needed across the region," the paper urges.

"What the region needs is a framework for regional ATM that makes the whole larger than the sum of its parts," says CANSO Asia-Pacific director Poh Theen Soh. "To achieve this, ideas are

explains. The situation was not helped by the COVID pandemic, which has impacted the sector financially and resulted in "doing things differently and, sometimes, at a different pace".

With this in mind, CANSO partnered with Think Research to conduct research and develop a White Paper to explore potential collaboration in the region. The research company interviewed senior management of Asia-Pacific ANSPs, conducted surveys and spoke to industry representatives from ATM technology companies to get a clear picture of the region's issues. Further discussions took place at the first Asia-Pacific ANSP leadership forum, which was conducted in Bali, Indonesia, in July 2023.

The task is not easy, with the size and diversity of the region, which comprises 39 countries of different sizes, geography and economics. The region includes countries with some of the highest and lowest gross domestic product per capita, but rapid and accelerating economic growth is common across the region, says the paper.

While there has been large investment in airports across the region, there has been less focus on airspace as 'publicly invisible' intangible infrastructure, says the paper. "The result is, in general but not always, lack of investment in modernisation of ANS infrastructure. Unless this imbalance is addressed through modernisation of APAC's ANS system, bottlenecks in air transport will shift from airports to ANS," warns the paper. "Evidence for such bottlenecks is already being observed in flight delays, as well as increased environmental impact due both to the delays themselves and inefficient flight routings," it adds.

A major challenge in APAC involves the fragmented nature of the region's ANS, with 49 separate flight information regions, leading to a "patchwork of interconnected but different technologies and capabilities" rather than an integrated system-of-systems. Technology, infrastructure and capability levels vary widely and data and information exchange is complicated, all inhibiting the seamless flow of traffic, says the White Paper. Furthermore, there is no framework for multilateral collaboration, as well as legal and regulatory barriers to enhanced collaboration. In addition, technical, human and financial resources across the region are varied and constrained.

"Most importantly, a single, agreed vision for the future of APAC's ANS is lacking and, even if such a vision existed, there is no mechanism for ANSPs and states to work together to achieve it," says the paper.

"To enable APAC modernisation, innovative solutions are required to address the complex challenges faced in upgrading ANS provision and implementing advanced technologies. Collaborative efforts among governments, ANSPs, international organisations and industry stakeholders are essential to foster successful modernisation initiatives," says the White Paper. "Prioritising critical projects based on regional needs, reducing investment needs, optimising resource allocation, and adopting phased implementation plans can help ANSPs manage budget constraints while ensuring steady progress in modernisation and the acquisition of modernised technology," it adds.

CANSO's answer is four potential solutions based on collaboration and partnership that could overcome the region's current



▲ *While there has been large investment in airports across the region, there has been less focus on airspace.*

needed, and this is the goal of the White Paper process. However, it has to be actions driven," he stresses.

"The region is behind in its implementation of the Asia-Pacific Seamless ANS Plan and its commitment to the Beijing Declaration [which set aviation safety and efficiency objectives in 2018]," he



▲ A single, agreed vision for the future of APAC's air navigation is lacking.

challenges and enable implementation of a shared vision. Firstly, it suggests moving to a service-based operating model whereby services that underpin ANS, such as communications, navigation, and surveillance, are delivered through partnerships or service agreements. It points, for example, to space-based ADS-B surveillance services provided by Aireon which deliver continuous and accurate surveillance of aircraft rather than relying on local and limited ground-based radar systems. Other examples include the L3Harris Data Comms programme which delivers data and voice network infrastructure to enable air traffic control of the US National Airspace System. Another example, under development, is Skykraft's space-based ATM service, which is due to be operational in 2025.

"Investing in services such as these reduces the considerable bur-

den of, for example, procurement, training, maintenance and cybersecurity," says the paper, with these costs shared across multiple ANSPs.

Secondly, the paper calls for ANSP alliances with technology providers to enable cost-effective and scalable technology acquisition. ANSPs need to collaborate to define requirements and pool resources for a single procurement process, including upgrades and maintenance cycles, with ANSPs able to procure add-ons to meet their specific needs. This reduces costs and risk, increases buying power and facilitates volume discounts, says the paper. It points to the Interoperability Through European Collaboration (iTEC) alliance as an example, whereby seven European ANSPs work with industrial partner Indra to develop an interoperable flight data processor, while the European COOPANS alliance sees six

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ANSPs working with Thales on a common ATM system.

A third solution is to introduce a common operational information system to foster resilience, particularly during disruptions caused by weather or technology outages which have a knock-on effect on surrounding airspace. Information sharing would allow all stakeholders to understand the scope and impact of the situation, allowing them to make informed decisions.

CANSO ATFM Data Exchange Network for Cooperative Excellence (CADENCE) and the CANSO ATFM Data Exchange for the Americas (CADENA) are successfully used in Latin America and the Caribbean to deal with severe weather disruptions, says CANSO, providing access to common information. APAC could use such a platform to enhance the region's capacity to respond to emergencies, it suggests.

Finally, CANSO is encouraging ANSPs to embrace virtualisation to enhance services. The region currently comprises country-based systems and processes which are vertically-integrated systems owned and operated by each ATM provider, resulting in a lack of

interoperability, higher costs and inefficiencies. Instead, CANSO suggests horizontal integration, separating data services such as flight data, radar data and weather information from the physical controller working position.

"This horizontal integration is the basis of the so-called virtual centre and is predicted to deliver a host of flexible and dynamic benefits focused on performance from workload reduction, unified common procedures, cost saving, reduced ATFM constraints and airspace resilience," it says. CANSO points, for example, to Switzerland's Skyguide and its Virtual Area Control Centre which spans two physical ACCs and allows controllers from both to collaboratively control traffic, share data and optimise resources.

The White Paper recommends six actions that should be undertaken to support the potential solutions. Firstly, as the top priority, it suggests establishing a forum and framework for cooperation in order to address the issues holistically. CANSO proposes that it, in conjunction with ICAO and IATA, establish a forum of ANSP CEOs as a first step to build relationships. This forum could build upon the recently established Asia and Pacific Air Navigation Service Provider Committee (AAC), which aims to accelerate ANS modernisation in the region, encouraging regional collaboration and enabling the region's ATM to meet growing traffic demand. The forum would provide a centralised platform for discussions, networking and sharing of insights, learning from each other's experiences and transferring knowledge to less experienced ANSPs.

It also proposes development of an information sharing platform to increase predictability and continuity during weather disruptions and natural disasters.

Educating political bodies on the importance of investing in ATM is also required. "Engaging in proactive advocacy and presenting well-researched data and case studies showcasing successful ATM modernisation in other regions are essential steps to gain political support," it says. "To convince politicians to invest, it is also crucial to demonstrate the cost of missed opportunities and the long-term impact of no investment," it adds.

It also urges ANSPs to enhance technology adoption through procurement alliances and managed services. In particular, it says the APAC region would benefit from the collective investment in a managed service like System Wide Information Management (SWIM) node implementation, which would allow real-time sharing of information between stakeholders, laying the foundation for collaboration as data exchange is standardised.

The region also needs to set and achieve sustainability goals, says CANSO, highlighting concepts such as user preferred route and free route airspace to reduce fuel consumption and emissions.

It also proposes research and innovation alliances for next generation technology development, such as those in the Single European Sky Research Programme and the US NextGen programme.

The White Paper is set to form the basis for a policy statement on regional ATM for the Asia Pacific Civil Aviation Ministerial Conference, which is scheduled for September in Delhi.



▲ Air navigation service providers are being urged to adopt new technologies to improve traffic control.

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Recommendations from the White Paper are also expected to be incorporated and tested by the AAC. "The White Paper and AAC reinforce each other," says Soh, who is also the vice-chair of the AAC. All 39 of the region's ANSPs were invited to participate in the AAC, as well as aviation organisations including CANSO, IATA and Airports Council International.

The AAC has so far met twice, most recently in October in Singapore. That meeting was attended by 68 participants from Australia, China, Hong Kong China, Macao China, France, India, Japan, New Zealand, Papua New Guinea, Philippines, Singapore, Thailand, USA, Vietnam, CANSO, IATA, and ICAO.



▲ The Pathfinder project will extend the work of the ANSPs of Canada, Japan, Singapore Thailand and the US.

The AAC has identified four priority areas of work, each with a working group led by different ANSPs. These comprise a work stream aimed at stepping up and coordinating investment in capacity and capabilities; a work stream aimed at making air traffic more seamless and sustainable; a group investigating how to minimise disruptions to air travel during service failures; and one aimed at supporting oceanic ANSPs. "Some of the initiatives planned for 2024 include capacity building workshops, sharing of procurement best practice, demonstrations and exercises," says Soh.

At the second meeting of the AAC, the first working group, for example, presented a Collaboration Plan aimed at developing an Asia Pacific ATM technology collaboration framework for collaboration on capacity building and technical assistance. Meanwhile, a survey was launched last year to gather updated information on the capacity building plans and associated modernisation needs and challenges in the implementation of seamless ANS initiatives in the region. The findings of the survey are expected to provide the AAC with deeper insights on the needs of the ANSPs within APAC,

and guide work stream one to refine its work and work stream two in developing strategies to accelerate the development and implementation of seamless ANS and enhance ANS sustainability.

Meanwhile, collaborative action in the region is already planned and under way. At the ICAO Air Navigation World – ATM Procedures for Today event, which coincided with the AAC's second meeting in Singapore in October, a letter of intent was signed by IATA, CANSO and the ANSPs of Singapore, Indonesia and New Zealand to work towards end-to-end free route options/user preferred routes for city pairs in Southeast Asia and Oceania in the South-East Asia-Oceania Implementation of Free Route Operations (FRTO) project.

The project will promote the use of FRTO between city pairs among the three countries, with the aim of delivering more efficient and effective flight paths, with reduced distance, flight time, fuel burn and thereby emissions. Under the project, suitable city pairs and flights will be identified leading to trial flights to demonstrate the efficiencies. The project is aiming for daily FRTO operations to validate the concept in the fourth quarter of this year.

"This initiative will utilise existing technology and capabilities, in the air and on the ground, and take advantage of current bilateral arrangements and provisions in a multilateral environment," says Blair Cowles, regional director, operation, safety and security, Asia-Pacific at IATA, which is a signatory to the FRTO agreement as well as being a co-lead for the AAC's oceanic working group and supporting other work streams. Cowles adds: "Airlines will benefit through the ability to utilise the most efficient flight path on any given day."

Also signed at the ICAO event was an agreement to launch the Asia-Pacific Trajectory-Based Operation (TBO) Pathfinder project. Signatories comprise eight of the region's ANSPs, namely China, Indonesia, Japan, New Zealand, the Philippines, Singapore, Thailand and the US, in addition to CANSO and IATA. The partners aim to jointly define, develop and demonstrate TBO in the region within four years. The Pathfinder project will extend the work of the ANSPs of Canada, Japan, Singapore Thailand and the US which last year successfully demonstrated the potential of TBO in the region as part of Boeing's latest ecoDemonstrator.

TBO will change how flights are managed, with ANSPs working together to plan and optimise an aircraft's flight trajectory across different flight information regions, from take-off to touchdown. Information on weather, airspace closures and traffic constraints is shared between the relevant ANSPs, allowing them to manage traffic strategically rather than being reactive. The ultimate aim is to improve safety and efficiency, reduce delays and disruptions, fuel burn and emissions.

The Civil Aviation Authority of Singapore (CAAS) says the partners will define the TBO concept of operations and requirements, develop rules and procedures, demonstrate processes and technical capabilities through laboratory simulations and live flight trials, building confidence and encouraging adoption. "We hope that these two initiatives will demonstrate what is achievable, build confidence and attract more ANSPs to come onboard," says Han Kok Juan, director general of CAAS and chair of the AAC. ➔



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All aboard the SAF train

Everyone in the aviation industry agrees that sustainable aviation fuel (SAF) is key to cutting carbon emissions. It works, it's a "drop-in fuel" and it's here today. So why isn't the industry using it all the time? **Matt Driskill** explains.

RARELY A DAY GOES BY that an airline in Asia or an engine manufacturer like Rolls-Royce or Pratt & Whitney doesn't issue a press release touting their latest tests of SAF. For those not familiar with what exactly SAF is, the International Air Transport Association (IATA) provides a succinct definition. "SAFs are liquid fuels currently used in commercial aviation, which can reduce CO₂ emissions by up to 80 percent. SAF can be produced from a number of sources. Feedstock including waste fats, oils and greases, municipal solid waste, agricultural and forestry residues, wet wastes, as well as non-food crops cultivated on marginal land. They can also be produced synthetically via a process that captures carbon directly from the air. SAFs can be considered 'sustainable,' as their feedstocks do

not compete with food crops or output, nor require incremental resource usage such as water or land clearing, and more broadly, do not promote environmental challenges such as deforestation, soil productivity loss or biodiversity loss."

IATA is a key player in promoting SAF and said in a recent report that more than 490,000 flights have taken place with more than 300 million litres of SAF produced in 2022. It also reported that more than 130 renewable fuel projects have been announced.

While all this is good news, the industry is still trying to get enough SAF into the system in order to meet its goal of net-zero emissions by 2050, which is looking increasingly unlikely.

"We estimate that SAF could contribute around 65 percent of

◀ Cathay Pacific recently added new partners to its SAF initiative.

► Airbus is conducting tests on SAF but is also planning on a hydrogen-based future.

the reduction in emissions needed by aviation to reach net-zero in 2050," IATA says. "This will require a massive increase in production in order to meet demand. The largest acceleration is expected in the 2030s as policy support becomes global, SAF becomes competitive with fossil kerosene and credible offsets become scarcer."

Success in getting wider adoption of SAF, according to IATA, will require "coordinated combined efforts of the entire industry (airlines, airports, air navigation service providers, manufacturers) and significant government support.

You only have to look at the COVID pandemic however to see that getting that "coordinated combined efforts" of everyone in the industry plus governments won't happen, at least not anytime soon. The industry and governments had two years to get their act together on things like health/travel permits, vaccination certificates and other similar items and it never happened.

SINGAPORE READY FOR SAF, BUT MORE NEEDED

The Civil Aviation Authority of Singapore (CAAS), GenZero, and Singapore Airlines (SIA) recently announced they had completed a 20-month SAF pilot programme to turn the city-state in a "Sustainable Air Hub" to create a long-term secured SAF supply ecosystem for Singapore. The pilot found that while Singapore is operationally ready to supply SAF, more is needed to support adoption.

The pilot programme validated the end-to-end process needed to bring SAF into Changi Airport, including procurement, blending of neat SAF with conventional jet fuel in Singapore facilities, safety certification and delivery of the blended SAF to Changi Airport. The pilot affirmed that SAF can be safely deployed to Changi Airport and uplifted onto flights without any modification to existing airport infrastructure.

Frederick Teo, CEO of GenZero, said, "SAF is widely acknowledged as a critical lever to decarbonise aviation. Ensuring that SAF can be operationally deployed in Singapore will help position Changi as both a regional and global sustainable aviation hub. The pilot is a demonstration of the community's ability to mobilise the aviation ecosystem for the operationalisation, deployment and usage of SAF. Through this pilot, GenZero also worked with partners like Climate Impact X and the RSB to launch SAF credits. This allowed us to develop the methodology and processes needed to test the extent to which corporates were willing to offset their travel emissions. It provided useful insights on how we can crowd in additional carbon financing to offset the price premium and support the adoption of SAF."

Singapore is not the only location in Asia working on SAF. Following the successful launch of its Corporate Sustainable Aviation Fuel Programme in 2022, Cathay Pacific in Hong Kong said it had added new partners to the programme. Cargo customers Dimerco

Express Group and Yusen Logistics, as well as the programme's first non-governmental organisation (NGO) partner, Business Environment Council, have joined Cathay to promote the wider adoption of renewable energy by the aviation industry to decarbonise their business travel and cargo shipments.

These new partners also join the programme's launch customers — AIA, Airport Authority Hong Kong (AAHK), Kintetsu World Express (KWE), PwC China, Standard Chartered and Swire Pacific. As leaders in corporate climate action, Cathay's Corporate SAF Programme partners are committed to reducing the climate impact from their business travel and airfreight activities through scaling up the use of SAF.

Cathay was among the first airlines in the world to announce a target of 10 percent SAF for its total fuel use by 2030. Since then, it uplifted SAF at Hong Kong International Airport for the first time in 2022, and successfully conducted its first overseas SAF uplifts on commercial flights at Singapore Changi Airport and Los Angeles International Airport last year.

The SAF Cathay used over the past year was made from used cooking oil and animal fat waste, and was made available by its



fuel suppliers, ExxonMobil and Shell. Last year, Cathay and State Power Investment Corporation (SPIC) signed a Memorandum of Understanding to drive the further development of the SAF supply chain in China.

Korean Air too is jumping into the SAF game. The airline recently announced a deal with Yusen Logistics, a global logistics company, to further promote the use of SAF in its cargo business. Yusen Logistics is the airline's first cargo SAF partner based in Japan, and the two companies will collaborate to promote SAF usage within the Asian

region in alignment with the aviation industry's climate change goals. In September 2023, Korean Air launched a program to use SAF for air cargo operations with air cargo customers and forwarders, a first of its kind in South Korea in the air cargo industry. Customers are able to purchase SAF for air cargo operations, and Korean Air will share the carbon emissions reductions with its customers.

ENGINE MAKERS JOIN THE SAF GAME

As well as airlines, engine makers are working on projects to develop new powerplants that can run on SAF. Following the successful completion of the design phase of its FLYCLEEN project, ARPA-E has awarded GE Aerospace Research US\$4.5 million in Phase 2 funding to take the next step of building and demonstrating a 25kW power generation subsystem integrating solid oxide fuel cells with a SAF-powered gas turbine for hybrid electric propulsion. The use of fuel cells could vastly improve the efficiency of converting the chemical energy from SAF into electric power and move closer to net zero CO₂ emissions, according to GE Aerospace.

fuel cells and gas turbines. A portion of SAF is reformed to Syngas to feed the fuel cells, while the rest of SAF is consumed in a gas turbine engine. This is a novel concept to combine the two.

GE Aerospace Research's ongoing programs in hybrid electric propulsion with ARPA-E are a great complement to the CFM RISE (Revolutionary Innovation for Sustainable Engines) program, a major technology demonstrator GE Aerospace unveiled with its 50/50 joint venture partner, Safran, in 2021. This demonstrator program aims to deliver a 20 percent reduction in fuel consumption compared to engines today, which would represent a major step change in propulsion efficiency.

Other engine makers are working on hydrogen-powered engines, but most industry experts agree that hydrogen-powered flight is too far off in the future to have any meaningful impact on carbon emissions to meet the 2050 goal. Hydrogen differs greatly from SAF because hydrogen would require an entire, industry-wide shift in fuel infrastructure from creation to airport deliveries to airplanes themselves.

WHAT NEEDS TO BE DONE?

Everyone in the industry agrees that SAF is key to cutting carbon emissions but what needs to be done? The World Travel & Tourism Council (WTTTC) said last year it had some answers. The council called on governments to:

- Provide strong incentives to encourage investment in SAF production, including tax credits, grants or other financial incentives;
- Work with the aviation sector to set ambitious SAF production targets;
- Coordinate their actions through the International Civil Aviation Organisation (ICAO), the specialised UN agency for aviation, to ensure global uniformity in SAF regulations, sustainability standards, procedures, and organisation.

The council said an example of a successful incentive programme is in the United States where the Inflation Reduction Act which, through the Tax Blender Credit, created tax incentives for SAF production that are already bearing fruit.

Julia Simpson, WTTTC president and CEO, said, "It is time for governments to take bold action and prioritise the production of sustainable aviation fuel. We are calling on all governments to act now. The demand for SAF has never been higher, airlines all over the world want to use SAF and have used every molecule ever made. However, current SAF production only meets 0.1 percent to 0.15 percent of requirement, despite a 200 percent increase in production in 2022 vs 2021. This leaves a massive gap that can only be filled through rapid and sustained investment. At today's prices, SAF is on average three to five times more expensive than traditional fossil fuels. Governments must address this cost disparity by providing financial support and incentives to make SAF more accessible and affordable. Without those targets and without those incentives, the sector cannot decarbonise." →



▲ Neste has struck several deals in Asia to boost the use of SAF.

John Hong, a GE Aerospace senior combustion research engineer and FLYCLEEN project leader, says the team is bringing to bear nearly two decades of experience in solid oxide fuel cell technology to support the development and demonstration of a high efficiency power generation system with lower carbon emissions, stating, "The integration of fuel cells into jet engine propulsion system represents a potentially promising hybrid technology for additional fuel efficiency technologies in higher thrust aircraft applications," Hong remarked. "The use of SAF demonstrates the compatibility with lower carbon fuels to capture further CO₂ reduction benefits."

Hong explained that this hybrid approach uses SAF in both the

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The world's most powerful passports

Singapore and Japan maintained high rankings in the Henley Passport Index for 2024 and were joined by several European countries as **Matt Driskill** reports.

THE LATEST RANKING by Henley & Partners saw four European countries join the ranks of the world's 'most powerful passports.' The top six countries include Singapore, Japan, Spain, Germany, France and Italy. All of these countries grant visa-free travel to 194 out of 227 destinations. Singapore and Japan have led the index for most of the past five years.

Coming in second place are South Korea, Finland and Sweden with visa-free access to 193 destinations while Denmark, Ireland, Netherlands and Austria came in third. Belgium,

Luxembourg, Norway, Portugal and the United Kingdom came in fourth. Australia and New Zealand took sixth place, while the U.S. retains its 7th place, according to Henley's rankings.

The passport ranking was conducted based on data provided by the International Air Transport Authority (IATA), which ranks the world's passports based on the number of destinations their holders can access without a visa.

The general trend shown in the rankings has been toward more travel freedom, with the average number of destinations that travellers can access visa-free nearly doubling from 58 in 2006 to 111 in 2024, said Christian Kaelin, chairman of Henley & Partners.

The United Arab Emirates was the fastest climber over the past decade, jumping to 11th place and offering access to 183 destinations without a visa. And China, up two spots this year to land in 62nd place, has visa-free access to 85 destinations — almost twice as many as 10 years ago.

Kaelin said while the general trend over the years had been toward greater travel freedom, the gap between those at either end of the list was wider than ever. "The average number of destinations travellers are able to access visa-free has nearly doubled from 58 in 2006 to 111 in 2024," he said in a report. "However, as we enter the new year, the top-ranked countries are now able to travel to a staggering 166 more destinations visa-free than Afghanistan, which sits at the bottom of the ranking with access to just 28 countries without a visa."

A different passport index compiled by Arton Capital takes into consideration the passports of 193 United Nations member countries and six territories made up of Taiwan, Macau, Hong Kong, Kosovo, the Palestinian territories and the Vatican.

Arton's Global Passport Power Rank 2024 puts the United Arab Emirates in the number one position with a visa-free/visa-on-arrival score of 180. In second place are Germany, Spain, France, Italy and the Netherlands. Sweden, Finland, Luxembourg, Austria and Switzerland are in third place while the UK is in fifth and the US in sixth place. ➔



France, Germany, Italy, Japan, Singapore, Spain (194 locations)

Finland, South Korea, Sweden (193 locations)

Austria, Denmark, Ireland, Netherlands (192 locations)

Belgium, Luxembourg, Norway, Portugal, United Kingdom (191 locations)

Greece, Malta, Switzerland (190 locations)

Australia, Czechia, New Zealand, Poland (189 locations)

Canada, Hungary, United States (188 locations)

Estonia, Lithuania (187 locations)

Latvia, Slovakia, Slovenia (186 locations)

Iceland (185 locations)



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Full speed ahead for K-UAM

South Korea's urban air mobility demonstration programme is proceeding to plan with the country eyeing commercial services next year, **Emma Kelly** reports.

SOUTH KOREA successfully completed the first phase of its Korean Urban Air Mobility (K-UAM) Grand Challenge in late 2023. The second phase of the project is due for launch in August 2024 as the country aims for commercial advanced air mobility services in 2025.

The South Korean Government has ambitious plans for UAM, seeing the new technology as a means to address road congestion issues in the country's major cities. In addition to air taxi services, the country has identified significant regional and logistics applications for electric vertical takeoff vehicles (eVTOL). The government is look-

ing to implement initial commercial eVTOL services in 2025, with full-scale implementation from 2030. The K-UAM Grand Challenge demonstration project is designed to demonstrate the viability of advanced air mobility and pave the way for commercial operations.

"For the commercialisation of UAM as a new means of transportation, it is most important to verify safety and enhance technology

▲ *International eVTOL developers are partnered with local companies, including Joby Aviation working with SK Telecom, which itself has an investment in Joby.*



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maturity," says the country's Ministry of Land, Infrastructure and Transport (MOLIT).

The project was launched in August 2023, with phase one comprising research and development and demonstrations on open land at Goheung Jeollanam-do in the south of the country. "The first phase was broadly divided into research and development and integrated operation fields. The five domestic consortia, along with private companies have been participating in the R&D field demonstration starting in August to verify the developed technologies," MOLIT explains.

From August through to the end of November, R&D demonstrations were conducted in two traffic management fields and one aircraft operation field. "The R&D demonstrations were conducted using drones and ultra-light aircraft produced by SMEs and the goals were successfully completed," says MOLIT.



▲ Vertical Aerospace, developer of the VX4 eVTOL, is partnered with local mobility technology companies Kakao Mobility and LG Uplus.

The R&D involves five consortia comprising local companies and international partners. More than 40 Korean aviation, transportation and technology companies are involved including Korean Air, Incheon Airport, Hyundai Motor, Hanwha Systems, Korea Airport Corporation, SK Telecom, Kakao Mobility, Daewoo, Jeju Air and LG.

For the integrated operation demonstration there are seven consortia, comprising domestic and foreign companies, with expertise in various areas.

"For the demonstration of the integrated operation, participation by domestic and foreign companies in the areas of aircraft, operation, vertiport and traffic management, the stability of integrated operation between operators, traffic management operators and vertiport operators is demonstrated in accordance with the operation scenario to be applied in the commercialisation phase, while

The commercialisation of the K-UAM is expected to be utilised in various service areas such as transportation, tourism, public services and logistics.

MOLIT

measuring the noise to determine the range of entry into urban centres," says MOLIT.

International eVTOL developers are partnered with local companies, including Joby Aviation working with SK Telecom, which itself has an investment in Joby. Vertical Aerospace, developer of the VX4 eVTOL, is partnered with local mobility technology companies Kakao Mobility and LG Uplus, while South Korean technology company Hanwha is a partner in the VX4 programme, supplying actuator systems.

The second phase of the project will be conducted in the Seoul Metropolitan Area from August and completed in December. "The second phase will be carried out in Arbatgil in Incheon City, Han River in Seoul and Tancheon urban area in Seoul to demonstrate the overall K-UAM operational system in the urban environment," says MOLIT.

This will all lead to commercial operations in 2025. "Korea established its roadmap back in 2021, corroborated by the relevant ministries. We have been and will be carrying out all this towards the goal of commercialising K-UAM in 2025," MOLIT explains.

The government sees wide-ranging potential for UAM in the country. MOLIT says: "The commercialisation of the K-UAM is expected to be utilised in various service areas such as transportation, tourism, public services and logistics."

NEW ZEALAND TEAM DEMONSTRATES AIRSPACE INTEGRATION

Advanced air mobility operator Wisk Aero recently successfully demonstrated the integration of uncrewed aircraft into controlled airspace in the latest stage of New Zealand's Airspace Integration Trial Programme (AITP).

The New Zealand Government launched the AITP in 2019 as a four-year project to enable the safe development, testing and market validation of advanced unmanned aircraft applications within the existing regulatory framework. Wisk was the first industry partner in the programme and has been conducting testing throughout.

In the latest stage, a series of test flights were completed to evaluate the operational integration of uncrewed aircraft flying beyond visual line of sight (BVLOS) into controlled airspace. The AITP team includes the New Zealand Government, remotely piloted aircraft (RPA) operator Insitu Pacific, the Civil Aviation Authority of New Zealand, air navigation services provider Airways New Zealand and indigenous-led aerospace venture Tāwhaki, which provided the flight test site. The test flights used Airways International's uncrewed traffic management (UTM) system, AirShare.



▲ China's EHang announced late in December it has used its certified EH216-S pilotless vehicle to complete demonstration flights in Guangzhou and Hefei.

The trial involved multiple flights to demonstrate an RPA can be operated under instrument flight rules in controlled airspace and integrated with regular crewed traffic. The flights, which took place at the Tāwhaki National Aerospace Centre at Kaitorete, included take-offs, landings, and controlled and uncontrolled airspace navigation.

"The successful completion of this phase of testing demonstrates that it is possible to safely integrate autonomous aircraft into controlled airspace that is shared with piloted aircraft," says Catherine MacGowan, Wisk's vice president of APAC and air operations. MacGowan adds: "The processes, data and learnings from these trial flights will help shape the future of AAM and the broader aviation industry."

CHINA'S EHang DEBUTS COMMERCIAL FLIGHT DEMOS

China's EHang, one of the earliest developers of UAM vehicles, is also moving ahead strongly in the air taxi space. The company announced late in December it has used its certified EH216-S pilotless vehicle to complete demonstration flights in Guangzhou and Hefei. The first EH216-S passenger-carrying unmanned aerial vehicle system, which has obtained the world's first standard airworthiness certificate, has been successfully delivered to ETON, an intelligent aviation technology subsidiary of Guangzhou Development District Communications Investment Group Co., Ltd., and has been deployed

at the Jiulong Lake operational site. More operation sites and flight routes for aerial sightseeing and logistics are under development in Huangpu district as well, the company said, adding that the Hefei Municipal Government intends to facilitate the purchase of at least 100 units of EH216 series pilotless aerial vehicles from EHang, and/or provide financing support, amounting up to a total of US\$100 million.

Quan Zhang, Standing Committee Member of Hefei Municipal Committee and Executive Vice Mayor of Hefei, said, "the low-altitude economy is an emerging industry as well as a new engine for economic growth. In recent years, Hefei has firmly grasped the national policy guidance, industrial development direction, and technological revolution trend, and has successfully ranked into the first tier in this new sector. EHang is definitely an industry-leading company with many 'first' and 'unique' achievements in fields of pilotless passenger-carrying flights and eVTOL. Today EHang's debut commercial flight demonstrations mark a new chapter in the development history of the pilotless passenger-carrying aerial vehicle and the low-altitude economy. In the next step, we will join hands with key enterprises like EHang to focus on application scenarios, industrial cooperation, and business model innovation, and strive to build Hefei as a low-altitude city of international influence." ➔

Note: AAV Editor Matt Driskill contributed to this story.



AAR

Indian MRO needs to step up

Over the last four decades the centre of the commercial aviation world has shifted away from the US and Europe to the Middle East and Asia. India too is becoming a regional powerhouse both in airline operations and in the MRO sector. **Michael Doran** explains.

THE NEXT DECADE is looming as the time for India to step up and take that mantle as the demographics of the world's most populated nation open air travel up to its burgeoning middle class. That's a given, but the challenge for India is how much of the aviation dollar can it keep and become a leading nation for aerospace engineering to capitalise on its own growth.

India is now the world's third-largest civil aviation market behind the US and China and over the last six years domestic traffic has

grown by 14.5 percent and international at 6.5 percent annually. In January president and managing director of Airbus India and South Asia, Remi Maillard said, "India is a force that will power global civil aviation over the next few decades."

▲ *An effective way of building MRO capacity in India is through joint ventures, such as the one between US MRO specialist AAR and Indamer, the oldest MRO provider in India.*



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▲ India's AI Engineering Services currently performs MRO for customers including Air India and SpiceJet.

India needs a vibrant and well-resourced maintenance, repair and overhaul (MRO) sector or it will see millions of dollars of crucial foreign exchange flow out of the country with every aircraft heading to a foreign MRO for work that could and should be done inside the country.

The big question facing ambitious airlines in India is not how many Airbus or Boeing aircraft to order or where to find the next batch of pilots to fly them, but how will they keep those planes in the air in a country light on MRO capacity.

In its Commercial Market Outlook Boeing predicts the South Asia fleet will grow from 700 aircraft in pre-COVID 2019 to 2,660 by 2040, triggering a need for 37,000 pilots, 45,000 cabin crew and 38,000 technicians in a services market of US\$435 billion.

A similar forecast by consultants Oliver Wyman says that India, China and the Middle East are some of MRO's fastest growing regions, with India expanding at 12.4 percent annually between 2023 and 2033. That is close to double the MRO

growth in China and dwarfs the projected 4.9 percent annual growth in the Middle East.

Mumbai-based analytics group CRISIL forecasts that India's annual MRO revenue could grow from around US\$18 billion to between US\$55 billion-US\$60 billion by 2028. The report also says that recent government policies to promote MRO growth will see MRO costs fall by 10-20 percent.

Those measures include cutting the Goods and Services Tax on MRO from 18 to 5 percent, scrapping the 13 percent government royalty on revenue, open tenders for land and allotting land to MRO providers for 30 years instead of the current three to five years.

Senior economic advisor to the Ministry of Civil Aviation, Piyush Srivastava told a recent conference that only 15 percent of Indian carriers' MRO business is handled in India, and that the work done is often focused only on line and airframe maintenance. He wants airlines to impose conditions on aircraft

Mumbai-based analytics group CRISIL forecasts that India's annual MRO revenue could grow from around US\$18 billion to between US\$55 billion-US\$60 billion by 2028.

and engine purchases that the OEMs must have an MRO facility in India, particularly as around 92 percent of engine MRO work is done outside the country.

An effective way of building MRO capacity in India is through joint ventures such as the one between US MRO specialist AAR and Indamer, the oldest MRO provider in India. AAR-Indamer launched in 2021 and in January completed its 100th Airbus A320 C-check on an IndiGo jet.

It is the first Indian MRO to complete 100 heavy-maintenance C-checks in such a short time. Significantly for IndiGo and the nation, all the C-checks which were previously done by overseas MROs, were done at facilities owned by AAR-Indamer and other Indian companies in 2023.

This year AAR-Indamer is expanding its existing facility and planning major growth as it looks further afield for new customers. The current facility in Nagpur has four hangars with six maintenance bays, an engine run-up bay and a dedicated paint hangar. It will add another six hangars which will triple its capacity and enable it to service widebody aircraft, whereas today it maintains only Airbus A320 family aircraft.

The expansion will also bring capabilities to work on Boeing and ATR turboprops, and in addition to airframe maintenance the company offers component repair, composite repair, aircraft cabin repair, engineering and landing gear repairs and aircraft painting. This year it is aiming to add capabilities for specialised MRO for thrust reversers and engine nacelles.

The current facilities employ close to 300 engineers with AAR providing technical support, while the Indamer Group's 525 employees across India also lend a hand when needed. To meet its expansion goals AAR-Indamer is looking to recruit more than 100 skilled maintenance engineers and technicians this year.

Another major US-based MRO, StandardAero is also evaluating an opportunity for a joint venture project in India, this one focused on aircraft engines. StandardAero is one of the world's largest independent MRO providers, with capabilities that include engines and engine component repair, APUs, airframes and avionics.

It has more than 50 MRO facilities in 13 countries and is investigating an opportunity coming out of engine OEM Safran's decision to set up an MRO facility in India by 2025. All of India's major airlines use engines from CFM International, which is a 50:50 joint venture between Safran and General Electric.

Given that only 8 percent of the nation's engine MRO is done in India this could offer significant opportunities, and StandardAero regional sales director (airlines and fleets) Tayeb Bouhassiss said the company would decide after gauging the workload coming out of the proposed Safran facility. He told India's Aero MRO 2023 it is something StandardAero has in mind, but more mid- and long-term, once it ascertains how much work will go through the facility to determine if a JV makes sense for the business.

AI Engineering Services (AIESL), formerly part of Air India before divestment and state ownership, said in November 2022 it was in

discussions with three to four foreign carriers for MRO business. The company said it is planning to lift revenue from third parties by acquiring new capabilities and aggressively marketing its existing ones.

It currently performs MRO for customers including Air India and SpiceJet, and added Kuwait Airways in September last year, its first international carrier, by inducting a Boeing 777 for a heavy maintenance check. AIESL has hangar space available for 30 aircraft, including 10 widebodies with capabilities including base and line maintenance, engine APU overhaul, landing gear overhaul, and avionics accessories and component repair.



▲ AAR-Indamer launched in 2021 and in January completed its 100th C-check on an IndiGo jet.

AIESL has also received approval from the Indian government to carry out specified checks on Boeing 737 MAX aircraft and is aiming to gain more MRO business from the 1,000 or so aircraft on order by Indian airlines. Those aircraft are expected to need around 200-300 major maintenance checks (A to D checks) annually and represent the major future opportunity for MRO development in India.

Another large area of MRO business comes from aircraft redelivery, which happens at the end of an aircraft lease when specified tasks need to be done prior to the aircraft's return to the lessor or delivery to a new operator.

However, AIESL identifies major competition for MRO work will come from Singapore, Malaysia and Indonesia, as well as from the Middle East and Sri Lanka where much of the airline MRO is currently outsourced. ➔



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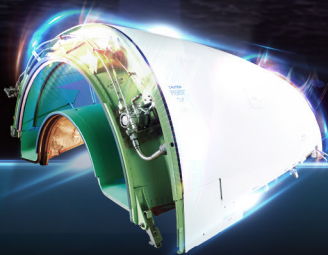


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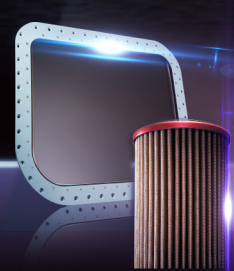
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