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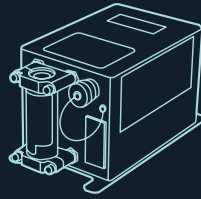
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COVER: An Etihad 787-10 aircraft is outfitted with more than 200 microphones by engineers at Boeing, Seattle, as part of the ecoDemonstrator testing.
PICTURE: BOEING

We must learn from Covid and act now to save the planet

There is, of course, no doubt that the Covid-19 pandemic will have left its mark on the aviation industry and on the world. But it is not the biggest threat to our existence.

The virus has seen the world come together in some respects to help mitigate the effects and fight the infections by sharing knowledge and science – although sadly there is a lack of consistency that hampers progress.

But it should act as a lesson that when the unexpected happens – even if we had been forewarned – it can have a literally deadly effect on our lives and our livelihoods.

For many years the aviation industry (indeed most industries) paid

lip service to the whole idea of global warming and the impact of emissions. Governments often still put their own domestic politics ahead of collaboration to solve a common problem.

But if Covid has taught us anything, it is simply this. Global warming will happen. It will wreak havoc on our lives and our livelihood. We must raise our game and raise awareness too.

Of course, aviation – at less than 3% of global carbon emissions – is a small but important part of the problem. It is a credit to the industry that it has seen remarkable improvements over the past 10 years, but more buy-in is needed.

Our cover story this month sees

Etihad and Boeing, along with Safran, pushing boundaries with the ecoDemonstrator 787-10 aircraft proving various technologies from noise emissions to sustainable fuels.

The huge reduction in flights over the past eight months has seen a marked drop in pollution. As our industry starts the painful recovery process from Covid-19 it must not do so without consideration of what we have learned. We have a responsibility to think more about what we do; we have a responsibility to act in a different way and we must be sure to tell people what we are doing.

And who knows, we may just save the world.

Alan Peaford, editor-in-chief



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Covid's huge blow to jobs in region

An estimated 1.7 million Middle East jobs will be lost in aviation and its support industries in 2020, according to new data published by the Air Transport Action Group, of which IATA is a member.

It is estimated that around 3.3 million people in the region are involved in aviation-related employment.

The report predicts that gross domestic product (GDP) supported by aviation in the region will fall by up to \$105 billion. This is 49% below pre-Covid-19 levels.

Another Eye spy

Saab has delivered a second GlobalEye Swing Role Surveillance System to the UAE. The first GlobalEye aircraft, of three ordered by the UAE in 2015, arrived in April this year.

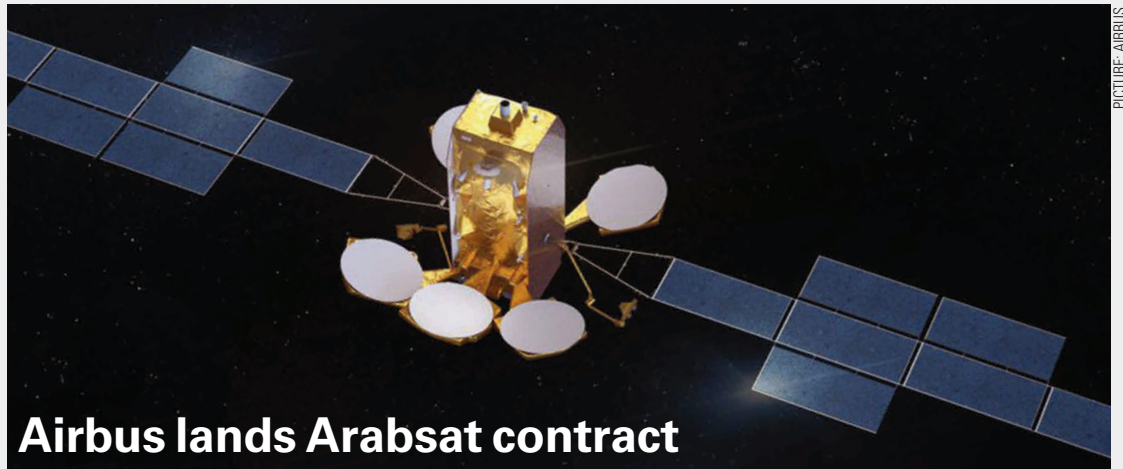
"Completing the second GlobalEye delivery in five months is a testament to Saab's in-house expertise as aircraft manufacturer, sensor provider and large system integrator. I am proud to contribute to the UAE airborne surveillance capability with GlobalEye, which is the most advanced solution of its kind," said Saab CEO Micael Johansson.

Sparky move

Rolls-Royce has completed testing of the ground-breaking technology that will power the world's fastest all-electric aircraft.

Everything has been tested on a full-scale replica of the aircraft's core, called an 'ionBird', including a 500hp electric powertrain powerful enough to set world speed records, and a battery with enough energy to supply 250 homes.

The aircraft is part of a Rolls-Royce initiative called ACCEL, short for 'accelerating the electrification of flight'.



PICTURE: AIRBUS

Airbus lands Arabsat contract

Airbus Defence and Space has won the contract to build the BADR-8 satellite for Arabsat, with optical communications payload TELEO.

The new generation telecommunications satellite, scheduled for launch in 2023, will increase Arabsat's capacity and its core business.

The multi-mission satellite will deliver broadcast, broadband and telecommunications services over Europe, the Middle East, Africa and central Asia.

Jean-Marc Nasr, head of space systems, said: "This important contract with our long-standing customer, Arabsat, has a special significance for Airbus. It is the first seventh-generation Arabsat satellite and the first Eurostar Neo satellite we are building for Arabsat after six previous Eurostar satellites."

"BADR-8 incorporates the best of our expertise and technologies, including a very innovative optical communications hosted payload."



PICTURE: MBRSC

Emirati astronauts to train with NASA

The Mohammed Bin Rashid Space Centre (MBRSC) and the National Aeronautics and Space Administration (NASA) have signed a strategic agreement to train four Emirati astronauts at NASA.

Emirati astronauts Hazzaa AlMansoori and Sultan AlNeyadi (pictured) are currently taking part in the training as part of the strategic partnership between the two organisations.

Two astronauts to be selected from the UAE astronaut programme will also join the 2021 NASA astronaut candidate class.

The training programme, conducted at NASA's Johnson Space Center, will prepare Emirati astronauts physically and psychologically for future space missions.

Kosher catering

Emirates Flight Catering (EFKC) has signed a memorandum of understanding (MoU) with CCL Holdings to set up a dedicated production facility for kosher food at EKFC's premises in the UAE.

The move comes on the heels of the signing of the US-brokered Abraham Accords between Jerusalem, Abu Dhabi and Manama, and ahead of the launch of direct Tel Aviv-Dubai flights.

The new venture – Kosher Arabia – is certified by the Kashrut Division of the Orthodox Union.

Ross Kriel, founder of CCL Holdings and president of the Jewish Council of the Emirates said: "Kosher Arabia was set up to supply kosher food to meet the growing demand in the UAE, not only from the Jewish community here but also from other consumers looking for healthy and halal-compliant options." ■ New Arab-Israeli links, page 16.

Deal on the EDGE

UAE defence conglomerate, EDGE, has entered into a conditional agreement to acquire the remaining 40% stake currently held by Lockheed Martin Corporation and Sikorsky, in the Advanced Military Maintenance Repair and Overhaul Centre (AMMROC).

Both Lockheed Martin and Sikorsky have been shareholders in AMMROC since its inception in 2010.

Upon completion of the transaction, AMMROC will become wholly owned by EDGE.

Emirates refunds

Emirates has returned more than AED 5 billion (\$1.4bn) in Covid-19-related travel refunds to date. This includes all requests received from customers around the world up until the end of June.

Sir Tim Clark, president Emirates Airline said: "We are committed to honouring refunds and are trying our utmost to clear the massive and unprecedented backlog that was caused by the pandemic."

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Saudia Cargo adds freighter to fleet

Saudia Cargo has added a Boeing 747-400F freighter to its fleet, bringing its total to seven aircraft.

The company said the aircraft would help meet the significant surge in demand for transportation of medicine, medical and preventive equipment, and other similar goods.

Omar Hariri, CEO, Saudia Cargo, said: "We have taken practical steps to guarantee the smooth continuity of cargo and supply operations to and from the kingdom in the wake of the Covid-19 pandemic.

"Once the new freighter has been put into operation, it will increase our capacity to provide logistic support to deliver urgent medical cargo to the kingdom."

Lunar rover plan

The UAE has plans to send a lunar rover to the Moon in 2024 as part of its long-term goal for the human settlement of Mars by 2117.

If successful, it would become only the fourth nation on Earth to land on the Moon, following the US, the Soviet Union and China. India, Japan and Israel have all attempted, but failed, to land a spacecraft on the Moon's surface.

The lunar rover will be known as 'Rashid' – named after the late Sheikh Rashid to honour his vision to develop Dubai.



PICTURE: ETIHAD AIRWAYS

Etihad helps reduce in-flight food waste

Etihad Airways has partnered with Singapore food technology start-up, Lumitics, to trial the use of computer vision and machine learning in order to reduce food wastage on Etihad flights.

The partnership will see Etihad and Lumitics track

unconsumed economy-class meals from Etihad's flights, with the collated data used to highlight food consumption and wastage patterns across the network. Analysis of the results will help to reduce food waste, improve meal planning and reduce operating costs.

Kucko steps down

Kresimir Kucko stepped down from his role as CEO of Gulf Air in September.

Kucko said: "I was truly honoured to have contributed to the success story of Gulf Air over the past three years amidst the many challenges we faced. Working with a talented, majority Bahraini workforce of aviation professionals has been a positive experience that saw us collectively deliver strong results for Gulf Air.

"The experience of living in the Kingdom of Bahrain has been truly incredible, both for myself and my

family; we have been warmly welcomed by all and truly embraced Bahrain's rich culture."

Training boost

UAE pilot training provider, Alpha Aviation Academy, has launched private pilot licence (PPC) validation, licence renewals and Airbus A320 type-rating.

Approved by the UAE General Civil Aviation Authority (GCAA), the training offerings include Airbus A320 type-rating recurrent/revalidation, Airbus A320 type-rating renewal, initial A320 type-rating, Airbus cross-crew

qualification (CCQ) and foreign licence conversion.

Alpha Aviation Academy UAE general manager, Captain Nadhem AlHamad, said: "The training will offer greater convenience and flexibility for pilots who are looking to maintain their type-ratings."

Alpha is the first approved training organisation (ATO) to be granted approval by the UAE GCAA to conduct the training for pilots who hold, or have held, UAE commercial pilot licence (CPL) or airline transport pilot licence (ATPL) qualifications.

Safety measures

Turkish low-cost carrier, Pegasus Airlines, has signed up to the Covid-19 aviation health safety protocol published jointly by the European Aviation Safety Agency (EASA) and the European Centre for Disease Prevention and Control (ECDC).

The protocol, an operational guide for the management of air travellers and aviation personnel during the Covid-19 pandemic, includes measures defined by EASA and ECDC to ensure the health safety of travellers and aviation personnel.

Bell's birthday suite

As Bell Textron celebrated its 85th anniversary in August, the company revealed a suite of next-generation products in development, including the Nexus air taxi concept (pictured), which it said aims to revolutionise the urban commute.

Another product in development is the autonomous pod transport (APT), which can go further and faster, while carrying payloads at increased ranges and speeds, unlike any other unmanned aerial vehicle (UAV) in the market today.

Bell executive vice president, Robert T Hastings Jr, said: "The future of Bell is linked to the future of flight.

"To fulfil this vision, we are no longer just a company that works in aviation but rather one that is redefining flight. We are wide open to any technology, opportunity, or service model that will help humans become more mobile or more effective in the vertical dimension."



PICTURE: BELL TEXTRON

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Below: The test flights took place at the remote northern Montana Glasgow Industrial Airport. Right: The Etihad 787-10 was outfitted with more than 200 microphones fitted flush against the forward and lower fuselage. Far right: One of the 'wellness' initiatives trialled during the programme was an ultraviolet wand designed to eliminate bacteria and viruses from the flightdeck without the need for liquid cleaners.

PICTURES: BOEING



ETIHAD'S SOUND

A research programme has seen Etihad Airways, Boeing, NASA and Safran banding together to reduce noise emissions from future generations of airliners.

Alan Dron has been finding out more.

With the global pandemic dominating the headlines in 2020, it is easy to forget that, only a year ago, the big issue was the environment.

That situation has not changed. When coronavirus has been dealt with by the world community, the need to improve airliners' environmental credentials will still have to be addressed.

With that in mind, the latest in a series of Boeing aircraft to bear the ecoDemonstrator title undertook a number of test flights in the US in September, using a fresh-off-the-production-line Etihad Airways 787-10.

The aircraft operated the flights in September, before it was formally handed over to Abu Dhabi-based Etihad. Other key partners included NASA and France's Safran Landing Systems.

The ecoDemonstrator programme extends back almost 10 years and aims to accelerate innovation by taking promising technologies out of the laboratory and testing them in the air to improve sustainability for airlines, passengers and the environment.

Over the years, Boeing has taken a succession of

aircraft and tested new technologies on them with the aim of making flying safer, more economical and less intrusive.

Around one-third of the technologies tested on ecoDemonstrator aircraft have found their way into production. Among improvements to have materialised are the winglets now seen on the tips of the latest-generation 737 MAXs.

The manufacturer works with partners from the aviation industry, government and airlines to develop these new measures.

Strategic sustainability alliance

The 2020 programme with Etihad expanded a strategic sustainability alliance the two companies formed in autumn 2019 at the Dubai Air Show.

At the show, Etihad and Boeing announced the 'Etihad Greenliner', which is being used by the companies to explore and assess sustainability initiatives while the aircraft operates scheduled services across the airline's network.

Other stakeholders, from equipment suppliers to airspace regulators, are being invited to join the companies in advancing and testing efficiency measures on or with the Greenliner.

One of aviation's biggest bugbears, especially for residents who live close to airports, is noise. Even with steady reductions – compare the decibels created by a Boeing 707 in the early 1960s with those of a modern wide-body – take-offs and landings continue to cause disruption for large numbers of people around the world.

Noise formed the core of this year's programme of work.

"A 787-10 was taken over to Seattle, where it was configured for these trials," said Rami Awadalla, Etihad's director of fleet engineering. "They had to install around 200 microphones, spread across the front of the fuselage and on the belly."

The aircraft then flew to Boeing's facility at Glasgow Industrial Airport, Montana – a former Strategic Air Command base – where the runway and surrounding area had been outfitted with another 1,000 microphones to record the aircraft's noise levels. In the space of eight days, the 787 made 88 passes over the microphone array in more than 60 configurations, with differing flap settings and engine thrust levels, and with the undercarriage retracted or lowered.

The 787 flew in a racetrack pattern over the airport, each time passing over the microphones between 600 to 800 feet above the ground. This low altitude improved the quality of the data collected.

"It's a balance between low enough for a good quality signal and not being too low for safety reasons," said Russell Thomas, an acoustics expert at NASA's Langley Research Center in Virginia,



INVESTMENT

who led what is officially called the propulsion airframe aeroacoustics and aircraft system noise flight test.

All the test flights were operated using 50,000 gallons of a 50-50 blend of standard fuel and a sustainable aviation fuel made from agricultural waste.

“This is an opportunity we get very rarely,” said Thomas. “It’s not possible to put an aircraft the size of a 787 in a wind tunnel or rely solely on computer simulations that may not perfectly represent reality.

“Only by flying can we obtain the most realistic conditions for obtaining the measurements we need. And this is really the first time we’ve ever been able to attempt the kind of research we’ve planned.

“This is pushing the boundaries of acoustic flight-testing. I don’t think either NASA or Boeing has ever put so many microphones on the ground or on the aircraft.”

The testing generated 1.6 terabytes of noise data. Such a huge amount will require considerable analysis, but will eventually be used to improve NASA’s aircraft noise prediction capabilities, as well as create lessons for pilots to reduce noise and feed into future quiet aircraft designs.

One particular field of study was in trying to quieten the levels that occur when an aircraft’s undercarriage is lowered. Up to 30% of noise from aircraft on approach to a runway is caused by air flowing around the landing gear.

The undercarriage legs, struts and assorted

pipes, create considerable air turbulence; as aircraft engines have become progressively quieter over the years, this undercarriage-generated problem has become an increasingly large component of the overall noise generated by an aircraft as it lands.

With this in mind, Etihad’s 787 was outfitted with a series of fairings around components of the landing gear. Designed by Safran Landing Systems, the perforated fairings covered part of the nose landing gear, while aerofoil-shaped panels wrapped around struts on the main gear, with the aim of smoothing out the airflow.

Strategic sustainability alliance

This part of the programme will also look at future designs of undercarriage that could eliminate some of the gaps and holes around the gear, together with rerouting items such as hydraulic tubes, to try to cut down the whistling sound that the airflow creates when passing over them.

Eight acoustic sensors mounted on the landing gear augmented the 1,200 microphones used on the aircraft fuselage and on the ground.

Data from the testing must be analysed, but preliminary results were said to be positive and observers on the ground reported a noticeable reduction in noise.

The aircraft was flown by Boeing pilots and space was cleared in part of the cabin for engineers and their equipment racks, to help record the data.

As well as the noise experiments, the

ecoDemonstrator was also used to test some of the latest wellness techniques, Awadalla added.

One of these was a new type of anti-virus treatment for flightdecks. Designed by Boeing, it is an ultraviolet (UV) wand that a technician or cleaner can pass over high-touch areas in the flightdeck to kill any bacteria or viruses.

Boeing designed and developed the UV wand as part of its confident travel initiative (CTI) to support customers and enhance the safety and well-being of passengers and crews during the Covid-19 pandemic.

The self-contained apparatus resembles a carry-on suitcase. Crews pass UV light over high-touch surfaces, sanitising everywhere the light reaches. The UV wand can disinfect a flightdeck in less than 15 minutes, said Boeing. It eliminates the need to use liquid disinfectants on sensitive electronic panels or display screens.

Boeing has now signed a deal with Florida-based Healthe, which will manufacture and distribute the wand.

“Boeing spent six months transforming an idea for the wand into a working model, and Healthe will now take that prototype and make it available to the world at large,” said Mike Delaney, who leads Boeing’s CTI efforts.

The wand could be ready for sale to airlines before the end of the year.

Etihad’s 787, meanwhile, has reverted to its normal duties of carrying passengers, having played a small part in making life more comfortable for future residents living near airports. ■

Digital tower steps for success

Remote digital towers are becoming more interesting for ANSPs looking for efficiency gains and to enhance tower operations. Moritz Manzel, Regional Manager Middle East and Yannick Beyer, Sales Director at Frequentis DFS Aerosense, explain the importance of stakeholder involvement and change management for a successful digital tower project delivery.

Replacing an air traffic controllers (ATCOs) traditional "out-of-the-window" view with a digital/virtual environment has many operational as well as cost benefits, however it is also a complex task that relies on operator participation to make it a success.

Any project involving change will come up against a number of challenges. For ATCOs working in remote locations it is not only a complete change of technology but also a potential change of location, as they move away from the airport tower to a bespoke facility or even a remote tower centre including multiple airports.

A project of this kind relies on the appropriate involvement of operational staff from the very beginning and throughout the project. A thorough change management process should consist of safety, transition and training aspects to fully prepare operators, but also to ensure a seamless approval process within the regulatory authorities.

Remote digital towers (RDT) are not new and have already been implemented and put into operational use around the world; experience and lessons learned have been gained. The remote tower solution Frequentis and the German air navigation service provider (ANSP), DFS Deutsche Flugsicherung (DFS), developed, has been successfully managing air traffic



The working station for air traffic control of Saarbrücken Airport in the remote tower centre in Langen. Optimally adapted to the needs of the ATCOs. The entire control environment can be grasped by the controllers at a glance.

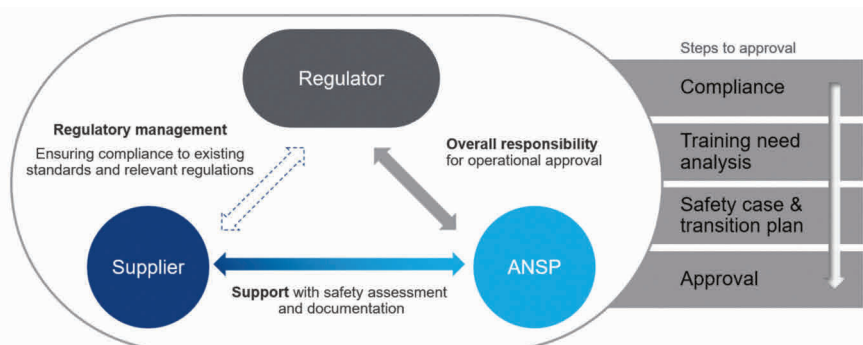
for Saarbrücken airport, South West Germany, from a remote tower centre in Leipzig, East Germany (over 450 kilometres away), for two years now. DFS implemented this remote digital tower over a three-year period starting in 2015; to ensure success we set up several workshops with all stakeholders and assigned a core team in Leipzig. We also involved a representative team of ATCOs to

participate in six validation cycles and in the iterative process to define the final operational layout and HMI. The solution, made up of cameras located at the airport, feeding information to high definition screens in a remote facility at Leipzig Airport, ensures the safe handling of over 15,000 flight movements per year.

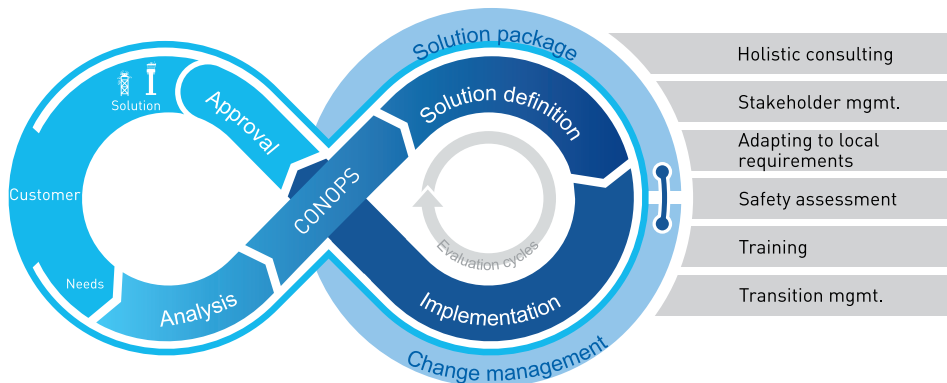
It was during the project that, together, both Frequentis and DFS came to the realisation that we worked well as a team and could use the lessons learned to deliver further projects for other ANSPs. It was at the start of 2018 that Frequentis DFS Aerosense was formed.

A turnkey solution

Frequentis DFS Aerosense GmbH is a joint venture company between Frequentis and DFS Aviation Services, which focuses on providing advanced turnkey remote sensing solutions for air traffic control (ATC) across the world, supporting airports with capacity and growth. Frequentis contributes the technologies, as well as



Steps to regulatory approval.



The Frequentis DFS Aerosense turnkey solution provides technical and operational support in all process phases.

expertise in developing customised remote tower systems, while DFS Aviation Services contributes its operational air traffic management experience in consulting, validation, transition and regulatory support.

As interest in remote digital towers grows for ANSPs looking for efficiency and tower operation enhancements, we believe that every airport in the world will have one in the next decade, just with different use cases. For bigger airports, RDTs will begin as more of a contingency service or a vision enhancement, but the same technology will allow physical towers to be replaced (cost effectively) with an RDT, a logical alternative to expensive investments in tower buildings.

The other benefit of an RDT is a digital or virtual tower centre where more than one airport can be located at the same facility. For regions like the Middle East, with quite some low traffic volume airports, this becomes a real benefit for efficiently managing air traffic volume. DFS also analysed this potential for its own airports in a research project with the German Aerospace Centre (DLR) in 2010. On this basis Frequentis and DFS developed the advanced solution with a remote tower centre (RTC) in Leipzig for the three international airports, Saarbrücken, Erfurt and Dresden, but with the potential to add two more airports later. In December 2018, remote tower control was put into regular operation for Saarbrücken International Airport. The other two airports will be phased into the Remote Tower Control Centre in Leipzig step by step. Control of Erfurt from the centre in Leipzig is already close. And the topic of digital tower control in Germany does not end here.

DFS and Frequentis have mastered the new challenges posed by an RDT project and so Frequentis DFS Aerosense is able to offer RDT consulting, which means that ANSPs can avoid a lot of the potential complications of an RDT project, just by

using the lessons learned from the DFS change management process.

The early involvement of all stakeholders, including the local regulator and relevant authorities, is a critical factor for a timely and successful project implementation. In order to earn full acceptance, DFS involved the German Regulator BAF (in German Bundesaufsichtsamt für Flugsicherung) from the very beginning through the introduction of regular workshops and active collection of feedback. This regulatory approval approach, developed by DFS, offers a suitable guide for others as well. The new safety cases and their respective documentation can be adapted and customised.

Agile techniques for a complex project

The operational and technical experiences DFS and Frequentis gained during their launch project in Germany can be shared among the ATM world and support other ANSPs in pursuing their own RDT plans. Because of the complex change of the technical and operational environment, an agile approach during the implementation phase is recommended. This includes a close coordination of all involved parties in short intervals, the consistent use of agile project tools and a combined and continuous adaptation of next steps. Because the right project basis is also a critical success factor, the agile methods should be clearly defined at the very beginning of the project and all those involved should be informed and, if necessary, trained accordingly.

Even though each project and its requirements must be considered individually, the experience gained during the Frequentis/DFS RDT project can help ANSPs to facilitate acceptance throughout the whole stakeholder landscape and save exhausting loops in the evaluation stage, along the change process. By relying on proven experience, the implementation of a RDT project can be significantly

accelerated. In addition, ANSPs can reduce usage of valuable internal resources by leveraging the experienced external support from Aerosense, leading to cost savings during project planning and execution.



Moritz Manzel, Regional Manager Middle East, Frequentis DFS Aerosense

With a degree in International Management and a Masters' in Service Marketing, Moritz joined

the DFS Group in 2010 as a Project Manager and Consultant for several aviation/ATC projects throughout the Middle East, where he was based for three-years. In 2018 he was appointed Managing Director for DFS Aviation Services Bahrain Co WLL, a subsidiary of DFS Aviation Services.



Yannick Beyer, Sales director, Frequentis DFS Aerosense

Yannick joined the DFS Group in 2012 as a Consultant for international ATM projects. With a degree in Aviation Management and a Masters' in Business Administration, he today serves customers from all over the world in ATM topics. Since 2020 Yannick is Director Sales at Frequentis DFS Aerosense.

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Launch date: Air Arabia CEO Adel Ali (fourth from left) and Etihad CEO Tony Douglas (second from left) were on hand to mark the launch of their new joint venture.

PICTURE: AIR ARABIA

Right: Wizz Air Abu Dhabi has recently had its first Airbus A321neo delivered and plans to base six in the emirate within six months.

PICTURE: WIZZ AIR

LOW BLOWS...

Airline passengers in Abu Dhabi stand to benefit as two new low-cost carriers fight it out for their dirhams. But, asks Alan Dron, is there enough business for both companies?

It promises to be one of the most closely watched developments in Middle East commercial aviation for many years. Two major low-cost carriers (LCCs) are starting operations from Abu Dhabi International Airport, with plans to launch cut-price flights both within the region and beyond.

Air Arabia has joined up with locally based Etihad Airways to form Air Arabia Abu Dhabi (AAAD), while Hungary-based Wizz Air, which has become a major force in central and eastern Europe, is setting up Wizz Air Abu Dhabi (WAAD) in cooperation with Abu Dhabi Developmental Holding Company.

AAAD started services in July, flying to Alexandria and Sohag in Egypt. Since then it has expanded its flights to Cairo, Kabul (Afghanistan) and Dhaka (Bangladesh). It has also been granted permission to start operating to the Uzbek capital, Tashkent.

Immediate competition

WAAD, meanwhile, at the time of writing planned to start services on November 15. It would find itself in immediate competition with AAAD to Alexandria, while also beginning flights to Athens (Greece), Kutaisi (Georgia), Larnaca (Cyprus), Odessa (Ukraine) and Yerevan (Armenia).

Air Arabia's link with Etihad at Abu Dhabi is not dissimilar to the situation in neighbouring Dubai, where Emirates Airline has built an increasingly comprehensive strategic partnership with LCC Flydubai – although those two companies have the same owner.

They complement each other, as Flydubai operates to many destinations closer to Dubai than the long-haul-biased Emirates and, increasingly, large numbers of passengers transfer between the two carriers.

Air Arabia declined to detail its plans for its venture with Etihad. A spokesman said it felt unable to comment on markets and routes because of the rapidly changing conditions caused by the coronavirus pandemic.

However, Wizz Air has been on the PR offensive ever since announcing its venture last December. The scale of its ambitions can be judged by the fact that it plans to base up to 100 aircraft in the Gulf by 2035.

It was initially thought that WAAD would tend to operate

north and west towards Europe. However, Wizz CEO, József Váradi, has said that it will also be looking at intra-Gulf flights, north Africa and the Indian sub-continent. Wizz has served Dubai World Central for some years, “gaining experience going further east from Europe”, Váradi said.

He described the UAE as a compelling market, with Abu Dhabi keen to expand its aviation sector as part of its plans to diversify from a hydrocarbon-based economy.

He noted that the roughly six-hour range of Wizz's fleet of Airbus A320s and A321s meant that the UAE was at the limit of their range from Europe; setting up a base in the UAE would allow it to greatly expand its area of operations, especially with a UAE air operator's certificate (AOC). WAAD has now been named an official UAE flag-carrier.

However, some analysts have expressed doubts whether there are sufficient passengers in Abu Dhabi for two LCCs to operate profitably, particularly if they become locked into a price war.

Ultra-low prices

Even ultra-low prices will not be sufficient to widen the local pool of prospective passengers, Saj Ahmad, chief analyst at London-based StrategicAero Research, believes.

“No one in their right mind is going to travel two hours from Dubai to catch a flight from Abu Dhabi, just because it's cheaper,” he said. “There is even less incentive to come from [the more distant emirates of] Sharjah, Fujairah or Ras Al Khaimah.”

Váradi is confident that there is sufficient traffic, for two main reasons. “Abu Dhabi leaks passengers heavily to Dubai and Sharjah,” he said. He believes WAAD can reclaim those passengers. And he believes that, as elsewhere in the Gulf, the presence of LCCs will ‘grow the pie’, increasing both the overall number of passengers and the number of flights they take. For that reason, he does not believe over-capacity will be a problem. There will also be new passengers in the form of in-bound leisure traffic.

“Competition is good for the market. There are benefits for consumers [and] it's good for airlines. If you compete, you simply become a better airline.”

■ Global consistency call – Page 22.

“No one in their right mind is going to travel two hours from Dubai to catch a flight from Abu Dhabi, just because it's cheaper.”

SAJ AHMAD



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NEW ARAB-ISRAELI LINKS

The announcement that the UAE and Bahrain are to establish diplomatic ties with Israel will have major implications for both civil and military aviation in the region.

Alan Dron reports.

There had been straws in the wind for some time. In October 2018, Israeli Prime Minister, Binyamin Netanyahu, was received in Oman by the late Sultan Qaboos. Days later, Israel's sports minister openly visited Abu Dhabi for a judo tournament.

Nevertheless, August's announcement that the UAE and Israel had agreed to normalise relations came as a shock to many.

The first visible sign of the rapprochement was the sight of an El Al Boeing 737-900ER landing in Abu Dhabi carrying Israeli officials and US representatives, who had helped broker the deal.

Just as significantly, the airliner had been permitted by Saudi Arabia to transit its airspace to reach the UAE. Access to Saudi airspace makes the route commercially viable, cutting flying time between the UAE and Israel by more than half, to around three hours 20 minutes.

Without access across Saudi Arabia, a flight from Tel Aviv to Abu Dhabi would have to make a huge circuit around the bottom of the Arabian Peninsula.

Riyadh has said that it will allow any such future flights, if they are requested by the UAE.

Relations discreetly warming

Relations between Gulf states and Israel have been discreetly warming for some time. In a classic example of the old saying 'my enemy's enemy is my friend', both Israelis and Gulf Arab nations regard Iran as the greater threat to peace in the region.

What are the chances of regular flights between Israel and the UAE? A spokesman for El Al told *Arabian Aerospace* that he had "no information" on future flights to the UAE, but that the situation was under review. Etihad Airways similarly said there were no immediate plans for flights to Israel.

However, an Israeli travel firm, Tal Aviation Group, has already started offering tickets for Etihad flights. "Currently, we are cooperating with other airlines such as Aegean or Royal Jordanian, and from Athens or Amman we offer connection to the wide network of Etihad around the world," a spokeswoman said. "We all hope to see Etihad launching a direct flight from Abu Dhabi to Tel Aviv, but this might take more time, and is not expected in the near future."

However, El Al has announced the start of a

■ **Israeli travel firm, Tal Aviation Group, has already started offering tickets for Etihad flights.**

■ **El Al has announced the start of a weekly cargo flight between Tel Aviv and Dubai.**

■ **Israeli charter airline, Israil, has applied for permission to operate flights to the UAE.**

■ **Bahrain, which operates a flight information zone in the northern Gulf, has said that Israeli flights can now use that airspace for future flights.**

weekly cargo flight between Tel Aviv and Dubai, operated by a wet-leased Boeing 747F freighter operated by US-based Atlas Air. The first such flight, on September 16, carried agricultural and high-tech equipment. Rather oddly, the flight will go via Liège in Belgium, El Al Cargo's main European hub.

Meanwhile, an Israeli charter airline, Israil, has applied for permission to operate flights to the UAE and has tentatively booked departure and arrival slots at Tel Aviv's Ben Gurion Airport in order to open a route to Dubai International Airport. It pencilled in at least eight flights from October onwards.

Israil also operated a flight by one of its Airbus A320s to Manama on September 21. The flight, which according to tracking website Flightradar 24, returned the same day, was much more low-key than the El Al flight to Abu Dhabi but was said to have taken an Israeli Government delegation to Bahrain. It, too, crossed Saudi airspace to reach its destination.

Bahrain, which operates a flight information zone in the northern Gulf, has said that Israeli flights can now use that airspace for future flights.



However, there have been some demonstrations in Bahrain against normalisation of relations with Israel. A majority of the Bahraini population is Shi'ite and Shia Moslem Iran remains bitterly opposed to any settlement with the Jewish state.

Some other Arab states, notably Algeria, have said they will not normalise relations with Israel while the fate of the Palestinians is unresolved.

Israelis will, doubtless, welcome the chance to explore areas of the Arab world previously closed to them, while Arabs will increasingly be able to worship freely at Jerusalem's Al Aqsa Mosque, Islam's third-holiest shrine. Websites showed videos of young Israelis and Emiratis excitedly discussing the options of visiting each other's countries.

Immediate result

In the military field, the most immediate result of the new links between Israel and the UAE is likely to be a UAE order for Lockheed Martin's F-35 fighter. The UAE has wanted to buy the advanced combat aircraft for some time but has been blocked by the US policy of allowing Israel to keep a 'qualitative military edge' over the Arab world.

With that obstacle removed, an order is expected within months.

"We ought to get them... The whole idea of a state of belligerency or war with Israel no longer exists," the UAE's minister of state for foreign affairs, Anwar Gargash, was reported as saying by the *Aljazeera* news agency after the Israeli delegation's visit to Abu Dhabi.

"We feel that, with the signing of this peace treaty in the coming weeks or months... that any

A BOOST FOR THE REGION



Harbinger of peace: An El Al Boeing 737-900ER was the first Israeli commercial aircraft to touch down in the UAE following an agreement to normalise relations with the Jewish state.

PICTURE: NICKY BOOGAARD/WIKIMEDIA COMMONS.

hurdle towards this should no longer be there,” he added.

According to Douglas Barrie, senior fellow for military aerospace at the UK’s International Institute of Strategic Studies: “The signals are that the F-35 will be released to the UAE in the near future.”

This would fit in with the established US pattern of allowing Arab nations to buy US military hardware, but only after Israel had ‘bedded in’ the same equipment first, such as Saudi Arabia’s purchase of the Boeing F-15 Eagle.

“The UAE has got a pretty advanced F-16 and its Mirage 2000s are going through an upgrade programme at the moment,” Barrie added. The question was whether the UAE would increase the number of types in its inventory, or whether an existing model would be replaced.

However, he anticipated that the greatest Israeli-UAE cooperation would be in the sharing of intelligence on areas of mutual concern, something that was unlikely to enter the public domain.



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Palestinian Airlines in limbo as aircraft are put up for sale

Captain Zeyad Al Bada: "It's very early to talk about this question [the future of the airline] now."

PICTURE: BILLYPIX



For sale: Palestinian Airlines' two long-serving Fokker F50s have been operating on lease in west Africa but are now to be sold.

PICTURE: BRAM STEEMAN, WIKIMEDIA COMMONS

Palestinian Airlines faces yet another challenge as the occupied territories' government puts its aircraft up for sale.

Alan Dron
reports.

For years now, Palestinian Airlines has been a company with no airport to call home, no timetable and no air services flying under its own name.

Now, the chance for Palestinians to see their national airline operating is about to become even more remote, with the news that the carrier's only two aircraft – a pair of Fokker F50 turboprops more than 30 years old – are being put up for sale by the company's owner, the Palestinian Authority.

The two aircraft have spent recent years in west Africa, operating on wet leases to Niger Airlines, an activity that brought in valuable revenue. They have been employed in operating a network of domestic services between five cities in the Sahel nation.

However, with the Covid-19 pandemic leading to Niger Airlines suspending operations, the two Fokkers are not currently needed.

Both are currently at Cairo International Airport awaiting their fate, according to Palestinian Airlines' director-general, Captain Zeyad Al Bada.

Media reports have suggested that, once the Fokkers have been disposed of, the Palestinian Authority will look around for replacement aircraft. The company has, for several years, been hopeful of obtaining a pair of Boeing 737 or Airbus A320-family aircraft, probably with the help of financial assistance from Arab nations, but this plan has so far failed to come to fruition.

Also unclear is when exactly the Palestinian authorities might purchase new aircraft to replace the Fokkers. The current pandemic has seen hundreds of aircraft returned to lessors by airlines and these are now available at rock-bottom lease rates. However, like many governments, the

Palestinian Authority currently has little money available, and what it has is being spent on essentials.

However, Al Bada said he was sure that the Palestinian Government continued to support the idea of the territories having their own airline.

The biggest problem, of course, was the continued occupation of Palestinian land by Israel. The airline began life with services from Gaza Airport when that facility opened in 1998 but, just three years later, the airport was bombed by the Israeli Air Force during the Second Intifada. Then, in January 2002, Israeli bulldozers ripped up the airport's runway and the site has been unusable ever since.

Unable to base itself in its homeland, Palestinian Airlines moved to El Arish Airport in Egypt, some 60km west of the Rafah border crossing between the Gaza Strip and Egypt. Although the airline used the small coastal airport at El Arish for several years after 2012, it was often difficult for passengers to negotiate the border controls between Gaza and Egypt in time to make their flights.

The main destinations served from El Arish were Jeddah and Amman, with Palestinian Airlines' passengers making onward connections from the Jordanian capital.

However, despite the current lack of services from the Palestinian Territories – or, indeed, anywhere by Palestinian Airlines – staff at the airline will continue to have their salaries paid, said Al Bada. "They are on standby," said the director-general.

Al Bada, whose earlier career included a lengthy spell as personal pilot to former Palestinian leader, Yasser Arafat, stressed that much was unclear about the future of the airline and its fleet.

"It's very early to talk about this question now. The [Palestinian] government is changing and everything is changing [with the pandemic]." With the international situation developing so swiftly at present, it was difficult to look two days ahead, never mind two years, he said.

As well as the uncertain path of the pandemic, it is difficult to foresee if the current thawing of relations between Israel and the UAE and Bahrain will spread throughout the Arab world and, if so, what effect this might have on the Palestinian situation.

There is little doubt that Palestinians would use a home-grown airline, seeing in it a small emblem of statehood. But it may be some years yet before new aircraft are available to take to the sky bearing the Palestinian flag. ■



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Adel Al Ali: "We have started to see the gradual reopening of airports and we hope more will follow."

PICTURE: AIR ARABIA

Global consistency the key to travel recovery

Air Arabia's dynamic business model has enabled the airline to react quickly to sudden changes in the market due to the coronavirus crisis. Group CEO, Adel Al Ali, told Vincent Chappard that consistent measures must be taken globally to enable markets to open for people to travel safely.

Air Arabia has built a sustainable low-cost carrier (LCC) in the MENA region over the years. According to Adel Al Ali, group CEO, it "has pioneered a business model that has transformed the region's airline sector".

He said: "Our strategic commitment to our customers remains in creating exceptional value while maintaining the highest levels of service and operational excellence."

Even though Air Arabia registered a net loss of AED 169 million (\$46m) for the first half of this year (ending June 30) he pointed out: "2019 was one of the best performing years for the aviation industry and so was early 2020, until the Covid-19 impact in mid-March, where airlines around the world had to face closed skies and travel restrictions."

Air Arabia took early measures to control overall costs and enhance its cash position, despite the challenges.

This included deferred capital expenditure, workforce restructuring, as well as cost rationalisation and efficiency savings, which all resulted in reducing overall cost and preserving liquidity.

The company's turnover for the first six months of 2020 dropped by 53% compared to the corresponding period last year. Air Arabia served a total of 2.48 million passengers from its four hubs (Sharjah, Ras Al Khaimah, Casablanca, and Alexandria) during the first half of 2020, a drop of 57% compared to 2019.

"Today, we see gradual recovery and we continue to add more destinations as more markets open," said the CEO. "While the current situation remains uncertain and provides little visibility towards the future, we are hopeful that the industry is now ready to adopt universal measures to enable air travel during the pandemic, which, in turn, will help in the recovery."

Some north African countries are still under restrictions. Consequently, Air Arabia has gradually restarted serving regional destinations by operating a mix of scheduled, repatriation, charter, and cargo flights, across its operating hubs in Morocco and Egypt.

"We have started to see gradual reopening of airports and we hope more will follow."

Health and safety have always been the industry's top priority and remain fundamental elements of Air Arabia's business and development plan. "We have seen how quickly airlines and airports upgraded their travel experience to include the best health measures, which enable people to travel safely. We believe that it is time now for the industry to adopt consistent measures that can be applied universally," said Al Ali.

If done, he believed this would allow more markets to open and enable more people to connect and travel safely.

In the midst of the pandemic, Air Arabia Abu Dhabi launched operations from its base at Abu Dhabi International Airport. "We decided to proceed with the launch because we strongly believe in the prospects of low-cost air travel, as well as the role the aviation industry will play in the overall economic recovery," explained Al Ali. "This fact will not change. We look forward to the gradual recovery of the industry, which will enable us to serve more customers looking to connect with the world."

Air Arabia chairman, Sheikh Abdullah Bin Mohamed Al Thani, said: "While we remain in a strong position weathering the Covid-19 impact, we continue to look at this challenge with a long-term view, keeping business continuity as the prime focus."

Air Arabia is now looking at adding new longer-haul markets and placing a large aircraft order to enlarge its footprint. ■

Summer sun is cold comfort to north African airlines

It was hoped that the summer period would give north African airlines the chance to recover from the early blows dealt them by the coronavirus pandemic. The results were not what air transport stakeholders were expecting. Vincent Chappard and Anuradha Deenapanray report.

The health crisis is continuing to deeply affect airlines globally, with many in survival mode.

According to the International Air Transport Association (IATA), global air traffic did not record the much-hoped-for increase during the summer. This was particularly the case in north Africa. Tunisia's tourism receipts, for example, fell by 61%, according to figures released by the Central Bank of Tunisia.

The whole of north Africa, which depends so much on tourism and air connectivity, is being hit hard by travel restrictions and border closures, measures taken by governments to prevent the spread of coronavirus.

In Morocco, the authorities have announced the renewal of the health emergency and, therefore, the closure of the country's borders. At the time of writing, no commercial flights were expected until November 10.

Royal Air Maroc (RAM) has only been operating a special flight programme since mid-July. A rescue plan of six billion dirhams (\$649 million) has been announced. This aid will, however, be subject to a restructuring of the airline.

Drop in demand

According to CEO, Abdelhamid Addou: "The company will face an inevitable drop in demand and in its activity over the next three to four years."

RAM is also planning to reduce its workforce by around 30%, withdraw 20 aircraft from its fleet, and streamline its network in America, Asia, Europe and Africa.

Even though Tunisia reopened its borders on June 27, the summer season didn't take off.

At the time of writing, Tunisia had just strengthened health measures for travellers coming from countries seeing a rise in coronavirus contamination, like in France and Belgium.

The national carrier, Tunisair, was reported to be in a "catastrophic situation", which necessitates "deep structural reforms, sacrifices and bold decisions". Revenue and passenger numbers have collapsed. A recovery plan and a drastic restructuring are urgently needed to save the airline, which was founded as far back as 1948. It will be a burning issue for the new Minister of Transport and Logistics, Moez Chakchouk.

In Algeria, air transport has been at a standstill since March and Air Algérie's losses have been piling up.

The airline's CEO, Bakhouche Alleche, said



Tough times: RAM is planning to reduce its workforce by around 30%, withdraw 20 aircraft from its fleet, and streamline its network in America, Asia, Europe and Africa.

PICTURE: RAM



Virtually grounded: In Algeria, air transport has been at a standstill since March and Air Algérie's losses have been piling up.

PICTURE: AIR ALGÉRIE

nothing has been decided yet and the reopening of borders strongly depended on the coronavirus situation within the country.

However, Air Algérie spokesperson, Amine Andaloussi, told reporters that the airline, which has operated repatriation flights for more than 8,000 Algerian nationals, is getting prepared to resume operations.

In Egypt, all airports restarted their operations to commercial flights on July 1. The government took this decision to revive the tourism sector and air transport is recovering slowly.

By the end of August, EgyptAir has reported a 45% daily operating rate for its flights.

EgyptAir and Air Cairo have also formalised their cooperation through a codeshare agreement, which will extend their networks to further destinations, domestically and beyond Cairo Airport.

The agreement will be implemented during the winter season 2020/2021.

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Sustainable future is written in the STARS

The MEBAA Show, the Middle East's leading business aviation platform, may have been eased back a couple of months to now be scheduled for February 22-24 in Dubai, but there's still plenty happening in the sector, as Dave Calderwood reports.

There are two buzzwords flying around business aviation at the moment – Covid-19 and sustainability.

We all know how the virus is affecting all areas of aviation – indeed it caused the MEBAA show to be moved from its original December 2020 date – but on the positive side, right across business aviation, sustainability is gathering pace.

It is the issue of the moment and is even being seen as a central part of the recovery.

In late September, the European Business Aviation Association (EBAA) launched two working groups tasked with defining guidelines for the sector's standards and training for aviation responsibility and sustainability (STARS) initiative.

STARS is supported by the International Business Aviation Council (IBAC) and comprises a three-tier set of standards and resources, which permits even the smallest of business aircraft operators and companies to receive accreditation for complying with progressive social and environmental best practices.

"The road to recovery from Covid-19 can, and should, happen in a sustainable way across all industries," said EBAA secretary-general Athar

Husain Khan. "For business aviation, STARS aims to provide the guidance and resources to do so. We anticipate having the standards and the accompanying label ready to launch in early 2021."

The Middle East is ready to play its part, too. One of the founders of UAS International Flight Support, headquartered in Dubai, Omar Hosari, said: "This is a perfect time to explore new approaches to aviation's energy systems and ways to accelerate energy transition. Naturally, technological innovations will play a great part in this, as will the autonomous actions of governments as they rebuild the industry in their own countries.

"It would be great to all collectively agree on a blueprint for green recovery that fits all of our needs, taking into account the inevitable challenges that were unforeseen a year ago. It should also include details of the social benefits of aviation and the outcome of CO2 goal analysis. Greener recovery is possible and, at a time like this, all sectors need to be on the same page so we can best work together toward achieving it."

Jet Aviation is another major business aviation company committing itself to sustainable

Continued
on Page 28

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CONTINUED FROM PAGE 25

aviation. At a virtual summit, held in September by the Business Aviation Coalition for Sustainable Aviation Fuel, Jet Aviation president and GAMA chairman, David Paddock, joined a panel of industry and original equipment manufacturer (OEM) leaders. Paddock emphasised the need to invest in solutions for owners and operators and the importance of public-private partnerships in driving awareness, understanding, research and development.

“We intend to make sustainable aviation fuel (SAF) available when and wherever possible throughout the Jet Aviation global network,” said Paddock.

“We are always looking for ways to adopt new technologies and develop innovative solutions. In our completions business, we have invested considerably in research and development to improve our designs, including reducing fuel consumption through lighter weight cabins and lower power consumption, and are also exploring the use of sustainable materials. Similarly, we are constructing new buildings and adding new equipment to existing facilities with sustainability in mind, including incorporating solar panels, electric vehicles, and recycling systems.”

Driving the change

Aircraft makers are driving the change to more efficient and less polluting aircraft. Airbus Corporate Jets (ACJ), for instance, says its A321LR delivers 30% fuel savings and a reduction of 50% in noise footprint compared to earlier aircraft. The French firm has recently won an order for two multi-mission-capable A321LR jets from the German Air Force, joining an existing order of three ACJ350s.

ACJ has also revealed a new cabin concept, called Harmony, which will first be seen on an ACJ330neo but can also be installed on other ACJ wide-body jets, such as the ACJ350.

“The Harmony cabin concept combines the benefits of ACJ VIP wide-bodies – such as comfort, space and quietness – to produce a consistently harmonious customer experience,” said a company spokesperson.

“Long-haul flights provide time for productive work and socialising, as well as rest. ACJ’s Harmony cabin concept is wonderfully well designed to enable all of these possibilities. Harmony is a timeless and elegant design concept. Concentric circles, like ripples on a pond, are a feature of the cabin layout.”

ACJ’s rotary counterpart, Airbus Corporate Helicopters (ACH), has also been busy. It has received its European Aviation Safety Agency (EASA) type certificate for the all-new H160 medium-size multi-role helicopter. American (FAA) certification is under way.

“This achievement represents years of hard work designing, industrialising and defining the support ecosystem with our suppliers and partners,” said Bruno Even, Airbus Helicopters CEO. “I now look forward to the H160 entering into service and offering its innovative features

PICTURE: GULFSTREAM



PICTURE: EMBRAER

that bring competitiveness alongside additional comfort and safety to customers worldwide,” he added.

The H160 performs a wide range of missions, such as offshore transportation, emergency medical services, private and business aviation, and public services. It includes advanced safety features such as Helionix pilot assistance and flight envelope protection, sound-reducing Blue Edge blades, fuel efficiency, and a simplified maintenance eco-system.

Demanding standards

Abu Dhabi-based Falcon Aviation is one Middle East operator interested in the H160, with at least four helicopters on order. Falcon chief operating officer, Captain Raman Oberoi, said: “The H160 definitely meets our demanding standards for VIP travelling in terms of comfort.”

Over at rival Boeing, the company recently won the private jet design concept title in the 2020 International Yacht and Aviation Awards for the Massari design for its BBJ Max 7.

“The open-plan living area serves as a relaxation area that can also be used for dining and business needs. The large bathroom area mimics that of a luxury five-star hotel; open plan and spacious,” said the award citation.

BBJs are bread and butter for completions specialist GDC Technics. The Fort Worth, Texas-based company recently announced the installation of Aviation Clean Air’s (ACA’s) cabin ionization component, a proactive air and surface purification system for VVIP, business, and commercial aviation.

“The installation of this system will neutralise harmful pathogens that just sneezing, coughing, or breathing can spread within an aircraft,” said Brad Foreman, GDC Technics CEO.

GDC Technics also announced delivery of a B777-300ER, with exterior modifications and a fully customised interior cabin, for an unnamed head-of-state customer.

The B777-300ER is equipped with cutting-edge technologies to provide industry-leading in-flight data, connectivity, and passenger comfort capabilities. Exterior modifications include a full security system; forward-looking, quad, downward zoom, and tail fin cameras; and worldwide connectivity – including a dual satcom system, Ka-Band antenna, Iridium system, and satellite TV antenna, to provide live, 4K television.

Over at Gulfstream, flight-tests are continuing on the company’s latest aircraft, the G700 – the launch customer will be Qatar Executive – expanding the flight envelope at both low and high speeds, and recently reaching Mach 0.99 and an altitude of 54,000ft.

“These accomplishments at this stage in flight-test point to the impressive maturity of the G700 programme,” said Mark Burns, president, Gulfstream. “We designed and developed the G700 for our customers to fly safely, securely, and efficiently, while enjoying the same level of comfort as they do on the ground.”

Dassault Falcon, too, is pushing ahead with its latest and roomiest aircraft, the Falcon 6X, targeting early 2021 for the aircraft’s first flight, despite Covid-19 affecting work routines.



PICTURE: DASSAULT



PICTURE: AIRBUS



PICTURE: ERIC RAZ/AIRBUS HELICOPTERS.

Top, from left: The G700: Flight-tests are continuing on Gulfstream's latest aircraft; Dassault is aiming at early 2021 for the Falcon 6X's first flight; The Airbus ACJ330neo Harmony cabin concept.

Bottom from left: Embraer recently announced the Phenom 300MED, a medevac solution for Phenom aircraft; ACH has EASA type certification for the all-new H160 medium-size multi-role helicopter.

"Bringing the Falcon 6X to market on schedule is a top priority for the company," said Dassault Aviation chairman and CEO, Eric Trappier.

"Our planning and production staff have been diligent and resourceful in adapting procedures to new sanitary guidelines to keep this programme running smoothly. Our suppliers have also made extraordinary efforts to support us. We are grateful to them all."

The first of the three pre-production 6X aircraft that will take part in flight certification has been powered up and has entered ground-testing. A second and third aircraft are in advanced stages of assembly, and parts creation for serial production has already begun. Certification and entry into service are set for 2022, in keeping with the original timetable, confirmed Dassault.

Not all private jets are for VIP or corporate operations. Embraer recently announced the Phenom 300MED, a medevac solution for Phenom aircraft, which is available new or as a retro-fit. It's been developed with German aerospace company Umlaut and Aerolite, which supplies medevac equipment.

Embraer and Umlaut are developing various configurations, which will feature either one or two stretchers, as well as the ability to carry an incubator and additional medical equipment. The aircraft will also have hospital-grade trim and finishing, to be a purpose-built medevac solution.

"Umlaut is known for generating full-service, cross-industry, and end-to-end solutions," said Tobias Geißinger, managing director. "Now, we

are combining Embraer and Umlaut's strong competencies in aircraft engineering, refurbishment, and certification know-how to bring an unprecedented solution to the market.

"Together with Aerolite's state-of-the-art aeromedical equipment, we will deliver a solution that will transcend the current market."

Who's for the Bossa Nova? No, not the Brazilian dance, but Embraer's new interior for the latest Phenom 300E, the first being recently delivered to a US customer.

Bossa Nova encompasses Embraer's latest interior developments, such as carbon-fibre accents, Ipanema sew style and piano black surfaces. It was first introduced on Embraer's Praetor 500 and Praetor 600 and won best design in the 2019 International Yacht & Aviation Awards.

Entered into service

Can you believe it's already five years since the Cessna Citation Latitude entered into service? Around 240 have already been delivered, making it 40% of all mid-size business jet deliveries since 2015, according to Textron Aviation.

"Five years since its introduction, the Citation Latitude is now an industry icon," said Rob Scholl, senior vice president, sales. "Business travellers were the first to appreciate its versatility and comfortable cabin, which makes the jet ideal for business productivity and leisure alike.

"The jet's innovative design has enabled its deployment in a variety of applications, from European air ambulance operators, to the

Japan Air Self-Defence Force, which, in April of this year, took delivery of two Citation Latitude jets configured for flight inspection."

There's a new Beechcraft King Air turboprop, the 360/360ER, which is already in production with first deliveries taking place.

A key feature is an innovative solutions and support (IS&S) ThrustSense autothrottle, which automatically manages engine power from take-off through the climb, cruise, descent, go-around and landing phases of flight, reducing pilot workload.

There's also a new digital pressurisation controller, which automatically schedules cabin pressurisation during both climb and descent, again reducing pilot workload and increasing overall passenger comfort.

An idea that many thought would never happen – a supersonic business jet – achieved a major milestone in September when Honeywell Aerospace signed up to work on the avionics for the AS2.

This will include Honeywell's next-generation, state-of-the-art, flight deck – an advanced display system incorporating intuitive symbology, advanced communication and navigation systems, plus flight guidance and management systems.

All aspects of the new avionics will support supersonic flight and Aerion's revolutionary 'boomless cruise' technology, which enables the AS2 to fly at both transonic and supersonic speeds over land, with no perceived noise reaching the ground. ■

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Bombardier's new CEO, Éric Martel, believes that the current coronavirus crisis will have a positive impact on the business jet business. The company has great expectations regarding the Middle East market, especially for the long-range Global family. Vincent Chappard reports.



Impressive: Bombardier has delivered the first Global 7500 with the dual head-up display (HUD) capability, which provides additional safety and redundancy during low-visibility approaches.

PICTURE: BOMBARDIER

Bombardier just the ticket for distancing...

The Covid-19 pandemic has presented industry-wide challenges that will, no doubt, change the way people travel.

Éric Martel, who officially took command of Bombardier last April, has the daunting task of driving the Canadian manufacturer's new development strategy to reshape the company's capital structure and restore confidence.

The sale of its Q400 turboprop to Viking Air, its CRJ regional jets to Mitsubishi, and the deal between Airbus and the Québec Government on the A220 programme (formerly CSeries), has marked Bombardier's exit from commercial aviation.

The company is also expecting to sell its aerostructure business to Spirit AeroSystems Holdings.

These bold decisions were taken to stop the financial bleeding and falling stock prices.

Now, however, the plan to concentrate solely on business jets seems less risky, as business aviation is reacting better than its commercial rivals to the current global crisis.

"While it's too early to make any long-term projections, business jet traffic is recovering at a faster rate than commercial. Encouragingly, Bombardier has seen limited order cancellations and new interest in private air travel is generating lots of attention from a sales perspective," said Christophe Degoumois, vice president of sales, international, Bombardier Business Aircraft.

According to him, business jet travel is particularly attractive during the pandemic as passengers look for ways to avoid the crowds at large airports and the restricted personal space aboard commercial aircraft.

"Bombardier business jets, with their spacious cabins designed around wellness, are an ideal alternative," he said.

"In addition to being well ventilated, our aircraft allow for separation of crew and passengers via pocket doors, low passenger density, and physical distancing of passengers."

Bombardier has delivered the first Global 7500 with the dual head-up display (HUD) capability, which provides additional safety and redundancy during low-visibility approaches. The

sophisticated HUD is equipped with enhanced and synthetic vision systems for optimal situational awareness. Degoumois said: "The Global 7500 aircraft is the industry flagship, easily outpacing the competition."

With its new development strategy and innovative products, Bombardier wants to capture the Middle East market.

The company is well positioned to concentrate its activities around business aviation, with a diverse jet portfolio.

It is also growing its customer service footprint, and offering a wide range of solutions for special-mission aircraft based on its platforms.

"The Middle East is a very promising market for us, with our broad portfolio of aircraft that are ideally suited to the needs of customers based in the region," said Degoumois. "In particular, the long-range Global family of business jets, with their large cabins and best-in-class ranges, which can take busy customers to more cities around the world non-stop, offer the most comfortable and productive flight experiences, featuring Bombardier's signature smooth ride technology."

Given the global pandemic, Bombardier is currently evaluating the extent of its participation in industry events like the MEBAA Show in Dubai, which has now been postponed to February 2021.

"We are giving careful consideration to our participation, while at the same time exploring different ways to connect with current and potential customers in different regions," explained Degoumois.

The pandemic has had a huge impact on the company's cashflow and the aerospace component-manufacturing segment, with job cuts and a fall in orders.

Nevertheless, Bombardier is positioned for growth through certification and the ramp-up of new programmes, and service network expansion.

According to the second quarter financial report, "as operations recover in the second half of the year, aircraft deliveries are set to accelerate relative to the first half of the year, towards a seasonal peak in the fourth quarter supported by aviation's \$12.9 billion backlog".



Christophe Degoumois:
"Business jet traffic is recovering at a faster rate than commercial."

PICTURE: BOMBARDIER



Versatile: The Airbus H125 can carry up to six passengers and be reconfigured for multiple missions.

PICTURE: AIRBUS

Saudi start-up goes for the power of 10

Saudi start-up The Helicopter Company, which launched in 2018, is expanding its fleet with an order for 10 Airbus H125 light single-engine helicopters. Dave Calderwood reports.

The Airbus H125 can carry up to six passengers and be reconfigured for multiple missions, from scenic tourism to aerial work, such as filming, banner towing, and surveying. The Helicopter Company (THC) is fully owned by the Public Investment Fund of Saudi Arabia (PIF), which has a strategy to activate new sectors that support the realisation of the kingdom's Vision 2030 and generate long-term commercial returns.

THC is the first and, so far, only licensed helicopter operator for commercial flights in Saudi Arabia, with the aim of developing reliable, ground-breaking transport solutions.

"By signing this agreement, we have taken a massive step in expanding our fleet and implementing our ambitious operational plan," said THC chief operating officer, Captain Arnaud Martinez.

"We are proud to be contributing to the advancement of Saudi Arabia's tourism and aviation industries through our innovative air transport services that guarantee passengers a one-of-a-kind experience to relish the beauty of the kingdom from above.

"I would like to thank our partners at Airbus Helicopters, who have ensured we have reached an agreement that matches our requirements, and we look forward to furthering our collaboration in the near future.

"I would also like to extend our thanks to PIF for their enduring support since our founding, as we work together to advance Saudi Arabia's aviation industry."

Just fewer than 1,000 Airbus H125s aircraft are currently in service worldwide and are mainly used for high-performance missions in high and hot conditions – perfect for the region. Before being renamed as the H125, when Airbus Helicopters was formed from Eurocopter, the helicopter was known as the AS350 B3. It has been in service since 1978.

In 2005, the AS350 B3 broke the world record for the highest-altitude landing and take-off, performed on Mount Everest at 29,029ft, a record that still stands.

On May 19 2013, an AS350 B3 performed the highest-ever long-line rescue operation on Lhotse, the world's fourth-highest mountain, located in the Himalayas, at 25,590ft.

The H125/AS350 B3 is the entry-level helicopter in the Airbus Ecureuil ('Squirrel') family. Some 6,600 members of the Ecureuil family (AS350, AS355, AS550, AS555, H125, H125M, EC130, H130) have been delivered in nearly 120 countries for close to 2,000 operators, accumulating more than 34 million flight hours.

Touchscreen instrument panel

The helicopter has been progressively modernised over the years and now sports an Arriel 2D turboshaft engine with electronic control known as FADEC. Up front, pilots are faced with a state-of-the-art glass touchscreen cockpit instrument panel with Garmin G500H TXi flightdeck, and a vehicle and engine multifunction display (VEMD) especially developed for Airbus. The VEMD allows pilots to check the main vehicle and engine parameters with just a glance.

In the cabin, the flat floor makes it easy to reconfigure and make it a true multi-mission workhorse. It's said to be easy to fly, with good manoeuvrability, excellent visibility and low vibration levels, making it an efficient operator at all types of heliports, including hospital landing pads, police centres and airports around the world.

It also comes with a host of available supplemental type certificates (STCs), which allow it to be safely modified for specific missions.

As well as the workhorse configurations, the H125 can seat up to six and there's a luxury interior, called Stylence, available from Airbus for operators who seek both functionality and luxury VIP transport.

"This order marks the beginning of a new partnership with The Helicopter Company and we welcome it as a new customer," said Ben Bridge of Airbus Helicopters.

THC achieved its air operator's certificate (AOC) in near record time, receiving it in July 2019, authorising the company to operate in the airspace of the kingdom, the Middle East and Africa. THC plans to open up Saudi Arabia to both local and foreign tourists, concentrating at first on key sites such as Al-'Ula in the Medina region, world heritage site Mada'in Salih, Riyadh, and holy sites such as Mecca and Medina.

Yahya Al-Ghoriabi, chief executive of THC, said: "We're a new concept, a helicopter airline. It's new and the entire country is looking for this service." ■

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The UN is continuing attempts to broker peace to end Libya's deadly civil war and a preliminary deal was agreed in early September. But, with so many factions involved, and major countries backing both sides, no-one can predict what will happen next.

Alan Warnes analyses the current situation.

Peace hopes growing to end long-running civil war

Since Libya's deposed leader, Colonel Muammar Gaddafi, was killed in 2011, the north African state has been engaged in a deadly civil war.

Now the conflict between clans from the east and west, infiltrated by several terrorist organisations including Daesh, has morphed into a proxy war.

Turkey makes no secret of its support for the Tripoli-based Government of National Accord (GNA), while the opposing Libyan National Army (LNA), led by Benghazi-based General Khalifar Haftar, is backed by Russia, the UAE and Egypt, although the two Arab nations are more clandestine than Turkey with their support.

The UN-backed GNA has served as Libya's interim government since 2015, although its official governance ended two years ago.

There have been many twists and turns in the civil war in recent years. Although both sides still operate remnants of the former Libyan Air Force, newer, cheaper unmanned air vehicle (UAV) technologies have replaced the likes of the tired old Su-22s and MiG-21s in the ground-attack role.

Armed drones

As a result, Libya saw the first combat-UAV battleground, as opposing militias attacked each other with armed drones.

Turkey's Bayraktar TB2 and Anka-S are being used by the GNA to support their operational requirements, while the Chinese-built Wing Loong II, modified with a Thales satcom, is being used by the UAE to support the LNA's advance on Tripoli.

We have even seen drones from both sides attacking each other's civilian transport aircraft parked on the ground, after they were alleged to have landed with weapons and supplies.

However, the drone war has effectively been downgraded with the change of tactics by the GNA.

It set up integrated air defences in strategic locations, which brought devastating consequences for the LNA and, as a result, several Wing Loong IIs that do not possess any self-protection system were shot down. The aircraft now spends much of its time grounded.



Strike back: UAEAF&AD Mirage 2000-9s are thought to have carried out air strikes against Al Watiya Air Base in early July.

Turkish President Erdogan's intervention in January, to prop up the GNA when it was losing ground, changed the course of the conflict.

Turkish surface-to-air missiles were introduced on to the battlefield to establish air defence umbrellas, first around Tripoli, to stop the LNA's Wing Loong II drones operating around the capital's airspace, and then other strategic areas.

A network of systems, including the medium-range Raytheon MIM-23 Hawk surface-to-air missile (SAM), shorter-range Hisar-A SAM, and Korkut anti-aircraft guns, were deployed, not to just shoot down enemy combat-drones but also to protect high-value assets.

They are backed up by Turkish Navy Gabya-class frigates sitting off Libya's coast, which act as mobile anti access area denial (A2AD) systems against anything operating over the west of Tripoli.

These former US Navy Oliver Hazard Perry frigates have been comprehensively upgraded by Turkey's Havelsan. They are now fitted with the 250km (156 mile) range Thales SMART S Mk2 3D multibeam radar, operating in S-band, and optimised for medium-to-long-range surveillance and target designation in littoral environments.

The system can detect small surface targets, helicopters, and anti-ship missiles.

On board, the radar combines with the RIM-66E standard medium-range SAM or the RIM-

162 Evolved Sea Sparrow Missile (ESSM) to provide a lethal response.

Their 60km (38 mile) range is very similar to the MIM-23 Hawks, but mounted on the frigates patrolling the coastal waters close to Tripoli and other northern areas they are a flexible threat.

Tactics to target the LNA's Wing Loong IIs have worked because these drones don't have any jamming/self-protection systems on board.

Shot down

Ironically, the Wing Loong IIs, fitted with Thales satcom systems, are being shot down by Thales SMART S Mk2 radars. It meant the drones cannot not work in the areas covered by the Turkish air defences.

A security source told *Arabian Aerospace*: "This is a big game-changer and the Emirati-backed LNA will now have to develop complex counter A2AD operations, for which they have never been trained."

As a result, the LNA's western front collapsed because the Emiratis' Wing Loong II and Pantsir S1 SAM combo could not deter any threats.

Turkey trains the GNA to operate the Bayraktar TB-2 and Anka-S drones, while the UAE's Wing Loong IIs are under strict Emirati control.

The GNA use the Turkish weapons autonomously, developing key capabilities and employing armed Bayraktar TB2 unmanned

Supporting operations: Turkey has deployed the Bayraktar TB-2 to Libya, where the GNA militias are operating them.



Vulnerable: The Wing Loong II unmanned combat air vehicle, operated by the UAE on behalf of the LNA, played a major role in ops until the Turkish changed tactics and started to shoot them down.

ALL PICTURES: ALAN WARNES.



combat air vehicles – arguably the first militia to operate a drone in combat operations in Africa.

On May 18 this year, the LNA's Al Watiyah Air Base was re-taken by the GNA, after the Turkish placed one of its air defence bubbles around the area.

There are suggestions that the United Arab Emirates Air Force and Air Defence (UAEAF&AD) did not respond immediately with Egypt-based Mirage 2000-9s because they could be targeted by a MiM-23 or RIM missile.

But, when a strike did come on July 5, the UAEAF&AD would have probably been working alongside French Air Force Rafales to provide much-needed destruction of enemy air defence (SEAD) and electronic warfare expertise.

The strikes saw some of the Turkish MiM-23s being struck at the base, probably with Al Tariq precision-guided missiles (PGMs).

No one has ever admitted responsibility for the July 5 attack, but the French Navy had been humiliated by Turkish Navy frigates on at least four occasions prior to that date. The most recent had come on June 10, when Turkish and French Navy warships clashed in the Mediterranean as the latter was trying to enforce the UN arms embargo.

As part of NATO's Sea Guardian operation, the French frigate, *Courbet*, had attempted to

intercept a Turkish-owned ship suspected of arms trafficking. However, it was stopped by Turkish Navy frigates.

There remains a lot of bad-blood between Turkey and France, with the latter having blocked Turkey's admission to the EU several years previously.

Nearly three months after the Mediterranean clash, on September 22, the EU issued sanctions against Avrasya Shipping, which owns the *Cirkin* cargo-vessel that the *Courbet* was trying to intercept.

It remains to be seen whether the EU starts to sanction other companies, like Bayraktar, and even France's Thales, which is supporting both sides.

Twist in the war

Another twist in this long civil war came on May 26, when the Russians deployed 14 MiG-29 Fulcrums and Su-24 Fencers to Al-Jufra (50km west of Benghazi) and Al-Khadim (170km east of Benghazi). This deployment has now been increased to 24.

The US Africa Command (AFRICOM) was quick to denounce their arrival, with an official press release stating the aircraft were: "To support Russian state-sponsored private military contractors (PMCs) operating on the ground there."

The aircraft are flown by mercenaries from Russia's Wagner PMC Group, supporting the LNA.

Wagner is owned by Yevgeny Prigozhin, a Russian oligarch with close ties to President Vladimir Putin.

Two of the jets were lost in accidents in June and early September.

Russia is believed to have positioned S-300 or S-400 SAMs along Libya's coast, between Sirte and Ras Lanuf, in recent weeks, to deter any Turkish threat to the east and to protect the oil fields.

As well as being highly efficient at shooting down aircraft and long-range missiles, there is also an anti-naval variant. The security source continued: "They are positioned there as a show of force to Turkey and a warning – do not come any further east."

On September 18, General Haftar agreed to lift the year-long blockade on the oil refineries in the country's east after an agreement with the Tripoli government that the revenues would be shared.

Meanwhile, the UN continues with efforts to broker a peace deal between both sides, with a preliminary deal agreed in early September. This would include elections within 18 months and the demilitarisation of the city of Sirte, held by Haftar, and the gateway to Libya's major oil fields and export terminals.

Whether Turkey and Russia will support such an arrangement is unclear, but both will also want a share of the spoils. ■

As 2020 continues to be a bumper year for fighter aircraft across the MENA region, Jon Lake looks at this, and various other, defence matters.



Upsetting the US: The first Sukhoi Su-35SKs were delivered to Egypt on August 5.

PICTURE: SUKHOI

Egypt fighter deal still ruffling American feathers

The first Sukhoi Su-35SKs were delivered to Egypt on August 5, after the signing of a \$2 billion contract for 24 of the Russian-made fighters in March 2019.

The Su-35SKs followed a similar number of Dassault Rafales and 46 MiG-29M/M2 fighters.

The deal attracted the ire of the US, with threats of sanctions under the Countering America's Adversaries Through Sanctions Act (CAATSA) regulation.

This prompted Major-General Nasr Salem, a professor of strategic studies at the Nasser Higher Military Academy, to ask: "Why doesn't the US supply Egypt with the F-35 fighters that it supplied Israel with, since it is objecting to the Russian Su-35 fighter deal?"

Though the US has been unwilling to export the Lockheed Martin F-35A Joint Strike Fighter to the region, in an effort to ensure that one of its allies maintains a 'qualitative military edge', the US and the UAE are understood to be working towards having a letter of agreement for the supply of F-35s in place in time for UAE National Day, celebrated on December 2.

Any delivery of F-35s to the UAE will inevitably lead to pressure from Saudi Arabia to acquire more advanced fighters, in order to maintain the 'balance of power'.

Saudi Arabia could make its own request for F-35s, or could confirm its long-expected order for 48 more Eurofighter Typhoons – ensuring that these are to the latest standard, with the new Leonardo ECRS Mk 2 radar, which provides advanced electronic attack capabilities, allowing the aircraft to operate even in the most contested airspace.

The Royal Saudi Air Force (RSAF) has now

received almost all of its 84 new-build F-15SA Advanced Eagles ordered in December 2011. It received the first two in December 2016, with an additional 26 in 2017, 21 in 2018, 25 in 2019, and four in 2020 for a total of 78 delivered to date.

Just six remain undelivered, and three of these are expected to remain in the US for training and test duties.

The new build F-15SAs are to be augmented by 70 F-15SRs – existing F-15S Strike Eagles converted to the new F-15SA standard.

Withdrawal of advisors

In Iraq, the worsening security situation has led to a withdrawal of US advisors and contractors from some air force bases, including Balad, home to the Iraqi Air Force fleet of F-16C/D fighter-bombers. This, in turn, led to a dramatic reduction in F-16 serviceability and availability.

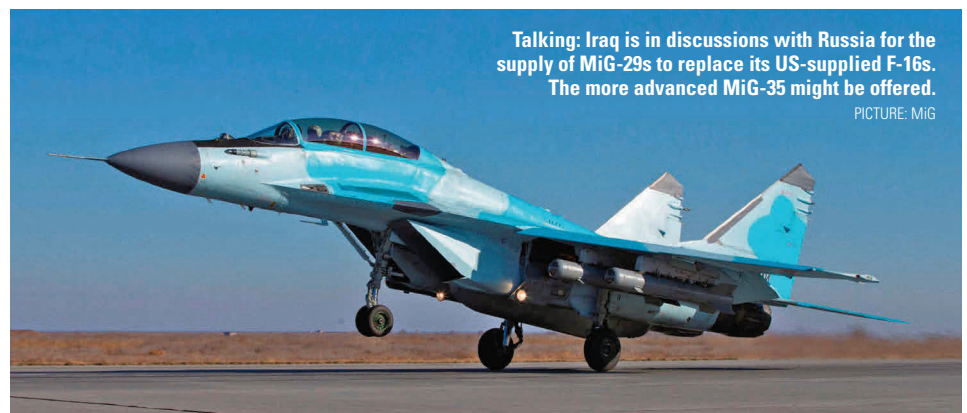
Iraq received the first of 28 F-16Cs and eight

two-seat F-16Ds in mid-2015, equipping the 9th Fighter Squadron at Balad. These aircraft were, by far, the most capable aircraft operated by the Iraqi Air Force since the end of Saddam Hussein's rule, and have been heavily committed to the war against the so-called Islamic State.

There have been reports that the Iraqi Defence Ministry has undertaken discussions with Moscow with the aim of purchasing the Mikoyan MiG-29 to replace the troubled F-16 fleet. It would seem likely that Iraq is being offered the modernised MiG-29M/M2, as used by Egypt.

The Saddam-era Iraqi Air Force operated first generation MiG-29s, taking delivery of some 38 aircraft. Five were shot down during Operation Desert Storm, 12 were destroyed on the ground, and four fled to Iran. Of the remainder, about 12 were still in service when the type was withdrawn from use in 1995 – a retirement prompted by a need

Continued
on Page 38



Talking: Iraq is in discussions with Russia for the supply of MiG-29s to replace its US-supplied F-16s. The more advanced MiG-35 might be offered.

PICTURE: MiG

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CONTINUED FROM PAGE 36

for engine overhauls, which Iraq was unable to undertake.

Syria was also an historic operator of the original MiG-29 variant, taking delivery of 48 from 1988, 14 more in 2000, and then about 22 second-hand aircraft in 2001-02.

About 20 were upgraded to MiG-29SM standards from 2011, gaining a new NO19ME pulse-Doppler radar, compatible with the Vypel NPO R77 'Amraamski' air-to-air missile, and with new hardpoints allowing a heavier weaponload to be carried, including a number of new precision-guided weapons.

The cockpit, navigation and communications systems, were also upgraded.

One of the upgraded aircraft was lost in a fatal accident at Shayrat Air Base in March 2020.

On May 30, the Syrian SANA news agency reported that Russia had supplied Syria with a "second batch of modernised MiG-29 fighter jets" that it claimed were "more effective than the previous generation".

The new aircraft were handed over at Khmeimim (the main Russian air base in Syria), before being dispatched to different bases across the country. They were reported to have begun combat operations on June 1.

The two batches of new MiG-29s were said to have included between six and 10 aircraft each, but the variant involved was not specified.

The new aircraft will probably be fitted with Talisman jamming pods, a number of which were acquired from the Defence Initiatives company in Belarus, and which have been used by Syrian MiG-29s for some months.

Some of the new aircraft seem to have been flown on to join General Khalifa Haftar's Libyan National Army Air Force in Libya, with the US Africa Command issuing a press release alleging that the MiG-29 jets flown to Syria had been intended to support Haftar.

Unmarked MiG-29s did begin operating from Al Jufra in Libya from June 2020. One of them



Out and about: One of at least three Turkish TAI T129s deployed to Azerbaijan for recent exercises.

PICTURE: AZERBAIJAN MOD.



Warrior: A battered-looking Syrian Air Force MiG-29 'Fulcrum-A' – probably a survivor of the original batch.

PICTURE: SYRIAN AIR FORCE

was reportedly lost on June 28, and another on September 7.

With relations between Azerbaijan and Armenia deteriorating, Turkey deployed Lockheed Martin F-16 fighters and TAI T129 attack helicopters to Nakhchivan Airfield in Azerbaijan to participate in the "TurAz Qartal-2020" joint exercises.

Though they had returned home by the time tensions exploded into full-scale military conflict between the two Caucasus neighbours, there are reports that Azerbaijan has requested the sale of T129s for its own air force.

Another helicopter request has been made by Jordan, with the US State Department approving the possible sale of a single UH-60M Black Hawk helicopter.

The Royal Jordanian Air Force (RJAF) has previously taken delivery of eight UH-60L and two VIP-configured VH-60M Black Hawks, augmenting the survivors of eight S-70A-11s acquired in the 1990s and five ex-US Army UH-60As that were donated in 2015.

All are operated by the RJAF's No30 Squadron, based at Zarqa, as part of the Special Operations Aviation Brigade. ■

MOROCCO'S VIPERS POISED TO STRIKE IN 2021

The first shipment of 12 new 'Viper' F-16C/D fighters for Morocco is scheduled to begin next year, writes *Jon Lake*.

In March 2019, the US State Department cleared the Royal Moroccan Air Force to purchase 25 new-build Block 72 F-16C/D fighters, at an estimated cost of \$3.787 billion, and to receive an upgrade to its existing fleet of 23 F-16s – the survivors of 16 F-16Cs and eight F-16Ds originally delivered in 2010-11.

Although the planned \$985.2 million upgrade has now reportedly been put on hold, the purchase of the new-build aircraft is expected to go ahead.

The US Department of Defense placed a contract for the manufacture of 90 Block 72 F-16 aircraft on August 14. These will be manufactured by Lockheed Martin at its new F-16 assembly facility at Greenville, South Carolina.

The identity of the purchasers was not officially revealed, but was understood to have included 66 F-16s for Taiwan's Republic of China Air Force, and the Moroccan aircraft. ■



Hold up: Plans to upgrade Morocco's existing fleet of F-16C/Ds to the new F-16V standard have reportedly been put on hold.

PICTURE: CARL RICHARDS

Morocco's, Al-Darak al-Malikiy al-Maghribiy (the Gendarmerie Royale Marocaine) has also been recapitalising its helicopter fleet, with seven new aircraft delivered in the last year.

These comprised a pair of new H125s, bought from Airbus Helicopters, and five second-hand EC145s, purchased from the Swiss Air Rescue service, REGA.

The royal gendarmerie is a paramilitary police service that reports to the Administration of National Defence (Morocco's defence ministry), and which operates a fleet of more than 20 helicopters – all of them from Airbus Helicopters and its predecessor companies, Eurocopter, Aerospatiale and Sud Aviation.

Its air unit supports anti-smuggling and counter-narcotics, but also performs search-and-rescue operations, coastal and fishing zone surveillance, border patrol, emergency medical airlift, and humanitarian and disaster relief missions, including fire-fighting. ■

Saudi Arabia's drive to establish itself as a tourist destination is taking another step forward with the construction of The Red Sea Project – with its own international airport. Alan Dron reports.

Panorama: Red Sea International Airport will have five 'pods', each with two gates. Passengers will disembark into shade created by the terminal's roofline. All passengers will have access to lounges in each of the five terminal 'pods'.

PICTURES: THE RED SEA DEVELOPMENT COMPANY

SEA CHANGE FOR SAUDI PROJECT

Its promoters describe it as 'the world's most ambitious and exciting hospitality project'. Situated between the cities of Umluj and Al Wajh on the west coast of Saudi Arabia, the Red Sea Project will be a luxury tourism destination within a 28,000sqkm area encompassing more than 200km of coastline, around 90 islands, and including ancient archaeological sites and unspoilt nature.

Serving this will be the latest in a group of new airports along Saudi Arabia's Red Sea coast that will provide the entry points to several new resorts designed as part of the country's Vision 2030 programme, diversifying the economy away from hydrocarbon production.

Red Sea International is being built at a record pace. In Europe, a new airport would take a minimum of a decade to plan, build and bring into service. In August, The Red Sea Development Company (TRSDC) awarded contracts to a joint venture between Saudi contractors Nesma & Partners Contracting and Almbani General Contractors for the construction of airside infrastructure works. The airport should be operational in around two years' time.

Project remains on schedule

"Land levelling work is already under way to prepare the airport for development and the project remains on schedule to support our plans to welcome the first guests to the destination by the end of 2022," said TRSDC chief project delivery officer, Ian Williamson.

The airside contract covers the construction of a 3,700-metre runway, a separate runway for seaplane and helicopter operations, parallel and link taxiways, navigational aids, aerodrome ground lighting, helipads, roads, airside utilities, and associated buildings.

"Seaplanes will provide an option for travelling to the outer islands of the archipelago of more than 90 islands. They will ensure we can keep travel from the airport to any final Red Sea destination to below 40 minutes," he explained.

The next major stage will come shortly, with contracts to be awarded for the airport's terminal, hangars and other buildings by January 2021.

UK architects Foster + Partners are designing the terminal, whose shape will echo aspects of the surrounding

Infrastructure already started

Enabling infrastructure for the Red Sea Project is already under way.

A marine infrastructure contract, awarded in July 2019, includes the construction of a 3.3km crossing that will connect a hub island that will feature nine hotels as well as retail, leisure and entertainment facilities, to the mainland.

Overall, the development, which is on schedule for completion by the end of 2022, will include 14 luxury hotels with more than 3,000 rooms, built over five islands and two inland resorts.

It will include a yachting marina, the airport, and the necessary supporting infrastructure and utilities.

It will also pay particular attention to sustainability and environmental factors, with all power being supplied by renewable energy.

Development has begun at the 'Coastal Village', which will be home to around 14,000 people who will work at the destination. ■



landscape, which consists of a coastal plain with a dunescape leading to mountains.

The terminal will consist of five 'pods' with decentralised facilities and two gates each. One pod is dedicated for passengers going to the resorts using the seaplane facility and will also be used for VVIP movements.

Red Sea International will serve an estimated 1 million arriving tourists per year, with a peak throughput of 900 passengers an hour. Provision has been allowed for an additional terminal building at a later date.

It is being built "to the highest standards of sustainability, with visitors disembarking directly under the terminal canopy and walking through a naturally ventilated zone to minimise reliance on air conditioning", said Williamson.

Together with the rest of the resort, the airport will rely totally on renewable energy through a combination of solar- and wind-generated power.

"Working with key environmental and sustainability partners like King Abdullah University of Science and Technology, we are looking at how we can use innovative technology to capture CO2 emissions in a bid to offset the carbon generated by flights," Williamson added. "We are investigating a number of methods to not only sequester carbon but also potentially produce biofuel for refuelling aircraft." ■

In August, Istanbul Grand Airport (IGA) became the first such facility in the world to receive certification under the airport health accreditation programme launched by Airport Council International (ACI).

Marcelle Nethersole reports.

World-first as IGA receives health award

The Turkish airport's award came just days after ACI had launched its new programme on July 24.

The high-tech airport had already made its mark with the health measures it had taken during the Covid-19 pandemic, receiving the airport pandemic certificate from the Directorate General of Civil Aviation.

It had also signed the Covid-19 aviation health safety protocol, published by the European Aviation Safety Agency (EASA).

"Aviation is an important industry that is bound by international rules and committed to continuous improvement," said Kadri Samsunlu, chief executive officer at IGA Airport Operation.

"We aim to maximise the passenger experience and we shall continue our efforts to offer our passengers safe travel at maximum hygiene levels in the new normal.

"The certificate, awarded by ACI, is really

important to make sure that the aviation industry is in the finest possible position to support strong recovery in the near future.

"Aviation is a very resilient industry and we need to take measures to combat the impact of Covid-19 by implementing strict health and safety standards at our facilities and operations."

IGA, which is 35km from the city centre, began life on October 7, 2013. The first phase was finalised with three runways and a terminal with a passenger capacity of 90 million.

Completed in four phases

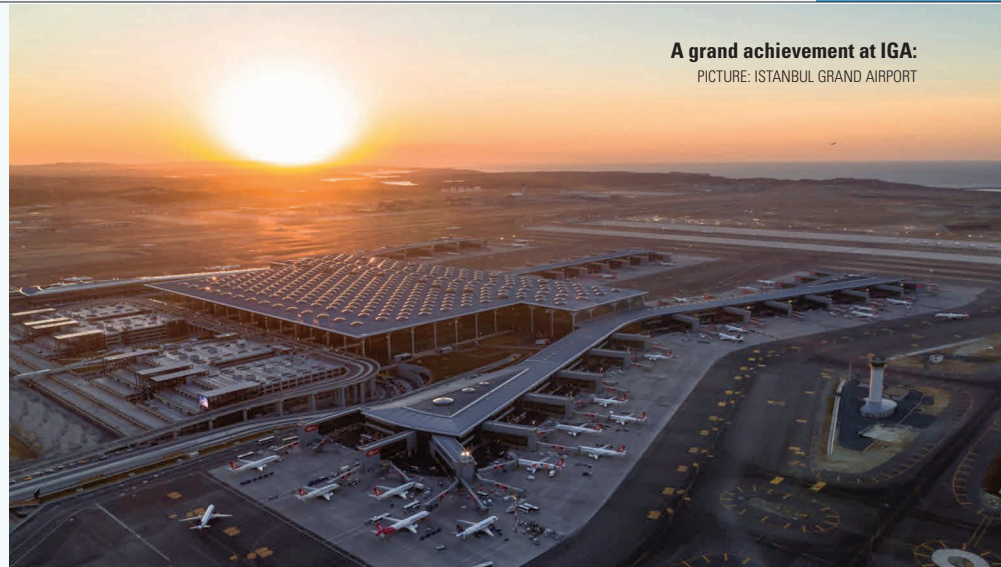
Over the next 25 years, construction will be completed in four phases. By the 2030s, the airport will host flights to more than 300 destinations with an annual capacity of 200 million passengers.

The ACI audits for the evaluation award covered a wide range of measures taken at

passenger-intensive areas, including cleaning, disinfection, social distancing, protection of personnel, passenger communication, access to the terminal, safety screening, waiting areas, bridges, escalators, elevators, and baggage claim.

Olivier Jankovec, director general, ACI Europe said: "Recovery from this unprecedented crisis has called for the swift and thorough implementation across the entire aviation system of the global standards developed jointly by competent authorities.

"ACI has worked hand-in-hand with the International Civil Aviation Organization (ICAO), EASA and the European Centre for Disease Prevention and Control (ECDC) to help deliver a blueprint for safe airport operations amid the ongoing Covid-19 pandemic. We congratulate Istanbul for being the first airport to be accredited."



A grand achievement at IGA:
PICTURE: ISTANBUL GRAND AIRPORT

SHARJAH AIRPORT ACHIEVES CARBON NEUTRALITY

Sharjah Airport has become the first certified carbon-neutral airport in the GCC and only the second in the Middle East. **Jill Stockbridge** reports.

Carbon neutrality is achieved when net carbon dioxide emissions over a full year are zero. Sharjah attained the level 3+ neutrality accreditation from the airport carbon accreditation programme, issued by Airports Council International (ACI).

It now joins the list of airports that have been awarded level three accreditation, including both Sydney and Brisbane in Australia, and Queen Alia in Jordan.

The award reflects the airport's ongoing strategy to ensure its growing operations have a minimal impact on the environment, by reducing carbon footprint and energy consumption.

His Excellency Ali Salim Al Midfa, chairman of Sharjah Airport Authority, said: "The airport has adopted many green initiatives and programmes in line with the UAE commitment towards reducing carbon emissions that fall under the green growth strategy, and to support the national agenda to attain the UAE Vision 2021."

Environmental and sustainability projects implemented by Sharjah Airport include energy conservation initiatives, clean energy projects, and circular economic initiatives to encourage all the airport stakeholders to engage and contribute to good green practice.

As well as strictly monitoring electricity and water consumption, an integrated waste management system, targeted at zero landfill waste, was introduced.

Sharjah Airport also supports the International Civil Aviation Organization (ICAO) global strategy on climate change.

"By reaching carbon-neutral status, the highest position currently in the internationally recognised airport carbon accreditation programme, Sharjah Airport is firmly positioning itself as an environmental leader in the region and beyond," said Stefano Baronci, director general, ACI Asia-Pacific.

"We are grateful to the management team at Sharjah Airport for their continued commitment and active participation in ACI Asia-Pacific environmental initiatives and in support of working towards a new societal value."

The airport carbon accreditation programme is the only independent, institutionally endorsed carbon standard for airports that recognises the efforts made to manage and reduce their Co2 emissions.

It is progressively being implemented across the world's airports.



His Excellency Ali Salim Al Midfa:
"The airport has adopted many green initiatives and programmes."

PICTURE: SHARJAH AIRPORT AUTHORITY

The Dubai HeliShow is set to go ahead in January in both physical and 3D virtual format. Marcelle Nethersole finds out more about the new concept.



Scene from the past: The coronavirus pandemic has forced changes to what was witnessed at the last edition of the show in 2018.

PICTURE: DOMUS GROUP

Is this the 'new norm' for events?

Events run in the way we knew before may be a thing of the past as we get used to online versions following the ongoing Covid-19 pandemic.

Domus Group, which organises of The Dubai HeliShow, the biennial international helicopter technology and operations exhibition, has come up with a new concept to maintain safety measures for the next event, confirmed to take place on January 19-21.

Originally scheduled for November 2020, the eighth edition will be a new formatted hybrid type of show – believed to be the first event in the Middle East region to use a combination of physical and 3D virtual format.

The conference is set to combine a 'live' in-person experience with a 'virtual' online component – giving both physical and online speakers and attendees the same event interaction.

Feedback from the industry

Ahmad Abulhoul, managing director, Domus Group, explained: "Following feedback from the industry and with the future development of Dubai HeliShow in mind, it was necessary to postpone the November event date.

"Though 70% of the planned exhibition space and sponsorship was already booked, the over-riding factor for the decision was to give our exhibitors and sponsors a wide ranging audience from around the world – either in person or online.

"The new dates will allow more time for global participants to prepare, and the implementation of the hybrid format will add convenience and flexibility to allow our expansion into other world markets that had previously found it difficult, or too costly, to attend in person."

He added: "All of our physical exhibitors are automatically present in our virtual exhibition, in addition

to the companies who can't make it physically but still want to exhibit virtually.

"It's the same with the conference; delegates who cannot attend physically can attend virtually through livestream in our virtual platform."

So far, more than 30 physical exhibitors from the rotor, drone, and military sectors, have been confirmed. The physical aspect of the exhibition and conference will still take place at Dubai South, Al Maktoum International Airport.

The event will highlight new developments in the rotary industry, including the next-generation of helicopters and air taxis; the futuristic vertical take-off and landing (VTOL) technologies; the future maintenance and repair organisations (MROs) in the region; and updates on aerodrome and heliport regulations.

It will also feature the unmanned air vehicle/drone sector as a new addition to its exhibition and conference platform.

Some of the international companies set to participate include Columbia Helicopters (heavy-lift helicopter fleet operator); Cartivator/SkyDrive (Japanese company building a flying car and targeting its use to light the 2021 Tokyo Olympic flame); Vita Inclinata Technologies (a load stability systems specialist from the USA); Bertoli Srl (Italian ground power manufacturer); Donaldson Aerospace (aircraft filtration systems provider); and PBS (high-quality and innovative aerospace engineering company).

Virtual experience

Maysoon Abulhoul, chief operating officer, Domus Group, said: "The exhibition component of the show will be combining physical exhibitors over an exciting three-day period and a virtual experience via an engaging and immersive 3D virtual platform that will be live 24/7 for one year for this event.

"The platform will include a 3D tour with a 360-degree view and walk-through of a virtual venue consisting of a main lobby, exhibition hall, auditorium, and a virtual networking area."

Key speakers are yet to be announced, but Abulhoul said the organisers are in regular contact with experts regarding participation status, depending on travel restrictions from their home countries.

The helicopter fleet to be displayed is also still to be confirmed due to "changes and logistic challenges".

Abulhoul said the helicopter industry is "very optimistic" during this challenging time and the new 3D virtual/hybrid format was the perfect way for it to safely come together. It could, perhaps, be the 'new norm' for the events industry, he added.

"Many MROs, OEMs, component and software manufacturers are still very optimistic with regards to the growth of the industry because of new developments with next-generation helicopters, increased automation, technological advancements, and other future plans," concluded Abulhoul. ■



The UAE is preparing for the fast-approaching urban air mobility sector with what it believes to be the world's first set of regulations governing unmanned and autonomous air vehicles.

Alan Dron reports.



UAE LEADING THE WORLD INTO THE 'SCI-FI ZONE'

For almost a century, science fiction authors have written of future cityscapes where the skies are full of personal air vehicles, airborne taxis, and drones ferrying cargo on what transport specialists call 'the last mile' of their destinations.

That future is very nearly here. Cargo drones are already starting to appear in locations as far apart as the US and Ghana, delivering everything from pizza to urgently needed medicines. Advances in propulsion and guidance technologies will make personal air vehicles a reality by the end of this decade, possibly well before.

This personal mobility industry is in its infancy. Ensuring that it develops in an orderly way will be the next big challenge for city councils or national governments, which face the prospect of the same traffic congestion – or, potentially, accidents – in the skies as on their roads if they do not impose some form of regulation.

With that in mind, the UAE's General Civil Aviation Authority (GCAA) has issued a framework of rules to govern urban air mobility (UAM).

The aim is to create the conditions for the safe, secure and efficient operation of flights in close proximity to populated urban areas. This, says the GCAA, is the world's first such set of regulations.

"We have been observing rapid development in

every aspect of the aviation industry, in particular an emergence of new players in the UAM ecosystem," said GCAA chairman and minister of economy, Abdulla bin Touq Al Marri.

"UAM should introduce enormous opportunities for [a] smarter, faster, greener and safer integrated transport system for mega-cities, as well as creating an economic boost."

One aim of the new regulations is to expand the UAE's economy via the aviation sector, which already makes up a significant percentage of the country's gross domestic product (GDP). The regulations are also intended to help create an integrated transport system.

Legislative and operative framework

With the later point in mind, the country's Roads and Transport Authority (RTA) has worked side-by-side with the GCAA in helping develop the legislative and operational framework.

"The issuance of this regulation supports the efforts of the RTA in translating Dubai's smart driving strategy for self-driving, which aims to convert 25% of the total mobility trips in Dubai to self-driving trips through various means of transportation by 2030," said Mattar Mohammed Al Tayer, the RTA's director-general and chairman.

A major concern for both transport

professionals and the general public is how this new generation of unmanned air vehicles will fit in with existing manned aircraft and air traffic control.

"GCAA has set a strategy to have a pragmatic approach in dealing with new emerging types of air transport activities, hence it will be a phased development for safe integration of those activities with the existing traditional operations," explained Aqeel Ahmed Al Zarouni, the GCAA's acting director - policy, regulation and planning.

These new air vehicles, whether piloted, remotely piloted or unmanned, will be introduced on defined, predetermined routes, segregated from existing manned aircraft.

Piloted air taxis and unmanned cargo-carriers will not share the same routes, at least in the early stages of the project. They will then be integrated with existing air traffic management systems. Eventually, as the new vehicles reach maturity, they will operate autonomously.

Sensor technology to allow drones and air taxis to integrate with air traffic control is advancing quickly in terms of reliability, accuracy, and miniaturisation, said Al Zarouni. The larger size of air taxis would make it relatively easier to fit these sensors on them, compared to the smaller drones.

So, how will unmanned vehicles be controlled, to ensure no collisions occur?

"Well, UAM will start operating initially as

Taxi for four: Airbus's City Airbus is a four-seater air taxi design that will have low noise and zero emissions. It has made its first untethered flights.

PICTURE: AIRBUS

Inset: The Boeing Passenger Air Vehicle, seen here at the 2019 Dubai Air Show, is typical of the emerging breed of personal aerial transports that could transform urban transport in the next decade.

PICTURE: BOEING



INNOVATION

piloted vehicles, hence the pilot will have the direct control and communications of the vehicle to avoid any collision," explained Al Zarouni.

"Then, gradually, the operation will convert to remotely piloted, then to fully autonomous, until we make sure the vehicle designs and systems are mature enough to conduct fully autonomous flight.

"In the case of drones, segregated airspace will be given to ensure safe operations with other traffic and it will be communicated to all airspace users, including manned flights, using notifications to airman (NOTAMs) that will be issued to alert other traffic in the vicinity of unmanned operation [and] to take all the precautionary measures needed to ensure flight safety is not compromised."

The new generation of unmanned air vehicles, together with the emergence of new UAM platforms, will need robust and adaptive control techniques, such as automation of their 'sense and avoid' sensors that will allow the vehicles to function autonomously.

To achieve this, added Al Zarouni: "The efficiency and reliability of the communication link with the ground station and other airspace users is crucial."

Global investments in this market segment of around \$52 billion are expected by 2025.

This robust communication system will be vital,

as 40,000 drones and 23,000 UAM vehicles are expected to be in the air by 2030. "So we need to prepare those congested airspaces for mass operations," emphasised Al Zarouni.

The UAE, he added, aims to create manufacturing capabilities in this new sector, especially for UAVs, with the GCAA planning to create a new set of regulations for UAV manufacturers. Safety standards will be harmonised for both manufacturers and UAV operators.

Set global standards

And, in a sign of the UAE's growing influence in this sector, Al Zarouni noted that the Gulf nation "is engaged with global aircraft manufacturers, leading authorities and the International Civil Aviation Organization (ICAO) to set global standards".

The UAE anticipates some challenges when introducing these emerging UAM technologies. For example, social acceptance will be required before the public is comfortable with the thought of unmanned aircraft operating in the skies above them. This is likely to require social campaigns, the establishment of environmental noise levels, and the setting of altitude and proximity standards to reassure residents.

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UAE SATELLITE TO STUDY RED TIDE ALGAE IN ARABIAN GULF

Students from the American University of Ras Al Khaimah (AURAK) have successfully launched their MeznSat satellite, which will be used to collect data on greenhouse gas concentrations and monitor the occurrence of red tide algae in the Arabian Gulf. **Steve Nichols** reports.

MeznSat was launched on a Soyuz-2 rocket from the Plesetsk Cosmodrome in Russia on September 28 and will orbit Earth at an altitude of 565km on a mission expected to last three years.

The 2.7kg nanosat is carrying a shortwave infrared (SWIR) micro-spectrometer as its primary payload, with the aim of deriving greenhouse gas concentrations in the atmosphere. Its secondary payload is a high-definition (HD) camera.

This is the first three-unit nanosat to be built by the UAE, meaning it features more systems than the previous one-unit versions.

The AURAK students were fully involved in the project. They prepared the ground station, developed a work plan and manufactured all the parts of the satellite, including the special camera and receiving station.

The ground station at AURAK's space lab will monitor its movements and collect data that will be sent to Khalifa University for analysis.

MeznSat is the third cubesat to be launched by the UAE, after Nayif-1 in 2017 and MySat-1 in 2018. It joins the recently-launched Hope space probe to Mars and



Developing capabilities: The project has been a major learning experience for the students involved.

PICTURE: AURAK

the earlier DubaiSat missions as examples of the UAE's growing expertise in space.

Sponsored and supervised by the UAE Space Agency, the nanosat was developed by AURAK in collaboration with Khalifa University in Abu Dhabi.

Dr Abdul-Halim Jallad, a faculty member at AURAK's Engineering School, has led the project since its inception. He said: "It has been a journey for the students, both in an educational sense and in terms of their own personal development, and I know that each of them will go on to achieve their career goals, as they are an intelligent and hard-working group."

MeznSat was devised to provide the UAE space industry with well-trained graduates who have practical experience, while also creating opportunities for advanced space research.

Dr Mohammed Al Ahabbi, director-general of the UAE Space Agency (UAESA), said: "These projects seek to develop national capabilities and enhance scientific research in universities, bringing up a new generation of Emirati engineers ready to join in the space sector."

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As Middle East airlines start to increase their capacity again following the Covid-19 outbreak, Panasonic Avionics is responding. **Steve Nichols** reports.



Rolling out:
Panasonic NEXT
brings fully immersive
4K high-definition IFE.

PICTURES: PANASONIC

Interaction key to post-virus airlines

There is a lot going on. Airlines are starting to wake up and realise that we are still here! That's the view of Tom Eskola, Panasonic Avionics vice president and general manager, Middle East, central and southern Asia, and Africa.

He said that he thought airlines were looking for leadership in a post-coronavirus world.

"They are asking, 'how can we interact with the passenger in a more digital way'?"

"We have the capability to pair passengers' mobile devices with the seat-back screen. With our Companion app, we can also show menus on either the seat back monitor or the passenger's device, so reducing the need for interaction with cabin crew.

"Passengers can, therefore, choose their meals electronically, either before or during their flight. "These types of products, integrated with an airline's applications, can be a really powerful way to interact with the passenger."

Eskola added: "Several airlines have also approached us about crew interaction. They want to use the in-flight WiFi and satellite connectivity to enhance their ability to communicate with their personnel during flights using crew devices. These are things we couldn't do a few years ago, but we are now already delivering for airlines in the region."

Panasonic's new Arc in-flight map solution also allows for personalised map profiles and preferences that appear whenever people log into the in-flight entertainment and connectivity (IFEC) system. Arc can also integrate with Panasonic's e-commerce platform, allowing sales to be directly tied to real-time flight events.

The company currently has equipment flying on

Emirates, Turkish, Etihad, Qatar, Saudia, EgyptAir, Kuwait, Middle East Airlines-Air Liban, Saudi Gulf and several private operators.

It recently unveiled its 'welcome aboard collection' – a selection of in-flight products designed to help airlines address passenger concerns about Covid-19.

As well as an on-board reader to digitise print publications and the Companion app, the collection also includes the Nanoe air cleanser, which improves air quality by generating nano-sized electrostatic-atomised water particles that can suppress odours and inhibit certain viruses, bacteria, and allergens.

The collection includes other innovative solutions, such as 'active surfaces', which allows for easy wipe-down from flight-to-flight.

So what's next for Panasonic?

"With our fully embedded NEXT in-flight entertainment systems, which we are rolling out to airlines in the region, we will bring fully immersive 4K high-definition IFE," said Eskola.

Panasonic also delivers Ku-band satellite-based in-flight connectivity and has almost completed its global 'Gen 3' modem roll-out worldwide, which delivers faster connection speeds.

"We have used multiple satellites to provide Ku-band spot beams for extra capacity where it is needed. We only have a handful of aircraft that still need to make the transition to Gen 3 and we are working with the airlines to bring them on board."

This high-throughput satellite (HTS) network will be augmented in 2022 by Panasonic's extreme throughput satellite (XTS) network, thanks to the launch of Eutelsat 10B.

More powerful spot beams

Located at 10 degrees east, Eutelsat 10B will have an orbital position that offers visibility from the Americas to Asia. This will allow Panasonic to funnel multiple gigahertz of XTS Ku-band connectivity to airlines flying throughout the region by utilising more powerful spot beams.

"The combination of embedded and installed systems, plus fast satellite connectivity, allows us to really showcase digital products and enhance the passenger experience," explained Eskola.

"We can deliver value-added services to the airlines, putting live television, phone systems and content to portable personal devices. We can also integrate with airline applications, even allowing mobile devices to act as a remote control for the IFE."

The higher-speed network will also help enable Panasonic's ZeroTouch system, which moves data to and from an aircraft using Wi-Fi, 4G or a Ku-band satellite connection.

ZeroTouch reduces an airline's need to physically touch the aircraft because all interactions are managed through a virtual dashboard.

It provides access to real-time passenger data, software and media; plus content updates can be data-driven, helping to deliver a relevant and personalised passenger experience.

"The first few aircraft for two airlines have been rolled out with ZeroTouch capability and we are working on finalising it for larger fleets," Eskola concluded. ■



“We have used multiple satellites to provide Ku-band spot beams for extra capacity where it is needed.”

TOM ESKOLA

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Good news: Masked Joramco workers celebrate their first winter season contract with Ryanair.

PICTURE: JORAMCO



THE HEAVY TOLL FOR MRO

The deferral or cancellation of heavy maintenance on the civil aviation fleet could have serious long-term consequences for the MRO workforce.

Chuck Grieve
investigates.

The impact of the pandemic on MRO in the Middle East is staggering. International management consulting firm, Oliver Wyman, in its forecast update of July 31, said the total projected MRO spend of \$5.2 billion in 2020 represents a 48% loss of business.

Figures for 2021 are only marginally better. There, the global analyst projects an MRO spend of \$7.4 billion, representing a loss of 34% on earlier estimates.

Industry observers suggest it will be at least two years before demand for maintenance approaches pre-pandemic levels.

Moving fleets into temporary storage and deferring heavy checks provided short-term cash flow relief, but the knock-on effects on capability may be significant.

“The industry faces a huge dilemma in terms of the labour force, particularly the highly skilled technicians employed to actually repair aircraft at the heavy checks,” said Phil Seymour, head of aviation consultancy IBA.

Demand for shop visits does not go away, noted Seymour; for the most part, it is simply deferred. “What bothers me on a long-term scale is that we’re seeing a number of engine shops and airframe overhaul facilities making people redundant where, only a few months ago, qualified people were in demand.”

IBA pegs the level of redundancies in the aftermarket workforce at “between 20-60%”, depending on the entity.

“We’re going to store up a lot of engines that will need refurbishment,” added Seymour. The quandary for the MRO sector is how to bridge the gap to keep highly trained staff employed despite the drop in demand.

His fears were echoed by the Aeronautical Repair Station Association (ARSA). A June survey carried out by the organisation showed a 27% reduction in headcount – equivalent to the cuts announced by major MRO providers, such as GE Aviation.

ARSA executive vice-president, Christian Klein, warned of a “massive loss of technical talent [that] is going to haunt aviation for years to come”.

While it appears few MROs have escaped the industry-wide collapse in demand, some are doing better than others at finding “the opportunity amidst the crisis”, as Frederic Dupont, of Etihad Engineering, put it. His

company kept its engineers and technicians busy with the biggest-ever cabin refurbishment for its parent airline, involving close to 100 aircraft.

One source, looking at the overall redundancy picture in the aviation industry, suggested the level of lay-offs throughout the MRO community was lower than among flight deck and cabin crew, a result of right-sizing exercises carried out over recent years.

That was a factor for Joramco, but the Amman-based MRO was also in a different situation: its workforce is 100% Jordanian and the company takes its social responsibilities seriously. It pledged job security to its 1,100 permanent employees, as well as extensions of three months to temporary workers whose contracts were due to expire.

Chief executive, Jeff Wilkinson, said the well-being of his workforce is a central pillar of Joramco’s strategy, and “letting any of our staff go is simply not an option”. Scheduled heavy maintenance work for airlines, including Ryanair, helped bridge any gaps.

Cautious optimism

Meanwhile in India, Air Works, a leading independent MRO, reported “a sense of cautious optimism” with both scheduled and non-scheduled tasks on the increase as the focus switched from preservation to operations.

Throughout the lockdown, Air Works managed to keep all its technicians on salary as it continued to service international customers, including those from the Middle East.

D Anand Bhaskar, the company’s managing director and chief executive, said: “Our line maintenance teams continue to support cargo and repatriation flights from various countries at more than 10 international airports.”

More fortunate than many is AMAC Aerospace, whose core business focuses on long-term projects. The MRO said its operations in Switzerland, France, and Turkey remain busy and its workforce fully employed, albeit with adjusted shift patterns and enhanced infection control in place.

A spokesman said some clients “decided to use the downtime due to the pandemic for having checks and/or refurbishment or upgrades done”.

Every problem offers potential opportunities and even the pandemic is no exception, as Alan Dron found out when he spoke to Etihad's Engineering division.

Etihad engineers fresh opportunities

The second quarter of 2020 saw the world's fleet of airliners grounded, with the exception of those operating repatriation flights for stranded passengers or ferrying urgently needed medical supplies around the globe.

Most airlines, faced with plummeting passenger loads and a plethora of quarantining regulations, felt they had no option but to ground their fleets.

Within weeks, stories were appearing in the aviation press of how the shutdown posed a major threat, not only to airlines but also to the maintenance repair and overhaul (MRO) companies that carried out major checks and kept their aircraft flying.

However, as the old saying puts it: "When life gives you lemons, make lemonade." Which is exactly what Etihad Engineering did.

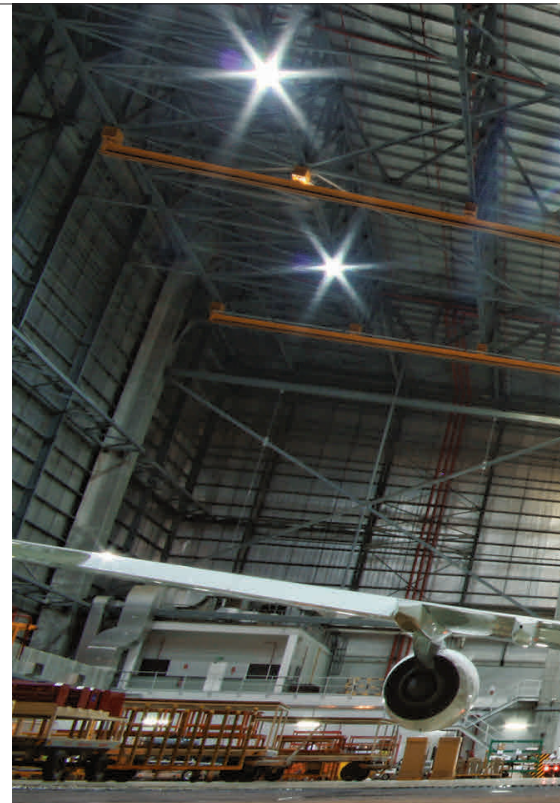
The first major influx of work came from close at hand. Etihad decided to use the enforced

down-time to bring all the aircraft in its 96-strong passenger fleet up to the same standard of cabin fit-out.

This process has been ongoing for some time, but having idle aircraft allowed the process to shift up a gear.

Seven 'legacy' Boeing 777-300ERs were "completely refurbished and brought in line with the rest of the fleet", said David Doherty, Etihad Engineering's head of MRO sales. "They were programmed to come in over the next 12 to 18 months, aligned with C-checks." However, this timetable was brought forward. The aircraft are now outfitted internally to the same standard as the rest of the airline's wide-body fleet, notably its newer 787s.

Similarly, a total of 23 Airbus A320s and A321s underwent cabin transformations by removing two rows of business-class seats, while the economy-class cabin received new slimline seats, allowing increased passenger capacity.



Additionally, the airline's fleet of 787-9s and -10s, the remaining 777s, and those A320s that had already had new seats fitted, were brought in for what Doherty described as "a light cabin refresh".

He explained: "All the aircraft came into the hangar, had their carpets replaced, seat covers cleaned and replaced where required, and had

When innovation comes with a price tag



Frederic Dupont: "We're always looking at how we can reinvent ourselves from an efficiency and operational perspective."

PICTURE: ETIHAD GROUP

Customer benefit underpins the uptake of innovation in MRO, where OEM and regulatory approvals compete with cost as the biggest hurdle to overcome. Chuck Grieve reports.

Adaptability is the key to success as an MRO, says Frederic Dupont, Etihad Engineering's vice-president technical sales and customer service.

"We're always looking at how we can reinvent ourselves from an efficiency and operational perspective – how we can loop into MRO innovations that can deliver benefits to our customers."

Companies need to be able to see beyond today's 'buzzwords' to the customer benefits now, and in five or 10 years. A customer doesn't ask if additive manufacturing (AM), for example, will produce a part that's 10g lighter or with lower CO2 emissions; they want to know the cost.

Etihad Engineering has broken new ground with AM since first receiving European Aviation Safety Agency (EASA) approval. Its AM lab in Abu Dhabi produces cabin parts from polymers – items such as arm rests and arm caps. Dupont says the system "works well".

Drone technology is rapidly advancing but is not yet mature enough to provide sufficient returns for Etihad Engineering to implement 'as is' in a heavy maintenance environment.

A critical success factor is to link the entire ecosystem: from measuring the cracks/defects to the regulatory/OEM approval of the analysis of such data – still a work in progress. At that point, he said, "You will be talking about bringing real benefits to the customer."

Etihad Engineering set up an innovation steering committee and roadmap to look at technologies "through our customers' eyes" and structure the activity surrounding assessment. "We have a business to run," said Dupont. "We don't have 20 people standing by to explore every new thing that comes along."

Technology and innovation is never cheap; its adoption and, ultimately, its success, depends on feasibility assessment, proof of concept, trials and development.

"We can't go and buy [technology] off the shelf," said Dupont. "We need to customise it, adapt it to our business in order to maximise the returns to our customers."

The overriding question is always: "When will a technology bring enough benefits to effectively outweigh all the implementation costs and disruption to operations?"

"At end of the day, we're just MROs, we're not OEMs."



Not hanging around: The Etihad Engineering hangars continued to log around 150,000 man-hours of work per month during the pandemic. PICTURE: ETIHAD ENGINEERING

PICTURES: ETIHAD ENGINEERING

areas, such as the sidewall panels, bulkheads, and toilet monuments repanelled, and lamination replaced.”

Additionally, seatbacks in the A320-family economy-class were given new attachments to allow passengers to plug in their own electronic devices, through which they could stream entertainment content.

With freight capacity at a premium in the early months of the pandemic, Etihad also considered whether to strip seats out of the economy-class cabins to allow pallets to be fitted.

However, with some aircraft being used for repatriation flights, it was decided that the greatest flexibility could be achieved by leaving the seats in place and simply piling cargo on the seats, anchored with a tie-down cover.

Work on the Etihad fleet occupied the engineering division team for the first two months of the pandemic.

Beyond work on Etihad’s own fleet, there were some major changes in the division’s maintenance work for third-party airlines. There has been much talk in the industry of airlines



David Doherty: “Coping with the influx of airliners meant switching more staff on to night shifts, partly to help with social distancing.”

deferring maintenance procedures on their fleets to reduce costs, but Etihad has found that just as many companies actually pulled maintenance forward.

“We have customers who have delayed their maintenance because they’ve already made the decision to store the aircraft. But some airlines have gone the other way,” said Doherty.

“Cash considerations are a big issue for every airline, but some took the view that they would get any maintenance out of the way so their fleet was ready to fly as soon as possible.

“Those who deferred maintenance – yes, they’ve conserved cash, but they also have engineering tasks to complete before they can start making money again.”

Airlines have been desperate to find parking space for temporarily idle aircraft and Etihad Engineering’s apron became a valuable piece of tarmac.

“We don’t have the biggest parking space, but we had up to 12 aircraft parked on the ramp, with additional ones at our airport facility,” concluded Doherty.



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International companies are stepping up their training activities for Gulf nationals seeking employment in the civil aviation industry. Alan Dron reports.

Opening the door to careers in aviation

Training services for potential airline staff in the Arabian Gulf, both in the air and on the ground, have increased in tempo with two international companies' deciding to increase their presence in the region.

US-based aviation and defence giant, L3Harris, has launched a new course to support Saudi citizens who wish to become commercial pilots, while Spain's Simloc Research has agreed what it describes as a strategic alliance with Bahrain's Gulf Aviation Academy (GAA).

The latter development will see Simloc establishing a new base of operations in Bahrain for business development, as well as research and development projects.

Simloc designs and produces fixed-base flight-training devices. It also markets simulators, produced by its Flight Level subsidiary, of passenger cabin doors and windows, as well as fire and emergency equipment, for cabin crew training.

The Spanish company plans to increase the exposure of its training devices to GAA clients in Bahrain and around the region. The academy will also become Simloc's local business partner for the GCC, MENA and the Indian subcontinent regions, for selling and installing its simulators.

"During the last year we identified an incredible opportunity to bring and develop new technology to be exported worldwide," said Simloc CEO, Carlos Pérez.

Trust and commitment

GAA CEO, Captain Dhaffer Al Abbasi, added: "Having a highly reputable company such as Simloc on board is a testament of their trust and commitment in working with GAA in achieving its expansion plans, which aim to reach more customers by offering more flight-training services."

Meanwhile, the L3Harris Saudi Arabian pilot training course will allow self-sponsored cadets to enrol and follow a route to become commercial pilots, incorporating private, instrument and commercial training, with flying being undertaken at L3Harris' Florida Flight Academy in the US. L3Harris has long-standing experience of training pilots for the region, with continuing programmes for both Saudi Arabian Airlines (Saudia) and Kuwait Airways.

It is offering two courses designed to meet the needs of those seeking future employment in Saudi Arabia – the commercial pilot track (CPT) and the Saudi Arabian pilot track (SAPT).

The CPT provides the minimum ratings and certificates required to become a commercially licensed multi-engine pilot.

The SAPT also provides this, but includes an additional 103 hours of flight time to help trainees develop their cockpit skills, providing them with the experience sought after by several Saudi airlines.

L3 Harris has designed the course to match the training



PICTURE: ISTOCK

outline and requirements for Saudia's cadet programme. However, the company makes the point that successfully completing the course does not guarantee a job with the kingdom's flag-carrier.

Although many airlines are currently making pilots redundant, L3Harris commercial vice-president sales, Middle East Africa and South Asia, Kinda Sarrage, said that by the time the next generation of young pilots graduated, the economic tide should have turned.

"Flight-training takes anywhere between 18 to 24 months. So, if a potential candidate wants to start researching flight-training today, by the time they go through selection, start their training programme, obtain their commercial pilot's licence and go on to Airbus A320 or Boeing 737 type-rating, it will be a good two years.

"That's in line with when the market should be recovering. We do see there is demand and growth opportunities in this market."

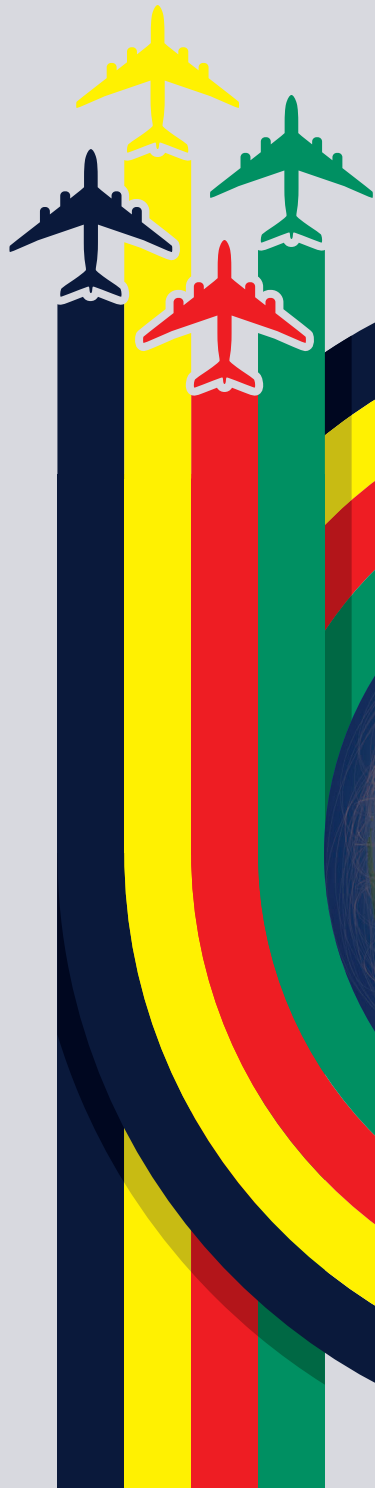
Saudi Arabia is aligned to US Federal Aviation Administration regulations and, as such, the pilots will receive an FAA licence upon completion of their course that can be quickly converted to Saudi licences approved by national regulator, GACA.

Pilot numbers set to increase

Around 6,000 commercial pilots are estimated to be required in Saudi Arabia by 2030, double the number employed today.

Qualifying as a commercial pilot can cost between \$60,000 to \$100,000. However, Sarrage said: "I always say it's cheaper to get a pilot's licence than a four-year university degree – and you don't have a guaranteed job at the end of a degree."

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Jonathan Hackett

Marcelle Nethersole *speaks to the CEO of Botany Weaving.*

1

■ Tell me about Botany Weaving

Botany Weaving was founded in Dublin, Ireland, in 1934 by Mr James Hackett. Originally it produced clothing fabrics but, in the late 1980s, it changed direction and started to produce office and contract furnishing fabrics.

Then, in the early 1990s, it moved into producing aircraft seat fabrics, followed by aircraft carpets in 2012.

It is now one of the largest manufacturers of aircraft carpet and seat fabric in the world, with sales of €45 million (\$52.7m) in 2019.

PICTURE: BOTANY WEAVING



“ From the onset of Covid-19, we have been working with our airline customers to develop anti-viral treatments on our seat fabrics. ”

2

■ I understand the company has strong relations in the Middle East?

Yes, we have a strong market position in the Middle East, being a major supplier of aircraft seat fabrics, carpets, and curtain fabrics to Emirates, Etihad, Qatar Airways, Flydubai, Air Arabia, Kuwait Airways, and Jazeera Airways.

The Middle East is an important region to us.

3

■ What has been the impact of Covid-19 on the company?

Covid-19 has had a very significant impact. We were heading for a record year in sales for 2020 but, following the impact of the pandemic from March 2020, we received many order cancellations and deferrals.

We don't see the situation changing until at least mid-2021, or until a vaccine is found.

However, we took the necessary quick action to reduce our operating expenses and cash outflow and, with no borrowings or rent to pay, we are in a strong position to ride out this downturn and avail ourselves of any new opportunities when they arise.

We have also diversified into other product areas, which have helped offset the downturn in aviation sales. Some of these product diversifications have proved to be very successful, so much so that we received our largest order ever in the history of the company in May 2020.

I believe the impact of Covid-19 has hit aircraft interiors companies disproportionately hard, as it is usually the first area of expenditure to be cut when there is a downturn.

From the onset of Covid-19, we have been working with our airline customers to develop anti-viral treatments on our seat fabrics, which will protect passengers from coming into contact with the virus. These treatments have been very well received.

4

■ Is there anything new for Botany Weaving?

We have developed a new range of environmentally friendly seating fabrics made from recycled polyester. They have the added advantage of being able to be washed rather than dry cleaned, which, in itself, is more environmentally friendly.

We have managed to create a really soft and luxurious finish, which is unusual for 100% polyester fabrics. In addition, we will shortly launch a range of printed 100% polyester seat fabrics. The benefit is that we can weave the fabric and print to any design with very short lead times. Minimum order quantities are also much lower. We expect this product to appeal to airlines that want to keep stocks to a minimum, thereby reducing their cash outflow.

5

■ What does a typical day hold for you?

At the moment, a typical day for me is very varied as I am dealing with so many issues and managing a very dynamic and ever-changing situation.

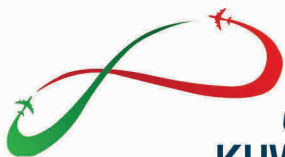
My tasks can range from helping to manage cashflow, helping customers restructure their deliveries, being part of the new product development team, exploring and researching new product and market diversifications, and working with our staff and procurement teams to help bring our costs into line with the reduction in activity.

Every day is different and each day goes by very quickly as there is so much to do.



Let's Share the Sky

See you in 2022



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