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**RIYADH AIR'S
COLOURFUL LAUNCH
AND GREAT AMBITIONS**

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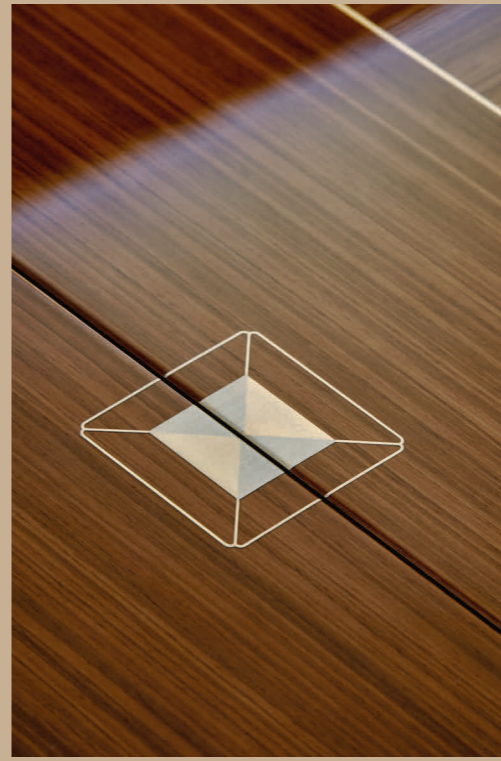


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Fears
grow over
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COVER: International debut of
Riyadh Air's first
Boeing 787-9 Dreamliner
at the Paris Air Show
showing new brand and livery
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DUBAI SET TO ZERO IN ON THE 'S' WORD

As the heat of the summer subsides thoughts turn to the biggest event in the region's aerospace calendar, the Dubai Air Show, which will take place November 13-17.

As the first of the major global shows to bounce back from Covid at the end of 2021, the Dubai event felt the benefit of being the first to allow rekindling of face-to-face meetings and to begin cooperative broad discussions about the key issues facing our industry.

That event attracted a high number of the top level executives to the event, some for the first time. And the DWC spectacular didn't fail to impress.

The bounce-back followed for the other two global events – Farnborough Air Show and June's Paris Airshow. Many people at Le Bourget were asking about this year's Dubai event and expressing interest – no wonder then that the show organisers are suggesting this year's Dubai Show will be the biggest yet.

Of course, with Dubai hosting the United Nations COP28 convention on climate change less than two weeks after the major aviation event takes place, it will be no surprise that the "S-word" will be on everybody's lips.

In Paris, the aerospace companies were jostling to take a prime spot with their sustainability messaging. As an industry we are accused in some quarters of 'greenwashing' but there is a genuine recognition that although just a tiny part of the problem, we are committed to finding and investing in the solutions.

These will not be overnight changes.

Anyone who cares to look into the industry in depth will know that changes – introduction of new models or new technology – take time. Safety is, after all, our number one priority. But regulators, manufacturers and operators are all on the same sheet here. We must succeed.

The Gulf airlines have committed to sustainability action; already operating some of the most modern fleets in the world, the airlines are keen to be first-to-market with so many on the new models as well as changing operations to be more environmentally efficient as you will read in this issue.

Across the region interest – and investment – in urban air mobility and advanced aircraft is stepping up, but no doubt that when we do gather in Dubai in November there will be a huge focus on how much we have achieved towards our net-zero targets by 2050.

While many would rather see aviation just halt, the world still wants to travel. That bounce-back from Covid reminds us of the challenges when flight was not possible during those dark days.

The launch of new airlines like Riyadh Air (featured in this issue) with clear quality coupled with sustainability goals should excite us, not shame us.

The Dubai show will give us the chance to shine and show the world we are here to stay.

Alan Peaford, editor-in-chief



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PICTURE: ETIHAD AIRWAYS

Mission possible: Tom cruises into Abu Dhabi

A touch of Hollywood landed in Abu Dhabi in July as Abu Dhabi International Airport welcomed Tom Cruise on the first flight into its new Midfield Terminal. The visit was to celebrate the release of last month's (July) "Mission: Impossible – Dead Reckoning Part One", where key parts of the movie were shot. Cruise unveiled the custom "Mission: Impossible"

livery on an Etihad Airways Boeing 787 Dreamliner. The movie marks the first time that the terminal's interior has been seen by the public when it was released in cinemas on July 13. Antonoaldo Neves, group chief executive officer of Etihad Aviation Group, said: "Partnering with 'Mission: Impossible' is a great testament to destination Abu Dhabi and what it has to offer."

Etihad Cargo expands Euro road services

Etihad has appointed Wallenborn Transports as its road feeder service (RFS) partner for Europe. This will expand its scheduled and specialised services across 27 countries, facilitating the transportation of cargo between Etihad Cargo's main European gateways, including Amsterdam, Paris and Frankfurt, and offline stations. Etihad Cargo's customers will benefit from the complete transparency provided by integrated telematics technology.

Etihad Cargo's head of cargo operations and delivery, Thomas Schürmann, said: "Strategic partnerships with leading RFS providers such as Wallenborn strengthen Etihad Cargo's value proposition and will enable the carrier to further expand operations in Europe, which is a key territory for the airline. Etihad Cargo remains committed to being the air

cargo partner of choice and is achieving this through the provision of fast, efficient and reliable transportation of cargo from its arrival in-country to its final destination."

Sustainable win for Turkish Airlines

Turkish Airlines was crowned the 'most sustainable flag carrier airline' in World Finance's Sustainability Awards 2023 in July having won the same award last year. Turkish Airlines chairman of the board,

Ahmet Bolat, said: "Our company, in line with our commitment to be a 'carbon neutral airline in 2050,' have expanded the use of sustainable aviation fuel (SAF), which we started to use as of 2022, by adding additional lines in 2023 as part of our plans to combat climate change."

Environmental award

Etihad Airways was named environmental airline of the year 2023 in the Airline Ratings awards at the end of May. The awards, which

acknowledge the best of the aviation industry, and ranks airlines on their innovation, route networks and safety score against a strict assessment criteria, recognised Etihad for its commitment to sustainable aviation through innovation and collaboration, along with its dedication to drive change and results from Abu Dhabi, or the world.

Freight expectations

Emirates SkyCargo has added two Boeing 747-400Fs to its freighter fleet.

It is expecting 15 more freighters to join its fleet from announced orders and its freighter conversion programme, plus a boost in belly-hold capacity from new passenger aircraft deliveries starting with Airbus A350s in late summer 2024, followed by Boeing 777-Xs the year after.

Over the next decade, Emirates SkyCargo expects to double its existing capacity and offer a fleet mix of more than 300 wide-body aircraft comprising 777s, 777-Fs, 747-Fs, A350s, and A380s.

Saudi Arabia completes first air taxi test flight

Saudi Arabia has completed its first air taxi test flight. Daniel MacGregor, chief growth officer at Serco Middle East, said: "The news of NEOM's Volocopter Test flight highlights the major progress that is being made in the development of urban air mobility (UAM). The recent test flights of eVTOL aircraft in NEOM are a big milestone, and they show that UAM is on the cusp of becoming a reality. "I believe that UAM has the potential to revolutionise transportation, making it faster, more efficient, and more sustainable. eVTOL aircraft are noiseless and emissions-free, making them ideal for urban environments. "They can also take off and land vertically, which means that they do not need runways, freeing up valuable space in cities. "As the technology continues to develop, UAM is likely to become increasingly popular. It has the potential to transform the way we travel, and it could have a major impact on the future of cities."



PICTURE: VOLOCOPTER



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Pharma champions programme

Etihad Cargo has launched its pharma champions programme to enhance customer service and team expertise through the delivery of dedicated PharmaLife training sessions. PharmaLife, Etihad Cargo's award-winning pharmaceutical shipment solution, has achieved significant year-on-year growth.

"Etihad Cargo has developed and launched pharma champions to enhance the carrier's capabilities in transporting high-value, temperature-sensitive pharmaceuticals across its global network," said Tim Isik, vice president commercial at Etihad Cargo.

CDB Lease deals

CDB Aviation has signed the lease agreements for a series of six Boeing 737 MAX 8 aircraft to Turkish Airlines.

All six aircraft are part of the lessor's existing order book with Boeing. They will be powered by CFM International Leap-1B engines and built with the AnadoluJet-specific configuration, which is a subsidiary of Turkish Airlines. Deliveries are set to take place in 2024 and 2025.

China connections

Etihad Cargo welcomed senior leaders from China's SF Airlines to Abu Dhabi in June to review the reciprocal block space agreement between the two airlines.

During the visit, Etihad Airways and SF Airlines entered an MoU to cement their commitment to strengthening ties and further cooperating to increase cargo capacity between China and the rest of the world via Abu Dhabi.



Iraqi Airways lives the dream with first Boeing 787

Iraqi Airways received its first Boeing 787 Dreamliner in June – the first of 10.

The delivery follows delivery of four Boeing 737 MAX airplanes since February.

The airline has ordered a total of six 737-8s and 10 737-10s, providing its single-aisle fleet with more capability across its regional and medium-haul routes.

Manaf Abdel-Monem, director general of Iraqi Airways, said:

"The 787 and 737 MAX aircraft we have received are key to our fleet renewal programme, which aims to ensure we can fly our passengers around the world in the safety and comfort they expect from a modern and efficient airline like Iraqi Airways."

Omar Arekat, Boeing vice president of commercial sales for the Middle East added: "Boeing is committed to supporting Iraqi Airways' ambition to bring greater optimisation and new route possibilities to the region."

In April 2023, Etihad Cargo and SF Airlines signed a reciprocal capacity agreement to connect their respective networks.

Boeings for Algérie

Air Algérie ordered eight Boeing 737-9 aircraft during the Paris Air Show in June.

The Algerian flag carrier also signed a memorandum of understanding (MoU) for two 737-800 Boeing converted freighters (BCF) to meet increasing cargo demand in the region.

"This order will contribute to the development of the Air Algérie fleet," said Yacine Benslimane, general manager of Air Algérie.

"This acquisition is part of Air Algérie's fleet extension strategy through the purchase of new aircraft."

Air Algérie operates a single-aisle fleet of more than 30 737-500, 737-600 and 737-800 jets.



Flynas continues fleet plan with A320neos

Flynas has received two next-generation Airbus A320neo aircraft. This represents the third batch of 19 new aircraft of the same model to be delivered in 2023, and comes after the low-cost-carrier (LCC) signed an agreement with Airbus during the Paris Airshow to purchase 30 A320neo aircraft, as part of plans to upscale its fleet.

Bander Almohanna, CEO and managing director of Flynas, said: "Taking delivery of the second A320neo batch in less than a month, and within days of signing the new 30-aircraft agreement, is an affirmation of our relentless efforts to support our exceptional growth with a modern, comfortable, and fuel-efficient operational capability, equipped with cutting-edge technologies, in line with our growth and expansion strategy under the slogan 'We Connect The World to the Kingdom.'"

Emirates energises African energy

The African Energy Chamber (AEC) has entered a partnership with Emirates as the official international airline partner for African Energy Week (AEW) – taking place 16-20 October 2023 in Cape Town.

Emirates will extend exclusive discounts to delegates attending the event.

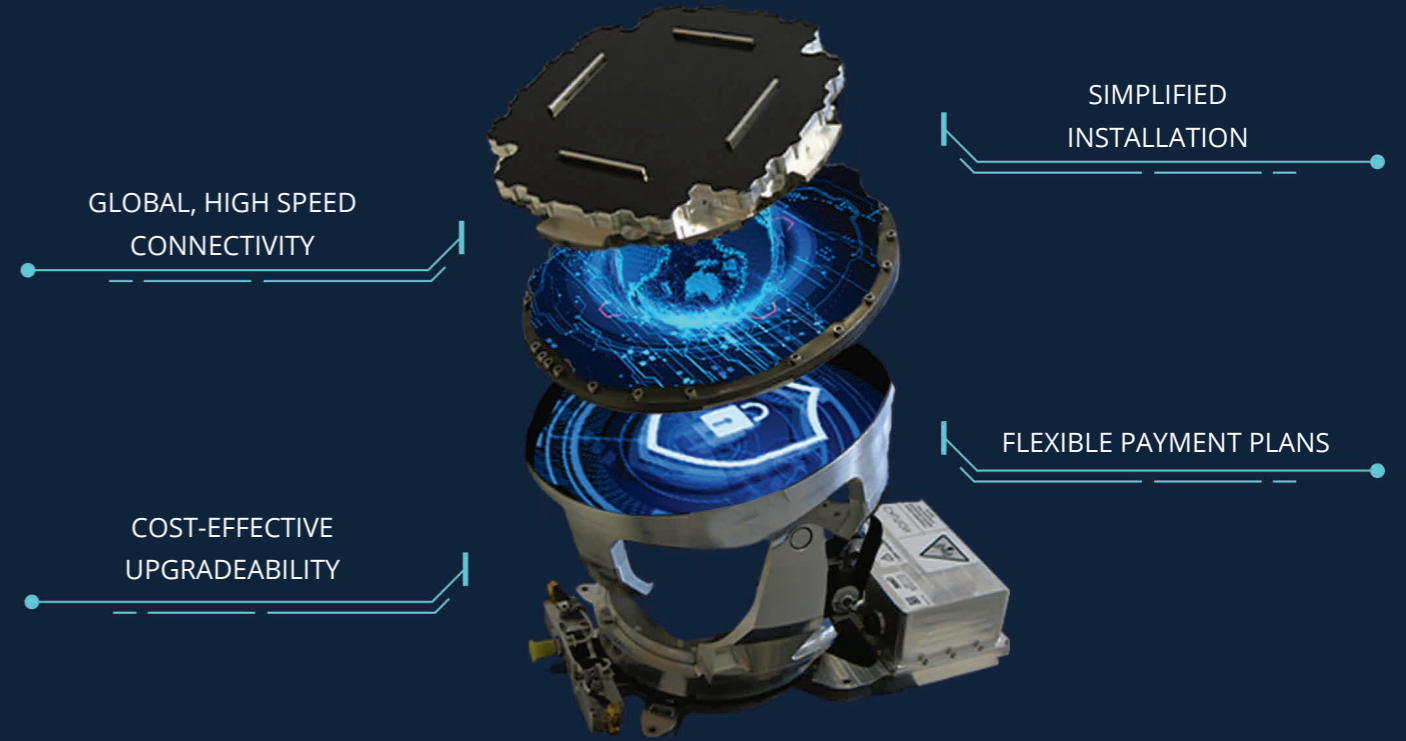
NJ Ayuk, executive chairman of the AEC, said: "This partnership not only signifies the international recognition and importance of the event but also highlights the significance of the energy sector in Africa."

"With Emirates' support, we can further enhance the accessibility and reach of AEW, attracting key stakeholders and facilitating meaningful discussions on Africa's energy future."



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Base maintenance agreement

Turkish Technic has signed another base maintenance agreement with Emirates. This agreement will serve as an extension to the initial base maintenance annex signed in April 2023, which covered five Emirates Boeing 777s. Under the terms of the new agreement, Turkish Technic will perform base maintenance services for a further 17 Boeing 777 aircraft in Emirates' fleet. The base maintenance operations for the first aircraft under scope of this agreement will commence in July 2023.

UAE tourism drive

Emirates Airline and Etihad Airways have signed an MoU to expand their interline agreement. This first of its kind agreement between the two UAE carriers aims to capitalise on opportunities to boost tourism to the UAE. Sir Tim Clark, president, Emirates Airline, said: "Emirates and Etihad are leveraging on our strengths to expand our respective customer offerings and boost UAE tourism. We believe this new agreement provides a strong foundation to develop further opportunities between both airlines."



Empire builds with first BBJ in charter fleet

Empire Aviation Group has announced the registration of a Boeing Business Jet (BBJ) under management for commercial charter services. The BBJ managed by Empire Aviation, is configured for 18 passengers and will operate with four crew members. It is based on the Boeing 737-700 commercial airliner and can fly up to 12 hours non-stop.

Paras P. Dhamecha, founder and managing director of Empire Aviation Group, commented: "The addition of a Boeing Business Jet (BBJ) adds a new dimension to our managed charter fleet with the aircraft's unique scale and significance and we are very confident the BBJ will attract a lot of interest from the business, governmental and leisure charter customers from across the globe."

Omani graduates

Oman Air recently celebrated the graduation of its first batch of Omani cadets from the Airline Transport Pilot Licence programme. "Oman's aviation sector is fast becoming a value engine of the country's growth. Oman Air's strategy reflects national priorities and as such, we continue to develop a sustainable, highly-skilled workforce that can support the advancement of the sector, meet the demands

of an ever-evolving industry, and fortify our contribution to Oman's 2040 Vision," said Captain Moosa Al Shidhani, senior vice president – flight operations at Oman Air.

Cool customers

Dnata handled 135,000 tonnes of perishable goods through its advanced cool chain facilities in Dubai in the 12 months up to 31 March 2023. The most popular imported products handled into Dubai included fruit

and vegetables such as mangoes, strawberries, tomatoes, avocados and cherries, primarily from locations in Europe, the Far East, South Asia and Africa. Dnata also managed the export of a significant quantity of local UAE perishable goods, including large shipments of frozen fish to Ethiopia.

SalamAir lease deal

Oman's low-cost carrier SalamAir has committed to lease three Airbus A330neo aircraft from

Avolon, the international aircraft leasing company. Captain Mohamed Ahmed, CEO of SalamAir, said: "The decision to introduce the Airbus A330neo complements the existing fleet of Airbus aircraft, which includes the A320neo, A321neo, and an A321 freighter. By adding the A330neo to the fleet, SalamAir aims to enhance its capacity, meet the growing demands of the market, and attract more inbound tourists, aligning with the objectives of Oman's Vision 2040."



Kuwait Airways and Rolls-Royce celebrate the TotalCare signing. PICTURE: KUWAIT AIRWAYS.

Kuwait signs TotalCare Agreement with Rolls-Royce

Kuwait Airways and Rolls-Royce has signed an agreement to enhance engine maintenance of the Trent 7000 engines. The maintenance will ensure optimal performance, reliability, and cost-efficiency of the Trent 7000 engines powering KAC's fleet of Airbus A330neos. The service agreement will use advanced technology to monitor the health and performance of engines in real-time, which will allow Kuwait Airways to effectively have proactive maintenance and minimise flight disruptions. Chairman of Kuwait Airways, Captain Ali Al-Dukhan, said: "This will not only lead to lowering our costs and increasing our productivity, but will also have a positive effect on our passengers as we will be able to better predict and prevent disruptions to our operations."



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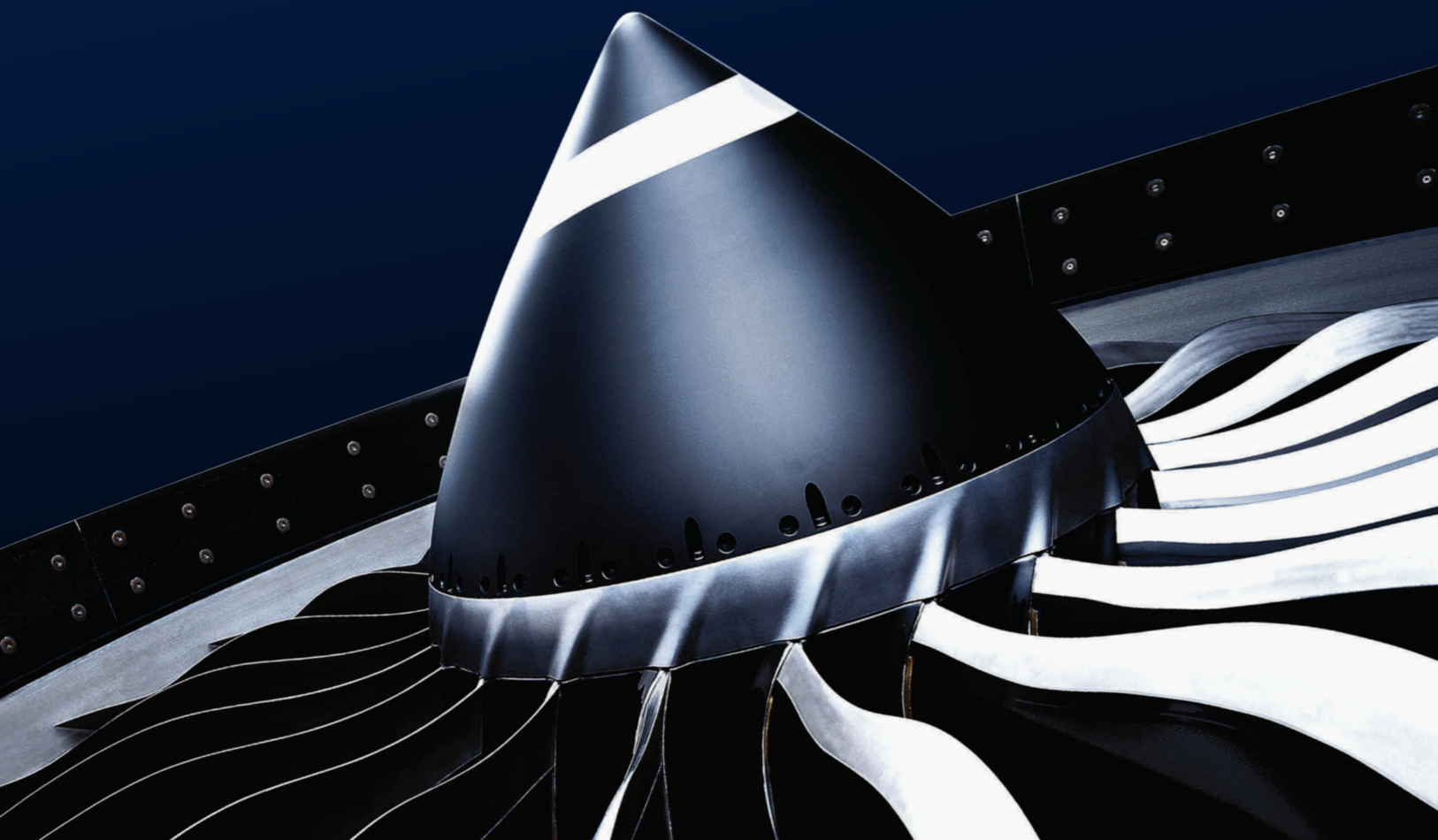


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PURPLE ART: Riyadh Air brought a Boeing 787-9 to the Paris Air Show, decked out in the new Saudi flag-carrier's distinctive indigo and lavender colour scheme.

PICTURE: BILLYPIX



BRINGING UP THE RIA

This year's Paris Air Show gave the world the first real idea of what the new national airline of Saudi Arabia will look like.

Alan Dron investigates.

One of the French capital's most expensive venues, the Hotel de Crillon, was the setting for what will be the first in a series of unveilings of aspects of the new Saudi flag-carrier, on the eve of the opening of the biennial salon at Le Bourget.

Riyadh International Air (RIA) plans to start services in early 2025. Although that date may seem some distance away, "That's a relatively short period of time when it comes to standing up what's probably the largest new full-service carrier in recent times," CEO Tony Douglas told journalists. "Probably nothing since Emirates in this scale of ambition."

That scale of ambition is absolutely required to support Saudi Arabia's Vision 2030 project to diversify its economy away from oil and gas, said the CEO.

The intervening two years until the first flight will be punctuated by a series of what Douglas calls "tease and reveals", when more details of RIA's planned services will gradually be unveiled.

However, RIA's creation is not only serving an ambition, but also a need. Its planned home hub, King Khalid International Airport, in the Saudi

capital, is notable in that 93% of its current flights are point-to-point services. In other words, there are very few onward connections.

This means that the capital's airport is badly under-served, a situation RIA intends to remedy. By 2030, the airline intends to be serving 100 destinations. Its first wave of routes will cover all of Europe and Asia's major capitals, Douglas said.

There will naturally be a build-up towards that goal: "Because we're a start-up by definition we'll need three aircraft at a minimum to start the first route. We'll start the minute we get three, and build progressively from that."

RIA placed a firm order for 39 Boeing 787-9s, plus 33 options, earlier this year and Douglas has said that a narrowbody order is anticipated imminently, although nothing was forthcoming at the show.

What was forthcoming was the first public viewing of the airline's striking indigo and lavender colour scheme on a Boeing 787-9 temporarily supplied by the manufacturer. The livery will mean that the airline certainly stands out among rivals on airport aprons.

Continued  on Page 14



The 'R' on the fin is a stylised version of the Arabic word for a bird.

PICTURE: BILLYPIX

CONTINUED FROM PAGE 13

Intriguingly, Douglas added that RIA would be rolling out a second colour scheme later this year, but he declined to go into further details.

Once passengers are on board, Saudi Arabia's new flag-carrier will aim to surpass the customer service standards set by other major Gulf carriers, according to Douglas.

Perhaps surprisingly, however, RIA will not offer a first-class cabin. This is in contrast with other airlines in the region such as Emirates, Etihad and Qatar Airways, which all offer one. The Gulf – and particularly Saudi Arabia – is one of the relatively few regions of the world where there are enough people with very high discretionary incomes to support first-class cabins.

"We won't go for first class, because for many airlines, first class is a sub-economic proposition when you're looking at financial stability," Douglas said. Often, according to airline insiders, the occupants of first-class cabins are people who have connections within the airline, or who are upgraded from business class. And, increasingly, for reasons of privacy, security and convenience, ultra-wealthy fly privately, by executive jet.

Instead, RIA says that it aims to offer new levels of comfort and facilities – in all cabins. "The standard we will represent and present will be of the highest order," Douglas said. "Think of the best ... and then add a bit."

Riyadh Air aims to become a super-connector, similar to Emirates, Qatar Airways and, increasingly, Turkish Airways. All three airlines have major connection hubs.

□□□□□

RIA will make use of the huge expansion scheduled for Riyadh's King Khalid International Airport (KKIA), as its hub. The new airline is a major plank in the planned growth of the country's aviation sector, which aims to triple passengers numbers at its airports to 350 million annually by 2030.

That connectivity will also apply domestically. With a population of some 38 million and a landmass roughly equal to half of western Europe, "We will be a global carrier, but we will absolutely connect within the Kingdom," Douglas said.

There has been much speculation about the future role of existing flag-carrier Saudia after RIA becomes operational. It has been suggested that Saudia will focus increasingly on religious tourism traffic.

However, from comments from RIA executives at the briefing in Paris, it seems that the new airline will seek to co-operate with Saudia, particularly when it comes to domestic services: "It will be a very close, well-organised relationship," said one senior member of the management team. Other Saudi carriers may also be involved in RIA's domestic network.

Douglas has also said previously that Saudia and RIA will be connected in some way that will make it even easier for travellers to move in and out of the kingdom. That process will be eased by



▼ **The standard we will represent and present will be of the highest order. Think of the best and then add a bit.** ▲
TONY DOUGLAS

PICTURE: BILLYPIX

the new tourism visa system, which can be applied for and approved online in a matter of minutes. This will help attract foreign visitors to the wide range of tourism attractions that are starting to appear, such as Al Ula, Neom and the Red Sea Global Resort.

The airline will be 'digitally-led', taking advantage of the fact that it is not bound by legacy processes and equipment. Saudi Arabia's young population has the highest use per capita of electronic devices in the world: "They expect to digitally interact with everything."

He has also previously noted that an indicator of national enthusiasm for the new airline was that, in slightly over two months from the opening of applications for staff positions, 336,000 had applied. More than 120,000 of the applications were from Saudi nationals, with 52% of them women.

"People are seeing this as a fresh, innovative brand. That's what's so exciting about it. It's a young, vibrant, digitally literate airline," said Douglas.

□□□□□

The company is building a highly-experienced management team. Douglas was previously Group CEO of Etihad, where he helped drag the company from making huge losses of \$1.5 billion to a profit in the space of four years.

He has attracted to Riyadh Etihad's former 'chief people officer', Ray Gammell, as chief corporate development and enablement officer and former Ryanair COO Peter Bellow to the same role with the new company. Vincent Coste, formerly chief commercial officer at Gulf Air, takes up that role with the new start-up.

In keeping with Islamic teachings, Saudi Arabia has long had a policy of not serving alcohol on board its commercial airliner fleet. Whether Riyadh Air will depart from that policy may seem trivial compared to the bigger picture of establishing an airline. However, in past years, travellers flying on Saudia or other Saudi airlines were almost invariably travelling to or from a Saudi Arabian destination and thus accepted the lack of alcoholic drinks.

However, if Riyadh Air plans to become a super-connector for flyers heading between Europe and the Far East, for example, the expectation of having a drink on board may become a more pressing matter.

Douglas is diplomatic on the matter: "We will conform to the [relevant] legislation at any point in time."

Douglas has previously admitted that he is in unknown territory in creating a new airline: "I had the most incredible five years with Etihad, doing a big transformation project. I've never done a start-up before. This, for me, is the most humbling and amazing experience in my career, but I guess the connection between the two airlines is that I've probably got a PhD in 'how not to do it'!" ▲

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LOW COST SUCCESS

SalamAir, Oman's fast-growing airline, is further expanding its network and joining the long-haul market. CEO Mohamed Ahmed told **Anuradha Deenapanray Chappard** that over the past two financial periods, the airline has made notable strides according to industry standards.

SalamAir in for the long haul

Reliability, affordability, and value-for-money service are the airline's utmost priority since the launch of its commercial operations in 2017. Pioneering low-cost carrier SalamAir is committed to pursue its growth in line with Oman's "Vision 2040".

Its strategic development plan aims at meeting the nation's growing demand for affordable travel options, generating further employment and creating business opportunities in various sectors in Oman.

Captain Mohamed Ahmed, CEO of SalamAir, said on its sixth anniversary: "We have achieved many milestones, survived, and overcome many adversities with grace and success. Starting very small, it's safe to say we have become a benchmark in the industry, and we couldn't have achieved it without the support of our customers and the die-hard supporters of our vision."

According to Ahmed, SalamAir has achieved a complete recovery from the pandemic with a significant increase in passenger numbers, revenue, and profitability.



Mohamed Ahmed: "It's safe to say we have become a benchmark in the industry."
PICTURE: SALEM AIR

During its first six years of operation, the airline has carried more than 7.5m passengers with a direct impact on tourism.

It lays emphasis on "omanisation" (standing at 65%) and is dedicated to strengthen employment opportunities.

In 2022, SalamAir generated an indirect economic impact of around 840 million Omani Rials.

SalamAir is dedicated to strategically and gradually growing its fleet. During the Paris Air Show 2023, the airline announced that it will introduce three Airbus A330neo aircraft on a lease from Avolon. The first deliveries will start next October.

"The decision to introduce the Airbus A330neo complements the existing fleet of Airbus aircraft, which includes the A320neo, A321neo, and an A321 freighter," said Ahmed. He added that the twin-aisle jet will enhance the airline's capacity to respond to the growing demand of the market and attract inbound tourists to Oman.



SalamAir's fleet caters for diverse market needs. As part of its commitment, its fleet consists of various aircraft types. It plans to introduce three Embraer E195-E2 aircraft, expected to be received by the end of the year. With purchase rights for six more E2s, SalamAir will be the first operator of this type in the Middle East.

"This strategic fleet mix underscores our strong belief in the growth potential of air travel and reaffirms our position as one of the region's leading low-cost carriers", underlined SalamAir's CEO.

He noted that SalamAir has been named Oman's most trusted brand for the second consecutive year and has secured IATA's operational safety audit registration.

According to Ahmed: "The IOSA programme enables SalamAir to benchmark its operation safety standards by improving its operational management and control systems."

He added that safety will be one of the key factors for the airline's "progress towards excellent service, in line with the trend of new and modern aviation worldwide."

SalamAir is determined to remain on the upward trend as a home-grown carrier to make its operations innovative, cost-efficient, and customer-centric.

"Together with a positive outlook and diligent efforts, we are confident in the bright future ahead for SalamAir and the aviation industry as a whole," he said. ▲

With the latest addition of Fujairah (UAE), SalamAir now serves a total of 39 destinations. The airline's domestic network comprises scheduled flights connecting Muscat, Salalah, Suhar, Duqm, and Masirah.

"We have successfully established strong links between Oman and neighbouring countries such as the UAE, Saudi Arabia, Kuwait, Bahrain, Qatar, Iran, Egypt, Sudan, and Lebanon," he told *Arabian Aerospace*.

The airline has expanded its operations to encompass various regions, including East Asia and, more recently, Europe.

Its network spans across Malaysia, Sri Lanka, Thailand, Turkey, Kazakhstan, Czech Republic, Azerbaijan, Bangladesh, Pakistan, Nepal, and India. "We remain dedicated to further expanding our routes, aiming to provide enhanced connectivity and seamless travel experiences for our valued passengers," Ahmed said.

Routes to seasonal destinations will be reopened this summer between Muscat and Baku, Beirut, Bursa, Sarajevo and Trabzon, which now has a year-round direct connection due to its popularity.

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Saudi Arabia's Flyadeal, the Kingdom's largest low-cost carrier, aims to treble its fleet and introduce widebodies by 2030.

Chief executive Con Korfiastis explained the strategy to **Mark Pilling**.

THE REAL DEAL?

Airline activity in Saudi Arabia is only heading in one direction – up - and strongly on that trajectory is the Kingdom's premier low-cost carrier Flyadeal. "By 2030 we plan to be a 100-aircraft airline," said Con Korfiastis, the Jeddah-based carrier's Australian chief executive, speaking to *Arabian Aerospace* at the IATA AGM in Istanbul in June. This is a trebling of its fleet from the 32 units expected to be in service by the end of 2023.

Korfiastis joined Flyadeal when it was founded in 2016 as a subsidiary of the Saudia group and a sister company of national carrier Saudia Airlines, becoming the country's first LCC.

Apart from a lull during the pandemic, Korfiastis has overseen rapid growth at Flyadeal with an expectation of carrying almost nine million passengers this year.

Much of Flyadeal's focus to date has been on establishing a local network from its three largest bases in Riyadh, Jeddah, and Dammam, said Korfiastis. The carrier has worked longer than expected on its domestic build-up simply because "we found such a big appetite for the low-cost product in Saudi Arabia," he said.

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"As quickly as the aircraft were arriving and we were deploying them domestically we were filling them," he said. "So, we thought, better to build the network here [in Saudi]. You can't really call yourself a national carrier if you don't have a comprehensive local presence."

While the domestic network was created more quickly than expected, Flyadeal delayed its international launch, said Korfiastis. The overseas push is now going full steam ahead.

"International was almost non-existent in 2021. We had a modest footprint in 2022 and now in 2023 we're more heavily investing in that," he explained. "Going forward, domestic is nowhere near mature and will continue to grow, but probably the majority of our additional fleet will go towards international from here on."

Over the past year it has added destinations such as Dubai, Cairo, Istanbul, Amman, and Kuwait City, and in March announced further expansion with 12 routes to European and regional destinations. This represents a 127% capacity increase in seasonal capacity compared with summer 2022.



Flyadeal: Taking off on a new adventure with its A320neo fleet. PICTURE: P PIGEYRE/AIRBUS

The services to Turkey's beach resorts, Montenegro, Bosnia, and Greece are its first routes to Europe and surely only the start of a larger European network.

"The market is there. The international strategy is that we start closer to home to begin with, but progressively go further and further away," said Korfiastis. Flyadeal's new-generation narrowbodies have the range to reach northern Europe, most of Africa, all the Gulf region, into the 'stans' in the north, and across to south Asia, and to Pakistan and India in the east, he noted.

"So all of those are places of interest over time. But obviously we are going step-by-step as the capacity and the aircraft arrive," he said.

Despite losing two years of growth because of Covid, Flyadeal, which turns six at the end of this year, is getting back on track.

"We went into a holding pattern for a while, but we grew through Covid. We went into it with 11 aircraft and came out of it with 27," said Korfiastis. It was boosted in 2021 with the opening of the domestic market and strong local tourism.

At present, Flyadeal's 28-aircraft strong fleet is entirely made up of Airbus A320 family types with 11 A320neos and 17 A320ceos in service and four more A320neos arriving by year-end. One of the A320neos is leased from Avolon with the other 20 leased from Avilease.

In November 2022, the Saudi Group signed a sale and leaseback deal for 20 A320neos with Avilease, which are Flyadeal aircraft from its order book. Avilease is a new player on the aircraft lease market, owned by the Saudi sovereign Public Investment Fund, and an important actor in the Kingdom's strategy to enter the air finance sector.

Flyadeal's remaining order stream direct from Airbus will see a further 10 A320neos to come, with five planned for delivery in 2024 and another five in 2025, said Korfiastis.

"We are also looking how to supplement these arrivals because we need more capacity in 2024, 2025 and beyond, so we'll be looking for additional aircraft, probably in the lease market," he explained.

This is in addition to the 20 A320neo order options Flyadeal has with Airbus. "We will for sure exercise the options, but we'll need more than that," said Korfiastis.

He is ready to take more A320neos from Airbus "as soon as we can get slots, wherever that is. And then we will need to add to the order book as well. So, I expect us to be adding to the order book and be in the leasing market." It will also look to the larger A321 and longer-range versions of the A321.

This growth plan will see Flyadeal reaching about 100 aircraft by 2030. Most will be narrowbodies, said Korfiastis, who added: "By then we will probably have a small sub-fleet of widebodies as well."

The airline is not in the market for widebodies yet, but Korfiastis sees a time for them as its network develops. "It's a combination of the sweet spot for the economics of a widebody versus a narrowbody and very thick routes."

Flyadeal, in common with Saudi Arabian Airlines, does not reveal financial information, but the carrier was "profitable in its second full year of operation," said Korfiastis. In years three and four, because of Covid, it went into the red but in 2022 it returned to the black and is on



▼ The international strategy is that we start closer to home to begin with, but progressively go further and further away. ▲
CON KORFIASTIS

PICTURE: BILLYPIX

track to be profitable this year, he said. "The opportunity is one of substantial growth, which means material and aggressive investment and capacity growth," said Korfiastis. "It's in line with where the national targets are. The Kingdom is looking to triple its passenger numbers by 2030."

"We belong to a strong group, and we have that backing," he added. "And we are holding our own. Through Covid we were able to keep our staff, not cut their salaries, and not really deplete our cash reserves. This shows that we've set up a pretty healthy company."

The carrier is benefiting from the rapid growth of the Islamic pilgrimage market. "The market has grown tremendously in 2023 driven by Umrah for the first three to four months of the year," said Korfiastis. "Now Haj season has started so we are moving into that peak."

"Following that, Saudi Arabia moves into its long summer season and school holidays, which brings a large outbound travel market," he said.

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Flyadeal is cashing in on strong demand for low fare travel in the Kingdom, which means it does not cannibalise sister carrier Saudia which is targeting a different passenger demographic.

"What we've seen since we came into the market is that we didn't fill our aircraft by stealing market share from the other two airlines [Saudia and Flynas]," said Korfiastis. "We actually grew the market."

Saudi Arabia's huge ambitions to bring in tourists demands not only growth among the existing players but new ones too, such as Riyadh Air, the new full-service carrier aiming to begin operating in 2025.

"The new national carriers that are coming along in Saudi Arabia are going to feature significantly in the targets that we have [in Saudi Arabia], and frankly, we're all going to grow tremendously to achieve those targets," said Korfiastis.

"We are rivals, but honestly, we are all proudly Saudi," he stated. "I've seen countries where there is fierce rivalry and almost animosity [between players] and that's not Saudi Arabia. The Kingdom's ambitions are bold, they are significant, and it is important to achieve a cohesive and collective eco-system, which is what we have." ▲



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Egyptair is focusing on restoring its operational capacity efficiently, and expanding its fleet and network. Chairman and chief executive Yehia Zakaria tells **Anuradha Deenapanray Chappard** why the group is looking for permanent solutions to counter the post-pandemic supply chain problems.

Step by step on the growth pyramid



PICTURE: EGYPTAIR

▼ We are recovering with a focus on the serviceability and availability of our aircraft as well as the expansion of our network. ▲
YEHIA ZAKARIA

Egyptair Group is bouncing back and returning to growth, buoyed by good indicators. It announced a profit of more than \$31 million for the first half of fiscal 2022-23.

Engineer Yehia Zakaria, who has been piloting one of the largest aviation groups in Africa since October 2022, said the Egyptian flag carrier did not lay off any workers or members of its teams during the pandemic, and has been focusing on "restoring our operation fast and efficiently".

"We are recovering with a focus on the serviceability and availability of our aircraft as well as the expansion of our network," he said.

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Egyptair's ambition is to increase the destinations it serves from today's 72 to 96, including Europe and Latin America (Brazil and Argentina in partnership with tour operator Master Flights). The New York route will also be enhanced.

Like other airlines, Egyptair is facing aircraft availability issues while manufacturers are battling to keep production lines going as the systemic problem of parts shortages persists.

Last February, the airline became the first African operator of the Airbus A321neo, taking delivery of the first of seven aircraft ordered.

Two Boeing 787 Dreamliners are expected to join the national carrier's fleet by end-2023.

"We have published a Request for Proposal (RFP) for 10 widebodies," said Zakaria. "We are also negotiating to acquire narrowbodies. We are looking for permanent solutions regarding plane acquisition and engineering as there are supply chain problems. We have to make fast decisions. Time is a very critical issue.

"There are many opportunities around the world. We must find profitable routes."

The airline returned to Manchester in July, having resumed flights to China (Beijing/Guangzhou and Hangzhou) in March after a three-year hiatus.

Zakaria sees "a lot of potential in China" and is "thinking about" Shanghai.

He added: "As for India, we already fly to Mumbai, and will now add Delhi to our network."

Its MRO division, Egyptair Maintenance and Engineering (M&E), is certified under the IATA Operational Safety Audit (IOSA) programme, and works with 136 airlines worldwide. "We provide maintenance services with international standards not only to the Egyptair, Air Cairo and Nile Air fleets, but also to other airlines such as Qatar Airways," said Zakaria.

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During last winter's MRO Africa exhibition, Egyptair M&E signed important agreements, including one with JAT Tehnika, a major MRO player in Europe, and a partnership contract with Jordan's Petra Aerospace in the field of repair and overhaul of CFM56-3 engines.

Egyptair takes pride in its training academy, which was the first training body in Africa to launch a simulator for the latest Airbus A320neo aircraft. It underlines its commitment to constantly improving its programme by integrating new technologies into its full set of training simulators.

The academy offers modern and diverse training programmes for pilots on A320, A320neo, A220-300, A350, A340 and Boeing B737-800, B777 simulators.

Egyptair intends to increase its cargo capacity to take full advantage of its geographic location, not far from the crossroads of Africa and the Middle East.

Egyptair Cargo introduced a B737-800SF converted freighter to its fleet of three A330-200P2F. This additional capacity of 21 tons per sector for the narrowbody and 55 tons for the widebody freighters will cater for the market needs and enhance the company's competitive advantage. It plans to introduce two more A330-200P2Fs by the first quarter of 2026.

Despite significant headwinds during recent years, Egyptair will not be privatised, Yehia Zakaria recently told CNN. "Egyptair is the flag carrier and the only bird carrying the flag of Egypt all over the world," Zakaria said, and "is not for sale." ▲



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Ambitious: Leaseback deals with Saudi low-cost carriers Flynas and Flyadeal have formed AviLease's initial forays into the marketplace.

PICTURES: AIRBUS



THE LEASE WE CAN DO...

Saudi Arabia's first aircraft lessor is growing and has ambitions to be a significant player in the leasing arena. **Alan Dron** investigates.

AviLease is typical of the huge scale of ambition that characterises Saudi Arabia's desire to create an aerospace sector that rivals that of Dubai. Having seen how aviation can act as an economic driver for a country, a major plank in Saudi Arabia's Vision 2030 programme to diversify its economy is the development of its aviation sector. This is taking several forms, most notably the creation of a new national airline, Riyadh

International Air (RIA), a huge expansion of Riyadh's King Khalid International Airport (to be renamed King Salman International Airport) and a cluster of huge holiday resorts on the Red Sea coast that will be served by new airports. One other piece in the jigsaw is the creation of an aircraft lessor, AviLease, which aims to have a portfolio of 300 aircraft by the end of the decade. While not the largest of the world's lessors, a company of that size will be a significant player in the marketplace.

AviLease has been created by the state-owned Public Investment Fund (PIF), which has said that AviLease will handle leasing, trading and asset management services. PIF is one of the world's largest sovereign wealth funds with its assets under management recently estimated at \$620bn. This level of financial backing will give AviLease significant financial firepower in the leasing world. AviLease's initial moves have been made through purchase-and-leaseback transactions with airlines, although portfolio acquisitions and direct orders from aircraft manufacturers are also planned. The focus primarily will be on new-generation narrowbody and widebody types.

PIF is prepared to use its financial strength to allow AviLease to gain scale quickly, with the leasing company on record as saying that it "will also look into expansions through corporate acquisitions." The establishment of AviLease is seen as an attempt to retain more value from the country's aerospace sector within Saudi Arabia, rather than by spending money on using foreign lessors. PIF has said that AviLease "will contribute to the reduction of value leakage for Saudi Arabia while enhancing integration into the global aircraft financing market". AviLease, as a fully-owned PIF subsidiary, is expected to use the PIF's liquidity and strong balance sheet, "combined with its depth of financing and investment-structuring expertise to ... leverage the opportunity in the aircraft leasing market".

In addition, the company will be supporting a thriving aviation sector and driving financial sustainability within the aviation ecosystem in line with Vision 2030." The company signed its first deal, for the purchase and leaseback of 12 Airbus A320neos to Saudi low-cost carrier Flynas, last year. That was followed in November last year by Saudia Group, owner of flag-carrier Saudia and low-cost carrier Flyadeal, signing a sale and leaseback agreement that will see it deliver 20 Airbus A320neo to Jeddah-based Flyadeal. The aircraft will be operated on long-term leases. "This sale and leaseback agreement with AviLease is an important deal for both companies, and an important step towards the realization of the Saudi aviation strategy," Saudia director-general Ibrahim Al-Omar

noted. "In the few months since it was launched, AviLease has already established itself as a key enabler of the Kingdom's aviation sector development." AviLease's chairman Fahad Al-Saif added: "Our partnership further cements AviLease's strong portfolio within Saudi Arabia by delivering next-generation aircraft solutions to locally based operators." That agreement took AviLease's portfolio to 32 aircraft and it was further increased in June this year by the acquisition of 13 aircraft, including seven Airbus A320neos, two Airbus A330neos and Boeing 737-8s, from fellow-lessor Avolon. It would be surprising if the leasing company was not also involved in securing aircraft for new flag-carrier RIA and other airlines within the Kingdom. ▲



Superdeal: The MoU signing for a state-of-the-art facility in Al Ain opens the way for assembly of the SuperJet 100. PICTURE: SUPERJET INTERNATIONAL

A TWIST IN THE

Dubai-based Mark AB Capital Investment (Mark AB) has acquired its entire stake in SuperJet International from Russia's United Aircraft Corporation (UAC) which manages the SuperJet 100 regional jet programme. Will this acquisition enable the United Arab Emirates to finally get this regional plane to take off? The relaunch plan drawn up in the wake of this deal looks like a good omen for the aircraft. "This agreement has a great value for our company, as the interruption of industrial and commercial relations with UAC will allow the company to no longer be burdened by the limitations resulting from the sanctioning regulations set by the European Union," said Camillo Perfido, CEO of SJI. The SSJ100 entered into service in 2011 by Sukhoi in collaboration with the Italian Finmeccanica and various manufacturers including the Safran group, Leonardo and Thales. It had around 15 operators, mainly Russians, including Aeroflot, Rossiya and

TALE FOR THE SUKHOI SUPERJET 100

Armavia, Cityjet (Europe) and Interjet (Mexico) operated the SSJ100 internationally. Seven years later, the SSJ100 was struggling to find customers beyond Russia in a competitive market. An accident that occurred in May 2019 during a forced landing at Sheremetyevo Airport in Moscow gave a severe blow to the commercial future of this regional aircraft. The outbreak of the Russia-Ukraine conflict sidelined the SSJ100 on the international market. In March 2022, EASA suspended the certificates of several Russian aircraft including the SSJ100 and future applications, such as the Irkut MC-21. The sanctions includes Russian aircraft and airline access in Europe as well as spare parts and flight simulators produced in Russia. The Italian government has also frozen €146m (\$159m) of SJI's assets, including four SSJ100-95s. The entry of a new shareholder, and the unfreezing of SJI's shares and assets, represent mandatory prerequisites according to SJI, without

which the relaunch plan cannot be implemented. This relaunch plan scribed by SJI and Mark Capital AB envisions investments of €190 million, of which €110 million at the Venice site. This investment will support the development of new aircraft configurations, the construction of the new SJI branch in the UAE, as well as the continuous development of the aircraft to address market competition. Sales forecasts are estimated to be 240 aircraft at a minimum, in different versions: passenger, business jet and cargo, mainly for the UAE and Indian markets. Abu Dhabi Investment Office is leading the collaboration with Mark AB Capital Investment and SuperJet International at an industrial level to uphold the development of the civil aviation industry in the UAE. A state-of-the-art facility in Al Ain, Abu Dhabi and transfer of know-how and technologies underpin the plan. According to the MoU signed between the parties

last May, SJI will establish a new final assembly line for regional aircraft in Al Ain by mid-2025. In parallel, SJI will set up a new supply-chain for aerostructure work packages in Italy and the UAE by 2026. Information gathered in the press show that Russia is investing in a 100% Russian regional aircraft like the SSJ100 by replacing all the parts and sub-assemblies resulting from Western manufacturers cooperation. Markab Capital will also help in training and capacity building of UAE nationals in the civil aviation industry as part of its strategy. The UAE aviation industry is gradually gaining momentum. Government initiatives and investment in the aerospace industry is driving robust demand for business partnerships and helping the UAE outpace other regional markets. The UAE has successfully manufactured aircraft components and is entering a new era in assembling, installing and aircraft manufacturing. ▲ ANURADHA DEENAPANRAY CHAPPARD

EGYPT SPHINX AHEAD

Egypt is investing markedly in upgrading its airports in line with "Egypt Vision 2030" to sustain economic growth and tourism. **Anuradha Deenapanray Chappard** reports.



With more than 97m inhabitants, Egypt is the third largest country in Africa in terms of population and the second most visited on the continent (more than 7.9m people last year). It is a popular tourist destination for global travellers, especially from Europe and the Middle East.

Designed in accordance with the UN Sustainable Development Goals (SDGs), "Egypt Vision 2030," and the National Climate Change Strategy (NCCS) 2050 aim to achieve a "comprehensive renaissance", leveraging the country's location, its history, its people and sectoral investments.

The Egyptian authorities have undertaken significant expansion and modernisation works during the past years at the country's main gateways: Cairo, Hurghada, Sharm El-Sheikh (connecting the south-Sinai region) and Alexandria Borg El Arab airports (serving the famous tourist sites around Alexandria and the Nile delta).

Egyptian prime minister Moustafa Madbouly recently told the media that his cabinet would give priority to the civil aviation sector.

He said that Sphinx International Airport was particularly important because of its proximity to the Giza plateau, into which the government of president Abdel Fattah El Sisi has invested millions to attract large numbers of tourists.



The new Sphinx International Airport, in service since last December, aims to reduce pressure and congestion at Cairo International Airport (15 million passengers before the Covid-19 crisis). The first flight was operated by the low-cost carrier Air Cairo.

Located on the desert road between Cairo and Alexandria, 45km from the pyramids of Giza, the airport is mainly dedicated to tourism. It covers a surface area of 4,000 sqm for its main building and 24,000sqm for the whole building with an annual capacity of 1.2m passengers per year.

The airport will boost one-day tourist programmes through a better access to archaeological sites for tourists, including the new Great Egyptian Museum of Giza.



TOURIST HUB: The Sphinx International Airport aims to reduce pressure and congestion at Cairo International Airport. PICTURES: EGYPTAIR

New domestic and international flights will also facilitate connections with the Red Sea resort, especially Sharm El-Sheikh and Hurghada.

Sphinx Airport is not an alternative to Cairo International Airport, but rather a higher value-added facility serving Egypt's air transport, civil aviation minister, Mohamed Abbas, underlined during the reopening ceremony.

Apart from flights to Luxor, Aswan, Hurghada and Sharm El-Sheikh, Sphinx Airport is attracting new airlines and new destinations.

According to Ahmed Mansour, chairman of the board of directors of the Egyptian Airports Company, expansion plans are meant to boost tourism and support the significant recovery in air traffic at Sphinx Airport during the summer period.

The airport is now an indispensable platform within the route development strategy of emerging airlines and dynamic markets like Saudi Arabia, the world's second fastest-growing economy.

Kuwait's low-cost carrier, Jazeera Airways, which operates from Kuwait International Airport has added Sphinx Airport as its

seventh Egyptian destination after Alexandria, Assiut, Cairo, Luxor, Sharm El-Sheikh and Sohag international airports.

"With four flights a week to this great leisure destination, we also offer a convenient and affordable travel option for Kuwaiti students studying in the country as well as the Egyptian ex-pat community visiting families back home", says Jazeera Airways CEO, Rohit Ramachandran.



Flynas also announced three weekly flights from Jeddah to Sphinx in June and three weekly flights from Riyadh as from July 2023. Sphinx Airport represents its fifth destination in Egypt.

"We already connect Egypt to the kingdom with more than 100 weekly direct flights, and the operation of direct flights to Sphinx International Airport pushes Flynas' expansion plans in the Egyptian market to a new level", points out Bander Almohanna, CEO and managing director of Flynas.

Wizz Air, which has a well-defined strategy to tap MENA markets, is now operating four weekly flights to Malpensa, Milan, Rome and Venice from Sphinx Airport.

As the third largest economy in the Arab world and a leading player in the MENA region, Egypt is fully committed to fuelling its economic development through massive investment and marketing. These solid groundworks, including the airport infrastructure, are undoubtedly vital for a sustainable rebound. ▲

The state-of-the-art Emirates Flight Training Academy (EFTA) is located at Al Maktoum International — Dubai World Central Airport (DWC).

David Oliver takes a closer look.

CADETS LAND ON THEIR FEET

EFTA includes 36 classrooms, next-generation CAE simulators, and a fleet of 30 Cirrus SR22 G6 single-engine, twin diesel-engine Diamond DA-42VI and Embraer Phenom 100EV very light jet (VLJ) aircraft.

It also has a 1,800-metre dedicated runway with navigation aids and lighting, an independent air traffic control tower, rescue and firefighting service, and a maintenance centre.

The academy utilises highly-interactive theoretical learning in classrooms using advanced digital content and immersive virtual reality (VR) technology. It uses experiential learning through hands-on instruction on modern training aircraft, the use of advanced flight simulators, and airline-focused line-oriented flight training.

EFTA has also established an innovative approach to training cadets, from learning to fly the Cirrus SR22 and DA-42 aircraft to progress to the Phenom 100EV VLJ aircraft, providing cadets with more experience on jet aircraft.

The last batch of cadets that graduated in December 2022 clocked up more than 6,000 flying hours during their training.

Cadets at EFTA graduate with a commercial pilot licence (CPL) on a multi-engine aircraft with instrument rating. The airline transport pilot licence (ATPL) programme is a comprehensive course that includes ground school, line-oriented flight training (LOFT), multi-crew cooperation



(MCC), and single-engine and multi-engine flight training. Over a course of two years, cadets will take part in five days of in-person and computer-based training every week, as well as self-study.

The total training duration for cadets ranges between 21 and 24 months.

The Emirates-sponsored national cadet pilot programme for aspiring young UAE pilots also takes place at EFTA. The 36-75 week phase one of the cadet's training course includes English, aviation English and aviation science courses.

Phase two takes place in Spain for 18 months and includes approximately 225 hours of flight experience. On successful completion, the cadets will receive a course completion certificate and an airline transport pilot licence (ATPL). The third phase takes place in Dubai and upon completion they are qualified to fly Emirates' large jet aircraft. ▲

HIGH FLYER: One of EFTA's three new twin-diesel engine Diamond DA-42VI trainers. PICTURE: DIAMOND AIRCRAFT

INSET: An EFTA Cirrus SR22 G6 single-piston engine trainer. PICTURE: EFTA

MOROCCO'S ROLE IN EASING THE SKILLS SHORTAGE

Morocco's vibrant aeronautical platform is ready to respond to the ramp-up of production required by major global manufacturers, thanks to a proactive training policy.

The first edition of the Aerospace African Forum held in Casablanca last February was tangible proof that the Moroccan aeronautical industry is back.

This dynamism is a source of satisfaction for the kingdom, which is addressing the training issue with efficiency.

Ryad Mezzour, minister of industry and trade, said: "The best news for me in a country that has a very competitive platform in the aerospace industry is that we need more aircraft. We are ready to produce with the best quality and at the best prices. Huge opportunities are opening up to us."

The vitality of Moroccan industry is linked to a forward-looking training policy. Training institutes like IMA and ISMALA are at the heart of the aeronautical ecosystem in Morocco. This target-driven policy, presented by the president of Rabat University Noureddine Mouaddib during the MEBAA Airshow in Marrakech in 2019, has since been strengthened.

According to Mouaddib: "There can be no



Upskilling: IMA offers tailor-made qualifying training in specific fields at its training centre in Morocco. PICTURE: PVA SERVICES.

development without qualified human resources, fully-equipped with the skills required in such a cutting-edge field as aeronautics. It is vital to train to perform."

IMA offers tailor-made qualifying training in specific fields in line with needs of manufacturers: boiler making, composite assembly, machining and electrical systems. It also provides in-service training. Students are immediately operational as they spend half of their training at the institute and the other half in the industry.

"Manufacturers come to see us for specific skills. A programme is then set up to meet their needs," said Patrick Ménager, IMA's general manager.

"As such, they can more easily transmit the required skills and know-how to enable students to respond to all situations within the company and to meet the high level of quality expected.

"We are clearly able to meet and adapt to the needs of manufacturers based in Morocco. It is really a win-win approach," said Patrick Ménager.

IMA conducts various campaigns and competitions to identify the best talent in all regions of Morocco. The institute has trained more than 13,000 young people since it was set up 12 years ago. ▲

ANURADHA DEENAPANRAY CHAPPARD

READY FOR ACTION: With their engines running all three UAEAF&AD Lockheed Martin F-16E/Fs get set to taxi out for a morning mission. The F-16s were the only aircraft seen with weapons at "Anatolian Eagle". The nearest jet is fitted with two high-speed anti-radiation (HARM) training missiles.

PICTURE: ALAN WARNES



LIFT-OFF: A QEAF Eurofighter Typhoon, one of five at "Anatolian Eagle", leaves the Konya runway on another mission.

PICTURE: ALAN WARNES



BOLD EAGLE

Fighters of the United Arab Emirates Air Force and Defence recently ventured into Europe for the second time in six months to attend joint manoeuvres in Turkey. **Alan Warnes** reports.

The prelude to the main event occurred when four Lockheed Martin F-16E/Fs – the most modern fighters in the UAEAF&AD – attended "Exercise Volfa" at Mont de Marsan, southern France in October 2022. While there, they worked with not just the French Air and Space Force but also several other NATO nations including Greece.

Then, in late April, four Lockheed Martin F-16E/Fs deployed to "Exercise Anatolian Eagle" in central Turkey – an event taking place annually at Konya Air Base, officially known as the third main jet base – for two weeks of manoeuvres that ended on May 12.

The Turkish Air Force has incredible facilities and ranges at Konya, covering 50,000 square miles. The vast area is made up of two major exercise areas, over land and in the sea, south-west of the Turkish holiday resort, Izmir. There were the usual scenarios acted out – air-to-ground, air-to-air and maritime.

The objectives of "Anatolian Eagle" are very similar to most other international exercises, allowing the participants to train in composite air operations (COMAO), time-sensitive targeting (TST), dynamic targeting (DT), high-value airborne asset protection (HVAA-P) and anti-surface forces air ops (ASFAO).

In addition, experiences were exchanged among the participating nations.

The UAEAF&AD feels it needs to send fighters to other countries, not just to learn

but to allow younger pilots to gain the experience of working in an international arena.

While the UAEAF&AD's "Exercise Desert Flag" is a regular US "Red Flag" style drill, occurring annually at Al Dhafra in UAE's desert, it might not give the true sense of international ops, operating in the desert under sunny skies. Flying in France and Turkey, though, opens the eyes of younger pilots to new experiences not just militarily, but culturally too.



Of the two UAEAF&AD Lockheed Martin F-16Es and two dual-seater F-16Fs that were present at "Anatolian Eagle", one single-seater spent all its time in a maintenance hangar during the three days I was there. One of the dual-seater F-16Fs never flew either – leaving all the work to the other pair.

Intriguingly, the UAE F-16s were the only aircraft carrying any type of air-to-ground weapon – albeit a training round.

According to one senior officer at the exercise, that was all down to personal choice. "If an air force requests to bring such weapons then they can, but most of the fighters simulated the dropping of bombs through their onboard systems," he said.

All three UAE F-16s on the flight line were fitted with sniper targeting pods, to both monitor the ground and to laze for laser-guided bombs. Two F-16s were carrying HARMs (heat-seeking anti-

radiation missiles) for destroying or suppressing enemy air defence (DEAD/SEAD) radars and a third was armed with an AGM-65 maverick for ground targets.

The UAE probably wanted to train their pilots in SEAD/DEAD and close air support (CAS) roles, and for the latter mission the sniper on board would be extremely valuable. By being able to visually identify the target through the sensor, before 'firing' the maverick.

The F-16F on the first day flew with just AIM-9 Sidewinders for air defence, but by the second day had been fitted with a pair of AGM-65 mavericks, presumably from the jet in the maintenance hangar.

None of the F-16s flew with ACMI pods, so it's unclear how they were tracked during the 'air war' – maybe by integrated onboard systems.

Another Arab nation to send fighters to "Anatolian Eagle" was the Qatar Emiri Air Force, taking five brand new Typhoons supported by BAE Systems ground crews.

The Qataris are not new to "Anatolian Eagle" – having sent Dassault Mirage 2000s in 2014 and Dassault Rafales in 2021, while Lockheed Martin C-130Js, Boeing C-17As, and during the recent "Anatolian Phoenix" helicopter exercise in June, sent NH Industries NH90s and Boeing AH-64Es.

Two years ago in a joint statement both Qatar and Turkey announced they would be setting up a joint training centre at Konya, that would include Dassault

Rafales but nothing has been heard since. The question fell upon deaf ears when the author enquired during this year's "Anatolian Eagle".

Clearly with little air space in Qatar, and a burgeoning combat fighter force, the QEAF are looking at all options to fulfil their tactical flying needs. So Konya with its massive ranges, over land and sea, and just a short flight from the Middle East is an ideal location.

The Pakistan Air Force, which regularly works with Saudi, Qatar and the UAE air forces in international exercises, has reaped major benefits from sending their fighters and personnel overseas over the past 20 years, and now others are doing likewise.



The PAF detachment commander, air commodore Asad Khan said: "We come here to learn, and if the pilots and aircrews only learn one thing it has been worth it."

While the UAEAF&AD and QEAF are shy of the media, they would have voiced similar views.

Qatar's five brand-new Eurofighter Typhoons, included a pair of dual-seat Typhoon Ts. The aircraft have been in service since August 2022, although the first dual seater did not reach the new base at Tamim Air Base until November 2022, where they are operated by number seven squadron.

This was the first overseas mission outside of the Middle East – having

attended the "Spears of Victory" exercise in Saudi Arabia in February.

All the jets were fitted with QEAF air combat manoeuvring instrumentation (ACMI) pods under the right wing and an AIM-132 ASRAAM (advanced short range air-to-air missile) for self defence under the left wing.

All five Typhoons flew on the second and third day of the author's visit. At the end of the exercise, colonel (pilot) Faisal Khaled Al-Ghanim, commander of the QEAF, said: "This joint exercise is part of the pre-prepared training programmes, and aims to develop and refine the skills of air crews, technical and administrative and support their readiness, in addition to raising the level of interoperability between friendly forces."

Clearly both the QEAF and UAEAF&AD went to "Anatolian Eagle" to learn, that was evident from the two dual-seaters that both sides brought.

Another plus is that the ground crews and aircrews would have experienced operations in another country, flying, working and mixing socially with personnel from other countries.

Unfortunately, the Royal Saudi Air Force which were expected to bring Boeing F-15 Eagles of some description, cancelled their attendance a week or so before the exercise started, which would obviously have been a blow to the Turkish Air Force. No reason was given, but two weeks earlier RSAF Eagles had visited Turkey's nemesis, Greece, for "Exercise Inichios" at Andravida. ▲

INTERNATIONAL FORCES LINK UP FOR COMBINED OPS

It has been a busy year so far for some of the Middle East air forces. In addition to their own national duties several have been involved in exercises both overseas and domestically.

The Royal Saudi Air Force launched its first "Spears of Victory" exercise in February 2022 attracting Pakistan Air Force Lockheed Martin F-16C/D block 52s from number five 'falcons' squadron (which were also at "Anatolian Eagle" this year) and Chengdu Aircraft Corporation (CAC) Pakistan Aeronautical Complex (PAC) JF-17s from 14 'tail choppers' squadron.

This now look set to be an annual event at Dhahran-King Abdulaziz Air Base because a second "Spears of Victory" took place in February, attracting a lot more air forces.

In addition to the RSAF hosts assets, that included six squadron Boeing F-15S/SA Eagles, seven squadron BAE Systems Tornados, 10 squadron Eurofighter Typhoons and 13 squadron Boeing F-15C/Ds, Bahrain brought Lockheed Martin F-16C/Ds, Jordan participated with Lockheed Martin F-16AM/BMs, and Qatar were flying its Eurofighter Typhoons.

That was quite an impressive collection of local air forces and guests which saw them working in combined air operations (COMAOs) with the Pakistan Air Force F16A/Bs from nine squadron and JF-17 Thunders of 26 squadron, RAF Typhoons, Greek F-16C/Ds and USAF F-16C/Ds.

One notable absentee was the UAEAF&AD, which hosts their own "Desert Flag" exercises at Al Dhafra, and probably feel there was nothing new for them at "Spears of Victory". The RSAF also sent Typhoons to "Exercise Cobra Warrior" in the UK during March, where it qualified weapons instructors. ▲

While much of the USA's focus has shifted to Europe – and specifically to Russia's war in Ukraine and also to long-term competition with China in the Indo-Pacific – the US remains committed to the US Central Command area of responsibility in the Middle East/South West Asia. But while the US is still supporting its allies and partners in the region, there are some signs that it plans to do so with fewer based-force elements – and by changing the aircraft types deployed and/or the scale and duration of deployments. **Jon Lake** takes a closer look.

Has the US lost its bite?



Despite a January 2023 visit to the region by US Air Force chief of staff Charles Q. Brown Jr, which included “key leader engagements in multiple countries”, many believe that they can see evidence of a reducing commitment, with permanent rotational deployments giving way to ‘flying visits’ by small ‘bomber task force’ elements, and shorter and non-continuous fighter deployments. This, it has been suggested, forms part of a broader strategy of maintaining a more modest US presence in the region in order to free-up resources for countering Russia and China.

US Air Forces Central (AFCENT) is continuing to support the ongoing campaign against Deash (the so-called Islamic State's self-declared caliphate in Iraq and Syria) as part of Operation Inherent Resolve, and is also facing increasing threats from Iran and its

proxies, including missile and drone attacks against US bases in Iraq and Syria. This occasionally includes retaliatory air strikes – for example when US forces were attacked by Iranian-backed militias using loitering munitions on March 23, USAF Boeing F-15Es flying from al-Udeid air base in Qatar mounted precision airstrikes against them.

At the Air Force Association's Warfare Symposium, the commander of AFCENT, Lt. Gen. Alexis G. Grynkeiwich, said that “We've seen an increase in Russian air activity where there was a pause.” He said that Russian operations picked up at the end of February, and that Russia had become increasingly belligerent towards US forces in the region.

Previously struggling to meet a requirement to base two and a half squadrons of fast jets in the region, the USAF augmented the Lockheed Martin F-

JAW DROPPING: A-10C Thunderbolt of the 23rd Wing deployed to Al Dhafra in April, boosting US fighter numbers in the region and allowing ‘higher end fighters’ to deploy elsewhere.

PICTURE: US AIR FORCE

16s at Prince Sultan Air Base at Al Kharij in Saudi Arabia and the Boeing F-15Es at al-Udeid by deploying a squadron of Fairchild A-10C Thunderbolt IIs to the 380th air expeditionary wing at Al Dhafra Air Base, in the United Arab Emirates in April 2023.

As well as ‘beefing up’ force levels, and compensating for aircraft being deployed elsewhere, the arrival of the A-10C afforded an opportunity for the ninth air force (Air Forces Central) to experiment with close air support (CAS) capabilities and to achieve a more robust, diverse force.

Critics argued that deploying A-10s to the Middle East in the place of more capable multi-role fighters would undermine the confidence of US regional allies.

The US has sought to reassure its allies in other ways, stepping up the scale and frequency of exercise – such as the

massive bilateral Juniper Oak live-fire exercise with Israel in January involving more than 100 American aircraft. The USAF has also stood up Air Forces Central's task force 99 which will apply autonomous solutions and artificial intelligence to bolster traditional platforms.

The USAF has also increased bomber task force missions in the region, most recently deploying a pair of Boeing (Rockwell) B-1B Lancers over the US Central Command area of responsibility, where they exercised with five partner-nation air forces and other coalition forces.



The B-1Bs, from Dyess Air Force base's ninth bomb squadron, had been forward deployed to Royal Air Force Fairford in the United Kingdom from where they flew a mission on 7/8 June using multiple weapons types. The two aircraft practised weapons employment against multiple simulated targets during the mission, dropping live GBU-38 joint direct attack munitions (JDAM), as well as an AGM-158A joint air-to-surface stand-off missile (JASSM).

US Air Force Lt. gen. Alexis Grynkeiwich, ninth air force (air forces central) commander, and combined forces air component commander for US Central Command said that: “These bomber missions represent the US's commitment to our partners and showcase our ability to deliver overwhelming power at a moment's notice,” he said.

Further action was undertaken after what general Grynkeiwich called “Russian unprofessional behaviour in the air”, with more frequent instances of armed Russian aircraft engaging in the ‘harassment’ of US ground forces, and attacking US-supported opposition forces. There were also said to have been 63 violations of established deconfliction protocols between March 1 and April 19.

In response, the US deployed Lockheed Martin F-22 Raptors from the 94th Fighter Squadron at joint base Langley-Eustis in Virginia to Muwaffaq Salti air base in Jordan in mid June. ▲

UK TYPHOONS FORGE STRONGER LINKS IN THE MIDDLE EAST



MAGIC MOMENT: One of No.12 Squadron's Qatari pilots after an exercise Magic Carpet sortie in Oman. PICTURE: ROYAL AIR FORCE

The UK's growing engagement in the Middle East is progressively spreading outside the GCC, though its Gulf allies remain both vital and valued, reports **Jon Lake**.

This was apparent in the high-profile Saudi participation in the UK-hosted multi-national Cobra Warrior exercise in March 2023, which saw Royal Saudi Air Force Typhoons operating from RAF Coningsby.

This followed the signing of a new defence co-operation plan between the UK and Saudi Arabia by Saudi defence minister Prince Khalid Bin Salman, (the younger brother of Saudi crown prince Mohammed Bin Salman) and his British counterpart, UK secretary of state for defence, Ben Wallace.

Saudi plans to procure 48-72 further Eurofighter Typhoons remain held up, however, although the integration of Leonardo's European common radar system (ECRS) mark two radar and a new large-area display (once thought to be a ‘sticking point’) are now well under way. Though there were reports that a German ban on exports to the Kingdom had been overturned, it is understood that this remains a concern when it comes to further Typhoon orders.

It is a happier story when it comes to defence co-operation with Qatar. Following the successful deployment of the joint UK-Qatar Typhoon squadron (number 12 Squadron) to Qatar under Exercise Thariyat (including defence of the football world cup as Operation Shadowfoot), the UK Royal Air Force and Qatar Emiri Air Force (QEAF) have signed an agreement to extend their joint



SIX APPEAL: Personnel from No.6 Squadron, RAF with their No.6 Squadron RJAF hosts at Muwaffaq Salti Air Base in Jordan on Exercise Agile Oryx. PICTURE: ROYAL AIR FORCE

Typhoon operations for the next two years. Following this deployment, in February 2023, No.12 Squadron completed the two-week ‘magic carpet’ exercise at Thumrait in southern Oman, operating alongside Omani Typhoons and F-16s. UK relations with Oman remain close, and some expect a further Typhoon order from the sultanate, while plans for more UK training in Oman are already bearing fruit.

Outside the GCC, British military forces participated in the ‘olive grove’ series of joint military exercises alongside the King Faisal II/16 brigade, a unit of the Jordanian armed forces. These were held in and around the Abu Salem urban training village, east of Amman, during February and early March.



MILITARY

CONTINUED FROM PAGE 31

In April, it was the turn of the RAF Typhoon force, whose number six squadron, 'the flying can-openers', deployed to Muwaffaq Salti Air Base in Jordan on exercise Agile Oryx.

Normally based at RAF Lossiemouth in Scotland, number six squadron has long-standing ties with Jordan, and of operating in the Middle East. The squadron is unique in having two royal standards, having been awarded a second standard by King Abdullah I of Jordan in October 1950.

Subsequently, King Hussein was the honorary air commodore of six squadron, and in 1995 the Jordanian number six squadron and the British number six squadron became sister squadrons, exchanging flags of friendship.

His royal highness Prince Faisal, Hussain's son and a Royal Jordanian Air Force pilot (and later RJAF commander), was instrumental in joining the two squadrons because he knew that co-operation would benefit both air forces.



Prince Faisal is the son of a British mother (princess Muna Al Hussein), who was born Toni Avril Gardiner.

After gaining his RJAF wings in 1985, Faisal underwent officer training and basic flying training at RAF Cranwell in 1986 before moving to RAF Valley where he completed advanced flying training on the BAE Systems Hawk and received his RAF wings in 1987. Later that year, Faisal completed RAF fast jet training at the tactical weapons unit at RAF Chivenor in Devon.

Brigadier-general Mohammad Hiyasat, the commander of the Royal Jordanian Air Force said: "The strength of the RAF and Royal Jordanian Air Force is the sense of shared history and co-operation we engender which informs the ethos that we have. We must continue on a path of shared experience and maintain our strong ties."

Agile Oryx saw the units involved developing dynamic force employment, conducting dissimilar fighter integration and developing their combined operating procedures.

The Jordanian units participating were numbers one and six squadron, Royal Jordanian Air Force equipped with the Lockheed Martin F-16.

Later in April, RAF Typhoons quietly participated in the Israeli 75th independence day flypast, alongside Luftwaffe and Italian Typhoons and USAF Lockheed Martin F-16Cs, as well as a host of Israel Defence Force/Air Force types. ▲



In demand: The Bell 505X Ranger. PICTURE: BELL

RANGERS RING THE BELL FOR THE ROYAL BAHRAIN AIR FORCE

Royal Bahrain Air Force has received three Bell 505X Ranger training helicopters from Bell, together with a training, tooling, and spares package.

Bell delivered the aircraft during an inspection and acceptance event in February 2023 at Bell's Mirabel, Canada, facility.

The Kingdom of Bahrain joins a number of other regional operators using the Bell 505 as their advanced military training helicopter of choice.

The Horizon international flight academy in the UAE operates 12 Bell 505s, while the Royal Jordanian Air Force signed an agreement for 10 Bell 505s in November 2022.

More than 30 Bell 505 helicopters are in service

throughout the Middle East and Africa. Additionally, The Bell 505 is also in use as a military training helicopter with the Montenegro Air Force, Republic of Korea Army and Republic of Korea Navy, the Jamaica Defence Force and the Japan Coast Guard.

Bahrain is a long-standing operator of the Bell 212 and various versions of the AH-1 Cobra attack helicopter. Sameer Rehman, Bell's managing director, Africa and Middle East, said that the company was: "Honoured to provide the Bahrain Defence Force another premiere Bell asset to train the next generation of Bahraini pilots."

"Generations of Bahraini pilots have flown in Bell helicopters, and the Bell 505 will continue the tradition of excellence for years to come," he said. ▲

HALCON PARTNERS WITH RHEINMETAL ON OERLIKON MSU

Edge-entity Halcon has partnered with Swiss-based Rheinmetall Air Defence to develop and qualify the advanced Oerlikon multi sensor unit (MSU), which is a truck-mounted, remote-controlled, rapidly-deployable sensor unit that forms part of the Oerlikon Skynex air-defence system.

Skynex also incorporates Halcon's Skyknight counter rocket, artillery, and mortar (C-RAM) missile system.



The MSU uses a 4D-active electronically-scanned array (AESA) search radar.

This has a field of view of 360° and can automatically classify detected targets and hand them over to the most suitable anti aircraft gun or missile launcher

autonomously or by the push of a consent button.

Marco Parisi, sales director at Rheinmetall Air Defence, has said that the collaboration: "shows both companies' commitment to providing the UAE with leading-edge air-defence systems.



The Oerlikon Skynex air-defence system, paired with Halcon's SkyKnight missile, is the ideal solution for the protection of UAE's most vital infrastructure."

Development and qualification of the MSU will be undertaken in Switzerland, while initial production will be carried out in Switzerland and Italy, before transferring to the UAE. ▲

TURKEY POD FOR IRAQ L-159

Iraq has integrated the Turkish Aselsan Aselpod airborne targeting system on its Aero L-159 advanced light combat aircraft (ALCA).

The Aselpod is a targeting and navigation pod originally developed for Turkish air force McDonnell Douglas F-4E 2020 and Lockheed Martin F-16C fighters.

It has since been integrated on the Chengdu J-10C fighter for the Pakistani and Nigerian Air Forces. ▲

This year's Dubai Airshow will highlight how technology is changing the industry with artificial intelligence, cyber security, blockchain solutions and advanced aerial mobility. **Marcelle Nethersole reports.**

TOMORROW'S WORLD

The Future of the Aerospace Industry is the theme of this year's Dubai Airshow, which is set to take place November 13-17 2023 in Dubai World Central (DWC), Dubai.

Advanced aerial mobility (AAM) will have a big focus as it is expected to be a pivotal year for the market as disruptive methods of aerial transportation are fast becoming the future of aviation.

With the global market expected to be valued at \$16.81bn in 2025, and reach \$110.02bn in 2035, registering a compound annual growth rate (CAGR) of 21.7%, the rapid growth is seeing an influx of new inventive air freight and passenger transport solutions – along with new regulations, resources and infrastructure.

Earlier this year His Highness Sheikh Mohammed Bin Rashid Al Maktoum, vice president and prime minister of the UAE and ruler of Dubai, announced that air taxis will begin flying in Dubai within three years.

He also approved plans to develop 'vertiports' as part of the Emirates' future air mobility infrastructure network to ease the mobility of individuals across urban areas in a safe, smooth and sustainable manner, with terminal design concepts now being worked on.

Meanwhile, the UAE General Civil Aviation Authority (GCAA) and the Mohammed bin Rashid Aerospace Hub (MBRAH) at Dubai South announced an agreement to establish the world's first AAM integrator world centre in Dubai, with the world's first ever vertiport certification process now underway as part of the project.



Tim Hawes, managing director of Tarsus F&E, organisers of the Dubai Airshow, said: "Aligning with the major developments seen across the advanced aerial mobility market, this will be a huge focus for Dubai Airshow 2023, where we will showcase the latest innovation and provide a platform to highlight the immense potential and opportunities for growth across the sector."

He added: "Welcoming new and returning exhibitors, visitors will have the opportunity to explore a host of aerial transport solutions, including drones, UAVs, UAMs and eVTOLs, at the brand new AAM pavilion. There will also be an eVTOL flying display to further highlight the capabilities of these future transport methods."

The advanced aerial mobility conference will also return, welcoming more industry experts for an extensive content programme.

This year's event expects pavilions from more than 20 countries, as we all senior military and civil delegations from over 96 countries. Plus, more than 160 commercial, private and military aircraft will be on display.

Visitors can also access show features such as the Tech Zone and Vista – the new start-up launchpad.

With the support of the UAE Space Agency, space will also be a highlight at the event, there will be a two-day dedicated and exclusive space content programme, an all-



new space start-up competition, as well as a display of space technology, and a large space pavilion.

Cargo, sustainability and air traffic management will also be a focus, with more than 80 hours of 'thought leadership' content.

As ever, Boeing and Airbus will make a large presence with a range of various aircraft on the static and flying in the display.

Kuljit Ghata-Aura, president, Boeing Middle East, Turkey and Africa (META) said the air show offers a platform for addressing 'complex problems'.

"Dubai Airshow will allow us to showcase our unique capability and demonstrate how we leverage that strength across the company and in our supply chain.

"We will continue our laser-focused efforts on advancing sustainable aviation and this will be showcased throughout the Dubai Airshow and COP28 taking place soon after, also in the UAE," said Ghata-Aura.

Co-located with the airshow, Vista, a dedicated hub for global aerospace start-ups, will be returning after a successful launch in 2021.

Hawes said: "Aligning with the UAE's "Year of Sustainability" and national strategies, as well as global aerospace carbon net zero strategies and COP28 taking place, Dubai Airshow 2023 will be underlined by innovations that bring about next-generation features, efficiencies and decarbonisation, ensuring the future of aviation, aerospace and defence is sustainable." ▲

TAXI FOR HIGHER: Dubai's unmanned aerial taxi made its first flight in 2017. Air taxis are scheduled to begin flying in Dubai within three years.

PICTURE: VOLOCOPTER



Connecting: Signing the agreement were His excellency Mr. Akbar Al Baker, (right), group chief executive of Qatar Airways and Ken Sain, CEO of Panasonic Avionics. PICTURE: PANASONIC

AIX's inside track on the road to recovery

Aircraft Interiors Expo in Hamburg returned in June with aircraft interior companies highlighting their latest technologies and innovations.

Marcelle Nethersole reports.

Aircraft Interiors Expo (AIX) returned to Hamburg in June, as the aviation industry forecast a return to profitability in 2023, with more than 4.2bn passengers set to take to the skies this year.

"It is great to see the recovery of the industry maintaining pace," said Molly Magraw, event director, Aircraft Interiors Expo. "While there is still a long way to go back to pre-pandemic levels, the industry is taking the right steps, and we were delighted to see airlines embracing the opportunity to transform their business operations to meet the evolving expectations of passengers."

"After the return of AIX in 2022, it was exciting to get back to business, creating even more opportunities for attendees to connect, learn and source the latest innovations."

More than 1,000 products from global airline suppliers based in over 30 countries turned out for the event, from seating companies to technology ones.

Panasonic Avionics unveiled its extension of its Astrova in-flight entertainment (IFE) portfolio with new 4K OLED monitors for first and business class cabins, and Qatar Airways became the launch customer as it signed an agreement for the 'groundbreaking' IFE solution. Its fleet of 40 Boeing 777X is the first aircraft type to feature the solution.

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Ken Sain, CEO of Panasonic Avionics said: "We are pleased that Qatar Airways has chosen Astrova for its fleet of 777X aircraft. Using our IFE innovation, Qatar Airways can leverage the latest consumer innovations to deliver unique passenger experiences to drive higher net promoter scores, enhance passenger engagement, increase revenue, and achieve even greater operational efficiencies through IFE."

IFE and cabin technology company, AERQ, a joint venture between LG Electronics and Lufthansa Technik, was displaying its latest cabin interior technology, and also said it looks forward to expanding in the Middle East.

"AERQ provides airlines with cabin solutions that allow them to tap into new business models, drive ancillary

revenues and generate operational efficiencies," said Arnd Kikker, managing director at AERQ.

"This year we had the opportunity to attend Aircraft Interiors Middle East for the first time. It was an excellent occasion to meet many interesting people and to make numerous connections that we expect to lead to fruitful partnerships in the future. We expect to partner with Middle Eastern airlines in order to empower them to become the playmakers of their own cabin while creating revenue."

Emirates also announced at AIX that it will become the first airline to operate Airbus' HBCplus agnostic satcom connectivity solution following its line-fit selection to equip its 50 new Airbus A350-900 aircraft with the service.

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Adel Al Redha, Emirates' chief operating officer said: "HBCplus, offered by Airbus, will provide our Airbus A350 fleet with better integration and performance using the latest generation of connectivity and antennas. With the first of our 50 new A350s joining Emirates' fleet next year, we look forward to providing our passengers with the latest standard of continuous high-bandwidth inflight connectivity throughout their journey to enjoy a better experience."

Vision Systems, a provider of shading and cabin ambience solutions, showcased electronically-dimmable windows, which were recently included in aircraft with: Comlux for Airbus ACJ TwoTwenty, Daher for its TBM 960, and AMAC Aerospace. Satair signed a multi-year agreement with CTT Systems extending their global exclusive distribution rights for CTT Systems' Airbus A350 humidifier pads and the cabin active humidity control system for commercial and VIP aircraft.

Collins Aerospace, a business of Raytheon Technologies, unveiled Aurora, the company's first fully lie-flat business class suite designed exclusively for narrowbody aircraft.

The 2023 Crystal Cabin Awards took place during AIX and Collins Aerospace won the 'passenger comfort' category, for its Collins' IntelliSense intelligent cabin. ▲

FLYDUBAI'S SEATING PLAN HITS THE SUITE SPOT

Dubai-based carrier has unveiled its new business-class offering for the increasingly-competitive Gulf marketplace.

Hybrid-carrier Flydubai is to introduce its new business-class cabin by the end of this year.

The aim, the company said at the Arabian Travel Market in May, is to bring widebody-style levels of privacy and comfort to the narrowbody market.

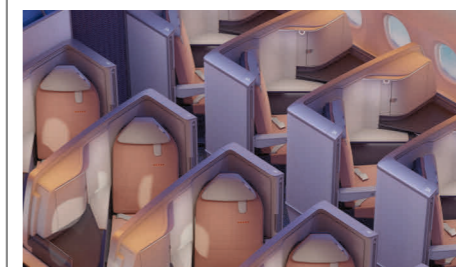
An airline spokesperson said that 'The Business Suite', which has been designed specifically for single-aisle aircraft, is the latest evolution in its premium cabin offering.

The airline began life as a low-cost carrier, but has for some years offered a business-class cabin to cater for local tastes.

The new business-class cabin will have 10 suites installed in some of the airline's newest Boeing 737 MAX aircraft with deliveries before the end of 2023. The new cabin will be available on up to six aircraft by Q1 2024 and will be scheduled on longer flights around the Flydubai network.

The new seat will offer all business-class passengers direct aisle access, which emulates business-class cabins on board many widebody aircraft.

Flydubai is the launch customer for the new seat, which has been designed in collaboration with Safran Seats and JPA Design, a multinational design company.



SITTING PRETTY: The new business-class cabin will have seats that can be converted from closed suites for privacy to a more open-plan format, for those wishing to talk to neighbours. PICTURE: FLYDUBAI

"Our business and product offerings have evolved from the initial no-frills model over the past 14 years to cater for the ever-growing needs of our customers and the markets we operate in," Flydubai CEO, Ghaith Al Ghaith said.

"We have come a long way since the introduction of our first business-class offering in 2013, which has served us well. We are proud to unveil a new premium product which rivals the business-class experience offered by many airlines on wide-body aircraft."

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The airline introduced lie-flat seats to its business-class cabins in 2017.

Daniel Kerrison, Flydubai's vice-president of inflight product, said that the increased height of the seat's back-shell, a sliding suite door, created a level of privacy never before seen on Boeing 737s. However, passengers will be able to transform their seats from a fully-closed suite experience to a more traditional open-plan seat for greater social interaction, should they wish.

In-flight entertainment will come in the form of a Bluetooth system that allows the use of personal headphones with a 17-inch 4K built-in touchscreen. ▲



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ExecuJet MRO Services' new facility at Al Maktoum International Airport will support and cater for the growth of business aviation in the region.

Marcelle Nethersole spoke with Nick Weber, regional VP Middle East.

Hangar management key to ExecuJet growth

PICTURE: EXECUJET



ExecuJet MRO Services (ExecuJet) has seen a lot of growth since it started operations at Dubai International Airport (DXB) more than two decades ago.

Now the MRO facility, which specialises in airframe maintenance and has the capability to support nearly all types of business jets, including Dassault, Bombardier, and Hawker, has expanded by launching a new certified heavy maintenance facility at Dubai South's Al Maktoum International Airport (OMDW).

Nick Weber, regional VP Middle East of ExecuJet, says it is designed to meet the projected growth in business aviation in the region and beyond. The hangar can accommodate up to 16-20 mid-to-large size business jets at a time, including the very largest Dassault business jets - Falcon 6X and Falcon 10X.

"The MRO facility is 15,350sqm, and is replete with large hangar space, additional back offices, workshops, and storage areas," explained Weber. "The hangar floor space is 8,300sqm. We have grown the hangar space by about 1,200sqm, but a key difference is that our operations will all be under one roof, as opposed to being split between the two hangars that we previously occupied at DXB."

Our internship programme leverages off the local UAE aerospace universities and colleges to attract fresh talent. **NICK WEBER**

"We have gained an additional 5,100sqm of workshop space, which we will utilise to expand our MRO shop capabilities. Whilst we had workshops at our previous DXB facilities - for wheels, batteries, avionics, and non-destructive testing (NDT) - with this incremental space, we can now expand on these capabilities even further."

Weber says having a heavy maintenance capability will support the increased business aviation in the region.

"Business aviation in this region is stronger than ever," he said. "The vast majority of those who migrated to business aviation during the Covid pandemic continue to fly on business jets today – it provides travellers with greater convenience and flexibility, and this was instrumental in revival of the sector."

"This uptick resulted in large orders for business jets that manufacturers will continue to deliver over the coming years, which has also driven strong demand for pre-owned aircraft."

He added: "Prior to Dassault Aviation's acquisition of ExecuJet MRO Services in 2019, we had never worked on heavy maintenance type aircraft here in Dubai, but now as a factory-owned Dassault MRO, we have gained approval to undertake heavy maintenance work on various Falcon aircraft. With this ramp up, Falcons now account for more than 30pc of our business."



"As we grow the business, this will necessitate recruiting around an additional 50 technically-skilled personnel, the majority being from within region. A vast number of new employees will include fresh graduates onboarded via our internship programme that gives local students hands-on aircraft maintenance experience, enabling them to progress further with their chosen career paths."

Weber said the growth of business aviation MRO depends on having a steady stream of new talent coming into the industry, as well as the region.

"Our internship programme leverages off the local UAE aerospace universities and colleges to attract fresh talent. We started this in 2016 and to date we have had 67 interns through our ranks, 21 of which, I am pleased to say, have taken up permanent employment with us, whilst others have gone on to fulfil their ambitions elsewhere within the industry."

Weber said the new facility has a lot of projects on, including preparing for the Falcon 6X which is due to enter service 'very soon'. "We have been acquiring tooling and spare parts for the aircraft and have sent four engineers overseas for maintenance training on the Falcon 6X," he said.

"We are also looking to support many other OEM types like Bombardier, Embraer, and Hawker business jets, as well as working with cabin interior specialist F/List in Dubai to provide cabin refurbishment. We have also developed limited paint capability."

Gayo Aviation has signed a letter of intent for 10 of Jekta Switzerland's PHA-ZE 100 aircraft, marking the first deal for the amphibious fledgling.

Marcelle Nethersole reports.



Jekta makes a splash in Dubai

PICTURE: JEKTA

Amphibious aircraft OEM Jekta Switzerland is making an impact in the Middle East region after Dubai-based private and specialist aviation provider Gayo Aviation signed a letter of intent (LOI) for 10 of its PHA-ZE 100 aircraft – the first in the region.

Jekta has more than two decades' of experience designing and building flying boats, including the eight-seat, composite LA-8, and D-Borey ultralight.

Its PHA-ZE 100, which stands for passenger hydro amphibious – zero emission 100 airframe, represents the first in a series of next-generation amphibious flying boats, which Jekta's CEO, George Alafinov, said: "Will define the future of transport by using environmentally-friendly propulsion combined with the world's waterways as its infrastructure."

Alafinov said: "With a powerful presence in the charter, travel and tourism sectors gained over a decade in the industry, Gayo Aviation recognises the PHA-ZE 100's potential to deliver against its ambition to support sustainable operations."

"Sustainability does not have to mean a compromise in comfort or capability and the PHA-ZE 100 has been designed to meet these needs. It also satisfies the increasing demand and opportunity to use water as infrastructure, the expansion of seaplane routes, and provides a sustainable, optimised solution to replace ageing seaplanes."



The airframe will be delivered in a baseline configuration for 19 passengers, with the deal including ground support equipment for charging and replacing the PHA-ZE 100's batteries; tools and component support for the first year of operation; training for two pilots and two technicians; and a three-year airframe warranty.

With offices in Sweden and Dubai, Gayo Aviation plans to make the aircraft available for environmental and experiential tourism and charter operators wishing to bolster their sustainable transport options. Gayo will also offer the aircraft on lease for scheduled affordable regional services in underserved communities.

Gisle Dueland, CEO of Gayo Aviation, said: "We are delighted to be the first customer to sign an LOI with Jekta for this impressive, versatile and comfortable airframe."

"We want to be among the first to provide our customers with a truly sustainable option to transport their passengers. With the potential to reduce per-passenger-per-hour costs by more than 70% compared with current seaplanes we can satisfy that need. The trend for the top end of the tourism community is towards sustainable and experiential travel, so we wanted to be ahead of the curve and first in line to serve this evolving sector. This opens up more opportunities to supply sustainable tourism options and Gayo is committed to supporting this expansion."

The PHA-ZE 100 is made from composites and is powered by 10 electric motors supplied with energy from batteries or hydrogen fuel cells. It will be certified to EASA CS-23 and US FAA FAR-23 and will operate from coastal waters with waves up to 1.2m high, lakes, waterways and runways."



Alafinov said Jekta is in negotiations with a second potential customer located in the Gulf and that the aircraft is generating a lot of interest from a wide range of companies.

He explained: "Low maintenance and fuel costs, plus minimal aviation infrastructure requirements, position the PHA-ZE 100 as an essential community transport asset. This might be for communities that need access to air transport at affordable prices (think Africa); island nations needing environmentally-friendly commuter aircraft (think the islands of Dubai); as well as for more-established countries where commuting by air is prohibited due to environmental pollution and noise regulations, such as Switzerland for example."

He added: "We're also receiving interest from areas that haven't always been associated with aviation. For example, as cruise liners are entering an era where they need to be carbon neutral, the opportunity to use zero-emission amphibious aircraft will add a new string to their bow."

An Inmarsat service outage in April underlined the implications and repercussions for its aviation services when one of its satellites experienced a technical failure.

Steve Nichols reports.

WHAT HAPPENS WHEN A SATELLITE FAILS?

On Sunday 16 April at 21:14h UTC, Inmarsat experienced an outage on its I-4 F1 satellite, which provides L-band services for East Asia and the Pacific region. This resulted in the temporary loss of services from the satellite.

The company immediately instigated recovery procedures. NOTAMs (Notices to Airmen) were issued by air traffic control in the US, Japan, Australia, New Zealand and Papua New Guinea regarding the outage.

Meanwhile, pilots were advised to communicate with air traffic control using legacy high frequency (HF) radio technology over areas that terrestrial VHF was unable to reach, mainly oceanic regions.

This in itself is problematic as HF communications are impacted by space weather effects, such as solar flares and coronal mass ejections (CMEs) from the Sun. Solar flares can cause HF blackouts for one to two hours, depending on their severity, while a CME can affect HF radio for a day or more.

The Inmarsat service affected was its L-band SwiftBroadband offering and not its faster Ka-band Global Xpress (GX) service, which is delivered by its I-5 and newer I-6 satellites. SwiftBroadband Safety (SB-S) also offers a secure internet protocol (IP) connection for operations and safety communications.



Its capabilities are approved for ICAO's Aircraft Control Domain (ACD) data usage, such as flight tracking, flight data streaming (so-called 'black box in the cloud'), and pilot communications. SB-S also offers IP channels that can be dedicated to operations usage, such as electronic flight bag applications.

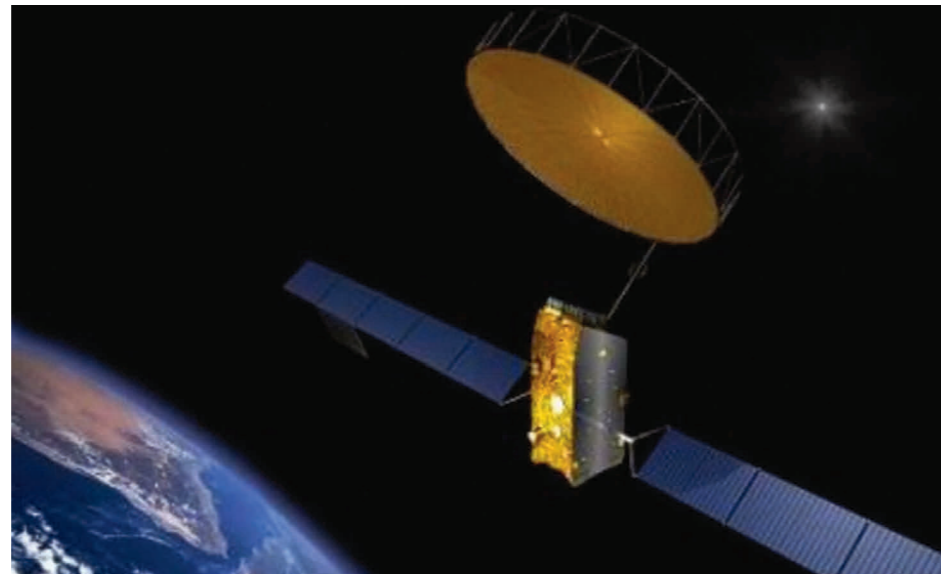
These can offer real-time information to help pilots optimise flights and enhance operations.

Inmarsat Classic Aero recovery was started after the loss of service and was operational in a matter of hours. This was followed by the transfer of Inmarsat-C services from the contingency satellite back to I-4 F1, and then restoration of other services.

The next day, Inmarsat announced that its services were back to normal, regretted the outage and apologised to all impacted users.

A report concluded that the failure was due to a partial loss of power, believed to be due to a fault in one of the I-4 satellite's solar arrays. This failure did not seem to correspond with any space weather event, although fast solar wind and other solar phenomena have been observed recently and will increase as solar maximum in 2026 approaches.

A recent NASA report said: "Space operations continue to be a challenge for both launch vehicles and spacecraft."



Attribution and mitigation of anomalies and failures remain an important concern for space system designers, operators and users.

"The space environment is becoming more hazardous for operations as solar activity increases towards the peak of solar cycle 25."

Inmarsat prides itself on its L-band satellite service reliability, promising more than 99.9% availability worldwide.

The Inmarsat I-4 satellite was built by EADS Astrium, now Airbus Defence and Space, and was launched in 2005 with an initial 13-year design life.

Many of the services currently delivered by I-4 F1 will be moved to Inmarsat's new, high-performance I-6 F1 satellite in the coming months as Inmarsat's investment in new and additional satellites continues.

All other satellites in the L-band fleet were unaffected by the incident, including Inmarsat's two new L-band satellites (I-6 F1 and F2) which will be joined in 2027 by a further three new micro L-band satellites, the Inmarsat-8s, specifically designed to enhance safety service back-up for L-band customers.

The cause of the outage remains a mystery, but Inmarsat ruled out space debris or anything malicious, such as a cyber attack.

No one can ever promise 100% satellite service reliability, but backup satellite systems help a lot. And legacy backup systems, such as HF voice and data will have a part to play for some time yet. ▲

Outage: The Inmarsat service affected was its L-band SwiftBroadband. PICTURE: INMARSAT

The UAE has declared 2023 the 'Year of Sustainability', showcasing its commitment to seek innovative solutions to energy and climate change challenges.

Anuradha Deenapanray Chappard reports.



SAF START: Emirates operated its first demonstration flight powering one of its engines with 100% SAF. PICTURE: EMIRATES

The SAF route to sustainability

ATA estimates show that Middle Eastern airlines posted a 38% traffic increase last April compared with 2022. Capacity climbed 27.8% and load factor rose 5.6 percentage points to 76.2%. The sector will pursue its recovery with international tourist arrivals likely to reach 85-90% of pre-pandemic levels in 2023.

Airlines and airports are thus prioritising sustainability and innovation to enhance operational efficiency and passenger experience. Governments and the aviation ecosystem in the Middle East, home to the world's top suppliers of fossil fuel, are tackling these challenges through pragmatic roadmaps.

Hubs like Dubai International Airport, Hamad International Airport in Qatar or Istanbul International Airport in Turkey are paving the way to sustainable growth to cater for the growing appetite of travellers globally.

Airlines are also aiming at reducing their carbon footprint by investing in new-generation aircraft and supporting SAF production initiatives.

According to the latest study published by the Oxford Business Group (OBG), SAFs would have to account for 65% of aviation fuel usage worldwide, requiring approximately 450bn litres annually to meet global 2050 zero-emissions targets set by the industry.

Dubai-based Emirates announced earlier this year that it wants to reach 50% sustainable fuel for its flights by 2030.

The airline has committed \$200m to fund research and development (R&D) projects focused on reducing the impact of fossil fuels in commercial aviation.

Last January, Emirates operated its first milestone demonstration flight in the Middle East and North Africa on a Boeing 777-300ER, powering one of its engines with 100% SAF. This was in partnership with GE Aerospace, Boeing, Honeywell, Neste and Virent.

The test flight demonstrated the compatibility of the specially-blended SAF as a safe and reliable fuel source. It also enriched industry data and research around SAF blends in higher proportions, paving the way for standardisation and future approval of 100% drop-in SAF as a replacement

for jet fuel, well above the current 50% blend limit.

If renewable energy production reaches 69bn litres by 2028 as estimated, the trajectory to 100bn litres (80m tonnes) by 2030 would be on track. If just 30% of that produced SAF, the industry could achieve 30bn litres (24m tonnes) of SAF production by 2030. SAF is expected to provide about 62% of the carbon mitigation needed in 2050.

"Achieving the necessary SAF percentage output from these new and expanding facilities is not a given," said Willie Walsh, IATA's director general. "But with governments the world-over agreeing at ICAO to a long-term aspirational goal (LTAG) of net zero by 2050, they now share accountability for aviation's decarbonisation. That means establishing a policy framework to ensure that aviation gets the needed share of renewable energy production in SAF."



Qatar Airways will also be reducing emissions on flights from Amsterdam by approximately 7,500 tonnes of CO2 for the fiscal year.

Furthermore, renewable energy company Masdar, oil major Abu Dhabi National Oil Company and international oil company BP are going to undertake a joint feasibility study for the production of SAFs in the UAE. They will use renewable hydrogen and solid municipal waste amongst other sources.

Saudi Arabia is also investing massively to support its economic development and diversification strategy underpinned by a long-term sustainable vision. Riyadh Air, the youngest airline in the region, will take off in 2025 with a strong sustainability vision to carry 100m passengers by 2030.

The airline said it will create 200,000 jobs and is expected to generate \$20bn in non-hydrocarbons revenue.

SAFs will play a crucial role in reducing the emissions of air travel, but to fully leverage its decarbonisation potential there must be 100% SAF use, according to specialists. ▲



Probing question: Turkish Technic trainees get to grips with electronic engine monitoring. Far left: Trainees in Turkish Technic classrooms benefit from modern, well-equipped facilities.

PICTURES: TURKISH TECHNIC

academy's intake at its main site at Queen Alia International Airport (QAIA). It encourages young nationals to take up aerospace engineering through an innovative MRO scholarship programme for a limited number of candidates that covers the full cost of training and guarantees a career at Joramco after graduation. Egyptair Training Academy, with more than 35 years of experience in MRO training, describes itself as a "regional leader" in the field. It trains engineers and technicians for a variety of roles in the MRO environment, from line and base maintenance up to heavy maintenance.



In Dubai, alongside independent training establishments such as Jetstream, Emirates Engineering Training College provides basic and type training to its own personnel, third party and external customers under EASA and UAE GCAA approvals. It is also approved to conduct exams. But demand is such that Emirates Engineering also dips into the international recruitment market on a grand scale. It recently announced plans to recruit for 475 technical and MRO roles in Australia, Brazil, Canada, South Africa and the UK.

MIND THE GAP!

When the MRO engineer shortage breaks into mainstream media with headlines such as 'Desperately seeking mechanics' – in other words, when what everyone in the industry has known for years is considered current affairs – you have to hope someone is taking it seriously.

In the Middle East, several academies are doing exactly that. But the numbers are daunting.

CAE's aviation talent forecast, released at the Paris airshow, predicts the need for 22,000 new commercial aircraft maintenance technicians in the Middle East in the next 10 years. The report splits demand almost equally between replacements for personnel leaving the industry and those needed to sustain growth.

Boeing's 20-year forecast puts the demand for new engineers and technicians at 50,000.



Supply chains suffer in times of manpower shortages, potentially leading to 'no-poach' deals between top-tier OEMs and their suppliers, as was alleged in a case in the US involving Pratt & Whitney (P&W) which was settled in late April when the court ruled that the engine prime and its suppliers had not violated labour laws.

Overlooked in the case was the impact of poaching on markets already facing a growing gap between demand and supply. In the Middle East, the resulting inflationary salary spiral is well-known and serves as a useful recruitment tool for MROs and airlines whose pace of growth outstrips the ability of their domestic markets to add to the talent pool.

Jordan, Turkey and Egypt are exceptions. There the needs of the principal domestic MROs are covered by their own nationals, trained at home.

However, tired of losing their engineering graduates to the 'big three' Gulf carriers, there have reportedly in the past been top-level

Storm clouds are forming over MRO manpower issues. Even running at capacity, Middle East training establishments will be stretched to keep up with demand, raising fears of poaching and bidding wars for qualified engineers. Chuck Grieve reports.

OUTSOURCING TO EASE THE SHORTAGE?

It is perhaps no surprise that Emirates, operator of the world's largest fleet of Boeing 777s, has outsourced some of its base maintenance to Joramco and Turkish Technic.

With near-100% domestic workforces, these two MROs appear least likely to suffer manpower shortages.

In mid-June, Turkish Technic announced an agreement with Emirates to provide base maintenance on another 17 of the Dubai carrier's fleet of Boeing 777 aircraft, building on the initial deal in April which covered base maintenance on five Emirates 777s.

The Emirates fleet of Boeing 777s is listed by independent sources as 134 in service, including 124 -300ERs and 10 -200LRs.

Turkish Technic chief executive Mikail Akbulut was understandably "delighted to strengthen the partnership" as it reflected Emirates' "confidence in our services" and underscored the strength of the Turkish MRO's in-house capabilities, of which manpower is a key element.

In March, Joramco welcomed the first of an undisclosed number of Emirates 777s to its Amman base for nose-to-tail C-checks and modifications under a contract set to run until June 2024.

conversations about formal arrangements between those with and those without their own academies to train candidates specifically for the MRO competition.

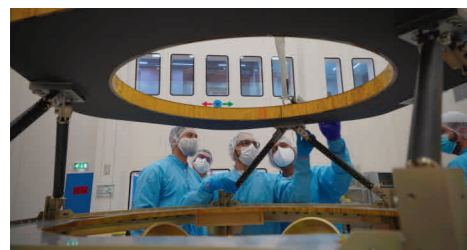
Newer players place additional demands on an already-stretched market. Flydubai, for example, is on an expansion drive. The low-cost carrier added 1,300 employees in 2022, the most for a single year since its inception in 2008. A spokesperson said the airline is on track to add another 1,100 this year, representing an increase of 24% in staffing; at mid-year, it had 550 hires still to make, including up to 100 engineers.

The Dubai-based airline does not train engineers at its own training centre or work with other establishments. It relies instead on "the desire of top talent to relocate to Dubai".



Sustainability is a key consideration of Turkish Technic and is reflected in its "education culture". General manager Mikail Akbulut says the company's approach is to develop training activities "in direct proportion" to its MRO capabilities and as a contribution to global civil aviation. With extensive and well-equipped facilities at Ataturk, Sabiha Gokcen and Esenboga airports, "we are able to meet the current and future demand for training", he added.

Turkish Technic courses encompass technical, type and basic training management, conducted under EASA Part 147 and SHY 147 approvals, for its own needs as well as for other domestic



HIGH FLYER: MBZ-SAT will be the region's most advanced high-accuracy, high-resolution imaging satellite. PICTURE: MBRSC

MBZ-SAT SATELLITE MOVES APACE

The Mohammed Bin Rashid Space Centre (MBRSC) is forging ahead with building its MBZ-SAT Earth-observation satellite.

This will be the region's most advanced high-accuracy, high-resolution imaging satellite. It is designed to monitor environmental changes, water quality, and assist in agricultural development.

MBZ-SAT will be equipped with an automated system for arranging images, around the clock, ensuring the highest quality standards of satellite images for commercial use globally. This project will strengthen the UAE's partnerships in the space industry between the public and private sectors.

As the UAE's fourth Earth observation satellite to be developed and launched by MBRSC, the project will strengthen the centre's efforts to expand its portfolio of imaging technologies and products for government agencies and commercial entities worldwide.

□□□□□

MBZ-SAT will contribute to meeting the growing commercial demand for high-resolution satellite images that will show details within an area of less than one square metre.

After launching the satellite into low-Earth orbit, the ground station team at MBRSC will analyse the data received from it, provide recommendations, high-resolution data and images to local and international entities.

MBRSC will offer rapid turnaround of captured data, sharing it to users.

The satellite, measuring 3m by 5m and weighing around 700kg, will improve image capture resolution by more than double the capability of the previously-launched satellites.

It will also increase the downlink data transmission speed by three times the current capacity. The fully-automated image scheduling and processing system of MBZ-SAT will also be able to produce more than 10 times the images the Centre produces currently.

Commercial and government entities can place orders online for high-res imaging around the clock. The image processing and downloads can be completed in less than two hours from receiving the request, depending on the satellite's location.

MBZ-SAT will be the first satellite capable of detecting a larger number of man-made as well as natural elements with a higher rate of precision and resolution, as compared with the current range of Earth observation satellites. ▲

The UAE is planning a second attempt to land a lunar rover on the moon after the first failed to land successfully. Steve Nichols reports.

SECOND LUNAR ROVER MISSION FOR 2024

Work is now under way on Rashid 2, a replacement lunar rover. The Emirati rover was among international payloads carried by the Japanese Hakuto-R Mission 1 lander, which was launched aboard a SpaceX rocket from the USA in December 2022. The spacecraft took a low-energy route to the moon rather than a direct approach, which meant a journey of about five months.

Hakuto-R attempted a soft touchdown on the moon's surface on 26 April, but ran out of fuel at the last moment due to an altitude miscalculation. If the rover had landed successfully, the UAE would have been the fourth country to reach the moon.

Investigations by Ispace, the independent spacecraft developer, showed that faulty software caused its lander to carry out incorrect altitude adjustments.

During the period of descent, said Ispace, an "unexpected behaviour occurred with the lander's altitude measurement". When the lander estimated its own altitude to be zero, or

on the lunar surface, it was later determined to have been at an altitude of approximately 5km above the lunar surface.

After reaching the scheduled landing time, the lander continued to descend at a low speed until the propulsion system ran out of fuel. It is believed then to have free-fallen to the moon's surface.

NASA has taken images of the crash site that appear to show some disturbance around where the lander is thought to have crashed onto the lunar surface.

HH Sheikh Mohammed bin Rashid Al Maktoum, UAE vice-president and ruler of Dubai, has instructed the Mohammed Bin Rashid Space Centre (MBRSC) to work on a second rover. HE Salem Humaid Al Marri, MBRSC director-general, said engineers were working on its design and the selection of a landing site.

A launch provider and date have yet to be announced, but Ispace says its Mission 2 moon lander is scheduled to launch in 2024. ▲

UAE ASTRONAUT'S 7HR SPACEWALK

UAE astronaut Sultan Al Neyadi recently completed a seven-hour space walk during which he and American astronaut Stephen Bowen carried out maintenance tasks on the International Space Station (ISS) and prepped an area for a future solar array installation.

In another space walk, he also helped relocate the Dragon capsule that carried him and his colleagues to the ISS. The capsule was moved to make way for another capsule due to rendezvous with the ISS.

Al Neyadi has conducted many experiments and made contacts with the Earth as part of his outreach activities during his six-month mission aboard the ISS. He also took part in a live call with his hometown, Al Ain, from the ISS on his 42nd birthday on 23 May, which included celebrations on board.

HE Salem Humaid Al Marri, director-general of the Mohammed Bin Rashid Space Centre (MBRSC), congratulated Al Neyadi on the milestone. "The dedication, resilience, and strength Sultan has demonstrated in consistently achieving one milestone after another truly reflect the calibre of astronauts we cultivate here in the UAE," Al Marri said.

"He represents the core values of the MBRSC by consistently focusing on knowledge-building



CAKE WALK: UAE astronaut Sultan Al Neyadi with his birthday cake on May 23. PICTURE: SULTAN AL NEYADI/TWITTER

initiatives for the next generation and we appreciate his commitment towards the community and student outreach.

"We are confident his journey will continue to make us proud and inspire future explorations."

Al Neyadi is due to return to Earth from the ISS in late August. Before then, he was expected to complete more than 200 experiments assigned to him and his colleagues by NASA, and 19 others given to him by UAE universities. ▲

I s p a c e

Mission 1 Milestones

Ispace has already completed 8 out of 10 milestones, verifying a large part of our lander technology and business model concept.

- ▶ **Success 1**
Completion of Launch Preparations
Completed 2022 Nov 28
- ▶ **Success 2**
Completion of Launch and Deployment
Completed 2022 Dec 11
- ▶ **Success 3**
Establishment of a Steady Operation State
(*Initial Critical Operation Status)
Completed 2022 Dec 16
- ▶ **Success 4**
Completion of first orbital control maneuver
Completed 2022 Dec 15
- ▶ **Success 5**
Completion of stable deep-space flight operations for one month
Completed 2023 Jan 11
- ▶ **Success 6**
Completion of all deep space orbital control maneuvers before LOI
Completed 2023 Mar 17
- ▶ **Success 7**
Reaching the lunar gravitational field / lunar orbit
Completed 2023 Mar 21
- ▶ **Success 8**
Completion of all orbit control maneuvers in lunar orbit
Completed 2023 Apr 13
- ▶ **Success 9**
Completion of lunar landing
Incomplete 2023 Apr 25
- ▶ **Success 10**
Establishment of a steady system state after lunar landing
Incomplete

LUNAR TICKS: Hakuto-R Mission One mission achievements. GRAPHIC: ISPACE

US SUMMIT IN QATAR FOCUSES ON MILITARY THREATS

US Central Command (Centcomm) held a space forum at Al-Udeid Air Base, Qatar, from 15 to 17 February 2023, which included discussions focused on developing threats, current space capability, theatre command and control architectures and processes.

It also explored possible ways of integrating space systems into joint and coalition operations. The growing reliance of the military on satellite communications, navigation and global missile warning has led to increasing vulnerability. Meanwhile, hostile states (including Russia, China and Iran) have stepped up their own space-based capabilities during the same period, and are aggressively preparing to extend conflict into space.

As space has become an increasingly contested and militarised domain, the US and its allies have realised that they will have to be able to compete in space, if they are to defend the space-based assets and infrastructure upon which economies increasingly rely.

Hostile actors can already interfere with civilian and military broadband communications, and are developing anti-satellite weapons that could knock out US and allied satellites, potentially scattering debris across space and paralysing satellite-dependent systems, from mobile phone networks, navigation systems and even nuclear weapons' command and control systems.

General Chance Saltzman, the chief of space operations at the USA's Space Force, and its



TEAM PHOTO: Leaders from US Space Force, partners and allies pose for a photo during the US Central Command theatre space forum at Al Udeid Air Base, Qatar, February 2023. PICTURE: US DOO

commander from November 1 2022, is known as "the father of multi-domain operations". He is a firm believer that space power is "a collaborative effort", and that it is "imperative to partner to win." Saltzman believes that the US must "strengthen the partnerships we rely on" in order to "build lasting operational advantages and to build resilient, credible, combat-ready forces."

The US Space Force established a Middle East presence at Al-Udeid in September 2020, standing up a unit of core space operators who will control satellites, track enemy operations and try to avert conflicts in space.

The USA's regional allies increasingly see space as the critical combat enabler, and have sought US advice while deciding whether they need a dedicated space force, and in working out how to integrate space capabilities within their own air forces or defence departments.

In May 2022 Saudi Arabia announced that it had launched an initiative to establish an air and space force.

The Royal Saudi Armed Forces established an executive committee headed by lieutenant general prince Turki Bin Bandar Bin Abdul Aziz, commander of the Royal Saudi Air Force. ▲

▲ ALL IN A DAY

Glenn Hogben

Marcelle Nethersole spoke to the CEO of the Air Charter Association.

Can you tell me about the Air Charter Association?

The association is the leading global trade association for the air charter industry with goals to promote the industry and ensure members maintain the highest standards of conduct in the air charter market, work with integrity and follow ethical business practices.

We lead industry self-regulation and promote the best supply chain relationships. Our members are accredited as experienced and trustworthy professionals who we support with expert guidance on compliance and best practice. We also offer training and business networking and work closely with aviation regulators and government bodies on key issues.

The ACA currently has more than 370 members across the globe and we work hard to deliver the best value to our membership which comprises air charter brokers, aircraft operators, airports and FBOs, consultants and closely-connected suppliers working to support the industry. We represent the whole air charter market.

Can you tell me about the work it does in the Middle East?

The association has had Middle Eastern members for many years who value the connectivity of the ACA network and accreditation as professionals in the industry. It is a region where we are continuing to develop new relationships and awareness to grow our network. We collaborate on some initiatives with MEBA.

Has air charter increased since the pandemic?

Initially, the pandemic significantly reduced all flying, but very quickly the air charter industry was called on to provide critical connectivity, supporting urgent cargo with PPE and medical supplies to be swiftly transported around the globe. In addition, as the scheduled carriers remained grounded private air charter provided the only means for passengers to travel.

As restrictions then started to lift, many new users were attracted to utilise air charter due to the speed of transport, flexibility and ability to travel to local airports and the increased sense of safety gained by travelling in smaller groups and travelling with known colleagues.

In the last 18 months high levels of demand continued as businesses ramped up again, but scheduled services had not returned to a large percentage of routes. In recent months though this demand has reduced but still maintains at a level 15-20% higher than pre-pandemic levels. We see this as a normalisation but at a new higher level as the advantages of private air charter continue to support businesses and individuals to travel and maintain connectivity.

We believe this trend will continue as ultimately air charter provides a critical service connecting people, goods, and places.

What is next for the Air Charter Association?

January 2023 saw our second 'Fly legal day' to raise awareness of the dangers of illegal charter flights and commemorate footballer Emiliano Sala who tragically lost his life when an illegally-chartered aircraft crashed into the English channel in 2019.

Sadly, while rare, chartering illegally remains an ongoing issue in our industry and the ACA continues to spread the word about this to prevent future tragedies.

We are also working to encourage more global memberships.

At the beginning of May 2023, we hosted our first international air charter broker qualification course in Munich, taking new and experienced brokers through a range of topics to build their knowledge.

Sustainability in air charter is also key. We support our members in their efforts to reduce environmental impacts on their path to net zero and we actively support the development of hybrid, electric and hydrogen-powered aircraft and eVTOL technology. The ACA also has a sustainability programme for members.

Our 'next gen group', a group of young industry professionals created to help the ACA engage with new generations and shape the industry's future, works to present to and provide career information to young people about the many varied, rewarding and challenging career opportunities available.

What does a typical day hold for you in your role?

As with pretty much all roles in aviation, every day is different, which is part of the wonderful attraction of our industry.

Alongside the business management of the association, I can be working with our team to plan our next events or the development of our next training courses or attending conferences and events to represent the industry.

I equally spend time working with member companies providing guidance and support or speaking with authorities and industry bodies about key issues facing the industry, such as sustainability.

At other times I can also be found visiting schools and colleges with some of our nextgen group. Many of the opportunities and industry roles are quite unknown, for example, the role of an 'air charter broker' appears to be one of the best kept secrets in the world!

It is therefore really important we work to promote the fantastic opportunities the industry has for young people.



PICTURE: AIR CHARTER ASSOCIATION

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