



SHOW BUSINESS



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255 A321neos ordered and the Airbus name is up in lights – literally

AIRBUS ORDER SETS SHOW ALIGHT

On Saturday night, Airbus set Dubai's Burj Khalifa alight with a spectacular visual display. Yesterday, the European manufacturer set the air show alight with a firm order for 255 Airbus A321neo family aircraft.

The buyer is Indigo Partners, parent to low-cost carriers (LCCs) Wizz Air (Hungary), Frontier (US), Volaris

(Mexico) and JetSMART (Chile, Argentina).

This order brings the total number of A320 family aircraft ordered by Indigo Partners' airlines to 1,145.

Gee Wizz!

Wizz will take 102 aircraft (75 A321neo and 27 A321XLR), Frontier 91 A321neo, Volaris 39 A321neo, and JetSMART 23 (21 A321neo and two

A321XLR).

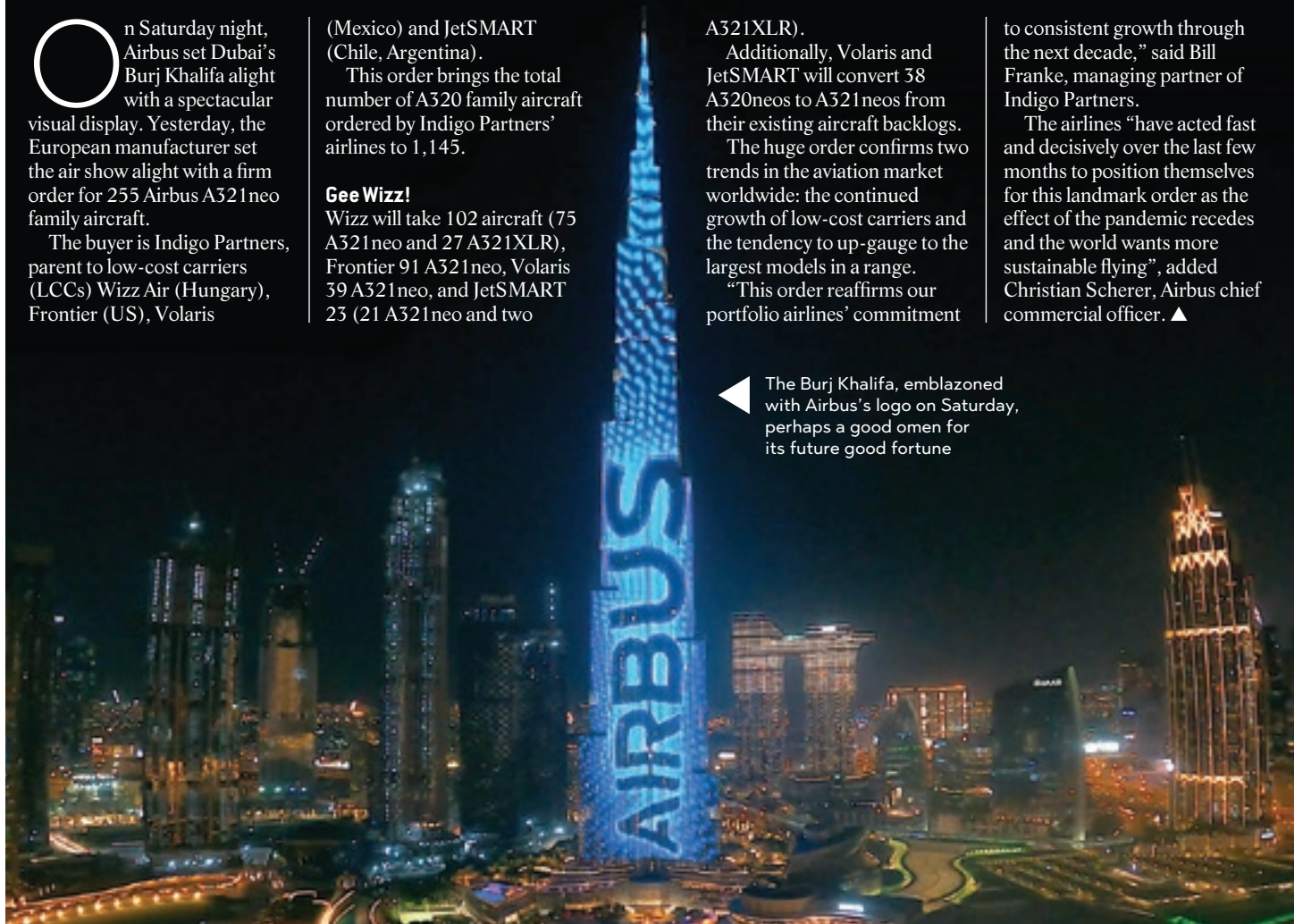
Additionally, Volaris and JetSMART will convert 38 A320neos to A321neos from their existing aircraft backlogs.

The huge order confirms two trends in the aviation market worldwide: the continued growth of low-cost carriers and the tendency to up-gauge to the largest models in a range.

"This order reaffirms our portfolio airlines' commitment

to consistent growth through the next decade," said Bill Franke, managing partner of Indigo Partners.

The airlines "have acted fast and decisively over the last few months to position themselves for this landmark order as the effect of the pandemic recedes and the world wants more sustainable flying", added Christian Scherer, Airbus chief commercial officer. ▲



◀ The Burj Khalifa, emblazoned with Airbus's logo on Saturday, perhaps a good omen for its future good fortune

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Pilatus unveils tech with the X-factor



“The world’s best smart basic trainer” – Pilatus says of its new PC-7 MKX

Pilatus has today unveiled its new PC-7 MKX aircraft, billed as the world’s best smart basic trainer.

The aircraft is based on the frame and fuselage of the tried-and-tested PC-7 MK2 trainer, but with the addition of a range of state-of-the-art avionics and innovative technologies that put the X factor in the MKX.

Other introductions include a new glass cockpit and improvements in crew comfort.

Central to the development of

the new PC-7 MKX is the state-of-the-art cockpit.

The three next-generation high-definition screens give the student a gentle introduction to modern avionics, while enabling them to practice vital flying skills in an airframe proven to have forgiving flying characteristics.

The broad capability of the smart avionics suite ensures that the student can move through the different platforms easily, as they embark on each phase of training.

Bruno Cabrini, senior marketing manager, said: “Although they appear to be very similar, the MKX is equipped with smart technology that can lead the new pilot through different stages. It also connects to the ground-based training system. That is what makes this different.”

The price of the new aircraft is only available by quotation, as it will depend on the level and range of avionics chosen by each customer. The PC-7 MKX, which uses conventional semi-monocoque construction for the wing, fuselage and empennage, is designed to be used to train the broadest possible range of aircrew.

Pilatus expects the PC-7 MKX to serve as a basic trainer with air forces around the world.



SO MUCH ANTICIPATION AS 2021 SHOW SWINGS INTO ACTION

After much anticipation, the Dubai Airshow 2021 swung open its doors yesterday after being officially opened by Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, the crown prince of Dubai.

The 17th edition means the show is the largest of its kind to be held in person this year, following the continuing problems with the Covid-19

pandemic. The event brings together more than 1,200 exhibitors and representatives from nearly 150 countries.

There will be civilian and military delegations from over 140 countries and the event will feature 20 country pavilions, including new additions from the Czech Republic, Belgium, Brazil, and Israel.

The show also features more than

160 of the world’s most advanced aircraft on the ground and in the air.

The flying teams include Al Fursan, the UAE Air Force aerobatic display team, the Russian Knights from the Russian Air Force, Surya Kiran – the aerobatics demonstration team of the Indian Air Force – and the Saudi Falcons, the Royal Saudi Air Force aerobatic team.

▲ NEWS IN BRIEF

Empire building

Gulfstream Aerospace Corp has appointed Dubai-based Empire Aviation Group as the authorised international sales representative (ISR) for Gulfstream business aircraft sales activities in India.



Visit our editorial office at stand 1020 or email us at news@arabianaerospace.aero

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EDGE wins \$3bn deal to service UAE Air Force and Air Defence aircraft

GAL has been awarded an exclusive three-year, AED11 billion (\$3bn), performance-based logistics (PBL) contract to supply the UAE Air Force and Air Defence (AFAD) with maintenance, repair and overhaul (MRO), and specialised support services. GAL is part of the mission support cluster at EDGE, and is a leading regional provider of integrated aircraft sustainment solutions.

The PBL arrangement will provide military MRO services organised under a cost-per-flying-hour model, and will support operational readiness. The contract will also facilitate ongoing upgrades and improvements.

HE Sheikh Mohammed bin Hamad bin Tahnoon Al Nahyan, the vice chairman of GAL, said: "This contract underscores our performance, excellence and reliability as one of the region's leading MRO service providers.

"With the combined strength of our team, we will leverage our cutting-edge capabilities to service AFAD's fleet and ensure optimised operational readiness, safety, and self-reliance. We are confident that this collaboration will provide strong foundations for future growth and enable us to continue fulfilling our longstanding vision of addressing customer needs with agility and precision."

Khalid Al Breiki, president of mission support at EDGE, and managing director of GAL said: "Signing this contract represents the trust our team has built with the UAE Air Force and Air Defence, allowing us to further grow our workforce of UAE nationals, and, most importantly, providing world-class support to our customer's growing fleet."

GAL was unable to confirm what aircraft types were covered by the new contract, but a model of their MRO facility on the EDGE stand showed F-16E/Fs, AH-64 Apaches, UH-60 Blackhawks, CH-47 Chinooks, IAI Kfir (presumably representing Mirage 2000s), and an unidentifiable four-jet, high-winged transport aircraft!



HOLD THE DRONE!
Adasi's new QX-6, modern vertical take-off and landing drone

EDGE ANNOUNCEMENTS KEEP COMING THICK AND FAST

The opening day of the show was packed with announcements of home-grown technological advances from the different entities under major exhibitor, EDGE

- Adasi unveiled three new additions to its product portfolio of advanced unmanned aerial vehicles. They were the new QX-5 and QX-6, modern vertical take-off and landing (VTOL) drones, and Rash 2H, a high-precision guided munition system – all designed and manufactured in the UAE.
- Precision-guided weapons division, Halcon, unveiled both the Hunter 10 tube-launched drone and Hunter 5 tube-launched drone, which are designed for recon and attack missions. Halcon also announced major progress in the development of its SkyKnight air defence missile system, including the completion of the system's naval missile concept design. The first-ever UAE-designed and manufactured counter-rocket, artillery, and mortar (C-RAM) missile system has reached a number of key milestones in the last 12 months.
- Sign4I, developer of electronic warfare and intelligence solutions, announced the launch of GPS-Protect, the first UAE-made anti-jam system, covering air, land and sea applications. GPS-protect provides significant immunity to jamming, thereby protecting mission-critical systems that require assured position, navigation and timing information from GPS.
- GAL, a provider of integrated aircraft sustainment solutions for military and civilian customers, announced the opening of the first regional distribution hub for aircraft logistics in Abu Dhabi in partnership with Chinese state-backed defence contractor, China National Aero-Technology Import & Export Corporation (CATIC). The new Middle East & Africa distribution centre (MEADC) aims to improve the availability of aircraft spare parts in the UAE and the wider MENA region.
- During the day, the company also signed MoUs with the Office of the Deputy Chief of Police & Public Security in Dubai, and with Abu Dhabi Police, to collaborate on advanced technological solutions addressing operational needs in law enforcement. The two deals enable the exchange of subject matter experts and their specialist knowledge, and provide capability-development training that leverages the latest virtual reality (VR) and augmented reality (AR) solutions.



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Iclease launch customer for Boeing's new freight conversion centre in Gatwick

Boeing is to open three new 737-800 freighter conversion lines, with Iclease as the launch customer for the forthcoming London facility.

Magnus Stephensen, CEO Iclease, and Ted Colbert, president and CEO Boeing Global Services, officially signed the agreement on the Boeing stand at the show yesterday.

The company will open one conversion line at its London Gatwick maintenance, repair & overhaul (MRO) facility in the United Kingdom; and two further lines in 2023 at KF Aerospace MRO in Kelowna, British Columbia, Canada.

The London site will open in 2022, with the first Iclease aircraft entering in April. Iclease has ordered 11 7437-800 BCF freighters, with work spread between the Boeing centres in London and Shanghai over the

18 months from April 2022 to September 2023.

Boeing now has more than 200 orders and commitments for 737-800BCF from 19 customers.

Stephensen said: "We researched our options and concluded that the 737-800 programme was the best fit to meet our needs and our customers' needs.

"The pandemic has changed the air cargo market for good. We were forced to adjust very quickly, but I think these changes will stay.

"We are confident in the quality and proven record of Boeing's 737-800 converted freighter, and pleased to be the launch customer for their new London MRO facility," he added.

"We look forward to bringing the freighter into our fleet to serve our growing global customer base operating domestic and short-haul routes."



▶ Ted Colbert, president and CEO Boeing Global Services (left), and Magnus Stephensen, CEO Iclease, sign the agreement yesterday

SAUDIA CELEBRATES SPECTACULAR SERVICES SPREE

Saudi Arabia Airlines made a strong statement of intent here at the show with its chief executive, His Excellency Eng Ibrahim Al-Omar, putting pen to paper on no less than four deals in the maintenance and services sector.

Contracts were signed with its

services giant, Saudia Aerospace Engineering Industries (SAEI) with Honeywell to service narrow-body airliner auxiliary power units (APUs); with Thales Aerospace to service in-flight entertainment equipment; with Leonardo to become an authorised service

centre to maintain AW139 helicopters; and with GE to service the CFM56-5B engines of subsidiary, Flyadeal.

Most of this work will take place at SAEI's huge MRO village in Jeddah, including its \$850 million Jet Propulsion Centre shop there, which will be commissioned in December. At full capacity this plant will be capable of servicing 500 aircraft engines and 300 auxiliary power units a year, said Captain Fahd Hamzh Cynndy, chief executive of SAEI.

SAEI has won a highly competitive tender to become the first authorised service centre in the Middle East for Honeywell's 131-9 APU installed on Boeing 737NGs and Airbus A320s.

The licence is for 10 years and could be worth up to \$260 million over this period, and there is a five-year extension option, said Captain Cynndy.

SAEI will induct its first customer APU in the second quarter of 2022 as it builds up capacity

and is keen to expand its capability into APUs on the 777 and A330 and, later, to develop the expertise to become a tier one supplier of specialist APU components, said Captain Cynndy.

The deal with Thales sees SAEI signing a comprehensive MRO platinum care agreement that strengthens the cooperation between the two companies in line maintenance activities and in the development of an industrial partnership for repairs of aircraft parts for the airline's own fleet.

With Leonardo, SAEI is launching the qualification process to become an authorised service centre for basic maintenance of AW139s in the kingdom. The deal includes the addition of the AW169 helicopter and the AW609 TiltRotor in the future.

Finally, Saudi Arabian low-cost carrier subsidiary, Flyadeal, has signed a seven-year TrueChoice overhaul agreement to cover CFM56-5B engines that power its 11-aircraft strong A320 fleet.



▶ His Excellency Eng Ibrahim Al-Omar, director general of Saudi Arabian Airlines (right), and Honeywell president Middle East & North Africa, Mohammed Mohaisen, sign on the dotted line



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Preaching to the converted: ACIA takes the plunge on hydrogen

ACIA Aero Leasing is committed to placing a firm order for 10 Universal Hydrogen ATR 72 conversion kits as part of the regional aircraft lessor's long-term strategy to support airline customers as they move to sustainable flying.

It has signed a letter of intent for 10 firm ATR 72 kit orders, plus 20 options, for conversion kits for various turboprop types totalling kits for 60 engines. The firm agreement will be signed within 60 days.

ACIA said it is focusing on long-term sustainability in aviation by working with Universal Hydrogen to decarbonise its fleet of turbo-prop aircraft, said Mick Mooney, chief executive of ACIA.

Universal Hydrogen is developing a conversion kit for regional aircraft that consists of a fuel cell electric powertrain that replaces the existing turboprop engines where hydrogen is the fuel source.

The first Universal Hydrogen powered demonstration aircraft, a de Havilland Dash 8-400, is expected to fly in 2022 with the first demonstration ATR 72

expected in 2023. ACIA expects to receive its first ATR 72 kits in 2025, said Mooney.

ACIA is making this move because of strong customer demand for zero emissions aircraft. "Our customers are pushing us to do this," said Mooney. "This is key for us. We don't want to be reacting to the market, we want to be in a leading position," he added.

"ACIA's diverse customer base allows us to have a major decarbonisation impact on regional aviation globally," said Paul Eremenko, Universal Hydrogen co-founder and chief executive. "ACIA's passenger and cargo aircraft leasing customers will be able to move to true zero emissions operations as early as the mid-2020s, putting them in the vanguard of clean aviation."

Mooney concluded: "Our lessees are actively looking for ways to decrease overall costs and reduce their carbon footprint. Decarbonising our fleet encourages customers and competitors to follow our lead in advancing the development of carbon-free solutions."



▲ Making moves to de-carbonise their fleet: (from left) Mick Mooney, chief executive of ACIA, Rod Williams, chief commercial officer of Universal Hydrogen, and Sameer Adam, senior VP commercial of ACIA

X-CITING DEAL: IRAQI ORDER BOOST FOR PANASONIC AVIONICS

Panasonic Avionics has been selected by Iraqi Airways to provide in-flight entertainment and connectivity (IFEC) solutions for its new fleet of 21 narrow-body and 10 wide-body aircraft.

These aircraft, which include five Airbus A220, 16 Boeing B737MAX, and 10 Boeing B787 types, will be line-fitted with Panasonic's X Series IFE solutions and are expected to enter service in October 2022.

Panasonic Avionics' X Series offers full HD seat-back monitors, complete with capacitive touch displays and handsets, and an intuitive, personalised interface.

Passengers will have access to USB and laptop charging

power points at every seat as well. The X Series portfolio also includes eXW, which delivers a premium passenger experience to customers' personal devices. Each of these systems are designed to help drive ancillary revenue, foster higher levels of passenger loyalty, and increase passenger engagement.

The airline's Boeing 737 MAX fleet, which will feature the company's eX1 narrow-body IFE solution, also offers Panasonic Avionics' in-flight Wi-Fi service.

Its next-generation connectivity enables a host of connectivity benefits, from fast internet to video streaming, all powered by its new satellite modem featuring band-

width up to 20 times greater than previously available.

Panasonic Avionics' IFEC solutions are also being fitted to Iraqi Airways' new fleet of five Airbus A220 aircraft, the first of which entered service last month.

To meet the airline's requirement of offering state-of-the-art wireless IFE streaming on its A220 fleet, Panasonic Avionics is installing its eXW solution, which delivers a wide range of content to passengers' personal electronic devices, along with its in-flight Wi-Fi service.

For Iraqi Airways' Boeing 787 aircraft, Panasonic is providing its eX3 in-flight system and global high-speed connectivity services.

▲ NEWS IN BRIEF

Italians want to cooperate

Finding local partners is the main theme of the show's Italian pavilion: "We are mostly dedicated to 22 small and medium-sized enterprises searching for opportunities in the Gulf Cooperation Council area and, specifically, here in the emirates," said Roberto Luongo, director-general of the Italian Trade Agency. "This is very important." There has been a significant number of Italian companies, both in the civil and military sectors, with a presence in this region since the 1980s. "From a trade point of view, we exported almost 4 billion (\$4.6 billion) to the UAE and bought almost \$3 billion from them," Luongo said.

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Reinventing the next era of air travel

Aviation inventors and innovators are being encouraged to get their thinking caps on after incubator Aviation X Lab announced a new competition to reinvent the next era of air travel.

Its next project, entitled “Moonshot: The joy of journey redefined”, will launch on December 6.

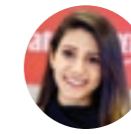
The incubator will select teams and start-ups and bring them to Dubai to co-create, experiment and develop prototypes at its premises in Dubai’s Area 2071. Winning entries will get seed funding worth 75,000 dirhams (\$20,400) per month to develop their ideas.

Aviation X Lab

Aviation X Lab manager, Amna Alredha, said that the travel experience has been hit drastically by the Covid-19 pandemic, and the reality is that the industry will continue to face threats in the years to come.

“Our mission is to ensure the passenger’s journey is protected, seamless and customised based on personal preference,” Alredha said. “The three domains we are looking at are the doorway to runway experience, inflight, and connections.”

“We are looking for ideas that can change the passenger experience and rebuild the future of aviation.”



“We are looking for ideas that can change the passenger experience and rebuild the future of aviation”

AMNA ALREDHA

Through the journey, Aviation X Lab will offer hands-on support, logistics, research, resources, peer

feedback, mentorship, and close collaboration. Aviation X Lab is described as “a bold and ambitious aviation-specific incubator that brings together five global aviation giants: Emirates Airline, Thales, Collins Aerospace, GE Aviation and Airbus”.

UAE telecom provider, Du, is the Lab’s digital innovation partner. Aviation X Lab was founded in October 2017 with an MoU signed in the presence of HH Sheikh Mohammed bin Rashid Al Maktoum, vice president and prime minister of the UAE and ruler of Dubai.

MARTIN BAKER SITTING PRETTY WITH NEW ORDER



A new ejection seat from UK company, Martin Baker, is being displayed at the show. The US18E has been selected by Lockheed Martin for the F-16 Block 70/72 aircraft, which will replace the ACES II.

“The US18E is based on the US16E that is installed in the Lockheed Martin F-35 aircraft, with some 939 in service and three lives saved to date,” said Steve Roberts, head of business development.

The new seat enables safe ejection for aircrew equipped with a helmet-mounted display across the size and speed range.

“Lots of helmets can cause injury during ejection. This allows safer ejection through the latest airbag technology, making the load easier on the head and neck,” explained Roberts.

The modular seat design also reduces the maintenance hours associated with canopy removals.

Martin Baker has a strong presence in the Middle East and currently boasts 1,639 of its seats in service in the region in countries including Egypt, Bahrain, Kuwait, Qatar, and Iraq – and, of course, the UAE.

The company has had a busy conference year already, despite restrictions due to the pandemic, including attending Aero India earlier in the year.

“This is actually our sixth live event,” said Roberts. “The Dubai Airshow is a big one for us as we have many important customers in the region.”

◀ Steve Roberts, head of business development at the show with the new seat

▲ NEWS IN BRIEF

UAE increases A330MRTT order

The United Arab Emirates Air Force & Air Defence has increased its fleet of Airbus A330 multirole tanker transport aircraft (MRTT) to five, having formally ordered two additional aircraft. Interoperable with receivers worldwide, the A330 MRTT delivers multi-functional capabilities, as demonstrated during recent medevac and strategic transport missions in response to the global pandemic. It combines the advanced technology of a new-generation tanker with the operational experience established over more than 250,000 in-service flight hours. Bernhard Brenner, executive vice president marketing and sales at Airbus Defence and Space, explained that, since its entry into service in 2013 with the UAE Air Force, the A330 MRTT has delivered more than initially expected. “This repeat order, added to the growing MRTT customer base, confirms the suitability of our platform as the world’s tanker of reference,” he said.



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777X: Inside the belly of the beast

Captain Heather Ross, 777/777X deputy chief pilot, flew Boeing's new wide-body twin here to Dubai and is full of praise for the aircraft. "What really sticks out for the pilot is the displays are really key," said Ross, speaking from the cockpit of the 777X.

"They are very much a similar architecture to the 787 as far as the information that can be projected down on to the airplane and the flexibility of that information.

"We also have some new features, where we have the capability of projecting information from our iPad on to the display, so we can actually show map displays," said Ross.

"Another new feature, different from the 777, but similar again to the 787, is we have these optional heads-up displays, and they are wonderful because there is so much out-the-window capability. The pilot can be flying eyes out the window looking out for traffic and seeing all the flight information they need to.

"The third thing is something you don't see, and that is the flight control system behind the 777-9/777X," added Ross. "That is



INNER SPACE
Captain Heather Ross, deputy chief pilot of the 777 and 777X programme, showcases the aircraft

taken over from the 787 airplane with adjustments for weight and for the dimensions of this airplane, but it's very much the same fully fly-by-wire control law that we use in the 787."

The 777X is now well into its first full year of test flying, having first taken to the air on January 25 2021. There are four aircraft in the test programme. Three are config-

ured like the 777X here in Dubai, which has 24 ballast tanks, a variety of avionics and flight system test racks, and seating for the 50 engineering, maintenance and support crew who are required to look after the aircraft.

There are 12,450kg ballast tanks in the forward cabin of the 777X and 12 in rear. They are plumbed together, and water is transferred

between them as fuel is burnt to ensure the aircraft is kept in a steady state under test conditions, explained Matt England, ground operations engineer in Boeing's test & evaluation team.

One of the remarkable features of the 777X is its foldable wingtips, which reduce the width of the aircraft to enable gate operations at many airport terminals.



The Zephyr flatbed, Jeffrey O'Neill's brainchild (pictured), can be experienced at the show - virtually

ZEPHYR BLOWS THROUGH THE WIND OF CHANGE

A new premium economy lie-flat bed seat concept is being highlighted at the show by US-based start-up company, Zephyr. "The Zephyr seat is lie-flat accommodation just for premium economy, creating a middle option from, what can be, miserable economy to overpriced business on long-distance flights," said founder Jeffrey O'Neill.

"Its patent-pending design introduces a social-distancing-compliant seating module that aims to disrupt the entire airline industry, making flying comfortable for all travellers by offering the comfort and privacy - with the use of a curtain that can drop down - of an individual cabin."

Users can either lie completely flat, lounge, or sit upright with their legs fully extended.

"By utilising an innovative stacked seating configuration, each Zephyr seat can be retrofitted into the existing real estate of the airline without a loss of seating density," said O'Neill.

"The simple architectural platform allows customisation for commercial aircraft - both Boeing and Airbus - enabling them to tailor their version of the seat depending on market, operational realities, cultural nuances, and branding."

O'Neill came up with the concept after noticing how unhappy some long-haul passengers on premium economy looked. "We did a survey of 50,000 people all but five said having sleep and privacy on board was the most important thing, not food and beverages and the frills you pay extra for in business," said O'Neill.

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RJ chief fuels the fire over inconsistent covid regulations

Royal Jordanian
Airlines CEO,
Samer Majali

Rising fuel prices and inconsistent government covid regulations are hampering the recovery of airlines in the region, according to Royal Jordanian Airlines (RJ) chief executive, Samer Majali.

"The main worry is that governments will reimpose things with this new resurgence of cases," Majali said. "The other one is the increase in fuel prices, which was something that we didn't expect to be as rapid as it has been in recent months.

"I mean, the fuel prices were really low in 2020. But there was no flying anyway, so nobody could take advantage of that. However, this year, the fuel price is really a big drag on airlines' plans to recover," he said.

RJ has currently recovered between 65 to 70% of its original

network in terms of flights and frequencies.

"We've announced a five-to-seven-year plan to really improve the destinations within the region and beyond. Royal Jordanian has a very good brand within the Levant region, and this is what we are leveraging," said Majali.

The new plan also includes a fleet renewal.

"Again, the fleet over the past difficult period in our region has not been renewed as fast as we would like," Majali said. "So now we're currently in the process of renewing the fleet plus growing at the same time."

With sustainability high of the agenda at the show, but with questions being asked about whether the targets are achievable, Majali was upbeat – but warned that it

needed a broader approach than just looking at the airlines.

"Sustainability is a challenge," he said. "I think there is time enough to be able to sort yourself out. We're talking about a 30-year period for the airline industry to get to zero emissions, which is doable, but it does require everybody to be involved, not just the airlines.

"The manufacturer has to be very engaged in terms of coming up with these new products, the incentives have to be given to provide sustainable aviation fuel at affordable prices, not to load the airlines again.

"It needs all stakeholders that are involved in the aviation business to actually help and, obviously, the call is always to governments not to keep on imposing taxes on top of this."



"I mean, in the end, airlines will have to make up the difference through carbon offsets. And that is, in itself, a tax in the end, but it's our job to do so. But we prefer not to have to pay additional taxes beyond that."



US pavilion opens up in style

The USA partnership pavilion, featuring more than 90 exhibitors, was officially opened yesterday.

This is the 26th year that Kallman Worldwide has organised the pavilion. Tom Kallman, president and CEO of Kallman Worldwide, said in his opening speech: "It is great to be here after the horror of Covid-19.

"Now, more than ever, success in international trade comes from partnership and teamwork. The USA pavilion is the largest in the show and represents 30,000 square feet of the very best."

Also at the opening were Kelli Seybolt, deputy undersecretary of the air force, international affairs, who said

it was a wonderful platform to support our partners worldwide.

Sean Murphy, charge d'affaires, US Embassy, Abu Dhabi, thanked US companies for attending and said the UAE was the gateway to the Middle East and South Asia.

Also present was Apollo 16 astronaut, Charlie Duke, who is an ambassador for the AI Worden endeavour scholarship awards, which will be presented to four students and one educator on Tuesday.

Sadly, AI Worden, who was command module pilot for the Apollo 15 lunar mission in 1971, and who was the inspiration for the awards, died in March last year.

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HYPER-LOOP TECH COULD TRANSFORM DUBAI AIRPORTS

New technology could effectively turn Dubai's two airports into one and solve the problem of runway capacity limits at Dubai International Airport, a conference heard this week.

Ultra-fast transport systems, such as the hyper-loop now under development in the US and China, could cut the journey time for the 68km between Dubai International and Dubai World Central (DWC) to around 12 minutes, Dubai Airports CEO Paul Griffiths told an Embraer airline symposium in Dubai.

That could effectively transform DWC into Dubai International's

'Terminal 4' and make it possible for connecting passengers to move between the two hubs in little more time than passengers took today to move between the latter airport's existing three terminals.

While new technology might solve the problem of diminishing runway capacity at Dubai International, the older skills of diplomacy will still be required to solve the wider connectivity problem of improving international air links, the symposium heard.

Diplomats had been trying for decades to increase bilateral links between the UAE and many

countries, with only limited success in some cases. India is a classic case, where efforts to increase access to the huge Indian market have been largely rebuffed by Delhi.

The problem with many countries is a desire to protect their own national carriers.

Traditionally, the Middle East has not been fertile ground for regional jet manufacturers such as Embraer. That class of aircraft has prospered in markets such as the US and European Union, where freedom to fly unfettered between cities has boosted the overall market.

The ability to use smaller airports

has also improved feed into major hubs. Regional traffic can be optimised to operate into those hubs between the peaks of international traffic.

Embraer's market forecast for the Middle East region and Turkey over the next 20 years predicts that there will be a shift – but only a slight one – towards smaller aircraft.

The Brazilian manufacturer predicts that the number of aircraft with less than 150 seats operating in the region will grow from 290 to 320, while the number of wide-bodies will shrink to 1,830, compared to 1,900 today.

Egis boosted by RAK airport expansion deal

Egis has been awarded a contract to expand Ras Al Khaimah International Airport's existing terminal. The signing took place yesterday.

The primary gateway for those travelling to and from Ras Al Khaimah, the airport last underwent an extensive expansion and upgrade project in 2007. This latest agreement comes after a surge in passenger traffic at the international hub.

"Ras Al Khaimah has quickly become more of an economic and tourism hub in the last couple of years and we are extremely proud of the growth we've seen," said Ras Al Khaimah chairman of the department of civil aviation. "The expansion of our international

airport reinforces this ambitious outlook and we look forward to welcoming passengers from all over the world," he continued.

Egis, which is focused on delivering engineering, project structuring and operations services to airports, has been awarded several aviation projects in the Middle East. Its most notable projects in the region include Riyadh Airport, for which it managed the design review, construction management and supervision of new airside infrastructure.

It is also currently working on the design and development of Amaala Airport – a greenfield facility that will serve a new luxury

Red Sea resort on Saudia Arabia's north-west coast.

Alaa Abusiam, CEO Egis Middle East, said: "We are delighted to be working on the expansion of Ras Al Khaimah as aviation is one of our strengths. Our goal is to provide the best possible solution to improve the passenger experience throughout their airport journey and our vast aviation experience in the Middle East and beyond will help us achieve that."

CEO of RAK Airport, Atanasios Titonis, added: "In order to keep up with this demand of passenger traffic, and welcome more airline partners, our immediate focus is on working to enhance our existing terminal at the earliest."



Sealing the deal: His Excellency Engr. Sheikh Salem Bin Sultan Al Qasimi (left) and Alaa Abusiam

▲ NEWS IN BRIEF

Jordanian partnership with Lufthansa Technik deepens

Royal Jordanian has renewed its links with Lufthansa Technik, signing an agreement for comprehensive component maintenance for the airline's Airbus A320 family fleet.

Over the next five years, Lufthansa Technik will provide its total component support (TCS), including spares support, parts pooling and homebase support services, for five A319s, six A320s and two A321s.

"Lufthansa Technik and Royal Jordanian have been partners over the past few years, and we are pleased to build on this partnership for the coming five years," said Royal Jordanian CEO, Samer Majali.

The new contract builds on a previous agreement in which Lufthansa Technik provided component MRO for Royal Jordanian since 2017.

In 2019, the two partners also extended their collaboration to components of the CFM56 turbofan engine.



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Aviation training gets a touch of Hollywood glamour

A touch of Hollywood is at the show in the form of Dynamic Advanced Training. The company, based out at the Mohammed bin Rashid aerospace hub in Dubai South, offers aviation training for pilots and cabin crew in a very different way to your usual classroom.

“This is reality-based safety and emergency procedure training, predominantly for business aircraft, but also for commercial aircraft. It is something very different to anything else anyone offers,” said James L Steward, manager training and learning resources.

“We are the first facility of its type in the MENASA region to offer private, business and commercial aviation safety training all in one place.”

The company, which soft-launched in 2018 and has customers across the Middle East, north Africa and South Asia, has a facility with total floor space of more than 4500sqm, which is fully equipped with two business jet simulators, wide and narrow-body commercial aircraft cabin simulators, aircraft door simulators, a firefighting facility, special effects wave pool, and film set themed survival training rooms. “Our jungle survival set allows students to actually experience what it would be like to crash



▲ Vive la difference – James L Steward, manager training and learning resources with models of the simulators with star quality...

into the jungle, while the polar survival set is an actual blowing snow room,” said Steward.

“Theoretical and hands-on, post-crash survival training uses challenging and realistic environmental conditions and scenarios, and trainees acquire experience in risk identification and management, in addition to an opportunity to implement CRM skills. Anything an aircraft can do, we can do.”

Steward said that this approach to training has proven to be a game

changer already. “When training is fun, people learn so much more and, in return, that means safer skies,” he said.

The company has also opened its doors to the film industry, with the support of The Dubai Film and TV Commission, making it the first aviation-themed filming location in the UAE and Middle East region. Dynamic is offering visitors to the Dubai show a tour of its impressive facilities each day at 11am and 2pm. The tour takes one hour.

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▲ Captain John Ntiskos, CEO Jetstream (standing) and Mark Kammer, managing partner, Dynamic at the Dynamic stand

Jetstream and Dynamic join forces

Jetstream Aviation Training & Services has joined with Dynamic Advanced Training (DAT), at Dubai South, to provide comprehensive EASA-approved training for cabin crew.

Captain John Ntiskos, CEO Jetstream, and Mark Kammer, managing partner, Dynamic, signed the final agreement on the eve of the Dubai Airshow.

The EASA cabin crew initial training will use the full facilities of DAT for hyper-realistic hands-on training, including the temperature-controlled jungle survival and polar survival rooms, pool with wave and

storm effects, and aircraft simulators, to lead to an EASA attestation.

Ntiskos said: “Dynamic has superb facilities and we have the EASA approved instructors, so it is an excellent partnership. With a choice of full motion aircraft simulators, including A330, Boeing 777, Boeing 737, and a private jet, we are able to train crew for both airline and VIP work. The initial cabin crew course takes 15 days, with type training and refresher training taking just a couple of days.”

The agreement will also cover pilots' initial training in safety and emergency procedures (SEP).



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The brakes are off and Joramco is expanding at home and abroad

Jordanian MRO and engineering specialist, Joramco, has long been seen as the Levant's poster company – and now it could be spreading its wings.

Speaking at the show yesterday, Joramco's CEO, Fraser Currie, said business was so good that the company is expanding at home and abroad.

"We are part of Dubai's DAE company," he said. "Naturally it made sense to look at the UAE to build on that relationship."

The Joramco business not only survived but flourished during the pandemic. More than 60 aircraft were stored at its Queen Alia International Airport (QAIA) facility in Amman, and the hangars were full.

Developing business like the passenger to freighter (P2F) conversions pushed the capacity even

further. Two years ago, DAE's CEO, Firoz Tapore, predicted that Joramco would need to expand soon. "Covid put the brakes on that," Currie said. "But now we are ready."

The company has already done land deals at QAIA, but is now looking at several options in different emirates. "There are a number of possibilities in the UAE, and we will be looking at what is strategically best for things like P2F or regular wide-body maintenance," he said.

"We have space to build now at QAIA. We are seeing work from Europe and India but there has been a huge rise in demand since the US opened its borders again. Wide-bodies are being brought back into service. It's looking good."

Joramco's CEO, Fraser Currie is all smiles now the company can spread its wings again



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OLIVER WYMAN WARNS OF SLOW MIDDLE EAST RECOVERY

As the Dubai Airshow opened its doors yesterday, management consultant, Oliver Wyman, warned that the Middle East and Africa region will be among the slowest areas for aviation recovery.

Partner at the firm, André Martins, said: "Oliver Wyman believes the global aviation industry will be back to its 2019 levels by the end of 2023, with a faster recovery in north, central and south America. The south Pacific, the Middle East and Africa will lag behind."

The views came as a result of the third edition of the Oliver Wyman travel sentiment survey, which

involved nearly 5,300 people across nine countries (Australia, Canada, China, France, Germany, Italy, Spain,

"As the industry recovers, many challenges need to be addressed"

ANDRÉ MARTINS



the UK, and the US), all of whom had flown at least once in 2019.

Nearly 90% had been vaccinated against Covid-19 or are planning to be vaccinated.

"As the industry recovers, many challenges need to be addressed. In the next two to three years, it will be particularly relevant to revamp the commercial offer to bring back air traffic, address production and supply chain issues from original equipment manufacturer (OEMs) and key suppliers, while also addressing pilot shortages and debt repayments," Martins said.

In the regional market, the compa-

ny expects short-term strong demand for the UAE and Qatar markets driven by the Expo 2020 and the FIFA World Cup, along with a slow recovery of the long-haul-to-long-haul connecting model and an increase of low-cost carrier (LCC) regional traffic.

"Furthermore, we should expect an intensification of the regional competition given new potential airlines, the need to revisit the business model of some of the airlines and airports, and the need to successfully transform some of the carriers in the region into more agile organisations, with the right-size fleets and value proposition," said Martins.



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ALAN DRON REPORTS

AIRBUS REPORT PAINTS REALISTIC PICTURE

Replacement aircraft will be key as growth slows, but staff and pilot shortfalls may be an issue

Sales of new airliners will increasingly be for replacement of existing models, rather than growth of today's fleet, Airbus says in its latest forecast of demand over the next 20 years.

The urgent need to cut the industry's emissions will drive the sale of new-generation aircraft. As fleets become more efficient, the expansion of the world's airlines will moderate, compared to expansion pre-pandemic.

However, the combination of rising global GDP, plus the rapidly increasing global middle class with its disposable income, means that demand for air transport will continue to grow.

The modernisation of the world's airliner fleet, with its improvement in fleet efficiency, sustainable fuels, operations and propulsion technologies, will – hopefully – allow the sector to meet its 2050 net-zero emissions objective.

Over the next 20 years, therefore, Airbus forecasts demand to result in a need for some 39,000 new-build passenger and freighter aircraft, of which 15,250 will be replacements.

As a consequence, says the company, by 2040 the vast majority of commercial aircraft in operation will be new-generation models. This will be a huge jump from around 13% today, considerably improving the CO₂ efficiency of the world's airliner fleet.

The economic benefits of aviation extend beyond the sector, contributing around 4% to annual global GDP and sustaining some 90 million jobs worldwide. However, shortage of skilled personnel, an increasingly severe difficulty facing airlines and ground support services before Covid-19, is likely to return with a vengeance.

Airbus forecasts a requirement for more than 550,000 new pilots



AIRBUS PREDICTS

The combination of rising global GDP, plus a rapidly increasing well-to-do global middle class, means demand for air transport will continue to grow

and more than 710,000 technicians over the next 20 years. While the shortage of personnel faded into the background when the pandemic struck and airlines laid off thousands of staff, there are already signs that the problem is returning.

Thousands of pilots have lost currency and will have to re-qualify in simulators before they can get behind the controls again.

A study by the Oliver Wyman consultancy found that, while the recovery in passenger numbers could occur any time between early 2022 to 2024 or beyond – estimates vary widely, depending on how rapidly nations ease travel restrictions – demand for pilots is driven by aircraft departures and utilisation rather than passengers.

Pilot certifications understandably slumped over the worst of the pandemic and there are doubts over whether they will quickly resume, as potential pilots worry over job security in the industry. The Wyman report forecast a

shortfall of 34,000 pilots as early as 2025.

Even more worryingly, some companies in the aviation sector are reporting a huge outflow of skilled personnel as worried staff seek safer jobs.

While having lost nearly two years of growth over the pandemic, passenger traffic has demonstrated its resilience and is set to rebound to annual growth of 3.9%, driven by expanding economies and commerce.

The demand for new aircraft will include around 29,700 'small' aircraft, such as the Airbus A220 and A320 families, as well as about 5,300 in the medium category,

Over the next 20 years, Airbus forecasts demand to result in a need for some 39,000 new-build passenger and freighter aircraft, of which 15,250 will be replacements...

such as the A321XLR and the A350neo. In the large segment, covered by the A350, some 4,000 deliveries are expected by 2040.

Cargo demand will continue to be spurred by the rapid growth in e-commerce and express freight. That sector is anticipated to see growth of 4.7% annually, while general cargo (representing about 75% of the market) will see predicted growth of 2.7%.

Overall, predicts Airbus, there will be a need for some 2,440 freighters, of which 880 will be new-build, over the next two decades.

"The world is expecting more sustainable flying and this will be made possible in the short-term by the introduction of most modern airplanes," said Airbus' chief commercial officer, Christian Scherer.

"Powering these new, efficient aircraft with sustainable aviation fuels (SAF) is the next big lever. All our aircraft are already certified to fly with a blend of 50% SAF, set to rise to 100% by 2030." ▲



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MENA Cargo launches a new freighter service with a “simple, but complicated” strategy

FREIGHT EXPECTATIONS

The rapid expansion of cargo operations in the Arabian Gulf is continuing with the start of freighter services by Bahrain-based MENA Cargo.

Bahrain is positioning itself as a logistics hub, taking advantage of its proximity to several growing markets. The Bahrain global sea-air logistics hub was launched last month and claims to be the fastest growing regional multi-modal logistics hub in the Middle East.

“Dr Mohammed Juman, founder and managing director of parent company, MENA Aerospace Enterprises, said: “We’ve looked at the regional markets, and asked where is the growth?”

He added that the parent company’s activities include managing executive jets, development of aviation real estate, and avionics technical workshops.

“The [cargo] growth we’ve seen is mainly in the Gulf area, Africa and south-east Asia,” Juman said. “So, our thought process was, let’s try to link these markets and let’s serve these markets.”

E-commerce is one of the main drivers behind cargo growth in the region. “Clearly, we are in the right place at the right time,” said Brian Hogan, MENA Aerospace Enterprises board member. “Cargo is going through the roof... if we had more aircraft now we think we could fly them continuously 24 hours a day.

“The strategy is simple but complicated,” he added. “We can use Bahrain as our hub, have three

to four aircraft here, move into Saudi, and then move into south-east Asia.”

MENA Cargo aims to acquire “at least three to four” new aircraft for its fleet in the next year and is aiming for a critical mass of 15 to 20 aircraft in the longer term.

It is initially operating a Boeing 737-300F Pemco cargo conversion. However, the airline has also signed a year-long lease with Portugal’s euroAtlantic Airways for a Boeing 777-200ER and a 767-300ER, both of which will be operated in passenger-to-freighter (P2F) configuration. The two companies said that further aircraft were likely to follow.

The longer-range wide-bodies

will be used to start to realise MENA Cargo’s plans of linking south-east Asia and China with the Middle East and Africa.

Hogan said that the airline’s expanding fleet was likely to include “at least two or three 737-800Fs” over the next year. One would be added by January, with a

“We are in the right place at the right time. Cargo is going through the roof... if we had more aircraft now we think we could fly them continuously 24 hours a day”

BRIAN HOGAN MENA AEROSPACE

further two expected in the second and third quarters next year.

For long-haul, the airline’s favoured equipment is the Boeing 777. However, slots for converting passenger 777s into freighters are full until at least 2023. To fill the gap until 777s become available, interim equipment could include Boeing 767s or Airbus A330s – again, operated in P2F layout.

MENA Cargo is confident that, despite the recent increase in freight capacity in the Gulf – from both cargo specialists and from belly-hold capacity in passenger aircraft as those services start to return – there will be more than enough traffic for the company to co-exist alongside rivals. ▲



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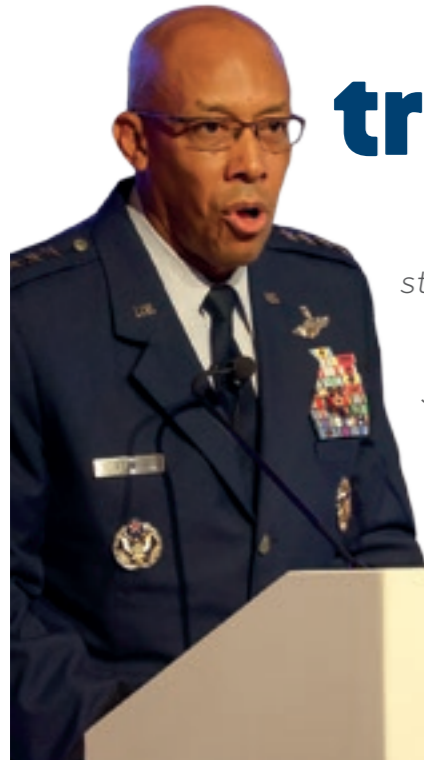
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INNOVATING TOGETHER



Does the US trust anyone?



The call for multi-domain operational strategy between the US and its allies came out loud and clear from the 10th Dubai International Air Chiefs Conference on Sunday. The only problem is, the US seems to be exhibiting a lack of the kind of trust it is extolling

▶ General Charles Q Brown: "Trust has to be developed by relationships built over time"

ALAN WARNES REPORTS

The US Air Force chief of air staff, General Charles Q Brown, certainly made all the right noises while on stage during the first presentation, but even he acknowledged there were issues.

"Our command and control processes are too manual, and work too slowly. There is simply too much data for our airmen, which hinders the process," he said. "Additionally, we have too much red tape. Data security is important and something we have to get right but what worked in the past doesn't necessarily mean it will work in the future."

The message was clear: "Thinking differently means knocking down archaic policies that prevent us from sharing data with our warfighters. It's about what we can do with our allies and partners. When we strengthen our partnerships and allies, we amplify power – we increase our collective security. So, we might have [doctrine in place like] joint all-domain command and control (JADC2) and

the advanced battle management system (ABMS), but the problem is sharing tactics and procedures and trusting one another.

"Trust", he said, "has to be developed by relationships built over time."

He told the audience: "A think-tank recently reported that the restrictions placed on release-ability and information-sharing causes barriers and prevented allies becoming integrated into our system. Some policy changes need to be made to improve our interoperability and we have to make a concerted effort.

"Our foreign military sales (FMS) programme should include interoperability from the design phase of platforms, so we must be able to import capabilities from our allies."

One couldn't help thinking he had the Saab GlobalEye, on his mind. The multirole swing role surveillance system provided a solution that the US could not provide for several reasons with export controls being a major factor, which has resulted in the

UAE spending \$2.5 billion on five aircraft since 2015.

He highlighted the defense exportability features programme – a big shift in the design and exportability of a platform over its life cycle. He told the audience there were 18 such DEFP programmes to date, although didn't give any further details, to increase interoperability with allies and partners.

DEFP tries to work around the USA's challenging arms exports controls.

He finished: "We must harness the power of information and share – we all should work together and we are approaching that turning point of change."

The UAEAF&AD is spending a lot of time and money creating a command-and-control network, with the integration of new ISR platforms like GlobalEye, bringing new information to create a better air battle management system.

Defeating ballistic missiles is a major factor. UAEAF&AD commander, Major General Staff Pilot Ibrahim Nasser Al Alawi told delegates: "The production of a new

multi-domain operational capability with manned-unmanned teaming brings a variety of C41STAR technologies. A new C41STAR set-up will greatly enhance our defences and we can share the bigger battlespace picture."

Reading between the lines it was easy to see that the commander was frustrated with the lack of trust shown by the US. "Over the

"Thinking differently means knocking down archaic policies that prevent us from sharing data with our warfighters. It's about what we can do with our allies and partners. When we strengthen our partnerships and allies, we amplify power – we increase our collective security."

GENERAL CHARLES Q BROWN
US AIR FORCE CHIEF OF AIR STAFF

past decade there have been newer emerging threats.

"These fundamental changes in warfare mean we have to keep abreast of the evolving threats posed by the fusion of new structured technologies by various terrorists and criminal groups. Its giving rise to a new kind of warfare and traditional military systems must be prepared to fight and defend," he said.

"But to confront these new threats, there must be access to [our partners] information and networks across the various air, land, maritime, cyber and space domains. The command-and-control uptick will allow the flow of information from these various routes and sensors."

"Fusing the info across nodes and gateways will be a transformational change on the way we work.

"Artificial intelligence will help to push information from sensors within seconds but a certain level of trust has to be achieved in order to expose the data across the cloud. Shared data is an important aspect of any networked system." ▲

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LTME's coming back strong with it's Aeroshark innovation

JILL STOCKBRIDGE REPORTS

Companies tend to emerge from periods of difficulty stronger and wiser, and that is what Ziad Al Hazmi, the head of Lufthansa Technik Middle East (LTME) is seeing in the regional MRO sector in the wake of the coronavirus

LTME is at the Dubai Airshow in confident mood as the benefits of reorganising and restructuring over the past 18 months begin to pay off.

Al Hazmi expects that the gradual pick-up of business, from the start of the year, will have carried the company to "about 90% of where we were pre-pandemic" and set it on course for a planned 30% increase of capacity for next year.

He acknowledged 2020 "was tough for everybody in the industry". It made LTME, its customers and competitors, look at their businesses "out of the box".

The result has been a drift toward cooperation, as Al Hazmi explained: "Partnerships and collaborations are the way to go."

He cited LTME's new bilateral



"We're seeing increasing demand for base maintenances"

TIM BUTZMANN



"Partnerships and collaborations are the way to go"

ZIAD AL HAZMI

arrangements with Joramco and GMR Aero Technic as examples. Both, he added, were "working very well" and "adding value" through exchanging ideas and best practices. "Hopefully, we'll be doing more."

At the show, Lufthansa Technik will be promoting digitalisation of the industry, with special focus on Aviatar, a platform that offers a one-stop-shop of digital products and services for the entire industry. This supports what Al Hazmi described as a "huge drive" toward increasing efficiency with artificial intelligence (AI), big data, robotics etc.

It's the platform for the moment, confirmed Tim Butzmann, Lufthansa Technik's senior director corporate sales Middle East and Africa. From his perspective,

there's a strong recovery under way. International traffic is returning and domestic markets, such as Saudi Arabia, seem to be picking up tremendously.

"Local carriers tell us their load factors are looking brighter. This is very encouraging," he said. "Some things are directly proportional, so the load in our component shops is significantly improved, compared with six months ago."

"We're seeing an increasing demand for base maintenance and it's now not that easy to accommodate the requirements and find slots for our customers."

One area lagging behind is engine servicing. Butzmann said operators were opting to use green time on engines while aircraft utilisation remained low.

Carriers were once again asking for longer-term agreements, and naturally using the crisis to get a good deal. "Not just in our region, but activity in negotiating engine agreements is pretty intense in general just now," he said.

One change that Lufthansa Technik has seen is a focus on managing



AeroShark's aerodynamic properties promise improvements in fuel use

the situations resulting from the crisis – aircraft reactivation, for example. Operators were also "ringing to discuss future topics again".

The MRO has noted an increased demand among its customers to talk about improvements in efficiency and sustainability. One solution from the company is its revolutionary AeroShark, innovative sharkskin technology

announced last May and on show at Dubai for the first time.

Butzmann described it as an adhesive film whose aerodynamic properties have been shown to improve fuel efficiency performance of an aircraft. It's a claim Lufthansa Technik can back up with statistics, thanks to new fuel analytics and tools it has developed to monitor and measure directly

comparable flight dynamics.

"AeroShark is already in use on a Lufthansa Boeing 747-400 test bed, which received the required supplemental type certification (STC) and first flew in December 2019 to prove the technology," he said. "The next milestone is that we will start applying it to the entire Lufthansa Cargo Boeing 777 fleet in early 2022."

Judging by indications of interest from local airlines, the skin technology could soon start appearing on Middle East fleets. That could lead to ramping up Lufthansa Technik's regional business faster than envisaged and create a new challenge: recruitment.

With foresight, LTME last year focused on building up its partnerships with UAE educational institutes, adding an agreement with Abu Dhabi Polytechnic (ADP) to those it already had with the American University of Sharjah and Emirates Aviation University.

Al Hazmi is proud to see UAE college interns – including women – making up 10% of his workforce of about 100. ▲

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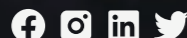
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Lockheed Martin

ALAN PEAFORD REPORTS

The world's largest aerospace manufacturer – Lockheed Martin – is at the show. How are views changing over future threats?

Partnerships are key in new network-centric world of defence

It is not just the global pandemic that has had an impact on aerospace and defence over the past two years.

Threats to governments have changed and there is a new way of working as defence and security manufacturers move their core attention away from platforms.

Lockheed Martin is at the Dubai show reflecting that change and presenting its vision for 21st century security solutions by focusing on network-centric technologies.

The US business will present advanced network-based security threats across all domains – land, air, sea, cyber, and space.

It will be demonstrating how multi-domain operations or joint all-domain operations (MDO/JADO) can synchronise major systems such as aircraft, ships, ground vehicles, satellites, and missile defence systems to improve situational awareness and accelerate decision-making in the field.

For Bob Harward, chief executive of Lockheed Martin Middle East, it is not just about platforms and systems but also about partnerships and an industry coming together.

“Like all air shows, our priorities are always partnerships, partnerships and partnerships,” Harward said. “And, in this case, it’s with the UAE, other countries in the region, and all the players who will be there participating in the defence industry. And, what’s exciting, is we’re back to meet up in person. So, this is the first in-person air show in ‘21. But, you know, there’s some strategic issues we’re going to be focused on.”

One issue is network-centric defence and just how allied forces

can tie in and bring networks and assets together to connect and pass information to assess and be prepared for 21st century threats.

Lockheed Martin has, historically, evolved to meet the changing threats, and Harward believes this time is no different.

“Lockheed Martin, has traditionally been a platform company. And we and our partners have a large range of platforms and we are more focused now on how we tie all those together,” he said. “How do we leverage all of those different platforms and their capabilities to support each other?”

“If you have the F-35 flying, which is part of that network, it can leverage the information they’re getting from Patriot, the information they’re getting from any of those other platforms and sensors, be it radars, satellites, or anything.”

“And it’s not only pulling it in but distributing it out as well. So, each of those commanders can see the information that’s available and make well-informed decisions to enhance the capabilities of all the platforms.”



“Our priorities are always partnerships, partnerships and partnerships”

BOB HARWARD
CHIEF EXECUTIVE,
LOCKHEED MARTIN MIDDLE EAST

Lockheed Martin

Lockheed Martin sponsored Saturday’s air chiefs’ conference, which focused on the network-centric defence systems. Recent geopolitical threats have seen the need for greater cooperation and interoperability has been essential.

History and experience

“These people have the experience,” Harward said. “They were in Bosnia, they were in Yemen, they were in Syria, they were in Afghanistan. They have a long history of military engagement and deterrence; more importantly, probably, the deterrence, so they built a lot of experience with those platforms.”

Partnerships and increasing participation in coalition exercises has made a difference. Following the Abraham accord and the warming of relationships with Israel, people have seen even more opportunities for collaboration.

“As they bring those new capabilities online and become a better network, they’ll be able to incorporate other players and assets. They have to allow this network to be very broad, very comprehensive, and, most importantly, very capable. That serves as a great deterrent to some of the hostile threats,” said Harward.

The challenge, he added, is identifying a roadmap with the new technology that’s coming online, which gives seamless and secure connectivity with all those platforms.

“Some of those platforms were procured through different countries, different agencies, and what network they’re leveraging will have to be identified first, and then mapped. We’re currently working with our UAE partners to do just that,” he concluded. ▲

defence ▲

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**DASSAULT
AVIATION**

ALAN DRON REPORTS

Boeing is in discussions with at least one Middle East nation for an armed version of its T-7A Red Hawk advanced trainer, as the company starts to cast its net wide for export customers for the new aircraft

Boeing getting Hawkish over military options

Boeing is in the second phase of flight-testing of the single-engined jet, being developed with Saab of Sweden to fulfil a longstanding US requirement for a new trainer to replace the 1960s-vintage Northrop T-38 Talon.

The US Air Force (USAF) has contracted for 351 T-7As, but Boeing foresees the aircraft competing for a potential market of up to 2,600 aircraft worldwide.

“Executing on the US Air Force contract for the T-7A Red Hawk is our top priority right now,” said Rick Lemaster, business development leader, Middle East, North Africa, Turkey and Israel in a pre-show briefing.

“We’re in discussions with several customers on their requirements, including here in the Middle East, for a light-attack variant.”

Discussions with the UAE during the show are likely to revolve around the T-7A, of which a model will be at the show, together with the CH-47 Chinook programme and the Integrator extended range (ER) unmanned air vehicle (UAV).

The UAE flies 20 examples of the CH-47F, which makes it the largest export operator of the model.

Significant components

Boeing says it is also seeking to expand its industrial cooperation with UAE companies, in both the military and civil spheres. The UAE supplies several significant components for Boeing’s commercial aircraft.

Elsewhere in the region, the US company has stepped up its involvement in both Saudi Arabia and Qatar over the past year with additional contracts to support those two nations’ F-15 Eagle

fighter aircraft.

In Qatar’s case, these developments support the new, advanced F-15QA variant.

Boeing rolled out the first example of the F-15QA in August and the initial aircraft from 2017’s 36-strong order are scheduled to fly to the emirate later this year.

Boeing has been providing maintenance and logistics support for the Qatar Emiri Air Force (QEAF) during pre-delivery pilot training, which began earlier this year.

The company will establish and operate an aircrew and maintenance training centre for the QEAF at Al Udeid Air Base in Qatar, while also providing in-country spares and logistics support once the aircraft are delivered.

The QEAF is undergoing a huge expansion over the next few years, with 36 Dassault Rafales and 24

Eurofighter Typhoons joining the F-15QAs. Intriguingly, Boeing says it is interested in talking to Qatar about its KC-46 Pegasus tanker aircraft. A KC-46 purchase would significantly extend the range of Qatar’s new frontline aircraft.

In Saudi Arabia, Boeing says it is pursuing opportunities for the CH-47, the AH-64 Apache and Airborne Early Warning & Control

aircraft – presumably the Boeing 737-based Wedgetail. The Royal Saudi Air Force currently operates the earlier-generation E-3A AWACS. It is also building eight CH-47Fs for the kingdom.

Meanwhile, delivery is expected imminently of 28 Boeing F-18E/F Super Hornet Block IIIs to Kuwait, as replacements for earlier-generation Hornets. The last of the batch was delivered to the US Navy in September, prior to their transfer to Kuwait.

Kuwait is also seeking to buy eight AH-64 Apaches and wants its existing 16 AH-64Ds remanufactured to the new AH-64E standard.

A similar remanufacturing request to upgrade 43 AH-64Ds has also come from Egypt, while in 2020 Boeing received a contract from Morocco for 24 examples of the attack helicopter. ▲

“Executing on the US Air Force contract for the T-7A Red Hawk is our top priority right now... We’re in discussions with several customers ... including here in the Middle East, for a light-attack variant”

RICK LEMASTER BOEING

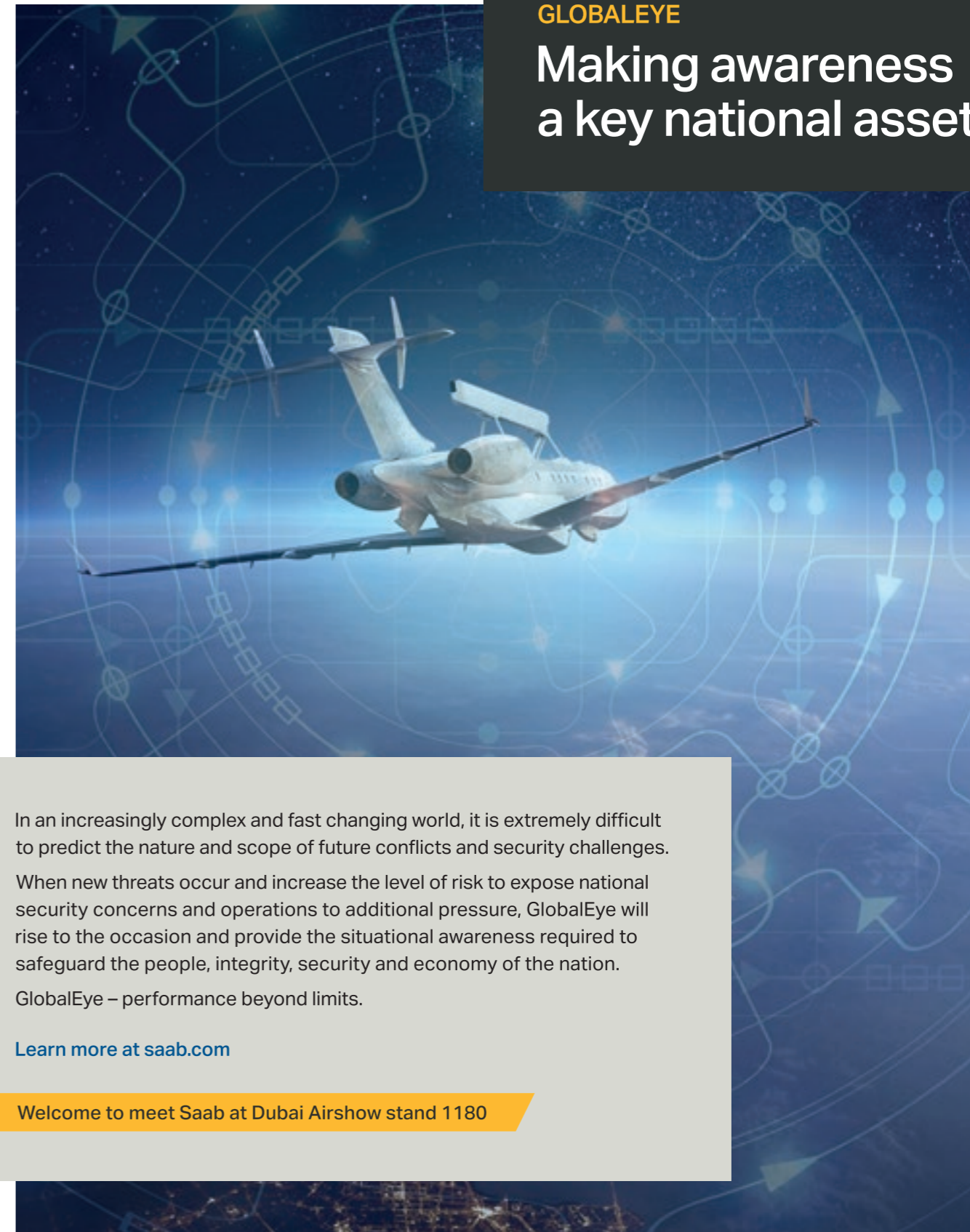


Production of the T-7A Red Hawk trainer is now under way. Boeing is talking to potential customers at the show

Boeing

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After an exciting start to Dubai Airshow, we're set for another action packed day 2. Thousands of global aerospace community members have turned out and enjoyed networking live in person once again, while viewing all the new products the big industry players have to offer.

DAY 2 ACTIVITIES

Today sees the launch of the VISTA 2021 Pitch Competitions! 3 challenges have been set with the winners going through to the final on Thursday and a chance to win up to \$25,000 for their business. Make sure you head over to the Start-Up stage in the VISTA Startup Hub. There are also guided tours to enjoy, just login to the Dubai Airshow app and book your timing to walk around the exhibition and learn about all the new products on display. With over 160+ Aircraft on the static display make sure you allow enough time to view them all! All maps for the exhibition hall and static display can be found on our mobile app.

FISH TANK TALKS

A rare opportunity to become a fly on the wall, this aquarium like live broadcast space creates an opportunity for engaging content to be delivered in a unique way. Important talks and discussions take place within a glass meeting room as visitors can listen in through headphones and capture the discussions as they unfold live.

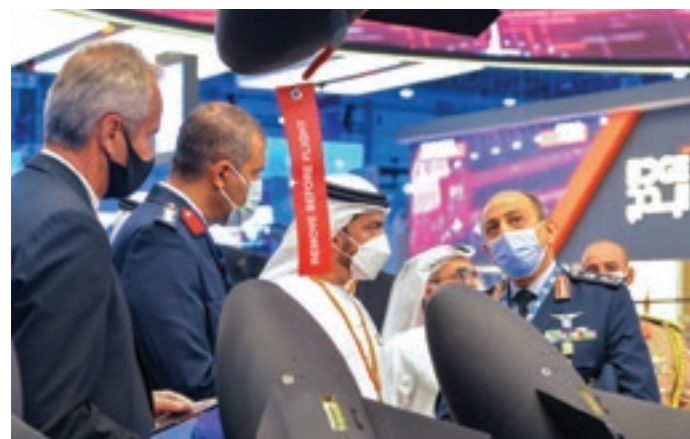
Monday 15th November - Fish Tank Talks Schedule

Time: 13.30-14.00

Topic: Apollo 16 moonwalker and UAE astronauts talk about space, mission preparation and planning and the experience of being an astronaut.

Speakers:
Charlie Duke, Apollo 16 Moonwalker
Sultan Al Neyadi, UAE Astronaut
Hazzaa Almansoori, UAE Astronaut

Interviewed by:
Matthew Cochran, Chairman and CEO, Defense Services Marketing Council (DSMC)



HUB STAGE – GATM

After the success of the last 3 editions, we are bringing the Global Air Traffic Management conference back, live and in person to the Dubai Airshow. GATM will serve as a platform to reconnect ANSPs and CAAs to discuss shared challenges, solutions, and contingencies for this new era.

10.35	KEYNOTE PANEL: DISRUPTION AND CRISIS MANAGEMENT - MANAGING UNPREDICTABLE RISK <ul style="list-style-type: none"> Tatevik Revazian, Director General of Civil Aviation Committee, Government of the Republic of Armenia Ryyan Tarabzoni, CEO, Jeddah Airports Company Ahmed Al Jallaf, Assistant Director General Air Navigation Service, GCAA Norbert Haslacher, CEO, Frequentis Neil Bowles, Executive Vice President, Business Development & ATM, Searidge Moderator: Kamil Al-Awadhi, Regional Vice President, Africa & The Middle East, IATA
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TECH XPLORE – CYBER SECURITY

The aviation digital landscape continues to expand constantly making it difficult not just to manage risk but also to gain insights into potential threats. Join us as we bring together industry experts and thought leaders at the Cyber Security in Aviation Conference to collaborate and discuss solutions to the most imminent cyber security challenges.

10.30	OPENING KEYNOTE PRESENTATION <ul style="list-style-type: none"> H.E Dr. Mohammed Al Kuwaiti, Head of Cyber Security, UAE Cyber Security Council, UAE Government
	KEYNOTE PRESENTATION BY DUBAI ELECTRONIC SECURITY CENTER (DESC) <ul style="list-style-type: none"> Faisal Abdulaziz, Manager of Security Systems Operations Section, Dubai Electronic Security Center (DESC)

AEROSPACE 2050 – AVIATION SUSTAINABILITY

Will the aerospace industry be able to make a viable business case for sustainability post-pandemic? Are the net zero emission targets achievable by 2030? Sustainability has never been more important. Join aircraft manufacturers, airline operators, airports and suppliers who are coming together to discover how to build back better and greener!

10.35	OPENING KEYNOTE PANEL: UAE'S COMMITMENT TO SUSTAINABILITY: CREATING A MORE SUSTAINABLE CIRCULAR ECONOMY <ul style="list-style-type: none"> Tony Douglas, Group Chief Executive Officer, Etihad Aviation Group Chris Raymond, Chief Sustainability Officer, Boeing Julie Kitcher, Executive Vice President Communications and Corporate Affairs, Airbus Rob Watson, Director, Rolls-Royce Electrical Moderator: Joseph McMonigle, Secretary General, International Energy Forum
	PRESENTATION: THE DISRUPTIVE TECHNOLOGIES ACCELERATING SAF DEVELOPMENT <ul style="list-style-type: none"> Andreea Moyes, Global Aviation Sustainability Director, Air bp

VISTA – STARTUP STAGE

STARTUP PITCH DAY

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Challenge 2: In conjunction with AWS and MBRSC

- "Palm Trees Detection Challenge, develop an end-to-end deep learning or machine learning model to automatically detect palm trees from RGB aerial imagery"

Challenge 3: The Vista Innovation Cup

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KEY INFORMATION



OPENING HOURS

Sunday 14 - Thursday 18 November: 10:00-17:30



Shuttle Buses: A daily shuttle bus service will run between the Dubai Airshow Site, the Ibn Battuta Metro Station and the Expo Metro Station.



Taxis: Demand for taxis in Dubai can be high especially at peak times. We strongly recommend the shuttle bus service as the quickest way to and from the Airshow site.



First Aid: Outside the exhibition hall, next to the Air Traffic Control Tower.

FLYING DISPLAY

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FLYING DISPLAY - DAY 2 MONDAY

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14:00	Surya Kiran	Indian Air Force
14:30	TEJAS	Indian Air Force
14:39	AW609	Italy (Leonardo)
14:49	Airbus A 350	Airbus
14:59	Super Mushak	Pakistan Air Force
15:09	MC 21	Russia (Irkut)
15:19	F 16 US	US Air Force
15:34	MI-28	JSC Russia
15:39	Mirage 2000	UAE AFAD
15:48	ANSAT	JSC Russia
15:53	Boeing 777-X	Boeing
16:01	F16 UAE	UAE AFAD
16:10	MV 22 Osprey	US Marines
16:17	C2 Kawasaki	Japanese Air Force
16:30	Russian Knights	Russian Air Force

COMMENTATORS

First Lt. Hazza Fahad Al Nuami, UAE Air Force
Joe McGrath

FLYING CONTROL COMMITTEE (FCC)

Brig. Gen. Staff. Pilot Abdulsalam R.Al Mehairbi, Chairman - FCC
Ibrahim Ahli, Deputy Chairman - FCC, Deputy CEO, Dubai Air Navigation Services

PROGRAMME SUBJECT TO CHANGE

CHLOE GREENBANK REPORTS

After nearly 90 years of activity in the region, Air bp is building on its strong history

Don't underestimate Baghdad... Air bp bullish over its Middle East future

Having last attended the Dubai Airshow in 2019, Air bp is delighted to be back supporting this year's event, with Anthony Leon, the company's senior asset director, MENA, underlining that it "sees a strong future in the Middle East".

Air bp, which has been active in the region for nearly 90 years, has commenced a joint venture (JV) at Baghdad International Airport in Iraq.

The JV, United Iraqi Company for Airports and Ground Handling Services Limited, is operating under the name MASIL. Its remit is to bring world-class standards and global industry expertise to further improve the customer experience, safety and operational standards at the airport.

Duce Gotora, VP of strategy and sustainability, said: "Fuel supply is a vital component of the airport operation that will add value to airline operators. Over time, Air bp and its partners aim to build a strong and sustainable business in Iraq, drawing upon the global expertise of the partners, combined with the local skills of Iraqis."

With the addition of Baghdad, Air bp currently markets fuel at 20 locations through the region providing fuel and services to around 190 general aviation, commercial aviation and military customers.

It recently extended its concession at Erbil International Airport to 2054, where it is the majority shareholder in MMAFCO, the JV at the airport, and has worked closely with the Ministry of Natural Resources and the largest local refinery (KAR) to enable stable jet fuel production and supply in line with international standards.

The new agreement will also see Air bp rehabilitate Erbil Airport's fuel farm.

The company has also



Air bp waits to fuel an Emirates Airline flight at Dubai Services Limited

successfully deployed its award-winning airfield automation technology at Dubai International Airport and Sharjah Aviation Services Company at Sharjah International Airport.

The innovative technology has been designed to enhance reliability in airport fuelling operations and has been well received by operators, who have reported increased efficiency in refuelling.

Core strategy

Looking ahead and with Air bp committed to continuing its investment and expanding its presence in the Middle East, sustainability is at the core of the company's strategy.

In September, parent company, BP, joined forces with the Abu Dhabi National Oil Company (ADNOC) and renewable energy firm, Masdar, to form a strategic collaboration to explore opportunities to provide clean energy solutions for the UAE and the UK.

As part of this collaboration, the three companies intend to work together to seek to pioneer

decarbonised air corridors between the UK and the UAE – one of the busiest global air travel routes.

Air bp has also recently unveiled its 'book and claim' solution. With certification provided by the Roundtable on Sustainable Biomaterials (RSB), this solution provides customers with wider market access for the optimal supply of sustainable aviation fuel (SAF).

To ensure the wider adoption of sustainable air travel, Air bp underlines that investment in advanced technologies is required to process SAF feedstocks more efficiently at greater scale, as well as investment in the development

of sustainable and scalable feedstock options.

Leon explained that governments have a role to play here. "Increasing SAF production requires long-term policy certainty to reduce investment risks, as well as a focus on the research, development and commercialisation of improved technologies and innovative sustainable feedstocks," he said.

The company is, however, confident that the aviation industry's low carbon goals are achievable. "Investments in more efficient aircraft, improving operations efficiency and infrastructure, optimal flight airspace planning, use of SAF, future energy such as hydrogen and electric, and carbon offsetting will all be integral to achieving those goals," concluded Leon.

Air bp's global aviation sustainability director, Andrea Moyes, will be presenting a session on disruptive technologies accelerating SAF development, which will take place during the show's aviation sustainability conference tomorrow. ▲

"Fuel supply is a vital component of the airport operation that will add value to airline operators. Over time, Air bp and its partners aim to build a strong and sustainable business in Iraq"

DUCE GOTORA VP OF STRATEGY AND SUSTAINABILITY

2022



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Aeroshark surface film

MARK PILLING REPORTS

Small riblets in Lufthansa Technik's new surface film mimic dermal denticles in shark skin to help reduce drag: turning to one of the ocean's oldest inhabitants for it's latest innovation

By the teeth of their skin...

AeroShark takes a bite out of CO₂ emissions

Two blue model sharks are swimming above the heads of visitors to Lufthansa Technik's stand here at the show, providing a visual cue for its AeroShark product, a surface film that mimics the fine structure of a shark's skin.

Lufthansa Technik and its partner, BASF, have been working on the film for years. It really is based on scientific work that examined how a shark's skin helps reduce water friction when the beast is powering through the water, explained Ziad Faisal Al Hazmi, chief executive of Lufthansa Technik Middle East.

There is a demonstration patch of the skin on the Aeroshark on Lufthansa Technik's stand, with visitors able to faintly detect the small riblets in the skin with their fingertips.

Lufthansa Technik is hoping to generate interest from customers who want to use the skin on their aircraft to help reduce drag and,

thus, improve fuel consumption, said Al Hamzi. The launch customer is Lufthansa Cargo, which will roll it out on its entire Boeing 777F freighter fleet from the beginning of 2022.

Lufthansa Technik estimates a drag reduction of more than 1% will be achieved by using the Aeroshark film. For the entire fleet of 10 aircraft, this translates to annual savings of around 3,700 tons of kerosene and just under 11,700 tons of CO₂ emissions, which is the equivalent of 48 individual freight flights from Frankfurt to Shanghai.

"It is based on scientific work that examined how a shark's skin helps reduce water friction when the beast is powering through the water"

ZIAD FAISAL AL HAZMI CHIEF EXECUTIVE, LUFTHANSA TECHNIK

The Aeroshark project is a collaboration between the BASF coatings division and Lufthansa Technik, which is responsible for the material specification, approval by the aviation authorities, and performance of aircraft modifications carried out as part of regular maintenance layovers.

To meet the strict requirements of the aviation industry and the elements, including UV radiation, BASF focused on developing extreme durability and weather resistance for Aeroshark. It also had to be simple to apply, handle and repair.

"We have always used our wealth of expertise as a global market leader in technical aircraft services to also contribute to reducing the ecological footprint of our industry. In doing so, we can leverage significant savings potential from all aircraft generations," explained Dr Johannes Bussmann, chief executive of Lufthansa Technik.

"I am, therefore, very proud that we will soon be able to transfer the positive findings of the validation phase into the series application with Lufthansa Cargo," said Bussmann. "The extremely constructive collaboration with BASF is also the best example of cross-sector cooperation in the interest of the sustainability of the aviation industry."

Climate protection progress

Dr Markus Kamieth, member of the board of executive directors of BASF, added: "The aviation industry is facing similar challenges to the chemical industry: ongoing progress must be made with climate protection despite high energy requirements.

"By collaborating closely and successfully combining our know-how in surface design and aerodynamics, we have now succeeded in taking a major step forward. This is an excellent example of sustainability in practice, achieved through partnership-based collaboration and innovative technologies."

The industry has been researching the use of sharkskin for aircraft for many years, albeit often just on a small scale. For the first time at the end of 2019, Lufthansa Technik and BASF fitted almost the entire lower half of a Lufthansa Boeing 747-400's fuselage with 500sqm of a sharkskin surface and had this modification certified by EASA.

This aircraft subsequently validated the savings potential of the technology on scheduled long-haul services during more than 1,500 flight hours. The savings for the Boeing 777F are estimated to be even higher compared to a passenger aircraft, partly because the application areas are even larger due to the absence of window rows on a freighter. ▲



Flying frenzy: Initial calculations suggest use of sharkskin technology could reduce CO₂ emissions by as much as 3%. Ziad Faisal Al Hazmi with the model at the show

Drink it in! Every night is ladies' night, somewhere...

Fancy a girls' night out? You'll be spoiled for choice

Ladies' night is now every evening somewhere in Dubai, with many of the bars, rooftop facilities, and upscale restaurants offering free drinks and discounted meals.

Here are just a handful...

If you're finishing at the show early and want to let your hair down at the beach – head to Barasti (Le Méridien Mina Seyahi Beach Resort & Marina). Women get free pool and beach access. And, if you buy a food item for Dhs50, you'll get free-flowing selected drinks from 10am until 4pm.

For a bit of craic, McGettigans JLT (next to the Bonnington Hotel), known for its live music, comedy, and sport screens, offers three free selected drinks when getting a Dhs50 food voucher from 6pm-10pm.

For a fancy Monday night, try Nobu and the world-renowned Atlantis the Palm. The famous eatery holds a ladies' night from



Above: Glad rags on ladies... So many venues, so little time!

8.30pm-11pm, offering three complimentary drinks and discounted tapas.

For a Tuesday night, STK JBR (Jumeriah Beach Residence) has a great New York vibe and serves up mouth-watering steaks.

Women enjoy three complimentary drinks with a two or three-course menu for AED 200 and AED 240 respectively.

For music lovers, try Tribeca (Ocean View Hotel Jumeriah Beach). This American restaurant and bar hosts different themed nights every week, including open-mic night on Sundays, where local talent can showcase their music.

On a Tuesday, Latin fiesta night offers free drinks for women from 8pm-11pm. ▲

DINING OUT

A bay that's just the business

Business Bay district is home to lots of new hotels and restaurants including SLS Dubai, which offers unobstructed views of the Burj Khalifa, as well as Dubai Creek.

Its restaurants include the female-led Italian Fi'lia Dubai, which features 'honest Italian food', and Carna by Dario Cecchini, a contemporary steakhouse located on the 74th floor, featuring super cool décor.

After dinner, head up to rooftop bar, Privelege, where two infinity pools are placed at the top of the 75 stories, with stunning city views.

ME Dubai by Melia Hotel is located in the highly distinctive Opus building, designed by the late Dame Zaha. Visitors can enjoy tapas in a 'modern, cosmopolitan way' at Central Cosmo Tapas & Bar. Its wine list offers a strong focus on Spanish and South American products. And you're sure to relax to the live performance from resident flamenco guitarist, Ramón Kailani.

At Roka, you can experience contemporary Japanese robata-yaki cuisine. Then, perhaps enjoy a gin and tonic at Botanica?



Get straight to The Pointe: a one-stop chill-out spot

The Pointe at Palm Jumeirah is a brand new resort with something for everyone – from the beach and shopping to alfresco dining. There are actually more than 80 restaurants and cafes to choose from.

The Pointe is located five kilometres out to sea and has a stunning 1.5km promenade, which can make a scenic walk after dinner.

Its centrepiece is a fountain display, which has lively

shows that can be viewed from the waterfront dining spots. It is also a great place for a photo opportunity with a backdrop of Dubai's iconic Atlantis The Palm.

Another great beachfront spot is La Mer. This is known as a chilled out one-spot destination with wide open spaces, palm tree-lined boulevards, graffiti art murals, loads of eateries, ice cream stores, little shops and market stalls, as well as a waterpark and water sports!

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