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THE MAGAZINE FOR AEROSPACE PROFESSIONALS IN THE MIDDLE EAST, NORTH AFRICA AND TURKEY

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GROUNDING!

HOW WILL AVIATION RECOVER
FROM COVID-19?

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AIR TRANSPORT

Why Nile
Air has
changed
course

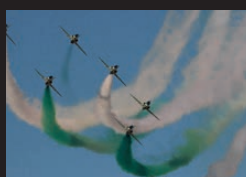
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Rolls-Royce
on a mission
to create
greener skies

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Are we facing a brave new world – or a grindingly slow collapse?

There is no doubt that the post-coronavirus world will be very different to the one we were celebrating barely six months ago. In this issue, you will see some of the comments in stories that came before the old world came crashing down.

Aviation – and the whole aerospace industry – has been in the spotlight throughout the coronavirus crisis as we have seen the unimaginable happen, with carriers across the world grounding their passenger fleets, while others limp on with the high-risk but essential role of repatriating stranded nationals left behind other countries' closed borders.

The International Air Transport Association (IATA) estimates the impact on the airline industry as being in the region of \$256 billion.

Even grounding aircraft and laying off staff, cancelling training, and halting

recruitment, are not enough. Nearly half of all airlines' costs are 'fixed' and so, as revenue dwindles to zero, cash has leaked out of the industry.

IATA reckons \$61 billion in cash could have gone in the second quarter alone – so no surprise, then, that the carriers were going cap-in-hand to their governments, making the case that commercial air transport is vital for a country's economy; that connectivity is the key to tourism and essential for the supply chains for industry and, in many cases, for fresh food and other vital items.

Around the world, some governments have responded. Dubai and Abu Dhabi were among the first – along with the US, Singapore and Germany – to push government funds at the airline industry, and the Gulf carriers will be among the first to resume revenue operations.

What will be fascinating as we move ahead will be whether governments invest in the industry – or just give more support to national carriers.

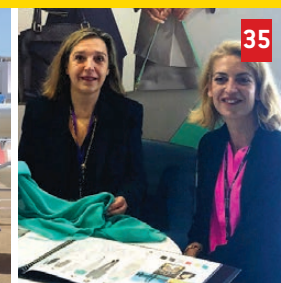
For many years, IATA has been banging on about profits being rare; there has been industry criticism of over-capacity; and an underlying race to grow debt to buy new aircraft, creating even more over-capacity.

Many governments are going to be very overstretched when this is over and aviation will need to be making a better case for investment than it is doing at the moment.

This may be the moment for that brand new world.

Lose that 49% foreign ownership rule; invest more in airspace modernisation; look again at those slot-rules; and let those airlines that survive the cut flourish.

Alan Peaford, editor-in-chief



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Guillaume Guyomar, Pall Aerospace manager responsible for Middle East business development.

Coming soon: Kuwait Airways' first A330-800neo.



IFE 'first' for Kuwait Airways

Panasonic Avionics is to provide in-flight entertainment (IFE) for Kuwait Airways' new fleet of eight Airbus A330-800neo aircraft.

Kuwait Airways will become the first airline in the world to operate the A330-800neo, starting in the second quarter of 2020 when it is scheduled to join the airline's existing fleet of Airbus A320 and Boeing 777-300ER aircraft, which are already equipped with Panasonic's X series IFE experience.

The deal covers Panasonic's full HD touchscreens, touch video

handsets, electronic device charging facilities, both universal and USB charging and more.

Panasonic's X series also features a passenger-friendly interface with multiple languages.

Ken Sain, CEO, Panasonic Avionics Corporation, said: "As Kuwait Airways develops its long-haul network with the introduction of its new A330-800neo fleet, Panasonic Avionics is honoured to be their partner of choice in enhancing their in-flight passenger experience."

Morocco buys second-hand drones

Morocco's Ministry of Defence has taken delivery of three Heron long-endurance drones, which were decommissioned from service with the French Armée de l'Air in early January 2018.

The three aircraft arrived in Morocco on January 26 for a reported price of \$48 million.

Though there has been no official confirmation of the deal by Morocco, it is believed the UAVs will be deployed to fight jihadist groups in the Western Sahara.

The three UAVs were previously deployed to Bagram Air Base in Afghanistan in February 2009, and were subsequently used in the Libyan conflict in August 2011 and in Operation Serval in Mali from January 2013.

Viper strikes up somewhere new

Bahrain's ambassador to the US, Shaikh Abdullah bin

Rashed Al Khalifa, was present as Lockheed Martin launched construction of the Block 70 F-16 Viper aircraft at its new production line at Greenville, South Carolina.

Lockheed Martin has a contract to produce 16 F-16 Viper Block 70 fighter aircraft for Bahrain, and to upgrade the country's existing fleet of 20 F-16s to the Viper configuration.

The US will also supply AIM-120C-7 AMRAAM and AIM-9X air-to-air missiles, as well as AGM-84 Block II Harpoon air-to-surface missiles and other weapons.

The first aircraft to come off the Greenville line – scheduled for December 2021 – is destined for the Royal Bahraini Air Force, the inaugural customer for the new-build F-16 Block 70.

Phenom 300E approval

Embraer Executive Jets announced that the new Phenom 300E – the fastest and longest-ranged single-pilot jet, capable of reaching

Mach 0.80 – has been granted its type certificate by the National Civil Aviation Agency of Brazil (ANAC), the European Aviation Safety Agency (EASA) and the US Federal Aviation Administration (FAA).

In addition, the aircraft received both avionics upgrades and enhancements that lowered cabin noise levels.

Avionics upgrade for Learjet

Bombardier has announced that the US Federal Aviation Administration (FAA) has certified the latest update to the popular Garmin G5000 avionics suite aboard Learjet aircraft.

The upgrade will be incorporated on new Learjet aircraft deliveries. The new Garmin G5000 avionics suite will also be a standard feature on Bombardier's newest Learjet, the Learjet 75 Liberty, which is expected to enter service in mid-2020.

A retrofit for in-service Learjet 70 and Learjet 75 aircraft will be available.



Done deal: From left, Salah Amin, Firoz Tarapore, and Fahad Al Qassim, chief executive officer of Emirates NBD Capital.

DAE signs \$300m five-year financing deal

Dubai Aerospace Enterprise (DAE) has signed a \$300 million five-year dual-tranche unsecured term financing facility with Emirates Islamic and Emirates NBD Capital, the investment banking arm of Emirates NBD.

The facility will contain a conventional and an Islamic tranche and can be upsized to \$600 million. It will support the future financing needs of DAE's business.

DAE chief executive, Firoz Tarapore, said: "We are very pleased to enter into this agreement with Emirates Islamic and Emirates NBD Capital, and to deepen our relationship with Emirates NBD as we continue to diversify our pool of liquidity."

Emirates Islamic CEO, Salah Amin, added: "We are committed to support the growth and development of prominent local companies like DAE. The funding demonstrates our unique capability to be the leading provider of Islamic banking solutions to corporations and individuals alike."

The background of the entire page is a large, detailed image of an NH 90 helicopter. The top half shows a close-up of the cockpit and the front fuselage, with the identification 'RN-07' visible on the side. The bottom right corner features a smaller, inset image of an NH 90 helicopter in flight, viewed from the front, with 'NAVY' written on its side. The overall tone is dark and professional, emphasizing the military and rescue capabilities of the aircraft.

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AIRBUS



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Serco the ace for service in Dubai

International public services company, Serco Middle East, has announced the award of a major new contract to deliver essential frontline hospitality services at both Dubai International (DXB) and Dubai World Central (DWC).

The contract builds on the company's long term-partnership with Dubai Airports and will see Serco deliver the services for five-years, operating until December 31 2024.

Serco Middle East CEO, Phil Malem said: "We recognise that Dubai Airports plans to take service levels to even greater heights and, throughout the next five years, we aim to jointly revolutionise the standards of customer service and hospitality in the region."

Dubai Airports CEO, Paul Griffiths, added: "This contract is part of a series of moves we have taken in recent years to enhance airport experience at DXB and DWC and wow our customers by delivering an amazing airport experience."

Software deal

UK-based Ideagen has secured a project with the Saudi Arabian flying academy, OxfordSaudia, which will see it provide software to help meet regulatory and operational requirements.

OxfordSaudia, owned by the Saudi National Company of Aviation (SNCA), will implement Ideagen's Coruson system for quality management, with additional functionality and capability for safety and risk.

The flying academy is the kingdom's first ever, and is an authorised training partner of the CAE, a global leader in training for

Etihad Cargo extends Dnata global partnership



Etihad Cargo and Dnata extend partnership to 15 global stations.

Etihad Cargo has bolstered its global handling partnership agreements with Dnata.

The new agreements align the two UAE-based companies until 2023, with Dnata providing warehouse and cargo-handling services to manage 180,000 tonnes of air freight carried annually across 15 gateways in Etihad Cargo's global network.

For the first time, the Etihad Cargo-Dnata alliance now extends to North America and South Asia Pacific, with Dnata having commenced warehouse operations at Canada's Toronto Pearson Airport from February 5, 2020, to be followed by Singapore's Changi Airport.



New deal: Captain Mohamed Ahmed, CEO of SalamAir, and Dr Rashid Mohammed Al Ghilani, CEO of ONEIC.

SalamAir cashes in with ONEIC

SalamAir has signed an agreement with Oman National Engineering and Investment Company (ONEIC) to facilitate a cash collection service.

ONEIC, a public joint stock company that operates in utilities and engineering sectors, is a key bill collector in Oman.

The partnership will allow SalamAir customers to use ONEIC's different payment channels (website, kiosks, mobile app and outlets) to pay for booking tickets and other added services. The facility is now available offline in its 73 outlets across the country.

the civil aviation, defence and security, and healthcare markets.

Fans in Dubai

Aerostructures Middle East Services (AMES) has opened a facility at Dubai's Jebel Ali Free Zone to accommodate fan stator module repair services for the GE90 engine.

The company specialises in engine nacelle and radome maintenance, but the extended facility will accommodate new preventive maintenance inspections and associated repairs on the fan stator modules found on the engine powering Boeing 777 aircraft.

Boeing 777X flies into next phase

Boeing's new 777X took to the skies in January for the first time to enter the next phase of its rigorous test programme.

Based on the popular 777, and with proven technologies from the 787 Dreamliner, it took off in front of thousands of onlookers at Paine Field in Everett, Washington, for a nearly four-hour flight before landing at Seattle's Boeing Field.

The 777X has already been ordered by Emirates, Etihad and Qatar Airways.

"The 777X flew beautifully and the testing was very productive," said Captain Van Chaney, 777/777X chief pilot for Boeing test and evaluation.

Marshall's Kuwait deal

Marshall Aerospace and Defence Group has signed a multi-year contract with the United States Government to support the Kuwait Air Force fleet of KC-130J tanker aircraft.

Marshall will carry out planned maintenance interval inspections, full aircraft repainting and specific overhaul tasks on

Kuwait's three KC-130Js – the extended-range tanker version of the C-130 Hercules transport aircraft modified for aerial refuelling.

Etihad's pass mark

Etihad Airways has announced a partnership with Norwegian technology developer, Braathens IT, to develop TravelPass, an innovative travel solution initially aimed at corporate and frequent travellers, which will launch later this year.

Customers can purchase a TravelPass for a set number of trips or a particular travel period instead of purchasing flights one by one.

Qatar's new lounge

Qatar Airways has officially opened its new premium lounge at Singapore Changi Airport's Terminal 1.

Qatar Airways Group chief, Akbar Al Baker, said: "The lounge design is inspired by modern-day Arabic architecture, reflecting our heritage."

"As the first Qatar Airways lounge following this design concept, it will serve as a new standard for all our premium lounges going forward."

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Etihad training approval

Etihad Aviation Training, the specialist training division of Etihad Aviation Group, has become the first aviation company in the Middle East to gain approval from the European Aviation Safety Agency (EASA) to train Boeing 777 and 787 pilots for European operators, and carriers elsewhere that adopt Europe's air safety standards.

The approval expands the global capabilities of Etihad Aviation Training, which, in 2018, also became the first Middle Eastern aerospace business to gain EASA designation as an approved training organisation for pilots of Airbus A320, A330 and A340 aircraft.

Training in on Alsim

Istanbul Aviation Academy has purchased an Alsim AL250 flight simulator. Hasan Keser, the flight-training school's quality manager said: "Alsim has proven itself over the years with the best quality, reliability and experience in the production of simulators."

The Alsim AL250 is a generic and compact simulator for single and multi-engine piston (SEP/MEP reconfigurable) private pilot licence, commercial pilot licence, and instrument rating training.



A320neo boost for EgyptAir

EgyptAir has taken delivery of its first of 15 A320neo family aircraft on lease from AerCap, becoming the first airline in Africa and the Middle East to operate both the A320neo and A220, the most modern and fuel-efficient single-aisle aircraft types. Alongside the A220, the A320neo will be an integral part of EgyptAir's fleet modernisation plan that will replace its existing ageing single-aisle fleet.

EgyptAir's A320neo is powered by CFM Leap 1 engines and configured in a two-class cabin with 142 seats. This will include 16 business-class seats, offering a 48in seat pitch, and an economy cabin with 126 seats offering 29-30in pitch.

Passengers in both cabins will also benefit from a superior cabin ambience featuring relaxing mood lighting in-flight entertainment and Wi-Fi connectivity.

Joramco's Express move

Amman-based Joramco, the engineering arm of Dubai Aerospace Enterprise (DAE), has entered into a first maintenance agreement with Avion Express, one of the largest narrow-body ACMI operators. The agreement includes heavy maintenance on six of the carrier's A320 aircraft.

Jeff Wilkinson, Joramco's chief executive said: "The agreement marks a strategic move forward as Joramco expands further into the Eastern European market. The continuous expansion

of our capabilities, skillset and service offerings, is part of DAE's progressive vision and a necessary part of maintaining our dynamic position as a world-class MRO."

Digital transformation

Dassault-owned ExecuJet MRO Services is to roll out several software applications from Ideagen across its global operations to standardise a series of processes as it prepares for a three-year growth project.

The various products will handle processes associated with quality, safety, risk and training

across ExecuJet MRO Services' global sites.

Ideagen's software will play a central part in ExecuJet MRO Services' digital transformation programme as it looks to grow the business following its recent acquisition by Dassault Aviation.

KlasJet milestone

European business aviation company, KlasJet, has completed more than 3,500 flights and flown 45,000 passengers to more than 80 countries and 200 airports worldwide.

KlasJet operations in the Middle East have seen nine countries served and more than 190 flights completed.

DC walks the line

DC Aviation has been selected to perform line maintenance and warranty work for Comlux customers based in Europe and the CIS.

The line and base maintenance services for aircraft of the Airbus ACJ Family, Global Express 5,000/6,000, and Challenger 604/605 will be carried out at DC Aviation's dedicated 5,700sqm Stuttgart Airport (EDDS) hangar, which also contains a large and well equipped parts inventory, a certified battery and tyre shop, and a maintenance logistics centre.

Gulf Air says goodbye to long-serving Airbus 330

Gulf Air bade farewell to its last Airbus 330 aircraft after 19 years' service. Members of Gulf Air's executive management and aircraft engineers and maintenance technicians joined in a farewell event at Bahrain International Airport.

CEO, Krešimir Kucko, said: "This Airbus 330 aircraft served the national carrier for almost 20 years and supported our growth during the last two decades.

"Gulf Air started its fleet modernisation programme in 2018, which began with the delivery of the Boeing 787-9 Dreamliner. As of today, all our long-haul routes are operated exclusively by Dreamliners, which showcase our new brand and new livery. By the end of this year we will receive the last three aircraft of our Boeing 787-9 Dreamliner order."



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As the Covid-19 virus spreads its deadly tentacles around the globe, Alan Peaford looks at how the region's airlines will survive the impact.

Government support is critical if airlines are to win the fight for survival

Much of the Middle East's aviation business is based on global connectivity. Until last year, Emirates was the airline carrying the greatest number of passengers to and from Africa – many from Asia. Qatar, Saudia and Etihad crossed the world bringing continents closer – while a further 29 carriers shared almost \$70 billion in revenue, carrying around 230 million passengers and serving the capitals and some secondary cities throughout the MENA region.

Today, many of the 1,406 aircraft serving the MENA region's carriers are idle. Parked on taxiways at quiet home airports or on military airfields.

In recent weeks, the airlines have begun flying limited routes – primarily to repatriate passengers. Training and recruitment have halted. Staff have been furloughed or, in some cases, made redundant.

The airlines themselves, which have done everything they can to reduce their variable overheads, are still burdened by almost 50% fixed costs – much to with the high-value assets sitting parked on the ground.

The biggest challenge is cash.

\$61 billion of cash reserves

"Globally, we estimate that airlines will burn through \$61 billion of their cash reserves during the second quarter, ending June 30," said Muhammed Ali Albakri, the International Air Transport Association (IATA) vice-president for the Middle East and Africa. "While posting a quarterly net loss of \$39 billion, the impact of that and cash burn would be amplified by \$35 billion liability for potential ticket refunds," he said.

Albakri added the eventual outcome could be a cost to the industry as a whole of more than \$250 billion.

IATA has called on governments for a mixture of direct financial support to the airlines, loans and loan guarantees, and support for corporate bond markets and tax relief.

"Many governments in the region have committed to provide relief from the negative effects of Covid-19. For instance, the United Arab Emirates and Qatar have already done so, but more help is needed – and specifically for aviation," Albakri said.

"Governments must recognise the vital importance of the air transport industry. Airlines are fighting for their survival in every corner of the world. Travel restrictions and evaporating demand mean that, aside from cargo, there is almost no passenger business.

"Failure by governments to act now will make this crisis more painful. Healthy airlines will be essential to jumpstart the Middle East and Africa and the global economies around the world."

The Middle East cargo business has weathered some of the storm.



Weathering some of the storm: The Middle East cargo business has increased capacity.



Strapped in: Flydubai has been working with the authorities to increase its payload by allowing cargo in the cabin.

Middle Eastern airlines' cargo demand increased 4.3% in February 2020 compared to a year-ago, according to figures from IATA. Capacity increased by 6.0%. However, given the region's position connecting trade between China and the rest of the world, its

carriers have significant exposure to the impact of Covid-19 in the period ahead, the statement said.

One airline looking to support the region's freight demand is Flydubai. Troubled by the grounding of its delivered and ordered Boeing 737 MAX aircraft ahead of the current virus, Flydubai has responded by allocating six 737-800 aircraft to operate as all-cargo flights.

Continuity of the supply chain

Hamad Obaidalla, CCO, said: "We recognise that air cargo has an important role to play in supporting the continuity of the supply chain and the efforts at a government and a private sector level to ensure the movement of essential supplies, especially during these unprecedented times."

Flydubai is utilising the cargo hold capacity in its passenger aircraft and has been working with the authorities to increase its payload by allowing cargo in the cabin.

Qatar Airways, which has maintained flights to key destinations throughout the crisis, has built up its cargo business. During March it transported more than 50,000 tonnes of medical and aid supplies to affected regions around the globe. This equates to roughly 500 fully loaded Boeing 777 freighters.

CEO, Akbar Al Baker, said: "Now, more than ever it is important to support global trade that ensures the supply of essential goods and vital aid worldwide. I am thankful to the airport authorities, ground-handlers, cargo agents and governments who have helped us increase our services to fulfil the demand for time-sensitive freight."



Muhammed Ali Albakri: "Failure by governments to act now will make this crisis more painful."



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*Like all Libyan carriers, Afriqiyah Airways is in a seemingly endless fight for survival. But chairman, Mustafa Maatug, tells **Martin Rivers** he's full of hope for the future.*

Silver lining shines through the fog of war

Mitiga Airport, Tripoli's only functioning gateway, resumed operations in December after it was closed for three months due to airstrikes by Khalifa Haftar, the country's most powerful warlord.

The disruption was just the latest blow for Libya's long-suffering airlines – their previous hub, Tripoli International Airport, was destroyed in 2014 – yet Mustafa Maatug, the chairman of Afriqiyah Airways, one of Libya's state-owned flag-carriers, is quick to find a silver lining.

"This sort of problem is happening very rarely," he said. "It happens from time to time, but these problems will not stop us from operating."

Used to crises

The reality is that Afriqiyah, its fellow flag-carrier Libyan Airlines, and a handful of private operators are used to such crises.

Libya began its slide into civil war in 2011 amid the Arab Spring uprisings that engulfed the region. Hopes were high that the oil-rich nation would embrace democracy after the overthrow of its dictator, Muammar Gaddafi. But the militias which toppled him fell back on to tribal loyalties and continued battling amongst themselves.

Power soon coalesced around two centres: a western government in Tripoli, which is backed by the United Nations; and an eastern government in Tobruk, which is allied to Haftar's troops and supported by Egypt and the UAE.

Fractured in this way, Libya's state-owned entities have found it difficult to stay impartial. The two national airlines are particularly exposed due to their operational presence in both Tripoli and the eastern city of Benghazi.

For Afriqiyah, these competing interests gave rise to "split administrations" in the east and the west, according to *The Libya Herald*, with rival managers steering the airline in two different directions. Once again, however, Maatug downplayed the problem and insisted that the leadership speaks with one voice.

"Afriqiyah is one company and there is no split between the east and the west," he said. "This rumour that you heard is not true. We did have some administration problems before, but now we have only one board and we



“Aviation in Libya has nothing to do with the political side.”

MUSTAFA MAATUG

are all together now. There is no split at Afriqiyah at all."

The chairman stressed that the Tripoli-based carrier has encountered "no problems" at its Benghazi station and that "aviation in Libya has nothing to do with the political side".

Although management have succeeded in keeping the airline alive, Afriqiyah's network is a shadow of its former self. Just seven overseas markets are operated on a scheduled basis: Tunis and Sfax in Tunisia; Istanbul in Turkey; Amman in Jordan; Alexandria in Egypt; Khartoum in Sudan; and Niamey in Niger.

Charter flights are also operated to Accra, Ghana.

Temporary hub

The domestic network links Tripoli and Benghazi with Sabha and Kufra in the south, and Zintan and Misrata in the west. Misrata Airport, located 200km east of Tripoli, served as the capital's temporary hub during the closure of Mitiga Airport.

Lagos, Nigeria and Cotonou, Benin are among the markets being evaluated for future expansion – but the size of the fleet poses a challenge.

Afriqiyah currently deploys nine aircraft: five Airbus A320s, two A319s, one A330-300 and one A300 freighter. A second A330-300 has been leased to Turkish Airlines, while four or five aeroplanes are inoperable

due to damage sustained in the war.

Talks are now under way with Airbus about replacing Afriqiyah's historic commitment for 10 wide-body A350s with a mixed order that would lift the fleet to 20 units, likely including A321neos.

"We're a very good customer for Airbus," Maatug said, predicting an announcement in the near future.

However, deliveries are unlikely until the company receives assurances that it can return to Europe. All Libyan carriers have been banned from the continent since 2012, when Brussels voiced "serious concerns" about the oversight capabilities of the Libyan Civil Aviation Authority. On that front, too, Maatug is full of optimism.

"Shortly, Libya is going back to its normal position, so don't you worry," he affirmed. "We are very close to Europe. Shortly this embargo will be lifted... When they lift the embargo, we are ready to go."

A large jet engine is shown in the background, mounted on a complex metal structure within a factory or assembly line. The engine is a high-bypass turbofan, with its fan blades clearly visible. The word "LEASES" is written in large, three-dimensional, metallic blue letters in the foreground, reflecting on the surface below. The background is a bright, industrial setting with a high ceiling and various structural elements.

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*Nile Air managing director,
Yossrey Abdel Wahab, explains to
Martin Rivers why the Egyptian
airline has paused its expansion.*

Nile's tide is turning

In recent years Nile Air had seemed to be a rare bright spot in Egypt's civil aviation market, spreading its wings even as the country grappled with a series of political and security crises.

Former boss, Ahmed Aly, attributed the airline's success to its varied customer base of business travellers, pilgrims, tourists, and those visiting friends and relatives. Under his watch, the full-service carrier grew its fleet from two to seven aircraft, while launching a host of new routes.

But the expansion ground to a halt in 2017 and Aly's successor, Yossrey Abdel Wahab, is far from convinced about the wisdom of the strategy.

It might have worked in less volatile times, he said, but with EgyptAir under pressure, the government is taking what many see as an uneven approach to traffic rights.

"The flag-carrier goes for our destinations," Wahab complained. "They have [multiple daily flights to] Jeddah, Medina. And the authorities refuse to give us daily to Jeddah or Riyadh. Instead, they give them to Saudi companies.

"There is a problem from our authorities. I have some destinations; I was surprised when the authorities gave the same destinations to other companies. Maybe they want to make us damage ourselves? Then we are closed and all our employees are going [out of work]."

Pitted against full-service rivals with higher frequencies and budget rivals with lower costs, Nile Air has now quit many of the routes that were launched during Aly's tenure.

Routes still in the red

Al Ain in the UAE; Basra in Iraq; Port Sudan in Sudan; and Abha, Hofuf and Riyadh in Saudi Arabia have all been axed.

Scheduled flights are still operated to eight points in Saudi Arabia; Baghdad in Iraq; Istanbul in Turkey; and Kuwait. The hub at Cairo International Airport is complemented by operations at seven other Egyptian gateways (Alexandria, Aswan, Asyut, Hurghada, Luxor, Sharm el-Sheikh and Suhag).

But, with many of those routes still in the red,

frequencies are variable and the airline's five A320s and two A321s are increasingly being placed with charter and wet-lease customers.

Last summer, for example, three aircraft were wet leased to Wings of Lebanon during what should have been Nile Air's busiest time of the year. The airline also operated repatriation flights on behalf of the UK Government following Thomas Cook's collapse.

Wahab confirmed that charter flying for tour operators is now one of the company's main income streams – and not by choice.

"We are taking a lot of business from Spain, France, Italy," he noted. "The potential for Egypt is coming strong. We have a lot of tourists. But it is not our work. We are a scheduled carrier, not a charter company."

Domestic operations from Cairo have survived the cull, but, once again, Wahab is downbeat on their performance. "Domestic [flying] is not profitable because it is a short cycle," he insisted. "It is no good. It damages your aircraft. You put a lot of money in maintenance."



WEIGHED DOWN UNDER THE WEIGHT

*Three years after taking on the top job at Tunisair,
Ilyes Mnakbi (left) tells Martin Rivers the flag-carrier
is still struggling to turn the corner.*

Tunisair is working on a new restructuring plan after its government owner walked away from a proposed overhaul that would have cost \$1.3 billion Tunisian dinar (\$457 million).

"We will use another plan that doesn't need for us this quantity [of money]," Ilyes Mnakbi, the airline's chief executive, said on the sidelines of an industry conference in Kuwait.

"We will make our own plan – not the government's plan – for restructuring the company. It will be less money than the other one. The government doesn't give us this amount."

Mnakbi provided few details about the revised

plan, insisting that management were still weighing up several options. But he reiterated his support for three strategic priorities: fleet renewal; rationalisation of the workforce; and an increased focus on Africa.

Tunisair has signed a sale-and-leaseback agreement for five Airbus A320neos, the chief executive confirmed, with deliveries expected by early 2021. It also plans to dry lease six more current-generation A320s this year.

The existing fleet of 15 A320s, four A319s, two A330s and six Boeing 737-600s, has an average aircraft age of 17 years – explaining the airline's reputation for



“I will make a lot of noise before I die. I’m going to the minister, the prime minister, the president, and after that I’m going to God.”

YOSSREY ABDEL WAHAB

A former journalist himself, the airline chief is reluctant to make bold claims in the media and would not be drawn on specifics about his recovery strategy.

However, the recent strengthening of two overseas stations may, perhaps, give a hint of management’s thinking. Jeddah and Kuwait were last year served from five-plus airports in Egypt, tilting the network away from the Cairo hub.

Deliberate strategy

What is not clear is whether that was a deliberate strategy or a forced retreat due to protectionism in the capital.

“Until now we are just trying to stand on our feet. We are looking for the civil aviation [authority] and the [transport] minister to stand with us – like when they stand with EgyptAir – because we are a national carrier also, and we work under the same laws,” Wahab said.

“I will make a lot of noise before I die. I’m going to the minister, the prime minister, the president, and after that I’m going to God.” ■

OF RESTRUCTURING, TUNISAIR TURNS TO PLAN B

delays, cancellations and poor on-board product.

Last October, Transport Minister Hichem Ben Ahmed admitted that only 22 of the 27 aircraft were operational.

As well as undermining flight schedules, the ageing fleet has exacted a heavy financial toll by pushing up maintenance costs and forcing management to rely on wet leases. Last summer, the flag-carrier sub-contracted two aircraft from newly resurrected Syphax Airlines, which is based in Sfax, Tunisia’s second city.

According to its 2017 financial statements – the most recent on record – the state-owned firm has now accumulated losses of 898 million dinars.

A bloated workforce is, perhaps, the biggest factor affecting performance. In January, Mnakbi announced his intention to remove 4,800 of the company’s 7,800 employees. But his ability to push through the crucial reform is in doubt. Earlier efforts to

downsize the company by 1,200 employees were blocked by Tunisia’s powerful trade unions.

Expansion across Africa is another longstanding priority that has not yet borne fruit. Tunisair currently serves eight overseas points in west Africa and five in north Africa – a fraction of its western European footprint.

Management have been trying to pivot towards their home continent since 2017, when Tunisia finalised an open-skies agreement in principle with the European Union. Khartoum in Sudan, Douala in Cameroon, and N’Djamena in Chad were eyed for route launches two years ago, but none of the services got under way.

Asked for an update on the strategy, Mnakbi would only say that “about another six destinations” in Africa are under review.

Whatever the macroeconomic benefits of open skies, there is little doubt that Tunisair would struggle to hold its own against Europe’s budget airlines. Opposition by

the flag-carrier has so far stopped the government from setting a date for the ratification of the treaty. When that eventually happens, Tunis, the country’s main hub, will be exempt for a period of five years.

The popular resorts of Djerba and Monastir will have no such reprieve, however, so Mnakbi is also evaluating plans for a low-cost subsidiary to defend market share in the leisure segment.

“We don’t approve it until now, but we are thinking to make a new strategy for low-cost, for the open skies,” he confirmed. “We are waiting for the agreement of the European Union as, until now, they didn’t give us this agreement.”

The low-cost venture would initially take the form of 737-600s borrowed from the flag-carrier and placed with Tunisair Express, the group’s regional operation.

Tunisair Express currently deploys four ATR 72s, including two brand new 72-600s that were delivered late last year. A third 72-600 is expected shortly. ■

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Jordan has always been a tough location in which to operate. One young airline fighting to make its mark in the local market is Fly Jordan Airlines. Alan Dron reports.



Watching and waiting: Fly Jordan aims to acquire younger Boeing 737-300s. PICTURE: FLYJORDANAIRLINE.COM

WHY A HOLIDAY COMPANY TOOK A TRIP INTO THE UNKNOWN



A small nation with few natural resources, in recent years Jordan's airlines have had to cope with the twin additional challenges of competition from both the major Gulf airlines and the increasing threat of low-cost carriers.

It might seem odd, then, that a company successful in another field would take the risk of setting up its own airline in the country.

However, confident in its 25 years' experience of the holiday industry, that was what the country's largest tourism agency, Dallas Travel and Tourism, decided to do in 2015.

The resulting company, Fly Jordan Airlines, launched in January 2016 and has steadily increased the scale of its operations each year since then, with the number of annual hours flown rising from 1,500 in 2016 to 2,800 by September last year.

Runway excursion

"In the beginning, it was very difficult, especially in 2017," admitted CEO, Ibrahim Shati. One problem was a runway excursion at Aqaba Airport by one of Fly Jordan's aircraft on wet lease (ACMI) to fellow-Jordanian carrier, Royal Wings. The aircraft veered off the runway and ended up in soft ground. The incident meant that the aircraft needed a new undercarriage and engine, putting it out of service for six months.

Amman-based Fly Jordan is currently a charter operation, flying outbound Jordanian tourists mainly to Egypt (notably to Sharm-el-Sheikh) and also to holiday destinations in Turkey, as well as to the coastal resorts of Batumi in Georgia and Varna in Bulgaria.

The company at present operates a modest fleet of two

Boeing 737-300s. There are plans to acquire a pair of younger 737-800s, but the grounding of the 737 MAX over the past year has meant that the -800, the previous generation of the 737 family, has been in high demand as airlines scramble to fill the gaps in their fleets caused by the absence of their MAXes.

"Because of the MAX problem, if you want to purchase a -800, it's a minimum of \$16 million," said Shati. "We're waiting for the MAX problem to be finished so we can get some -800s not quite so expensive as at present."

Shati and his team have ambitions to move into scheduled services. For this, however, they would require a larger partner – either another airline or an investor – to help them compete with larger rivals.

One potentially lucrative market would be Iraq; around 500,000 Iraqis have moved to Jordan because of the recent war with Islamic State, but they frequently travel home.

"It's a good business, but we can't compete with Iraqi Airways, which has newer aircraft – Boeing 737-700s and -800s. We can't compete with our -300, especially on maximum take-off weight. We can't take so much baggage."

We need an investor

Fly Jordan would also like to fly into London. "But you need an aircraft that can fly for five to six hours. That's why we need an investor to come in, with aircraft or an airline, to come and use our AOC and make [Amman] into a hub."

Fly Jordan also sees potential opportunities in the cargo sector. The country's sole dedicated freight operator was Jordan International Air Cargo, owned by the Royal Jordanian Air Force, but it has ceased operations. National carrier, Royal Jordanian, has only a single Airbus A310 that it uses as a freighter.

Fly Jordan has been modestly profitable in recent years, said Shati, but those profits have been eaten up by necessary improvements to the aircraft, such as installation of the automatic dependent surveillance – broadcast (ADS-B) navigational system. That has effectively become a mandatory requirement as, without it, no airline can fly into the European Union from July this year.

At \$500,000 per aircraft, that is a significant purchase for a small company.

A series of airworthiness directives from Boeing in 2019 also racked up expenses.

And 2021 will see the installation of a global navigation satellite system (GNSS) to allow the 737s to operate into Dubai; the airline cannot currently fly into the Gulf hub because its aircraft lack the system.

Overall, said Shati: "We're working on break-even." ■



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A big welcome: The new Universal Aviation Turkey team and Ataturk Airport.

Universal Aviation, the ground support division of Universal Weather and Aviation, has expanded its network in Turkey.

Dave Calderwood reports.

Going to ground in Turkey

Universal Aviation Turkey has opened a new facility at Ataturk Airport in Istanbul. The new base will provide supervisory ground-support for business aircraft at all airports across Turkey, and is a partnership with local operator, Ferda Yildiz, and Kaan Air.

Universal's decision to expand into Turkey was based on increasing customer demand for operations into that country and better service levels. Chairman, Greg Evans, explained: "Turkey, and Istanbul in particular, is a rapidly growing business aviation market with good infrastructure and potential for growth. But it also continues to be a challenging destination for our customers due to service levels, parking availability and operating restrictions.

"Our clients told us they needed faster response times and higher quality service on the ground, more transparency in pricing, and quicker parking confirmations in Turkey. By directly providing ground supervision for our clients throughout Turkey, with our own professionals trained to our global standards, we are better positioned to reduce the inherent operating risks and ensure the success of their missions."

Time of opportunity

The opening has come at a time of opportunity, with all commercial airline traffic leaving Ataturk Airport (LTBA) for the new Istanbul Airport (LBFM).

"We decided to base our Turkey headquarters at LTBA because it is now the best airport option for business aviation operators in Istanbul," said Evans.

"With no commercial traffic, arrivals, departure, and taxi times are significantly faster. LTBA is also much more conveniently located to Istanbul's city centre, and provides greater operational flexibility in terms of both parking, slots, scheduled maintenance options, and customer preference to the airport's general aviation terminal."

Ataturk Airport is now dedicated to private jets only through the general aviation terminal. It is a 24-hour airport-of-entry with customs, immigration, and

quarantine (CIQ) facilities. Hangar space is available for transient aircraft up to the size of a Boeing BBJ or Airbus ACJ.

Partnering with Ferda Yildiz and Kaan Air means Universal is able to offer helicopter transport from airside to many destinations in town and vice versa, or point-to-point for business meetings, avoiding the challenging Istanbul road traffic. Kaan Air specialises in air taxi and has been a leading helicopter operator in Turkey since 2002.

"Looking ahead, it is going to be an exciting time of growth for Universal and our Universal Aviation network, as we continue to expand to high-risk, high-stress locations," said Evans.

Cultures and people

Gokmen Sendag, operations manager of Universal Aviation Turkey, said: "Merhaba! [Hello] and welcome to Istanbul, the city of the past, the present and the future. Istanbul not only joins continents, it also joins cultures and people. Istanbul is one of the most visited and important places in the world. You will find our staff professional, providing exceptional service, fast parking confirmations and response times, and transparent pricing."

A word of caution. Universal's own guide for business aviation operators going to Turkey says: "As there are security concerns in this part of the world, it's recommended that operators travelling to all airports in Turkey arrange aircraft security for the duration of stay. Aircraft guards can be arranged for airside security purposes, but this must be organised and approved prior to the day of operation.

"In recent years, the US has issued several travel advisories for its citizens visiting Turkey. Because of this, you should consider obtaining a current security intelligence report for the city, the airport, and your hotel."

The addition of Universal Aviation Turkey extends the Universal Aviation network to 18 locations in the Europe, Middle East and Africa regions.

Universal Aviation Turkey

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- Worldwide weather briefings;
- Baggage-handling;
- Permit coordination;
- Lavatory service.



Electric move: Saudi Arabia is investing in Joby Aviation, which plans to produce its new S4 electric air taxi.

PICTURE: JOBY AVIATION.

SAUDI INVESTMENT COMPANY MAKING THE SPARKS FLY

A Saudi investment company is backing one of the new crop of electric aircraft designs aimed at bringing pollution-free flight to the public, writes *Alan Dron*.

The company hopes to see the new aircraft operating in the Middle East over the next few years.

Jameel Investment Management Company (JIMCO), the investment arm of Abdul Latif Jameel (ALJ), has not said how much it has sunk into Joby Aviation, but the Californian company has recently raised \$590 million in a third round of fund-raising, taking its total funding to \$720 million – believed to be the largest amount of cash raised by a company in the electric vertical take-off and landing (eVTOL) market.

Leading the investing group in the latest funding round was Japanese car-maker, Toyota Motor Corporation.

Joby Aviation's S4 electric air taxi aircraft is designed to carry a single pilot and four passengers and to be capable of flying at 200mph (320km/h) out to a range of around 150 miles (240km) on a single charge of electricity.

□ □ □ □ □

The aircraft has an inverted gull main wing, together with a highly glazed cabin with a tricycle undercarriage. Propulsion comes from four motors on the wing, plus two on rear booms.

All six motors swivel through 90 degrees from horizontal to vertical to allow vertical take-off and landing (VTOL).

The aircraft, if it receives the necessary certification

and goes into production, will be operated as a taxi service, with passengers paying per trip.

"We're building a new system for transportation to transform your daily life, at greater safety and, in time, at a similar cost to driving," said Joby Aviation's founder and CEO, Joe Ben Bevirt.

"Through JIMCO's investment, Abdul Lateef Jameel is leveraging its regional expertise for Joby Aviation," said Hassan Jameel, deputy president and vice chairman of ALJ.

"Air taxi service is still in the early stages of commercialisation, but one that has the potential to completely transform the future of mobility. We are excited to be part of this new chapter for the sector, bringing fast, affordable and zero-emissions air mobility to Saudi Arabia and the wider MENA region."

MEDEVAC 'FIRST' FOR HONDAJET

What are the important considerations for an aircraft configured for medevac or air ambulance operations? Speed, certainly, but also a quiet cabin to reduce fatigue for both patient and medical staff – and that's a key advantage of the innovative HondaJet's over-wing engine design, writes *Dave Calderwood*.

That's now been recognised by Wing Spirit, a charter company based in Hawaii, that carries out both charter and air ambulance flights.

The first HondaJet Elite to be fitted with a medevac interior was announced at the 2019 National Business Aviation Association (NBAA) Business Aviation Convention and Exhibition, where a mock-up of the cabin was on display.

Honda Aircraft Company president and CEO, Michimasa Fujino, who was also the designer of the aircraft, said: "We are pleased to announce the installation of the first medevac configuration on the HondaJet. We are confident the aircraft's size, efficiency, speed and cabin comfort are well-suited to these special missions."

Wing Spirit has ordered a total of 15 HondaJets to support luxury inter-island transportation around Hawaii.

"Wing Spirit's purchase of 15 aircraft to operate



Elite move: The installation of the first medevac configuration on the HondaJet has been announced.

throughout the Hawaiian Islands is a realisation of our goal to expand the world's business jet market," continued Fujino. "Prior to the HondaJet's entry into service in the region, no other light jet had operated in Hawaii."

The HondaJet is the most delivered aircraft in the light jet class for the past two years, and the fleet now comprises of more than 125 aircraft around the world, including the Middle East.

To meet increased demand for pilots, Honda Aircraft has begun construction on a second FlightSafety International HondaJet Elite simulator

located in Farnborough, UK, which was expected to begin operation as *Arabian Aerospace* was going to press. "As our fleet continues to increase in size, it is necessary for the HondaJet service, support and training network to expand," explained Fujino.

In addition to the over-wing engines, the HondaJet Elite also sports a natural laminar flow nose and wing, and a composite fuselage, which contribute to the aircraft's performance efficiency and help maximise fuselage space. Up front, there's a Garmin G3000 avionics suite customised for the HondaJet to help with single-pilot operation.

Since its launch in November last year, advanced defence technology group, Edge, has maintained a high profile. A major sponsor at the Dubai Airshow, the group has taken part in a number of defence, aviation and recruitment events in the region.

Jill Stockbridge spoke to CEO and managing director, His Excellency Faisal Al Bannai, at UMEX in Abu Dhabi.

His Excellency
Faisal Al Bannai:
"The aim is to use
the defence budget
to build our
economy."



LEADING EDGE

Advanced technology group, Edge, has three main aims – to create national sovereignty in defence assets; to develop a high-tech export market; and to attract and develop local talent.

These are lofty objectives, but HE Faisal Al Bannai, CEO and managing director, outlined the strategies that will make Edge both a leading international defence company and a national asset.

The creation of Edge enables the UAE to invest its defence budget back into the country.

He explained: "The UAE is the eighth largest spender on defence. The country has decided to use that budget, not just to defend ourselves, but to build capabilities. That is why much of this spending will now be routed through Edge to develop technologies and make acquisitions."

"The aim is to use the defence budget to build

our economy, instead of being used purely as an acquisition vehicle to buy products that fulfil a need."

The first responsibility of the company is to the country, which Al Bannai sees as an advantage.

"We are not going to develop every line of product, but the aim is to achieve, depending on the ministry of defence strategy, national sovereignty on critical defensive technologies. That takes first priority.

Export market

"However, that does not conflict with developing an export market. Our main client is the UAE Government. That is a very demanding client, and one that has access to technologies from all over the world. So, if we achieve national sovereignty with our technologies, it means that

we have products that can seriously compete on a global scale.

"We think both strategies support each other, and that national sovereignty is an anchor piece for our international sales in this domain. We can also develop products that our nation doesn't require, but other nations do, using sub-sets of the technologies we have already been developing.

"Some of the products in the defence industry are 10-15 years old. Who sells 15-year-old technology in the commercial market? Nobody. There is opportunity for a player, with an agile mindset, that has advanced tech, but also open architecture, that can be upgraded and refreshed on a much more frequent basis.

"In our situation, we are a fairly new player. We have technologies, but we don't have a lot of legacies.

Continued
on Page 24

CONTINUED FROM PAGE 23

I don't mind disrupting other products, as I have very little downside. Large players have downside, in any industry."

The company has brought together more than 25 entities to create its five clusters, and is interested in acquiring further technology and products.

The future corporate strategy is based on the formation of long-term partnerships for joint research and development projects. Al Bannai explained: "Strategically, we are having multiple discussions with multiple parties to establish a longer-term joint research and development programme. We will be announcing this year, a number of partnerships with international players.

"We have shied away from joint ventures, as it can complicate the operating model going forward. We prefer the model of creating product by product, joint interest, joint development, and having combined interest to develop products for both companies. Whether we sell it jointly is a commercial decision, but we are interested in partners who can jointly fund and develop.

"We also have an anchor customer that is willing to order, and that interests a lot of international companies. They see us as someone who is bringing in a client and funding, so it offsets some of the investment required and de-risks the project. That can really help the business case for many of these companies."

Skills of UAE nationals

The third aim of the group is develop the skills of UAE nationals in the high-tech sector. The company recently signed a memorandum of understanding (MoU) with Tawazun, allowing Edge to offer exceptional UAE nationals places in development programmes, job placement opportunities and internships through the sustain & enhance emiratization in defence and security (SEEDS) programme.

Al Bannai said: "We are working in cooperation with the education ministry to see what courses and programmes are required to develop the industry. You will see more and more students taking these courses as they can see the career opportunities.

"Before we had the Mohammed Bin Rashid Space Agency, why would anyone study space and satellites? Most people in the UAE study for work available in the UAE. Very few nationals leave the country to work overseas, and settle outside. So, having the space agency, opening the Mohammed Bin Zayed AI University, and having an employer like Edge, has stimulated the demand.

"At the same time, we are looking at what kind of specialised academia or programmes we can put in place to accelerate technical skills for individuals.

"Whether that will stay under the Edge umbrella, or we do that in collaboration with academia, doesn't matter, as long as we have it in the country. It is definitely on our agenda." ■

Fuel from the sky: An Egyptian MiG-29M2 trails the refuelling hose from its centreline PAZ-MK buddy refuelling pod.



Egyptian fighters demonstrate buddy refuelling capabilities

Egyptian Air Force Dassault Rafale and MIG-29M/M2 fighter aircraft conducted buddy-buddy aerial refuelling during the recent Qader-2020 military exercise.

The Egyptian Ministry of Defence said that Qader-2020 was intended to demonstrate its armed forces' capabilities, and to send a "tough message to Turkey", discouraging any intervention.

Turkey supports the UN-recognised government based in Tripoli and led by Fayez Al-Sarraj, while Egypt backs the rival Tobruk-based House of Representatives government led by Khalifa Haftar.

Until the exercise, the Egyptian Air Force was not thought to operate any air-to-air refuelling (AAR) tankers, limiting its ability to operate at extended range, and especially beyond Egypt's own borders. Some of its aircraft, including the

Dassault Mirage 2000EM, and the Lockheed Martin F-16C/D, did regularly practise AAR with allied tanker aircraft, and Egypt's new Rafales were filmed buddy refuelling from French Rafales during the Franco-Egyptian Ramses 2016 exercise.

Official video

An official Egyptian Ministry of Defence video of the more recent Qader-2020 exercise showed pairs of Rafales and pairs of MiG-29Ms buddy refuelling, and also showed Rafales refuelling from the MiG-29.

The Egyptian MiG-29s appear to have been supplied with a number of Zvezda PAZ-refuelling pods. Originally developed for use by the carrier-borne MiG-29K/KUB, the PAZ-MK allows the transfer of fuel from the tanker

Historic moment: The first F-15SR conversion by Alsalam taxis out for its initial post-upgrade flight.





aircraft's own fuel system, including both internal and external tanks, whereas earlier Russian buddy refuelling pods for tactical aircraft consisted of a hose drum unit with an integral fuel tank.

The PAZ-MK was developed from the UPAZ and UPAZ-1 aerial-refuelling systems used respectively on the Su-24M as a buddy refuelling store and on the Ilyushin Il-78 'Midas' tanker.

The PAZ-MK trails an 18.5 metre hose with an inner diameter of 52mm and can transfer fuel at rates of up to 750 litres per minute. It is equipped with a modernised hose response system, and a digital control system.

The centreline buddy refuelling store carried by the Rafale was not clearly shown in the video, but is probably the same unit as is used by the Armée de l'Air.



New era: Military officers attend the formal re-opening of the fighter brigade at Cairo West Airport.

PHANTOM WING FINALLY RE-EQUIPPED WITH F-16S

Egyptian and US military officers gathered at the formal re-opening of the fighter brigade at Cairo West Airport, which now operates the Block 52 F-16C/D.

The 222nd Tactical Fighter Brigade retired its last F-4E Phantoms in 1988, placing the aircraft in storage/reserve, while the 76th and 78th Squadrons were inactivated.

Now, however, the base has been rebuilt to accommodate new F-16s, which have replaced the ageing Phantoms.

The Egyptian Air Force was supplied with 35 ex-USAF F-4Es under the September 1977 Peace Pharaoh agreement, and also received AIM-7 Sparrow and AIM-9 Sidewinder air-to-air missiles and AGM-65 Maverick air-to-surface missiles at a cost of \$594 million. Ten further F-4Es were delivered between 1988 and 2000, bringing the 76th and 78th Squadrons to full strength and replacing losses.

Plans to procure more F-4Es were abandoned in favour of acquiring the F-16, and the multi-phase Peace Vector programme saw Egypt receiving a total of 220 F-16s between 1982 and 2002. Some 138 were delivered to Block 40 standards, 46 of them built by TUSAS in Turkey, and the remaining Block 15 F-16A/Bs and Block 32 F-16C/Ds were upgraded to Block 42 standards. These aircraft equipped air wings at Inshas, Beni Suef, Abu Sueir, Gianaklis, and Fayid.

However, the final 16 Block 52 F-16Cs and four F-16Ds, ordered under Peace Vector VII, were always intended to re-equip the units at Cairo West, and Peace Vector VII also covered the upgrade of existing F-4 operations and maintenance facilities to allow their use for the F-16 programme.

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Cairo West Air Base was to be fully functional, self-sustaining, and not reliant on facilities at other bases for operational or maintenance functions, while supporting operations by the F-4, the Northrop Grumman E-2C Hawkeye AEW aircraft, and the Lockheed C-130 Hercules transport.

This saw the construction of more than 100 buildings vital to the operation and maintenance of the aircraft including hangars, training facilities, munitions storage, living quarters, dining halls, and offices.

A ribbon-cutting ceremony marking the completion of the \$184 million construction project and the delivery of the 20 Peace Vector VII Block 52 F-16s was held in late 2019.

The new F-16s finally replaced the Egyptian F-4 fleet early this year, providing a significant increase in military capability.

FIRST SAUDI F-15SR CONVERSION FLIES

Alsalam Aerospace Industries (AAI) has completed the first in-country conversion of an F-15S (Saudi) aircraft to F-15SA (Saudi advanced) standard.

The F-15SA is a derivative of the two-seat F-15E Strike Eagle multi-role fighter, and is the most advanced variant of the Eagle in service.

The aircraft is equipped with a Raytheon AN/APG-63(V)3 active electronically scanned array (AESA) radar, a BAE Systems digital electronic warfare system/common missile warning system (DEWS/CMWS), and other advanced avionics systems.

The first locally converted Boeing F-15SR performed its initial functional check flight (FCF) from Riyadh International Airport on January 15 2020.

The F-15SR designation is applied to F-15S Strike Eagle aircraft converted to the latest F-15SA standards.

Saudi Arabia has purchased 84 new-build F-15SAs, and at least 68 of these have now been delivered to the Royal Saudi Air Force (RSAF). The 55th and 29th squadrons are now fully equipped.

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The F-15SA programme for Saudi Arabia includes the conversion of all surviving F-15S aircraft to the new standard, and 70 upgrade kits were ordered at the same time as the new-build aircraft.

The first two conversions were undertaken at Boeing's facilities at St Louis, one by a Saudi team from AAI. These two aircraft were delivered (with the first two F-15SAs) in December 2016.

The recent loss of two F-15S aircraft means that AAI

will now convert 66 surviving RSAF F-15S to F-15SA standards in-kingdom.

The company is manufacturing new wings, forward fuselages, pylons, and adaptors, as well as undertaking the upgrade. Riyadh-based AEC will manufacture certain avionics components as part of the programme.

AAI accepted the first F-15S aircraft for conversion on October 21 2018, and has now received 10 F-15S aircraft from the RSAF. The first of these to be completed made its initial functional check flight on February 2 2020, with the new nose section still in primer paint.

The F-15SR conversion programme will take six years, with the final aircraft to be handed over by June 2026.

WHEN EFFICIENCY MATTERS

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Song Hoi See and the new Premium Plaza Lounge, Dubai: "We were the first in the world to create lounges that are independent of the airport and the airlines."

A new lounge... but no time to relax for Premium Plaza

The latest Premium Plaza Lounge opened in Dubai International Airport Terminal 3 in January. The 1,260sqm facility is the third in the UAE, joining two at Abu Dhabi International.
Jill Stockbridge reports.

Song Hoi See, founder and CEO of the Premium Plaza Group, is delighted with the new facility, which was created from shell and core at a cost of around AED10 million (\$2.7m).

He said: "We were the first in the world to create lounges that are independent of the airport and the airlines. We are now in 46 international airports and have more than 160 locations worldwide."

The concept was born from Song's own frustration at the lack of facilities for business travellers on economy tickets.

He said: "I was in the airport for hours. I couldn't charge my laptop, couldn't send a fax, and it was frustrating. I thought 10-15% of the passengers are first and business class and the airlines take care of them. That leaves 85% that no-one is looking after. I need only a small percentage of that 85% to make the business model work."

While maintaining a signature style, each lounge is tailored to the airport, with local culture reflected in the décor and facilities.

Song explained: "First we studied the nationalities of those coming to DXB. We found India is the major one, then Saudi Arabia, third China, fourth the UK and the fifth Oman. We studied the profile of the customers. In 2001, a study said 68% of the people travelling through Dubai Airport are married, and over half are with companions. This means families, children, wives.

"So we designed our lounge to meet the requirement of the customers. Our lounge is family orientated as per Arab culture. We have four or five private family rooms, each of which can accommodate six people. We also have a children's room, where the youngsters can play. They will not disturb other visitors, and the parents can enjoy the facilities.

"Also, an outstanding element of the lounge is that all our food is freshly cooked. Food is a very important

element in the lounge experience. Our concept of food is 'glocal' – global and local. We are in this country, and we must introduce some local food, but also cater for the international tastes.

"We have segregation in the lounge, because you don't want to sit in the lounge resting and have someone eating next to you. We even create honeycomb seating, where you have an individual private area for working, or an individual cubical, where you can slide the door and take a nap."

Premium Plaza is looking at further investment in the Middle East, with Saudi Arabia of principal interest.

Greatest potential

Song said: "Saudi has the greatest potential and the country is just beginning to open up. To be frank, the service industry there is still very primitive. Places, such as Dubai, have five-star service, and Saudi will grow towards that. The crown prince is very open about that.

"They also have a good population, so the market size is not limited, and they have money. I am looking for new opportunities in Damam and Riyadh, and I am looking very seriously at Jeddah and other major airports in the kingdom."

The team will be expanding their service in Abu Dhabi this year, offering a meet-and-greet service when the Midfield Terminal opens. Song said: "The airport has realised we can do it more economically and has turned the concession over to us. We will have our own private check-in counter, immigration and customs. When the aircraft is ready, a car will shuttle you to the plane.

"Our meet-and-greet is an ambassador service. Our team talk to you, about the weather, places to go, things to see, where to find the best food. That is where we are strong. We know details. And the value of our service is in the details."



The second edition of the Kuwait Aviation Show was held under the patronage of HH Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah in January. Patrick Dirksen and Frank Mink were there.

KUWAIT FLIES THE FLAG WITH COLOURFUL SHOW

During the spectacular four-day show, in excess of 60,000 visitors witnessed more than 60 aircraft and helicopters, either on the ground or in the air, with companies from 37 countries taking part.

The show was officially opened by a Kuwait Air Force (KAF) SA.330 Puma, carrying the Kuwaiti flag, and flanked by two AH-64D Apache helicopters.

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The Qatar Emiri Air Force skydive team followed with 30 para jumpers. Some carried large national flags of Kuwait and Qatar, plus portraits of both the Amir of Kuwait and the Emir of Qatar, while 16 others formed different formations and ignited fireworks in the sky.

The team, which consists of special forces members, has been operating for eight years. It recently switched from using AW139 helicopters to two new DHC-6-400 Twin Otter aircraft.

This was their first public performance using the new aircraft.

Team members make more than 500

jumps a year – in the winter from home base, Al Udaid, while in summer they move to Florida, US, because of the heat in Qatar.

Finishing the first flypast was a Kuwait Airlines Boeing 777-300ER, flanked by two KAF F/A-18 Hornets, accompanied by the Hawks of Saudi Air Force display team, the Saudi Hawks.

The Americans were out in force during the week, displaying an F-15 and two F-35s doing a high-speed pass. The crowd especially loved the newest 'stealth fighter', the F-35 Lightning II.

Also, an MV-22 Osprey showed the best of both worlds with its interesting combination of aircraft and helicopter design, creating large sand storms, while hovering right in front of the crowd.

Italian Air Force test pilot, Major Domenico G, flew an impressive daily display with his F-2000A Typhoon. As the KAF has 28 on order, this display was a glimpse of things to come.

Three weeks earlier, the first instrumented series production aircraft (ISPA 6), equipped with the KAF configuration, successfully completed its first flight in Italy. Initial deliveries to

Above left:
Showing the flag during the opening of the show.

Above:
A para jumper from the Qatari team carries the flag featuring a portrait of the Amir of Kuwait.

Above right:
Focusing in on helicopters with the Kuwaiti Police's newest edition, the H225 Super Puma (top), one of the KOC Helicopter Service's AW169s (centre), and the Kuwaiti Police and Air Ambulance (bottom).

Kuwait are expected in the last quarter of this year.

Another Italian F-2000A could be admired on the ground, with the C-27J Spartan, which acted as support aircraft, parked next to it.

Turkish Aerospace Industries (TAI) had announced it would show its newest turboprop trainer aircraft – the Hürku – both on the ground and in the air. Unfortunately this didn't happen. A Saudi F-15 was also billed on the daily flying programme but it also didn't show up.

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However, two aerial demonstrations teams – the Saudi Hawks and the UAE's Al Fursan – performed impressive routines on most days. On the ground, large commercial airliners, small general aviation aircraft, different helicopter operators and multiple military variations were present.

National operator, Kuwait Airways, which had celebrated its 65th birthday the month before, showed one of its two brand new Airbus A320neo aircraft, delivered as part of the running order of 10.



Above left:
Spectacular
formation jumping.

Above right:
Very tight formation
flying from the Saudi
Hawks.

Kuwait Airways expects to order the A350 next, as part of its strategy to become more competitive in the global aviation sector and help stimulate economic growth for Kuwait. The carrier announced a codeshare partnership with UAE national airline, Etihad, combining more than a dozen destinations worldwide.

Emirates showed the world's largest aircraft, the A380. This was adorned with special markings promoting the upcoming Expo 2020 that will be held in Dubai at the end of this year.

Gulf Air also showed an aircraft with special markings, in their case for the airline's 70th anniversary in March. The brand new Boeing 787-9 Dreamliner also proudly mentioned the Bahrain Grand Prix, of which the airline is the main sponsor.

State-owned Kuwait Oil Company (KOC) was also at the show. It operates in remote areas doing high-risk work.

Because of the need for a rapid response to any type of emergency, KOC decided a year ago that a helicopter service would be vital. A dedicated helipad, Ahmadi Helipad, was built and opened in January 2019.

Three AW169 helicopters have been wet-leased from Falcon Aviation and a team of 17 pilots, nine engineers, and a few dozen other staff make sure one is on 24/7 search-and-rescue (SAR) standby.

Since the introduction, a year ago, they have been able to assist in two serious accidents and two oil spills, apart from many other regular transport tasks.



Another helicopter operator present was EMS Kuwait, showing one of its two Bell 429s. These are operated by the Ministry of Health, from a heliport in the centre of Kuwait City, and are wet leased from Kuwait International Aircraft Lease.

EMS Kuwait started in 2011 with two second-hand Bell 430s that were bought as a gap filler while waiting for two ordered new Bell 429s. One of the Bell 430s has been withdrawn from use while the other still acts as a back-up aircraft. If the current contract, which was due to end as *Arabian Aerospace* was going to press, is renewed, the company plans to acquire a third Bell 429 to replace the Bell 430.

The police helicopter department was also present with one of its trusted SA365 Dauphin helicopters and a new Airbus H-225, which could be seen leaving early on the first day of the show to carry out a border guard mission. It was back on the static park the next morning.

The KAF ground display featured an AH-64D Apache attack helicopter and a venerable SA330 Puma, still used for 24/7 SAR duties while replacement H-225s are currently being built in France.

One Kuwaiti C-17 could be seen flying operational missions during a couple of the days, and examples of the F/A-18 Hornet, KC-130J-30 Hercules, Hawk mk.64, Tucano and SA.341 Gazelle completed the KAF inventory.

The Qatar Emiri Air Force brought a C-130J Hercules and C-17 Globemaster III to the show, while Qatar Airways showed one of its A350-1000s, for which it was the global launch customer.

Qatar Airways also announced eight new destinations for its growing route network, bringing the total to 177. The next edition of the show is scheduled for January 19, 2022. ■

The first International Aviation and Defence Exhibition (IADE) in Tunisia took place at Djerba-Zarzis International Airport on the island of Djerba in March. Patrick Dirksen and Frank Mink report.

This inaugural show was deemed such a success that the organisers have already announced it will take place every two years for the next decade.

Kais Saied, president of the Republic of Tunisia, formally opened the exhibition and met with representatives of both national and international industries.

In total, 111 exhibitors, 38 participating countries and 43 official delegations attended the event, which the organisers described as an opportunity for many investors in the field of aviation and defence to hold business-to-business (B-to-B) and business-to-government (B-to-G) meetings.

There were many fruitful deals done, not least the Tunisian Air Force signing a \$240 million contract with Turkish Aerospace Industry (TAI) for six Anka-S unmanned aerial systems and three ground control stations.

The success of the show was confirmed by Brigadier General Mohamed Hajem, who led the Tunisian Air Force delegation at the event. "It opens the door to Africa," he said.

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The air force displayed aircraft in both the static and dynamic displays and one of the highlights was its C-130J-30 Hercules, a relatively new addition to the inventory.

The C-130J-30 Hercules is already heavily used as a multipurpose transport aircraft. One is often deployed to Mali in support of the UN mission there and, in early February, it was used to repatriate 12 Tunisian nationals from China because of the coronavirus.

The agile light-attack and reconnaissance OH-58D Kiowa helicopter was also showcased. It can be equipped with an impressive weapons load and sensor suite. One of its main tasks is to provide top cover for the UH-60M Black Hawk helicopter during missions.

Tunisian light aircraft manufacturer, Avionav, showcased its Rally aircraft as a low-cost surveillance platform. Avionav started a cooperation with Turkish company, Bayhar, to equip the Rally with sensors and ground link capabilities.

This new concept eliminates the requirement for an on-board controller as real-time data can be sent to a ground operator via a line-of-sight data link that has a range of up to 300km.



Little and large: The Avionav Evada amphibious aircraft prototype interested the crowds but the big draw was the Tunisian Air Force C-130J-30.

Tunisia show all set to run for a decade

In addition to two Rally aircraft, the company put its prototype Evada seaplane on the static display.

ABC Composites, from Mghira, Tunisia, specialises in patented prepreg products. It started to design and manufacture ultra-light motorised (ULM) aircraft and drones few years ago. The Senegalese Government will be the launch customer for the ABC Sparrow drone, the prototype of which is currently awaiting approval for first flight.

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The Tunisian Garde Nationale presented one of its three Bell 429 helicopters. These are used for a wide variety of tasks such as traffic monitoring; maritime surveillance; intelligence, surveillance, and reconnaissance (ISR); and support of the elite counter-terrorism tactical unit.

Czech-based Aero Vodochody pitched its L-39NG as a replacement for the aging

Displays of cooperation

The Royal Saudi Air Force aerobatic team, the Saudi Hawks, performed at IADE.

During the opening ceremony, the team flew their Hawk mk65s in formation while trailing smoke in the colours of the Tunisian national flag.

IADE was also the first show of the 2020 season for the Turkish Air Force's Solotürk F-16C demo team, which included a new manoeuvre called the 3D aileron roll.

L-59 Albatross fighters that are currently in the Tunisian Air Force inventory.

The L-39NG is a next-generation low-cost follow-up of the legacy L-39 that served in many African countries.

The US Air Force sent two F-16C Vipers, one C-130J Hercules, and a KC-135R tanker aircraft to underline the good security and defence cooperation between the countries.

Also, a brand new US Navy P-8A Poseidon maritime patrol aircraft was present.

Textron presented its latest Beech 250 model, equipped with a Proline cockpit. Current Beech 200 family operators in the sub-Saharan region report that the aircraft operates very well. Textron aims to extend its network to the western Sahara region.

Turkey, China and Pakistan took the opportunity to show their product portfolios, ranging from shipyards and aircraft overhaul capabilities, to small firearms production and cyber security. ■

Airline CEOs, regulators, and trade associations, gathered in Doha recently for the second CAPA Qatar Aviation Aeropolitical and Regulatory Summit. **Alan Dron** was there.

THE THREE RS...

RESILIENCE, ROBUSTNESS, AND RABBITS PULLED OUT OF THE HAT



Front row seats: The VIP group had plenty to mull over at the summit.

The airline industry is considerably more resilient than it was a decade ago, despite the current problems of company failures, aircraft groundings, and the ongoing coronavirus (still mainly based in China at the time of the conference) senior executives told the audience at the summit.

Airlines have suffered from Boeing's crisis with the grounded 737MAX and the Rolls-Royce Trent engine problems on the 787, while Airbus had experienced major problems with delays to the A321neo and its cabin fit, said outgoing International Airlines Group CEO, Willie Walsh.

The A321neo's cabin problems were not just inconvenient but had created "a big financial impact, especially at Aer Lingus, which had been looking forward to using them on transatlantic routes", he said.

However, both Boeing and Airbus had responded positively to these problems – although not as quickly as some would have liked, he said. Nevertheless, he was more optimistic than he had been a year

ago that the issues would be resolved.

Part of the underlying problems with both Airbus and Boeing had been over-eager salesmen determined to sell aircraft at all costs, whether or not the airline industry needed them, he added. "I could never see how the manufacturers were going to deliver the aircraft they said they were going to. Both were vying to be number one and to outdo their competitors."

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No conference featuring Qatar Airways' Group CEO, Akbar Al Baker, can pass without him pulling a rabbit from a hat – and the summit was no exception.

His unanticipated announcement that his airline is in negotiations to buy 49% of African carrier, RwandAir, was well up to his usual high standards of taking his audience aback – including his own staff, judging by overheard comments afterwards.

The move to take a stake in the small African flag-carrier should be seen

together with the announcement, in December 2019, of Qatar Airways' decision to take a controlling 60% stake in the under-construction Bugesera International Airport that will serve the Rwandan capital, Kigali. The value of the investment has not been formally announced, but is reckoned to be around \$780 million.

Al Baker told journalists at the conference that he wanted to set up shop in Rwanda because of Africa's unserved demand for air travel, together with the country's central location on the continent and business-friendly environment. The small African country is also regarded as being efficient and well-run.

Qatar Airways would invest as much as was required and as much as the small African nation could safely digest, said Al Baker, but the airline would remain a cautious, prudent investor. It would not be a 'cash cow' for over-ambitious projects.

The major Arabian Gulf airlines, together with Turkish Airlines, have been expanding into Africa for some time and it is against this background that Qatar's twin moves in Rwanda can be seen. The Gulf carriers are soaking up African traffic, partly because several of the larger African flag-carriers, such as Kenya

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Airways and South African Airways, are in poor financial shape, creating potential for non-African operators to move in.

RwandAir CEO, Yvonne Manzi Makolo, outlined the potential benefits of linking up with Qatar Airways. While negotiations were still at a very early stage she said: "In very general terms, to go into a venture with a world-class airline like Qatar Airways, there are a lot of benefits, as you can imagine, [from] capacity building to training of our staff."

Several speakers praised Rwanda's vision for the future of its aviation sector, but also made the point that the continent simply has too many airlines bidding for a relatively small number of passengers. In 2018, the entire continent accounted for around 85 million passengers; a major European low-cost carrier, such as Ryanair, carries that many people in less than a month in the European summer season.

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Qatar Airways is in expansionist mode again. Shortly after the summit, it announced that it had increased its stake in International Airlines Group (IAG), parent company of British Airways, Iberia, Vueling, Aer Lingus and Level, from 21.4% to 25.1%.

With IAG's 2018 after-tax profit of almost \$2.7 billion (2019's figures were anticipated as *Arabian Aerospace* went to press but are likely to be similar), the dividends will help plug the hole in Qatar Airways' accounts caused by the country's political disputes with its neighbours, which have pushed Al Baker's company into the red.

During the conference, Al Baker said he would not be averse to increasing his company's 10% stake in South America's LATAM airline group, despite the presence of Delta Air Lines – which has been traditionally hostile to Qatar Airways – as a major fellow shareholder.

"I'm ready to do business with the devil," said Al Baker. "People will ask, 'Why are you doing business with Delta?' I will shake hands with anyone and do business with anyone if it's in the interests of my airline and my country."



Qatar Airways remained keen to take a share in Indian low-cost carrier, IndiGo, he said, but not while a dispute between the two multi-millionaire owners was continuing.

African nations suffer a similar problem to many of their Arab counterparts, in that their governments often harbour grandiose schemes for their commercial aviation activities, Arab Air Carriers Organization (AACO) secretary-general, Abdul Wahab Teffaha, said.

"Aiming high is probably inherent in [governments] looking elsewhere, seeing success, and wanting to replicate it. I see that repeated time and time again in the Arab world."

Al Baker was also characteristically outspoken about the slow progress being made towards liberalisation. It was all very well to talk about open skies policies, where airlines are allowed to operate into a country or region without limitation, but those principles fell apart when an airline, such as Qatar Airways, was unable to get landing slots at airports, he said.

Despite the EU-Qatar Comprehensive Air Services Agreement signed last year,

Qatar Airways is still running into opposition from some European airlines that want to block it from their home turf, said Al Baker. The EU had been a reliable partner, he added, but "Open skies agreements are useless if airlines are blocked from slots at airports or face other regulatory issues." He called for a single, worldwide standard for allocating slots.

He was pleased, however, that the US Government had effectively told American Airlines, United Airlines and Delta Air Lines that it would not accept their complaints about the expansion of Qatar Airways, Etihad Airways and Emirates Airline into the US.

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On the subject of air agreements, Henrik Hololei, the European Commission's director-general for mobility and transport, said he hoped to conclude a similar agreement with Oman by the end of this year. The agreements will give air carriers from the 28 European Union nations and the two Gulf states 'unlimited and unrestricted' access to their respective territories.

However, in unusually robust remarks, Hololei said that other Middle East nations had not yet shown the degree of vision and ability to see "the bigger picture" that Qatar and Oman had displayed in their negotiations with the EU.

Inevitably, Al Baker touched on the continuing diplomatic row between Qatar, on the one hand, and Bahrain, Egypt, Saudi Arabia and the UAE on the other. The problem shows no signs of easing, he said. The closure of the surrounding states' airspace to Qatar Airways' aircraft meant that each service incurred an extra 25 minutes of flight time, with its attendant costs. This placed "a huge operational strain" on the company.

Fortunately, he said, "our friendly neighbour" – an apparent reference to Iran – "allowed us access".

Qatar Airways' services departing Doha now head across the Gulf to Iranian airspace before turning on to courses for their destinations. ■

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Hygienic choice: Boxmark's Thomas Benz, key account manager, sales centre upholstery, with the leather-covered seat.



Aircraft Interiors Middle East (AIME), co-located with MRO Middle East, took place in Dubai in February. More than 5,000 trade visitors attended. Jill Stockbridge reports.

TAKING AIME AT GERMS



Tuna Cevik (right): "What we are doing is preventing the germs from spreading."

Although it fell at the very beginning of the coronavirus pandemic, health and hygiene was high on the agenda with aircraft interiors exhibitors.

While the in-flight entertainment and connectivity (IFEC) seminars were dominated by presentations on aviation connectivity and capabilities, on the floor, exhibitors were promoting their hygiene credentials.

Austrian tannery, Boxmark, has been involved in traditional leather production for more than 200 years, with products that range from vegetable-tanned shoe leather and chamois to the modern-day industrial production and processing of high-class upholstery leather. The team was on hand to showcase the added value work on offer – cutting, sewing, embroidery and embossing – which can be seen in airlines around the world, including Emirates and Lufthansa.

Dirk Van den Brande, key account & project manager, said: "We have a long history in the Middle East. We started many years ago with Etihad, through the designers and manufacturers. We try to make the leather as the customer wants it, but we stay very firm on the technical requirements. We keep our customers happy, but we offer exclusivity in technical features."

One technical area that has become an important topic is the ability to clean the leather. Van den Brande added: "All the leather we produce can be cleaned with strong disinfectant. We have some important customers who are now happy. If they had taken the normal leather, they would not be able to clean it.

"With fabric you have to take it off and wash it, but no airline has the time to do this on a regular basis. We make a leather that you can do almost everything to. You can use soap or any other cleaner. It is built into the product; you never need to have it refinished. You just have to clean it and then wipe it dry.

"Hygiene, is one of the first choices in selecting leather, even if they don't get the coffee stain off the leather, it is a clean stain."

Tuna Cevik, business development and marketing coordinator, Kets Fabrics, also described cleaning as a hot issue, and one which they are approaching with new anti-bacterial finishes. He said: "What we are doing is preventing the germs from spreading. We apply a chemical-based technology during the

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finishing process of the fabric. We have the certification that says that 99% of germs cannot grow after the application of this finish. They are not killed, but it prevents them spreading around and increasing.

"We also have easi-clean technology, so whatever you spill on the fabric you can just wipe clean with water, which makes for easy maintenance. That is very important. Once your aircraft lands, you want it to depart quickly, and fast cleaning is essential."

Elsewhere, there were plenty of fascinating innovations on show. For example, Mercury Products introduced the Airchair to the Middle East market.

Sarah McOnie, operations manager, explained: "The product was designed by my father, who is an aircraft engineer and has long experience of working with people who are disabled. He has been selling it in the UK for the last 12 years, but this year we are promoting it globally."

The Airchair is a lightweight folding on-board wheelchair. It weighs only 6kg, but can carry weights of up to 150kgs. McOnie



Sarah McOnie: "Airchair is ideal for travellers who have been injured, such as skiers, or those who feel unwell."

said: "We have three different sizes – 14inch, 15inch, and 16inch. The 14inch version is designed for narrow-body, single-aisle aircraft, with the larger chairs available for the wider-body aircraft."

"All are small enough to be stored in an overhead locker or the dog box. Cabin crew love the product for its ease of use, compared to other on-board wheelchairs that are heavy and bulky, need special storage areas and are difficult to manoeuvre."



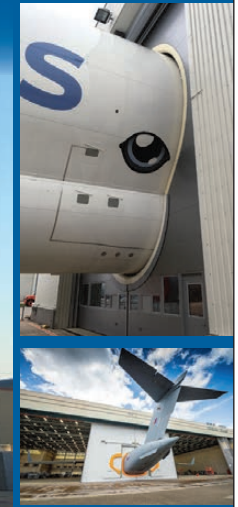
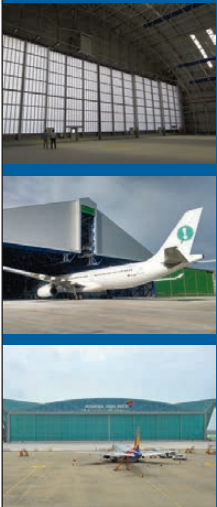
The back of the Airchair collapses down, which allows the helper to get closer to the person in the chair to help them shift across into their seat. McOnie explained: "With the back dropped down, the patient can easily slide across into the aircraft seat, or even on to the toilet seat, as the chair is small enough to go into the aircraft cubicle. Flydubai has equipped all its fleet with these chairs, which are ideal for those less able, who are going on pilgrimages. They were sold on how easy it is for the aircrew to use – saving physical stress on their backs."



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The Airchair can speed up boarding for anyone who is less mobile, not just wheelchair users. McOnie added: "It is ideal for travellers who have been injured, such as skiers, or those who feel unwell."

"We are trying to educate Middle Eastern airlines about the product and that it is a service that can be offered to a much wider group of passengers. The crew do not need much training, and it does not need special storage facilities. It is light and simple to use."

Bespoke uniform fashion house, Creation & Image, attended the show as part of the large French pavilion. The company has had aviation clients in the region for more than 20 years, outfitting commercial companies, as well as private, governmental and royal flight crew. Prominently on display was the new teal and grey Gulf Air uniform.

President and CEO, Claire Besancon, said: "This is our third time exhibiting in Dubai. Creation & Image Paris is a specialist in bespoke uniforms with extensive experience in regional airlines. We dress Gulf Air, Kuwait Airways,



Expanding their Middle East presence: Claire Besancon and Melissa Kohlbray of Creation & Image.

Oman Air, and Qatar Airways. For us, this is an opportunity to meet our clients, be introduced to new companies, and expand our presence in the Middle East."

While fashion may influence the designs of the uniform, it is not the main inspiration. Besancon explained: "It is really about the brand identity and ambitions."

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"The national airlines are the first ambassador of a country and, in most cases in the Gulf region, the government, the sultan or the king will be involved in the selection of the design. The uniform has to represent the way they would like the country to be portrayed internationally."

"In 20 years, the uniforms have not really changed, except in the quality of the fabrics. In all cases, it is the case of finding a strong identity that matches the country identity."

This can present challenges for the company, such as when the minister of

Continued on Page 36



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CONTINUED FROM PAGE 35

tourism for Bahrain chose light grey and pale teal for the new Gulf Air uniform. Besancon explained: "We had to mix a special treatment in both fabrics to protect them, as these colours stain easily. The light green is also very difficult to manufacture. We have to close the entire factory to make this material in order to avoid any loose threads in the air coming into the weave."

Every client is different. Kuwait Air required something very chic, Dior-like and heavily tailored. Qatar Airways preferred a more Hermès style, with a distinctive scarf.

Besancon said: "For the Oman Air uniform we designed a patterned material incorporating the shape of the khanjar. We also had to include the colours of the sea, but in two shades of blue as the sea off Musandam is different to the southern coast."

Brazilian company, Luminous, used the show to launch its ecowash in the region.

Luminous Aviation wash is environmentally friendly and free of chemicals and solvents. The water-based solution is engineered to provide aerodynamic support and reduce drag with each consecutive application. The product is a dry wash, which is sprayed on to the surface and polished off, and does not require additional water.



Fabio Marra, CEO and founder, said: "It is environmentally friendly and safe for health. It uses only natural ingredients, including seven minerals, water and essential oils.

"The first aviation product we made was for the military in Brazil. We provided bases with products to clean their aeroplanes, helicopters and tanks. Then we developed the auto, residential and nautical lines, and now we are targeting cruise ships. It is ideal for marine use as it leaves no residue."

Cleanliness in aircraft is a major topic, and the increasing disinfecting of interiors can contribute to a deterioration of cabin air quality. Marra added: "They just released a study of the reaction of the particles from the different chemical products that are used inside the cabin when the aircraft takes off. Sodium hyperchloride, solvents, alcohol – they behave differently when it is airborne, when it is pressurised, cold, hot – it all affects the quality of the air that we are breathing.

"We do not use solvents, but we have lab tests to show this it is a natural disinfectant. The toxicity tests for skin and eyes come in at zero. No one can say that



R J McLaren:
"Kontron has learned how to keep our product flexible, but certifiable."

their product kills this or that virus, as they are always mutating, but you can do things to control and prevent it, and our product will do that."

Asked about price, Marra replied: "We are not interested in having a very expensive product. Our vision is for everyone to have this product, which lowers cost by reducing drag and water use, as well as reducing aviation's impact on the environment."



Connectivity continues to be a big subject in aircraft interiors.

Kontron made its debut at AIME, with R J McLaren, systems product manager, explaining that the hardware company was offering flexibility that allows operators to add new software and use different providers.

"Ten years ago, you had closed systems, and the airlines had no flexibility, it was all or nothing. Now we offer open platforms. Our hardware allows you to change, add new software, and incorporate different software providers.

"A lot of the emerging companies are focusing on software applications, or media content, but they don't know about hardware, how to get it installed or qualified, so they will come to us and leverage our hardware into an airline. Our pitch, and we are unique in the

industry, is our open platform solution. Many independent software developers can now say that they have tested their software on Kontron hardware and it works.

"We have learned how to keep our product flexible, but certifiable, and we can service all the different airline needs – from the low-cost to the private jets. If you have open architecture, then you open up to creative solutions. We allow you to customise and be flexible, which makes you more competitive, and the industry benefits."

Kontron is an international company, but the avionics division had remained limited. The team is currently expanding the certification for avionics into the global network, concentrating initially on China and Europe.



French company, Gerflor, is the manufacturer of Batiflex, a comprehensive range of non-textile floor coverings (NTF) for aircraft.

Installed in galleys and lavatories, the product offers easy cleaning, but Olivier Kollmannsberger, sales director aviation, emphasised that the most important aspect was to ensure the water tightness of the galley areas.

"The goal of having an NTF floor is to protect the aircraft against corrosion by ensuring perfect water tightness of the installation. It has 50% technical use, and 50% aesthetic use. The aesthetic consideration is important for the passengers, as it is the first thing they see when they board the aircraft."

The company is well established in the Middle East, working with Emirates, Qatar Airways, Gulf Air, Oman Air, Royal Jordanian, and Kuwait Airways, which all use the printed décor designs.

Gerflor continues to innovate, working on improving the products it offers. Kollmannsberger added: "We are working on more lightweight products. Every year we improve. We have NTF that is 1.7kg per square metre, which is the lightest in the world.

"Our research and development team works on developing bonding layers that are durable, watertight and lightweight. However, the key is not only to be technical, but also to be able to deliver good designs to the customers.

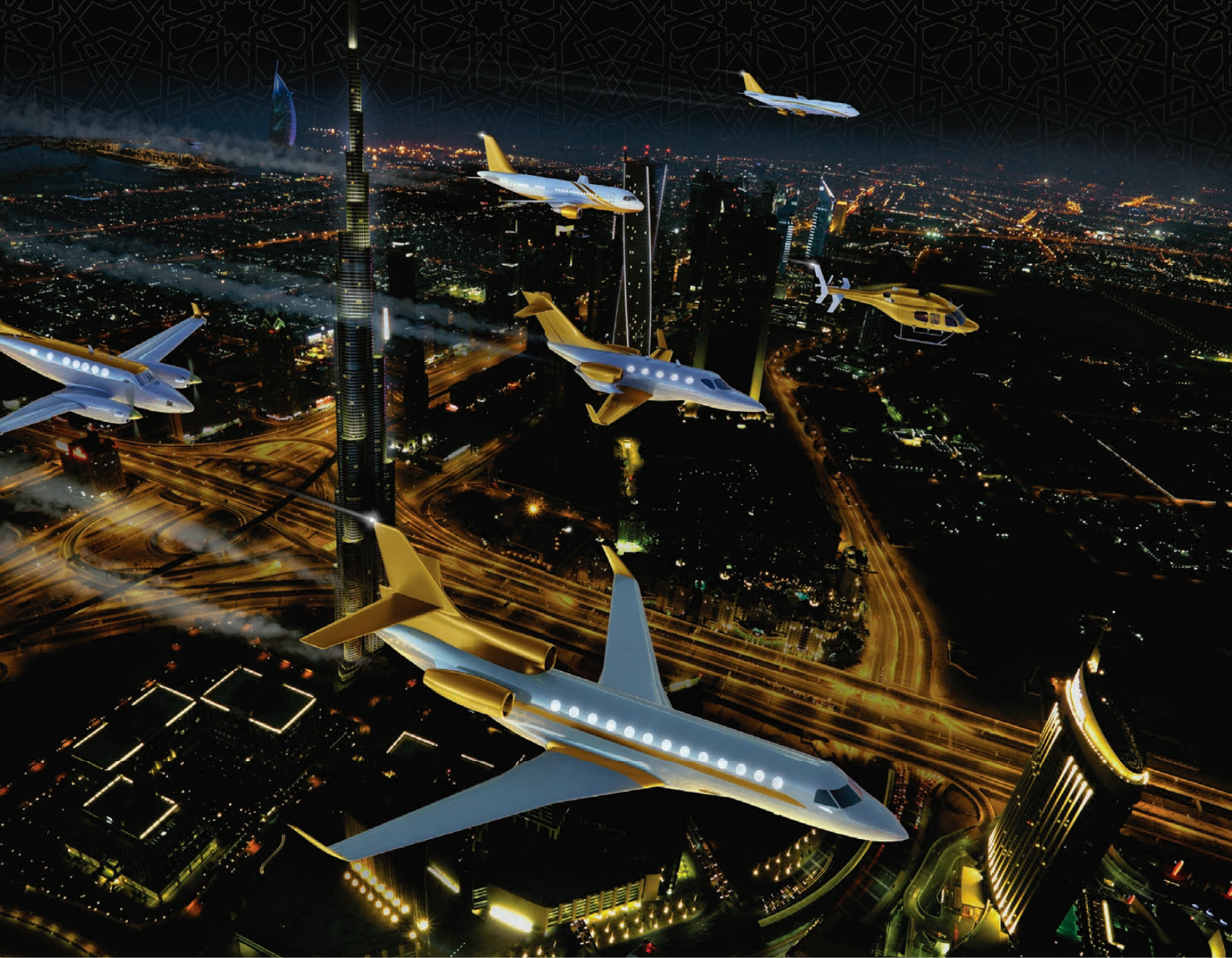
"This is not a big show, but it is a rendezvous for all airlines in the region.

"It is a local show where people have time to discuss business. Our focus is not to miss this chance to meet others within our client airlines."

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Business – but not as usual: Aircraft operators may put a freeze on non-essential maintenance. How that could affect Middle East facilities, like this one at Joramco, is, as yet, unknown.



MRO Middle East reinforced its reputation as the must-attend exhibition for aftermarket players, with good business opportunities despite the overshadowing influence of the coronavirus restrictions. Chuck Grieve reports.

MROs READY TO TAKE UP THE CHALLENGE

Predictions of difficult times ahead for the MRO industry, voiced by keynote speakers at the MRO Middle East summit in February, appear, in hindsight, to have been cautious.

The summit, which preceded the annual two-day MRO exhibition at Dubai World Trade Centre, brought together industry leaders from around the region to discuss the latest trends and best practice.

Few could have anticipated the speed or extent of civil aviation's response to halting the spread of the coronavirus, and its impact – as yet unclear – on MRO.

Speaking at the summit, Yann Cambier of ICF and Michael Wette of Oliver Wyman both warned that civil aviation appeared to be due a slowdown after a 10-year run of profit and growth. While neither speaker's modelling



Royal moment: HH Sheikh Ahmed bin Saeed Al Maktoum, president of the Dubai Civil Aviation Authority and chairman of the Emirates Group, speaks to exhibitors during his opening tour of the show. He was accompanied by Caryn McConnachie (right), aerospace director of show organiser Tarsus F&E LLC Middle East.

extended to the scale of disruption seen this spring, both drew attention to the pattern of recovery following previous global crises.

Cambier, senior manager airlines, aerospace and MRO consulting at ICF, said air traffic had continued to grow after periods of contraction due to external forces, such as the global financial crash or the SARS outbreak. "Expectations will be the same."

He said that when the situation normalises, the challenges facing Middle East MROs will remain the same as they have been for a long time: human resources, airframe check planning, management of outsourced repairs, and implementation of maintenance and engineering (M&E) software, which is "the most complex".

Wette, partner at the Oliver Wyman consultancy, said the

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A stylized illustration of a man with a beard and sunglasses, wearing a dark blue suit, a red vest, and a blue and red striped tie. He is standing with his hands in his pockets. The background is red with faint gear and airplane icons.

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MRO market was “definitely impacted” by a 50% increase in aircraft entering storage during the recession of 2001-2 and again in 2008-9, mainly through the “deferral of maintenance that they represented”.

But, he added, more aircraft in storage or retired is not necessarily a bad thing. “The used serviceable material (USM) market has been particularly tight in the last couple of years as aircraft that were expected to retire didn’t. This drives up material costs in general, as fewer alternatives to new parts are available to operators.”

An economic slowdown, he suggested, would allow stock replenishment, benefiting USM markets and dealers and operators themselves.

His longer-term focus was on an intensifying battle for the aftermarket. “In one corner,” he said, “the original equipment manufacturers (OEMs) have, and will significantly increase their presence and aggressiveness to capture a greater share of the aftermarket. In the other corner will be the independent MROs and material integrators, who will be providing alternatives to the OEM concentration and higher OEM prices.”

“We don’t know if the battle will be epic, but it certainly will be interesting to watch.”

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The exhibition itself, co-located with Aircraft Interiors Middle East (AIME), attracted 330 exhibitors and more than 5,000 trade visitors.

Even with a slightly subdued atmosphere, it met the expectations of participants. Mohammad Al Falasi, aerospace director of Mohammed Bin Rashid Aerospace Hub, said the show’s importance is its ability to attract “the majority of the big aviation companies” who are “potential clients”.

Xavier Mornand, head of APU services for French company, Revima, reported a “really busy” time over the two days of the exhibition. Revima used the occasion to sign a contract with Air Arabia for full support of landing gear.

Richard Levin, managing director of US-based consultants, AJ Levin, said the show was always a “useful touchstone” in a region where he had seen “a lot of changes” in many years of doing business here. Of the current situation, he said: “I’m more worried about OEMs pushing into MRO. There’s a reason why they’re not already in MRO, which [younger] executives will discover.”

Lydia Janow, managing director – events for Aviation Week Network, credited the sharp focus of the exhibition. “Time and again, we hear from exhibitors that the facetime and networking



Sign here: Abdulmajid Obaid of Ajwa Aviation Services and Jordi Pirretas, chief executive of Buildair.

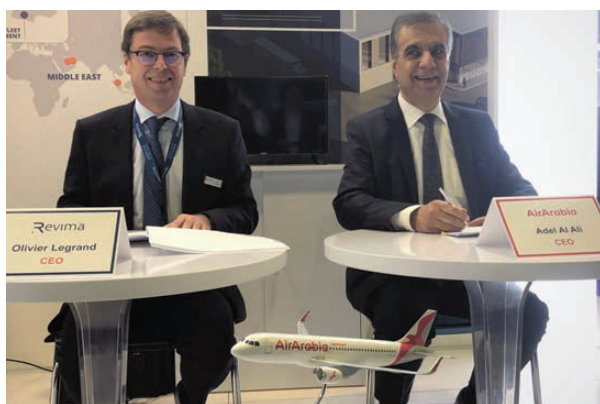
BUILDAIR HANGARS FOR RIYADH

Riyadh-based Ajwa Aviation Services signed a contract with Buildair of Spain for inflatable hangars to protect VIP aircraft at the private terminal of Riyadh International Airport.

Ajwa also plans to distribute Buildair products in the GCC countries. Chief executive, Abdulmajid Obaid, said he expected demand to grow significantly in the coming years for this unique service.

Jordi Pirretas, chief executive of Buildair, said the H47 hangar would be delivered in about four months. The deal “demonstrates that Buildair inflatable hangars are a reliable product capable of withstanding Saudi Arabia’s harsh environmental conditions”.

The company’s H75 hangar is already in use with Saudi Aerospace Engineering Industries (SAEI) in Riyadh.



Done deal: Olivier Legrand, chief executive of French company Revima, with Air Arabia chief executive, Adel Al Ali.

REVIMA LANDS AIR ARABIA DEAL

Revima, the French landing gear and APU MRO, signed a six-year contract with low-cost carrier, Air Arabia, for full support of landing gear on its fleet of Airbus A320 aircraft, totalling 40 shipsets for the period.

The work will be carried out at Revima’s facility in Normandy, France.

Adel Al Ali, group chief executive of Air Arabia, said: “We are pleased to partner with Revima on this A320 maintenance programme, which aligns with Air Arabia’s commitment to always secure the highest standards of quality for our fleet operations. We look forward to a fruitful partnership.”

Olivier Legrand, president and chief executive of Revima, added: “We are proud of having been chosen by Air Arabia, one of the very best carriers in the world. We look forward to bringing our tailor-made support and best-in-class services to such a successful and high-performing airline.”

opportunities are unrivalled,” she said.

John Sapp, senior director commercial sales & support, led a strong Collins Aerospace team. He said the company had seen “a major transformation” in the last 18 months with acquisitions and mergers that combined UTC Aerospace Systems together with Rockwell Collins under the Collins Aerospace name.

“Our biggest thing is making sure that we continue to find ways to evolve and support this quickly growing aftermarket responsibility, which arises from having components on just about every aircraft that operates in the world,” he said.

Middle East operators have been “terrific customers”, said Sapp, and Collins works to reciprocate. “You have to look at the growth in this region and understand that it requires a lot of attention to make sure we’re adapting to match their expectations and trying to redefine them in a continuing and better way.”

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Localisation is “very important”, he said. “We have a large MRO facility in Dubai’s Jebel Ali free trade zone (FTZ) that handles aerostructures work, landing systems, interiors, power and controls on the spot. We want to ensure we have the right work being done in that shop that supports these operators so we can drop our turnaround time.”

“We also continue to look at ways to help operators develop their own in-house capability. It’s not something we’re afraid to do – for some of our businesses, it makes sense.”

The company’s extensive global network – including a new innovation hub in Singapore, one of 15 centres of excellence – enables Collins to provide extensive support at outstations. “Obviously, we can’t be everywhere at all times,” said Sapp, “but we look to maximise our pooling to deal with issues.”

Overall, he said, the growth in aviation is putting significant pressures on supply chains across the industry. “There’s a balance to be struck between being able to deliver new aircraft and being able to support aftermarket services for spares.”

For Collins Aerospace, it means ensuring its supply chain is scaling up adequately to meet the long-term demands without undermining the “near-term certainty” of strong aftermarket demand. “That’s going to continue for some time,” he said. “That’s the biggest pressure we have, and it’s being felt across the entire aerospace business.”

First-time exhibitor, Airworks, India’s largest independent MRO, was at the

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show to promote a new station – its 28th in India – in the hope that its proximity to the Gulf will prove irresistible to the region's airlines and business jet operators.

Anand Bhashar, chief executive and managing director, said the new station, in Kochi, Kerala's largest city, would open in late spring. Its location on one of the busy flight paths between the Gulf and Asia was a strong argument for encouraging operators to select Airworks for their heavy maintenance.

Bhashar said Kochi may be followed by other bases to take advantage of new airport capacity that the Indian Government is planning as part of its drive for economic growth.

With bases dotted all around India, and an extensive list of accreditations, Airworks is positioned to support customers forced to divert for unplanned maintenance. "Customers know that Airworks will be there, anywhere in India," said Bhashar. "Engineering is in our DNA."

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A newcomer to the show was the Independent Aircraft Modifier Alliance (IAMA), whose managing director, Nicole Noack, said support for the Lufthansa Technik-led initiative has been growing. Coming up to its first anniversary, the alliance has eight full members.

The IAMA's stated aim is to create and apply common standards for retrofit programmes that rely on supplemental type certification (STC) rather than OEM service bulletins. "As a group, we want to strengthen the STC as one of two options to modify an aircraft," she said.

Noack said "challenges" to STC providers, including lease return conditions, an aircraft's movement during its life, and access to airframers' intellectual property (IP), provided the impetus "that brought us together".

In creating its standard, the IAMA addressed "pain points from leasing companies and airlines" to make a modification project predictable, irrespective of which IAMA member carried out the work.

She said the alliance aims to cap membership at just 20 full members, who are "significant players, who support the mission and will work together to shape the alliance, the standards and the other initiatives, such as digitization".

In due course, the standard may be opened to SMEs.

During the show, Abu Dhabi-based Falcon Aviation announced it had been awarded D1 approval for non-destructive

Drawn together: Daiva Zemaite, head of EngineStands24, and Brandon Lafferty of Rhinestahl.



ENGINESTANDS24'S BIG LEAP

Rhinestahl CTS and EngineStands24, a subsidiary of Magnetic MRO, signed an agreement to maintain and manage the global fleet of LEAP, CFM56, CF6 and CF34 engine stands at EngineStands24's Dubai, Amsterdam and Guangzhou hubs.

The deal makes Rhinestahl, a specialist in tooling and ground support equipment, the exclusive engine stands maintenance provider for Magnetic.

Daiva Zemaite, head of EngineStands24, said the two companies are a good fit geographically and in capabilities. "This partnership allows us to use their extensive knowledge and experience, while helping us provide customers with serviced engine stands that meet the highest industry standards," she said.

Brandon Lafferty, Rhinestahl's aftermarket services director, said: "We have expanded our facilities globally and are well-positioned for growth in the engine stand, tooling maintenance and repair market."

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Shake on it: Sabena Technics chief executive, Philippe Rochet (left), with Olivier Savin of Safran Nacelles.

NACELLE REPAIRS AGREEMENT

Safran Nacelles strengthened its global on-site repair capabilities through a long-term agreement, signed at the show, with Sabena Technics' Go Team support services. The deal makes Go Team's resources available for in-field nacelle interventions, and adds a new dimension to Safran's NacelleLife services programme.

Olivier Savin, Safran Nacelles executive vice-president – customer support and services, said the "reactivity" of Go Team was a major consideration. "We wanted to increase our own on-site intervention network and capability by developing partnerships."

testing (NDT) by three authorities, including the European Aviation Safety Agency (EASA).

The company said this approval opened up a new line of client support and made it one of a small group of operators in the region capable of providing NDT testing.

Meanwhile, US-based 8tree unveiled new capabilities for its dentCHECK damage-mapping tool, including panoLite, for large-area scanning, and an ultrasonic testing (UT) gauge interface to expedite blend-out remaining thickness measurement.

Alongside the show, Aerostructures Middle East Services (AMES) opened an extension that doubles the workshop surface of its MRO operation in Jebel Ali Free Zone. The joint venture of Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) and Safran Nacelles will also double its workforce to support its newest activity: preventive maintenance inspections (PMIs) and associated repairs on fan stator modules for the General Electric GE90 engines that power Boeing 777s.

Despite current circumstances, the demand for MRO services in the Middle East remains "crazy", in the view of Phil Randall of World Aero, a wheel and brake specialist. This has its downside as it encourages speculators to "jump on the bandwagon", [which] sort of pollutes the business.

"We get many enquiries from brokers and others – a lot of 'nothing' companies – probably one guy and a laptop. We're left trying to determine who the end-user is. You need to know for decent pricing, commercial terms and the like. If there's broker after broker between you and the end-user, it gets frustrating."

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*The MRO industry is braced for a major fall-out from the global pandemic crisis. Will independents be able to weather this perfect storm? **Chuck Grieve** searches for answers.*



Dr Johannes Bussmann:
"Everything depends on the duration of the crisis and how our customers will recover from it."

MRO FACES UP TO THE 'PERFECT STORM'

"Nothing is the same... first impacts are massive." So said Lufthansa Technik (LHT) chairman, Dr Johannes Bussmann, in late March, and few in the MRO industry would disagree.

Throughout the Middle East as elsewhere, MROs have been forced to recalibrate their workflow and financial projections as operators take drastic action against the spread of the coronavirus.

It led David Marcontell, a partner at global management consulting firm, Oliver Wyman, to tell journalists that the suspended services, parked fleets and cancelled or deferred work orders, would "turn into a real crisis for the MRO community".

As sober picture

Bussmann, speaking at LHT's annual financial presentation, painted a sober picture. The maintenance industry, normally a lagging indicator, was already suffering from the decline in air traffic. "Everything depends on the duration of the crisis and how our customers will recover from it."

The key, he said, was preparation, so MRO providers were able to deliver at any time. "Especially now, our customers need a reliable technical partner."

His sentiments were echoed by Michael Schreyögg, chief programme officer of MTU Aero Engines. Speaking in mid-

February, he said his company's policy was to "stay close" to customers at difficult times and help where possible. This could be by extending engine leasing periods or payment terms, or perhaps prioritising MRO shop activities by the criticality of customers' needs.

"We are certain that the medium and long-term prospects for the aviation industry will remain positive," he said. "All past crises have shown that the need for mobility will return."

For the Middle East, the Oliver Wyman forecast said international travel restrictions will drive "the steepest declines" before air travel, which underpins MRO demand, begins, what the consultancy predicts, will be a 9-18 month recovery.

Meanwhile, aircraft operators could be expected to put a freeze on non-essential maintenance, said Marcontell: "Anything that requires money being spent – for material or third-party MRO services."

At Etihad Engineering in Abu Dhabi, a spokesman said the fast-changing situation in global aviation was putting its flexibility and agility to the test as MRO customers weighed up their options. The spokesman said some had initially viewed reduced flight schedules as both an opportunity to bring forward some maintenance and to push scheduled heavy checks back in the year. "There are new developments every day."

Fleet rationalisation

Extensive fleet rationalisation is expected at airlines that survive the crisis. Industry commentators warn of the knock-on effect on MRO here too. Many MROs active in the Middle East saw a silver lining in the Boeing 737MAX cloud, as airlines turned to older models, such as the 737NG, to meet strong demand.

Airlines may now choose to swap older aircraft for new to avoid the cost of heavy maintenance checks. Boeing already has a backlog of 737MAX aircraft ready to deliver when it receives recertification; the US prime expects this part of the crisis to be resolved by the summer.

Having benefited in recent years from a strong demand for mid-life aircraft, especially narrow-bodies, MROs may find themselves much quieter as the newer aircraft that remain won't require the same level of maintenance for several years. However, the longer the MAX is grounded, the further into the future its mandated maintenance checks will be pushed, having an impact on MRO capacity and revenue.

Boeing will have its work cut out in more ways than one in coming years. MROs have gone on the record as saying the MAX saga has undermined confidence in the Seattle airframer. A possible upshot of this is greater caution in the aftermarket and a greater reliance on third-parties for inspection services.

It's the short term that worries the Aeronautical Repair Station Association (ARSA), the group representing MROs in the US. It has asked the US Government for "at least" \$11 billion in grants and loans to help its members pay their staff for the nine months that the association believes the pandemic-related disruption will last.

It is also asking for tax incentives, such as the "highly successful" depreciation bonus created after 9/11. ■



Michael Schreyögg:
"We are certain that the medium and long-term prospects for the aviation industry will remain positive."

Rolls-Royce is developing amazing new engine technology to help make aviation greener and more efficient for the future. Steve Nichols has been finding out more.

Propelling aircraft into the green age

Rolls-Royce is developing a number of different propulsion systems for use on future aircraft. However, the company says don't expect its large turbofan jet engines to disappear any time soon.

Phil Curnock, chief engineer, Rolls-Royce civil future programmes, explained that, while the company takes its concerns for the environment very seriously, there will always be limitations with electrical power.

"At the moment, it would be very difficult to make an electrically powered aircraft that could fly more than 1,000 miles," Curnock said. "The power capabilities and battery capacity required is just not there with current technology.

"We will take an incremental approach to electrification. We'll see more electric aircraft and some electrification for various parts of the flight," he said. "But the gas turbine will still be in use for some time."

So what is Rolls-Royce doing to reduce CO₂ and NO_x emissions?

"Air transport only contributes 2% to the world's total CO₂ emissions, but we do take it seriously. With more than an estimated 37,000 new aircraft being required over the next 20 years, it is important that we do," Curnock said.

"CO₂ emissions from jet engines are down 80% since the jet aircraft first flew, but the target is to reduce carbon emissions overall by a further 50% by 2050.

"We've come a long way towards meeting the CO₂ target already – we've saved 10 billion tonnes of CO₂ since 1990," he added.

The Strategic Research and Innovation

Agenda's (SRIA's) Advisory Council for Aviation Research and Innovation in Europe (ACARE) flightpath 2050 initiative calls for a 75% reduction in CO₂ emissions per passenger kilometre, a 90% reduction in NO_x emissions and a 65% reduction in noise by the middle of the century.

Rolls-Royce admits these are "extremely challenging targets that will demand integrated aircraft and engine solutions". The Trent XWB leads the way in each category for Rolls-Royce, but it will be the company's Advance and UltraFan initiatives that will enable it to take the next step.

Three-shaft engine architecture

"Advance is a three-shaft engine architecture with gearing. The high-efficiency core compression and turbine system incorporated into Advance will deliver the highest overall pressure ratio of any commercial turbofan engine ever-made," said Curnock.

The problem is simple – a jet turbine wants to rotate as quickly as possible for efficiency, but the fan needs to rotate much more slowly. The geared turbofan solves the problem, but has not been an easy invention.

Curnock said Rolls-Royce is now on its fifth iteration of the power gearbox, which has been developed after testing in Germany.

"The UltraFan engine will power single- and twin-aisle aircraft. The programme continues to develop the concept and we will eventually move to engine testing, flying on our Boeing 747 test bed," he said.



UltraFan combines the company's new core architecture with a lightweight, low-pressure (LP) system. It will have a composite fan, lean-burn combustion and innovative manufacturing and materials technologies, including 3D printing and ceramic matrix composites (CMCs).

"The power gearbox allows us to use a much larger fan, which gives us more flow through the engine and greater efficiency. A 139in fan will be used on engine tests in 2021.

"Other initiatives are materials that can handle higher temperatures and the use of composites for fan blades, which give a weight advantage," said Curnock.

Recently, all the composite elements of the advanced low-pressure system (ALPS), including fan blades, a fan case and annulus fillers, were tested together on a donor engine.

The engine parts are manufactured using fully automated construction methods at Rolls-Royce's composites technology facility.

Each fan blade is made robotically, building up around 500 layers of carbon fibre materials. Heat and pressure are then applied, and each blade is finished with a leading titanium edge, which offers extreme protection against foreign objects and bird strikes. When laid out, the layers of composite material that make up the fan blades and the fan case on this engine would stretch from Dubai to Abu Dhabi and back – more than 270km.

Composites are also being tested for a new engine casing design.

"We're currently building a new engine test



Phil Curnock: "We've come a long way towards meeting the CO2 target already – we've saved 10 billion tonnes of CO2 since 1990."

Left: Rolls-Royce's EVTOL hybrid electric vertical take-off and landing vehicle was launched at the Farnborough International Airshow in 2018.

Right: The ACCEL all-electric demonstrator aircraft.

bed, which will be the largest indoor platform in the world once complete," said Curnock.

The £90 million facility in Derby, UK, with an internal area of 7,500sqm, will benefit from the latest advances in X-ray equipment – so powerful it could X-ray a person standing six miles away.

Computer modelling features very heavily in the new engine design. Each fan blade has a "digital twin" – a virtual copy. During testing, vast amounts of data will be collected that will be fed into the digital twins, allowing engineers to predict how each blade will perform in service.

In fact, the computer modelling is now so good that blade-out testing can be done in a virtual world.

"With our 97KXWB engine, the certifying body accepted our computerised analysis and we didn't have to do a fan blade-out test," said Curnock.

But does all this mean Rolls-Royce is not interested in developing electrically powered aircraft? Absolutely not!

"Electrification is nothing new to Rolls-Royce. The ACCEL all-electric demonstrator aircraft builds on our existing expertise in applications such as hybrid trains and ships," said Curnock.

ACCEL could be heading for the record books this year. Flight-testing is scheduled to begin in 2020 and it is targeting a new air speed record of more than 300mph.

ACCEL – or 'Accelerating the Electrification of Flight' – is intended to pioneer a third wave of aviation in support of Rolls-Royce's strategy to champion electrification.

The ACCEL programme is partly funded by the UK Government and involves a host of partners, including electric motor and controller manufacturer, YASA, and aviation start-up, Electroflight.

The team also brings together some of the expertise from the world of Formula E racing, in providing enough power to fly more than 320km (London to Paris) on a single charge.

Rolls-Royce is also supporting Airbus' aircraft, E-Fan X, which could perform a maiden flight by 2021.

Hybrid-electric demonstrator

E-Fan X is a large hybrid-electric demonstrator. Rolls-Royce is delivering a power generation system and an electric motor unit that sits under the wing. Siemens was originally part of the development team, but subsequently dropped out. Rolls-Royce then agreed to acquire Siemens' electric and hybrid-electric aerospace propulsion activities.

"We're taking an Avro RJ100 (a 100-seater regional jet) aircraft and removing one of the Honeywell engines," said Curnock. "That will be replaced by a 2MW electric propulsor unit (EPU) with a gas-turbine-powered 2.5MW AE2100 generator system and battery.

"The E-Fan X demonstrator will explore the challenges of high-power propulsion systems, such as thermal effects, electric thrust management, altitude and dynamic effects on electrical systems, and electromagnetic compatibility issues.

Teams in the USA, the UK, Norway and Singapore are all working on the power generation system for E-Fan X.

"The project will provide us with valuable information that could ultimately lead to a commercial all-electric aircraft," Curnock said.

Rolls-Royce is also keen to get involved with urban mobility systems with its EVTOL programme. This is a hybrid electric vertical take-off and landing vehicle, which was launched at the Farnborough International Airshow in 2018.

There are a number of different approaches. In the first, a gas turbine is used to generate electricity – and there is no energy storage. In the second, the propulsive power is still electric, but batteries can be relied upon to power the aircraft at certain times during flight.

Finally, a parallel hybrid system is possible, where the propulsive power is a mix of conventional gas turbine-driven fans and electric-driven fans, with active energy storage.

"Rolls-Royce's hybrid EVTOL concept is based around the M250, the engine of choice for roughly 125 types of fixed-wing aircraft and helicopters," said Curnock.

"By adding an electrical generator, the M250 becomes part of a hybrid-electric propulsion system that can power a five-person vehicle capable of travelling at 250mph over a range of 500 miles or more."

Curnock said the aircraft could fly as soon as the early 2020s.

But, for the foreseeable future, larger long-range, wide-body aircraft will continue to use gas turbines. ■

Guillaume Guyomar

Marcelle Nethersole speaks to the Pall Aerospace business development manager responsible for Middle East and Africa.

Pall has several filtration products particularly adapted for Middle Eastern weather.

1

■ What does Pall Aerospace do?

Pall Aerospace provides fluid filtration and separation solutions for commercial and military aircraft, ground vehicles, and marine platforms, ensuring mission readiness and execution through consistent and reliable equipment performance.

We provide protection and cleanliness in engine lubricants, fuel, hydraulic and transmission fluids, mobile military and emergency relief water, cabin air, avionics electronic equipment cooling, and engine air filtration.

2

■ Can you tell me about your latest products, the PA100 and PA120 PUREair systems?

Helicopters operate in extreme environments, exposing their engines to abuse far beyond their fixed-wing siblings.

Our PUREair (PA) series of engine inlet protection systems are designed to protect helicopter engines from dust erosion and foreign object debris (FOD), especially when operating in sand or dust-laden environment.

Equipped with our technology, operators see significant cost reductions in maintenance, increased flight safety, and improved platform readiness.

3

■ What specific damage do your systems prevent and how do they work?

The ingress of environmental contamination, such as sand, dust, salt, and moisture, degrades engine performance and equipment life, creating mission-critical scenarios such as reduced engine reliability and engine power loss.

These can lead to airframe damage during landings in brownout conditions and reduced hover capability, as well as reduced manoeuvring capability.

The PA120 tackles these main reasons for premature engine failure.

The filters use the vortex tube technology, providing inertial separation of dust and sand. In each vortex tube, the particulate is spun to the outside by centrifugal force, where it is separated and ejected outside by a scavenge fan or an ejector.

Cleaned air passes into a second tube, then into the engine intake plenum. Overall protection efficiency is at or above 96%, with minimum power loss.

4

■ Which platforms does Pall serve with PA engine inlet protection systems?

PUREair PA100 is for the H125, EC130, and AS350 Airbus helicopters, while PA120 is designed for MI-8/17/171 Russian Helicopters.

PA120 is part of the service bulletin provided by the original equipment manufacturer (OEM).

6

■ Given the current climate, what filtration products do you have for commercial airlines?

Pall has several filtration products particularly adapted for Middle Eastern weather, as well as sand, and for its commercial airlines. Among them are hydraulic and fuel filtration systems, fluid purifiers and particle counters for commercial ground-support operations, as well as cabin air filtration systems.

We work closely with aircraft and system component OEMs to ensure that our filtration solutions meet, or exceed, the stringent requirements demanded by the industry.

We have more than seven decades' experience of applications solutions, bespoke design, and quality manufacturing expertise. This, coupled with our strong customer relationships, enables us to flexibly provide each customer with a solution that meets their individual requirements to prevent the contamination of their fluid systems and other critical systems and components.

7

■ Do you see a change in how cabins will be filtered against infections and keeping air clean?

Commercial and military aircraft use filters to remove viruses and microbes from their air supply.

This technology could also be modified to be used on helicopters.

5

■ What work do you do in the Middle East?

Pall Aerospace is working with several Middle Eastern helicopter operators, MRO companies, and OEMs.

Through several of our partners, we also provide cabin air filtration systems, ground support filtrations systems and other filtration products for commercial airlines, such as Emirates and Saudia.

8

■ What does a typical day involve for you?

My role is to develop new business partnerships in the Middle East and Africa.

Hence, I spend a typical day doing market research and analysis, reaching out to and visiting potential customers, answering customers' queries, and providing commercial offers that address our customers' key challenges.

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