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ARABIAN AEROSPACE

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

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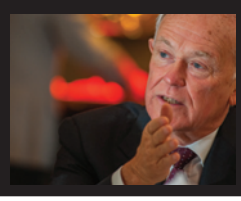

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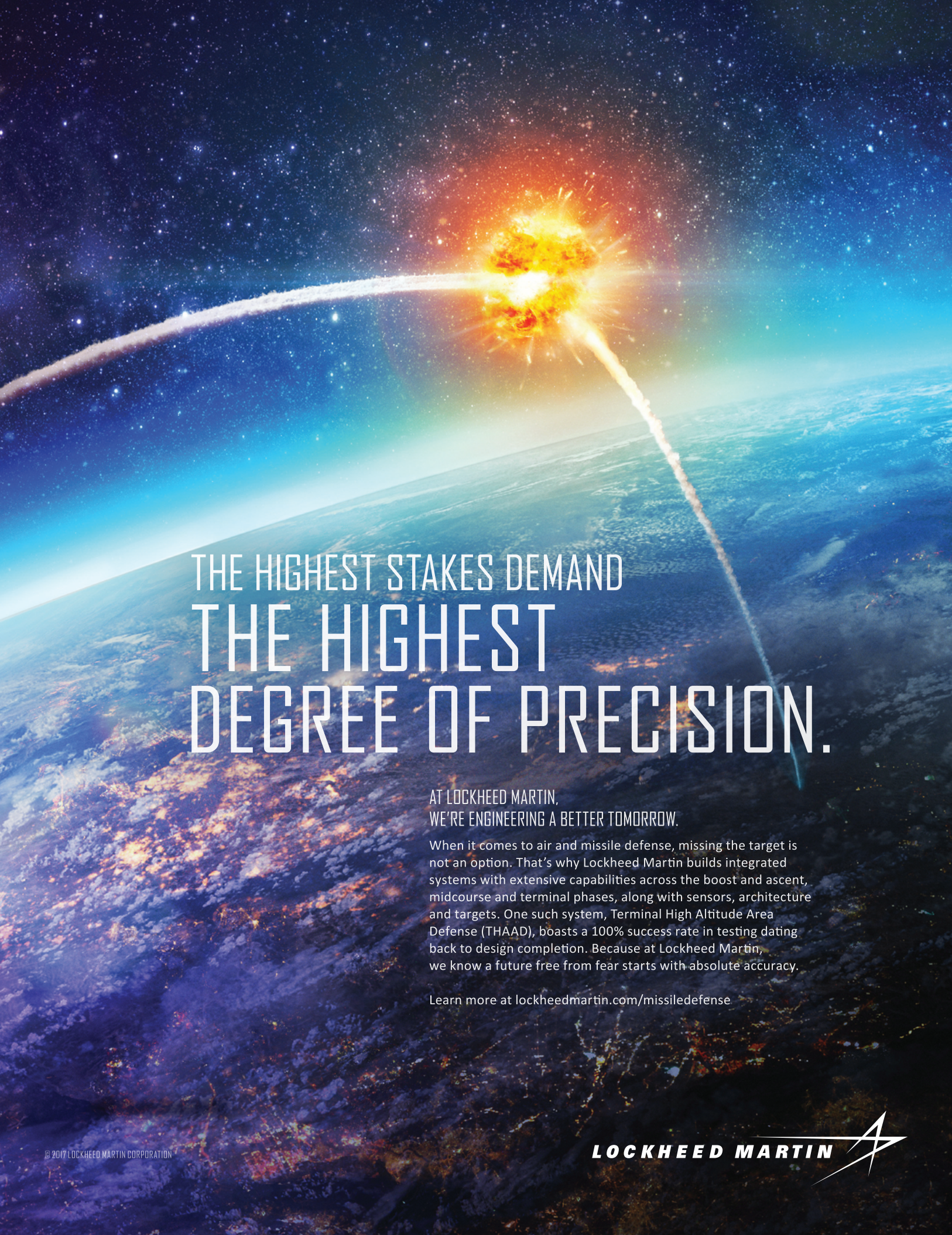
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How will the US Trump card play out?

As this issue goes to press, the 45th president of the United States has just been sworn in – and, while this event is half a world away, it could have immense impact on the aviation and defence industries in the Middle East.

Having been chairing conferences across the whole region during the past year, Donald Trump's name has been raised at all of them. In general – and perhaps a little surprisingly – many have been positive, from Tehran to Riyadh there has been a common message that "this is a businessman. He will want to do business."

But others fear protectionism and Islamophobia could outweigh business benefits as a new era begins for the west.

Congressional Republicans are fighting to counter the nuclear accord with Iran that paved the way for the huge aircraft orders from Iran for both Airbus and Boeing. The US House of Representatives has already passed a bill seeking to restrict financial transactions by US banks in an effort to block the sale of the passenger jets to Iran.

Such a move could affect up to 100,000 jobs in the United States and tens of thousands in Europe.

Trump has said the US should halt Saudi oil imports and demand "many billions of dollars" for the military defence of Saudi Arabia, and questioned military sales to the kingdom.

But, overall, it seems the region expects the strength of historic ties to hold firm and for business sense to prevail.

The Saudi Oil Minister, Khalid Al-Falih, who is also the chairman of Aramco, summed it up when he said the Saudis were waiting for Trump's presidency to get under way, as his presidential campaign had amounted to "50,000 feet of announcements" that may change.

History has shown us that cooperation and shared effort wins out. I hope that President Trump does succeed in making "America Great" and does so through encouraging strong international ties and commercial relationships.

Safe landings.

Alan Peaford, Editor-in-chief

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COVER: Qatar Airways CEO Akbar Al Baker. **PICTURE: TOM GORDON/BILLYPIX**

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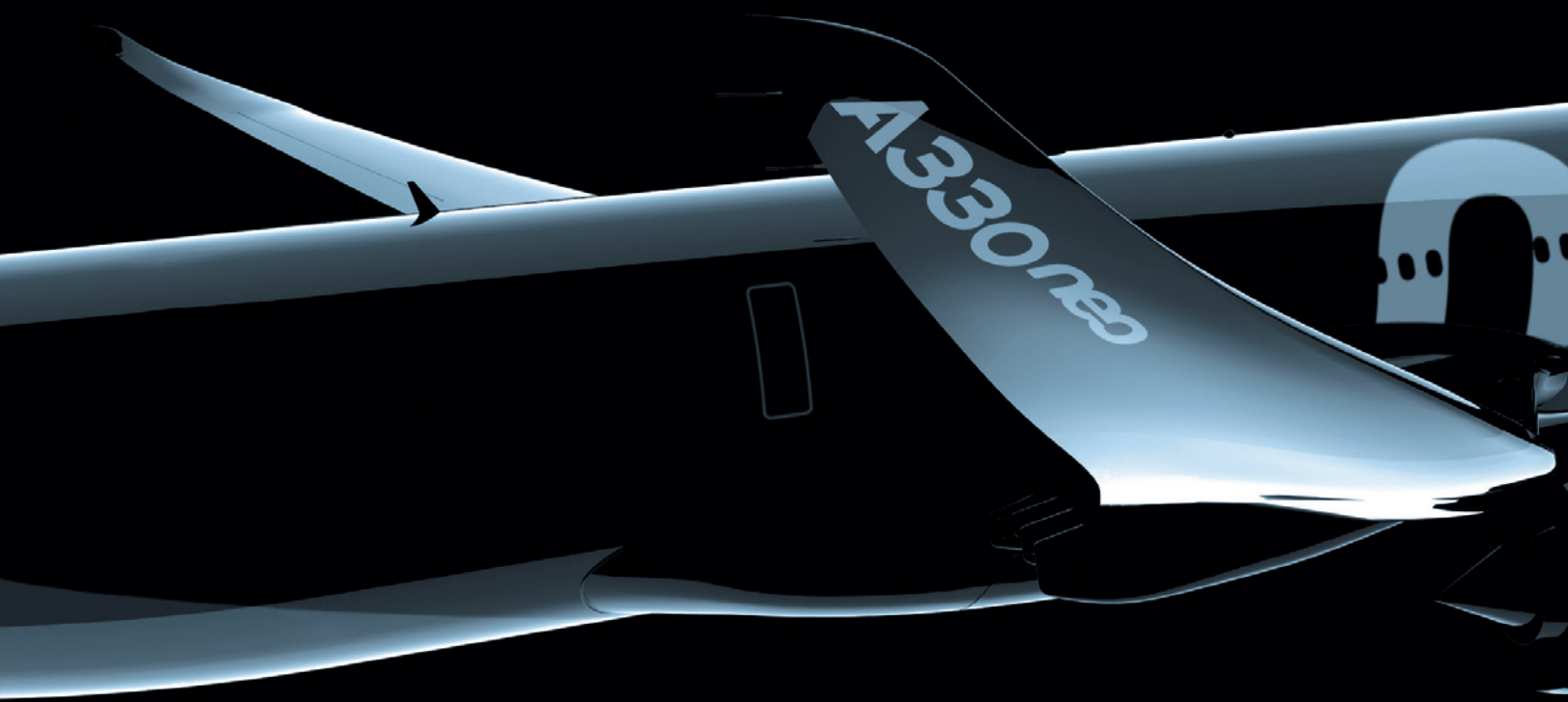

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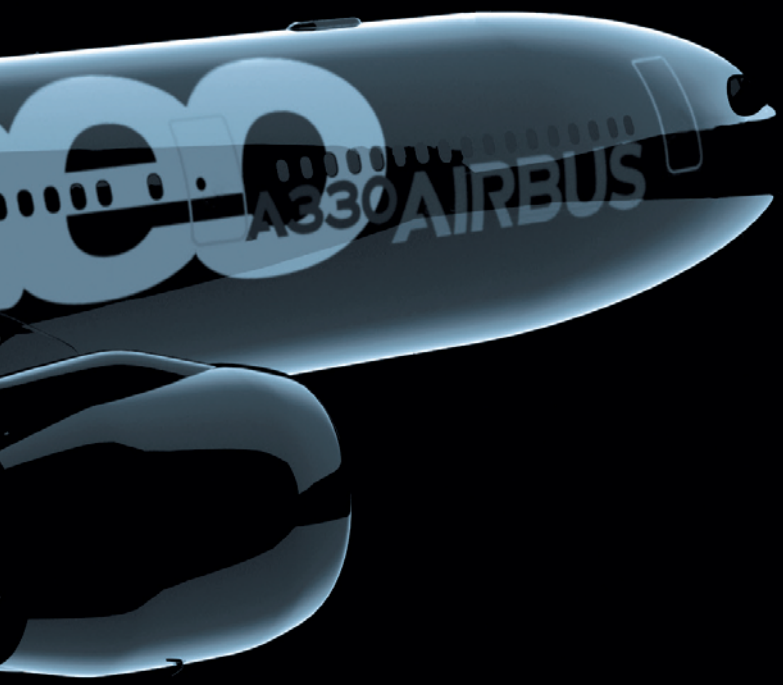

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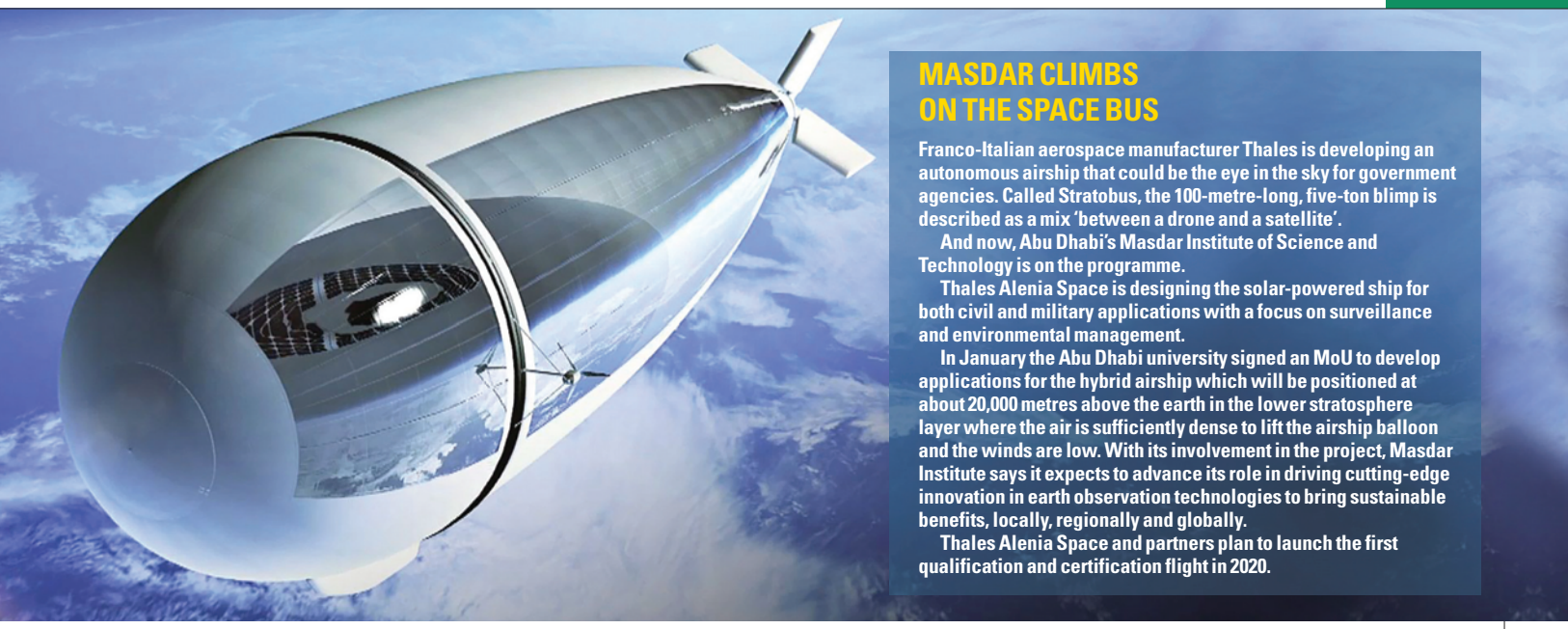

MASDAR CLIMBS ON THE SPACE BUS

Franco-Italian aerospace manufacturer Thales is developing an autonomous airship that could be the eye in the sky for government agencies. Called Stratobus, the 100-metre-long, five-ton blimp is described as a mix 'between a drone and a satellite'.

And now, Abu Dhabi's Masdar Institute of Science and Technology is on the programme.

Thales Alenia Space is designing the solar-powered ship for both civil and military applications with a focus on surveillance and environmental management.

In January the Abu Dhabi university signed an MoU to develop applications for the hybrid airship which will be positioned at about 20,000 metres above the earth in the lower stratosphere layer where the air is sufficiently dense to lift the airship balloon and the winds are low. With its involvement in the project, Masdar Institute says it expects to advance its role in driving cutting-edge innovation in earth observation technologies to bring sustainable benefits, locally, regionally and globally.

Thales Alenia Space and partners plan to launch the first qualification and certification flight in 2020.

Dubai airport funding bid

Dubai is looking to raise $3 billion to fund expansion of its two international airports and has hired HSBC to advise on raising the finance. The Dubai Government's Department of Finance says HSBC will advise it, the Investment Corporation of Dubai and Dubai Aviation City Corporation, on raising funds through various sources, including Islamic financing.

The emirate wants to boost annual passenger flows at its Dubai and Al Maktoum international airports from 78.5 million last year to 146 million by 2025.

AACO AGM venue

The Arab Air Carriers' Organization (AACO) has announced the dates for its 50th Annual General Meeting which will now be held in Sharjah - UAE, on 20 - 22 November 2017, hosted by Adel Ali group CEO of Air Arabia and the chairman of the AGM.

The Summit will begin with an opening ceremony on the evening of the 20th; working sessions take place on the 21st and the post-AGM networking event is on the 22nd.

Express delivery

Tunisia's Express Air Cargo has received its first aircraft. The 737-300 was positioned from Vilnius to Tunis Carthage International Airport on January 13. Configured in an all-freight layout, the 29 year-old aircraft is powered by CFM56-3B2 motors. A second 737-300 aircraft was at Istanbul Sabiha Gökcen undergoing pre-delivery maintenance checks as *Arabian Aerospace* went to press.

Bedtime bottle

Emirates has introduced new sustainable blankets made from 100% recycled plastic bottles.

The soft and warm blankets are made using ecoTHREAD patented technology and are now available in Economy Class on all long-haul Emirates flights.

Each Emirates ecoTHREAD blanket is made from 28 recycled plastic bottles which are recycled into plastic chips before being turned into yarn, creating a polar fleece material.

What a start…

Boeing and INJAZ Al-Arab have revealed that their start-up programme has supported the establishment of 60 businesses by Arab youth across the Middle East, including 23 in 2016 alone.

The programme was designed to bridge the gap between entrepreneurship education and economic success by supporting the creation of start-up ventures.

With Boeing's support, INJAZ Al-Arab embarked on creating a start-up programme for youth, accelerating their entrepreneurial talent into registered, operational ventures within an intense six-month period combining funding, training, mentoring and business operations.

A pilot programme was trialled by INJAZ Egypt and an evaluation was completed in 2014. Due to its success, the programme has now been rolled out to Algeria, Kuwait, Morocco, Oman and Qatar.

Flynas boosts fleet

Flynas, Saudi Arabia's leading low-cost carrier, has signed an agreement with Airbus for 60 A320neo Family aircraft. In addition to the 60 aircraft, Flynas has converted 20 A320ceo from a previous order to A320neo, bringing the airline's total firm order to 80 A320neo. The deliveries are scheduled to take place during 2018-2026.

Snake on a plane

An Emirates flight from Muscat to Dubai was cancelled in January after baggage-handlers discovered a snake in the cargo hold. A spokesperson for the airline said the snake was found before passengers boarded the aircraft and a full search took place before taking off to Dubai several hours later.

Honeywell double

Honeywell has signed an agreement with Arab Wings and Gulf Wings, both part of the International Wings Group, to provide its full suite of GoDirect cabin and cockpit in-flight connectivity services on more than 20 aircraft.

The technologies will enhance crew and passenger productivity, enabling them to stay connected via in-flight Wi-Fi while travelling.

E-mail security boost for Gulf Air

Gulf Air Dr Jassim Haji – Director of InformationTechnology at Gulf Air and Mohammad Ismail – VP of Sales at Shifra.

Security provider, Shifra, has equipped Gulf Air with a new e-mail security solution. Proofpoint Email Protection stops malware and non-malware threats, such as impostor e-mail – also known as business e-mail compromise, or BEC – and it provides granular filtering to control bulk 'greymail' and other unwanted e-mail.

Dr Jassim Haji, director of information technology at Gulf Air, said: "Information is one of the most critical assets for Gulf Air. Cyber security is one of the IT department's most important considerations. The e-mail service is one of the areas that opens us up to external threats and it is, therefore, important to be armed with the right secure gateway, complemented by up-to-date, advanced threat intelligence and protection features."

Opening up a new Field

US-based Field Aviation and Aselsan, a Turkish Armed Forces foundation company, are jointly developing a new special mission aircraft platform.

The platform is based on a Bombardier Challenger 605, which is being considerably modified to successfully accomplish the aircraft's specific mission requirements. The aircraft modifications include a missionized interior with multiple operator stations and critical structural aerodynamic alterations.

Mahan Aussie talks

Iran's Mahan Air is to open talks with authorities in Australia over the proposed launch of flights. This follows a new agreement between the two countries and is likely to allow for direct flights between Sydney Kingsford Smith, Brisbane International, Melbourne Tullamarine, and Perth International, and the Iranian cities of Tehran, Mashhad, Shiraz and Isfahan.

Dnata world grows

Dnata continues to strengthen its global businesses, which now span 83 countries. In the first half of 2016-17, Dnata announced its international operations accounted for more than 67% of its total revenue.

Libya lease deal

Libya's Buraq Air has wet-leased a B737-500 from fellow Libyan operator, Air Libya. The aircraft has been in service for Buraq Air on its Tripoli Mitiga-Tunis route since mid-December.

According to ch-aviation, Buraq Air's fleet consists of two B737-400s, one B737-500 (undergoing repairs at Tripoli International), and two B737-800s.

VIP Terminal opens at Dubai South

The VIP Terminal at Dubai South was officially opened in December. Doing the honours were Sheikh Ahmed Bin Saeed Al Maktoum, chairman of Dubai Civil Aviation Authority and chairman and chief executive of Emirates Airline and Group; Dr Sheikh Sultan Bin Khalifa Al Nahyan, advisor to the UAE president; and Sheikh Zayed Bin Sultan Bin Khalifa Al Nahyan.

The largest purpose-built facility of its kind in the world, the terminal is poised to be a game changer in the business aviation sector, offering VIP customers a seamless travel experience, coupled with time and cost efficiencies within a thriving aviation ecosystem.

Sheikh Ahmed Bin Saeed Al Maktoum said: "The launch of the terminal is yet another significant step towards realising Dubai's vision of becoming the aviation capital of the world."

TRI-umph: The three way deal is signed in Cairo.

Three-way deal seals new aircraft

EgyptAir, Boeing, and Dubai Aerospace Enterprise (DAE) have signed a cooperation agreement, including an order for eight Boeing 737 Next Generations (NG) aircraft.

Delivery of the first aircraft is expected in February 2017. Dubai-headquartered DAE is financing the deal.

This agreement emphasises a mutual commitment by Boeing and EgyptAir that dates back to 1969, said EgyptAir chairman and CEO, Safwat Musallam.

"The delivery of this new order will help us maintain EgyptAir's global flight schedule and continue to deliver a consistently great performance for our customers," he added.

That's the Spirit!

Ras Al Khaimah's Spatial has completed the successful installation of an A321 door trainer for American airline Spirit.

The device comprises L1, L3 and over-wing exits and provides full simulation of multiple malfunctions on each door, all controllable from fixed and mobile instructors' operating stations.

This is the third device Spatial has delivered to Spirit and was also the third the company had installed in the USA in 2016.

African adventure

Algeria's Tassili Airlines is to make its continental African debut during the first half of this year with Mauritania named as a likely new destination.

Speaking in Algiers, during an end-of-year press conference, the airline's chief executive, Belkacem Harchaoui, said the carrier had come under increasing pressure from Algerian Prime Minister, Abdelmalek Sellal, to operate more African routes and expand beyond the domestic and French routes currently served.

Kuwait cash blow

Kuwait Airways' hope for funding for 37 Airbus and Boeing aircraft hit a stumbling block in January when the country's National Assembly rejected an initial application to withdraw $1.96 billion from the country's general reserve fund that has been earmarked to cover payments for the aircraft, which were ordered as part of the airline's renewal and growth strategy.

$51bn for defence

Saudi Arabia has announced its budget for 2017, which sees an allocation of $51 billion for the kingdom's defence. Revenues are estimated at $184.5 billion. Two-thirds of this is from oil revenues, which are 46% higher than the 2016 projections.

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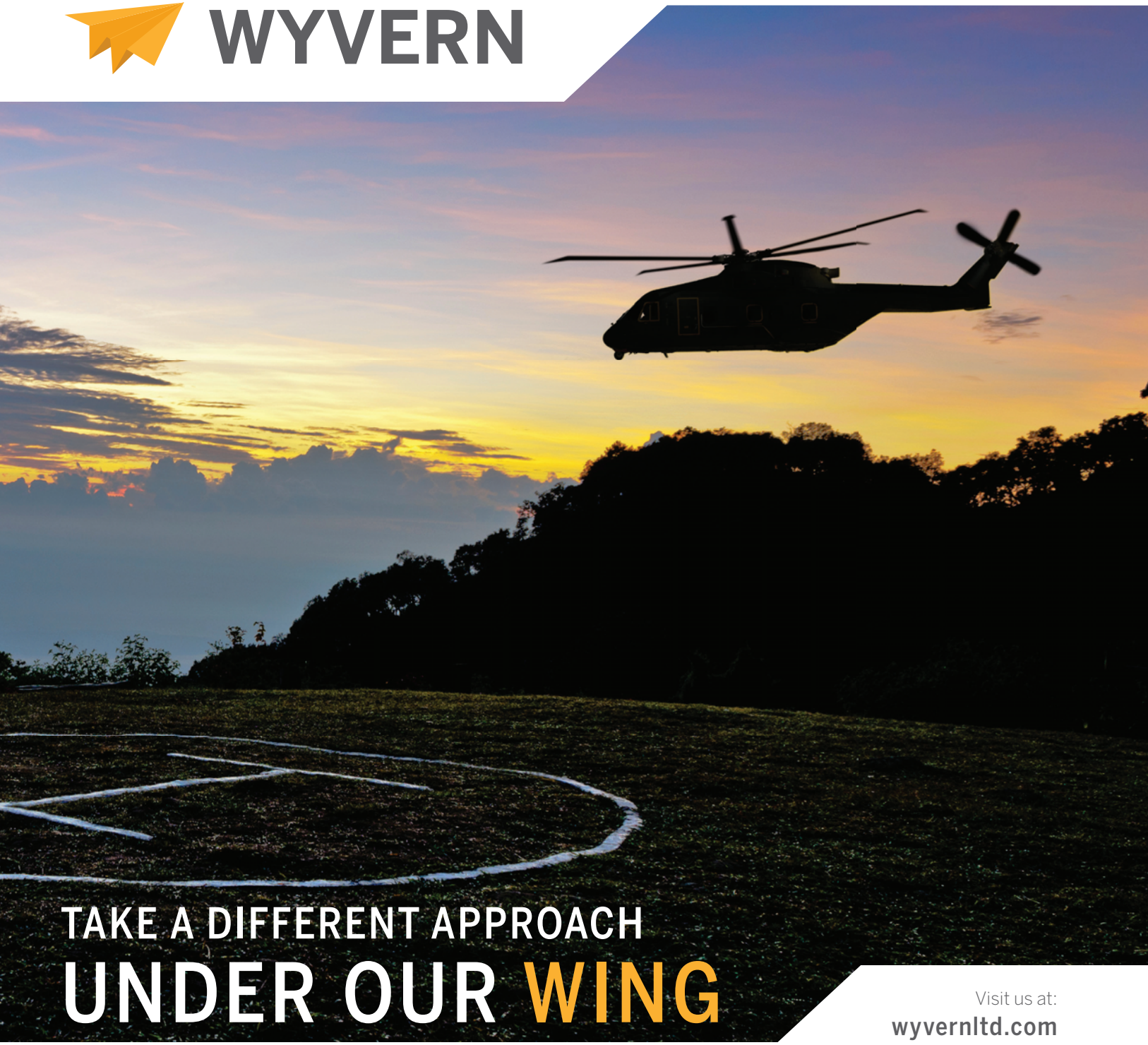

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Emirates' $11m DXB lounge makeover

Emirates has completed a major makeover of its business-class lounge at Dubai International Airport Concourse B. The $11 million refurbishment project took two years and is part of the airline's continuous investment to improve and upgrade its products. One feature includes its Moët & Chandon champagne lounge, pictured.

Turkish reports losses

Turkish Airlines reported a net loss of $463 million for the first nine months of 2016, compared to a net profit of $877 million the year before. The carrier blamed political and economic instability in Europe and the Middle East, as well as the increased perception of global and regional risks, which hit aviation demand and placed pressure on yields.

Increased capacity, led by low fuel prices and increased competition, also affected ticket prices and total revenue. Only Africa and the USA maintained revenue levels for both passenger and cargo traffic.

Freighter crash

A Turkish Boeing 747-400F crashed in the vicinity of Bishkek Manas airport in Kyrgyzstan in January.

The ACT Airlines aircraft, operating under the MyCargo brand, came down among homes to the west of the airport following a flight from Hong Kong.

All four crew were killed and at least 31 people on the ground died in the crash.

Smart move

Smart Aviation is purchasing a Eurocopter AS350B3 to service contracts with electrical engineering firms active across Egypt. The helicopter, which will be bought outright, will be used for the cleaning of power transmission pylons and other supporting infrastructure.

SR training solution

SR Technics has opened a new training centre in Masdar City, Abu Dhabi, offering flexible, comprehensive training solutions to supplement the company's existing training facilities in Zurich, Switzerland.

Stephan Wiegelmann, head of training services at SR Technics, said: "We chose this location because it is a progressive hub for educational, technical and scientific institutions, providing a modern environment for learning.

"Masdar City is also close to the Abu Dhabi Airport, so we are able to perform practical training on aircraft. The new centre is designed to offer high-quality technical training in an inspiring learning environment."

ME $100bn airport projects

More than $100 billion-worth of airport projects are under way or planned across the Middle East, according to the aviation and airports 2016 report from business intelligence service, MEED.

The report says the projects are intended to address a capacity gap as regional airport passenger volumes outstripped capacity by 11% last year.

The projects will provide an additional capacity of 400 million passengers a year across the region's airports over the next 10 to 20 years.

Emirates first

Emirates has taken delivery of its first A380-800 powered by Rolls-Royce.

The first of the aircraft was due to have arrived in the Gulf in early December but was delayed owing to technical issues with the Trent 900 powerplant. According to the Dubai carrier, the issue was resolved.

Five more of the type should be delivered during 2017.

Canada move for Dnata

Dnata has reached an agreement with Canada's GTA Aviation to purchase a 50% stake in its cargo and ground-handling operations at Toronto Pearson International Airport. The investment marks Dnata's first step into the Canadian market and is a significant development in the company's expansion into the Americas, less than a year after announcing investments in the USA and Brazil.

Baghdad's Beech

Iraq's regional carrier Fly Baghdad has added a its first Beech 1900D to its fleet. The aircraft arrived at Erbil after maintenance checks in Etebbe-Kampala, Uganda.

Yahsat and Talia sign satellite partnership deal

Yahsat, the UAE-based satellite operator, has announced the start of a strategic partnership with Talia, a market-leading teleport, satellite, and terrestrial network operator.

Under the agreement, Talia is committed to capacity on Yahsat's upcoming Ka-band Al Yah 3 satellite, located at 20°W, to be launched in 2017, alongside existing services on the Y1B satellite.

This arrangement will provide Talia's customers in the Middle East and Africa with a tightly integrated offering and a tailor-made solution to fit the changing demands of their customers.

UAE students get first-hand look

Etihad Airways Engineering opened its hangar doors to some of the UAE's brightest minds as part of its drive to attract university students from different disciplines to consider a career in aerospace engineering.

Jeff Wilkinson, chief executive officer of Etihad Airways Engineering, said: "There is a clear advantage for us in hiring graduates from different fields, as each one brings with them a different perspective and expertise, all of which are required to fulfil our engineering needs."

Amani Al Balooshi, an industrial and systems engineering student in her final year at Khalifa University, said: "I love my major because I can work in every field – aircraft, airport, manufacturing. We do a modern manufacturing course and it teaches you about processes in building and working to deliver engineered solutions that add value."

Vega launcher's world record

The Vega launcher has successfully completed its eighth mission, correctly positioning into orbit the Turkish satellite GÖKTÜRK-1, at an altitude of approximately 700 kilometres.

Julio Ranzo, CEO of Avio, said: "With eight perfect launches since its debut, Avio has set a world record. Let us continue on this path, with determination, by continuing to invest our resources for the future of the Italian aerospace industry and of our young, talented people."

The lease it could do

Cabot Aviation, a division of Air Partner, has been authorised by Turkish Airlines to remarket eight Airbus A330-200s for sublease – either dry or wet.

Neo commitment

Airbus Corporate Jets has won another commitment for an ACJ320neo.

The latest deal adds to the seven orders already won by the ACJ320neo family, taking total orders and commitments to six ACJ320neo and two ACJ319neo aircraft.

"The ACJ320neo family further improves a proven and successful design, allowing customers to take more of their lifestyles to even more of the world," said Airbus chief operating officer, customers, John Leahy.

Good times for Gulf

Gulf Air has been independently ranked by UK aviation analysts OAG as the most punctual airline in 2016, among GCC airlines, with an average on-time performance of 82.7%. In its ranking amongst global airlines, Gulf Air garnered 9th place for punctuality among Europe, Middle East and African airlines and 19th place for punctuality globally.

VD Gulf fleet work

Nigeria's Azman Air has selected VD Gulf to perform maintenance work on one of its Boeing 737CL fleet. Heavy C-check, major modifications, airworthiness directives and service bulletins work will be completed. Several components will also be repaired, including additional work on the aircraft's engines.

Panasonic choice

Turkish Airlines has selected Panasonic Avionics Corporation's advanced eX1 in-flight entertainment and communications system and global communications services for its new fleet of narrow-body aircraft.

The eX1's high-definition display technologies and high fidelity audio create a home theatre atmosphere that draws passengers into an immersive entertainment experience.

Aussie approval

The Australian Civil Aviation Safety Authority has granted Etihad Airways Engineering CASR Part 145 maintenance organisation approval to provide base maintenance services on the latest Airbus and Boeing aircraft – the Airbus A380 and the Boeing 787 – as well as the Boeing 777 and the Airbus A330 and A320 families of aircraft.

Falcon aims for 'first'

Abu Dhabi-based Falcon Aviation is planning to put its recently received twin-engined, AgustaWestland 169 into offshore service – the first AW169 to operate in the global offshore oil industry.

Broadband deal

Saudi Arabian Airlines has signed a strategic partnership with Taqnia Space to exclusively provide the airline's fleets with broadband internet access, voice calling and live TV services. Implantation of the new in-flight connectivity services will start by mid-2017, according to the director general of Saudi Arabian Airlines, Saleh Bin Nasser AlJasser.

Qatar picks Apple Pay mobile wallet

Qatar Airways has launched an Apple Pay feature – becoming the first Gulf carrier to offer the revolutionary 'mobile wallet' solution across all 12 countries where the facility, which lets users make payments using their mobile Apple devices, is available.

EAG's second G650

Empire Aviation Group (EAG) has added a second new Gulfstream G650 to its managed fleet in Dubai, making it one of the few major operators of the G650 in the region.

Heliport design

Air Synapsis is currently designing the world's second largest elevated heliport, to be located in central Dubai.

The facility is designed to accommodate two helicopters and is expected to become operational by the end of 2017, following the issuance of its General Civil Aviation Authority landing area acceptance certificate.

The heliport will be the first in the UAE to be equipped with touchdown and identification marking lighting systems.

Indian pilot programme at EgyptAir Training Centre

EgyptAir Training Center implemented a programme for Indian pilots on B737 -800 and A320 aircraft in October, which included theory and practical training on flight simulators by Egyptian instructors.

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Helidubai crash pilot error: GCAA

The UAE's General Civil Aviation Authority has attributed the January 2014 impact of a Helidubai Airbus ED-130B4 helicopter with the Atlantis Palm heliport to pilot error.

The incident happened during departure from the heliport to the Dubai Air Wing FBO at Dubai International Airport.

Both pilot and landing officer were injured.

Full details on the report can be found on the *Arabian Aerospace* website.

Rail partnership

Royal Jordanian has signed a partnership agreement with AccesRail, an International Air Transport Association travel partner with its own carrier code (9B), that allows passengers to reach AccesRail's destinations that connect to some of the airline's major gateway cities.

Egyptair slowdown

EgyptAir has reduced its intended fleet renewal and expansion plans, given Egypt's continued weak economic outlook.

Minister of Civil Aviation, Sherif Fathi, told the country's parliament that the state-owned carrier had originally planned to operate a fleet of 105 aircraft by 2021.

However, given the decline in the value of the Egyptian Pound, that number has now been revised to 93.

Minister inaugurates ATC tower

Ahmet Arslan, minister of transport, maritime and communication, was at the inauguration ceremony for Istanbul New Airport's air traffic control tower in October.

The tower, winner of the 2016 International Architecture Award, will be 90 metres tall and should be completed in around four months.

"Air traffic control towers have taken on a new significance in the next-generation airports, becoming an architectural design icon aside from their functionality," said Yusuf Akçayo lu, CEO of IGA Airports Construction.

"With inspiration drawn from the tulip flower, a symbol in Turkish history and Istanbul's rich cultural heritage, and its aerodynamic shape, our tower will be visible to all passengers travelling between Europe and Asia.

Loads of space

Space Systems Loral (SSL) has announced that it will work with Al Yah Satellite Communications Company (Yahsat) to support the Masdar Institute of Science and Technology's master concentration in space systems and technology in the United Arab Emirates.

Latin lover

Qatar Airways, through its wholly owned subsidiary Qatar Airways Investments, has completed its acquisition of 10% of Latam, the largest airline in Latin America, reaching a total of 60,837,452 shares.

University link

Emirates Aviation University has introduced a new executive MBA programme in aviation management in collaboration with Coventry University in the UK.

The curriculum was designed for students who plan to pursue a career in aviation management or want to move from an operational role into a general management role.

Alnaqbi's role

Ali Alnaqbi, founding chairman of the Middle East and North Africa Business Aviation Association (MEBAA), has been elected Vice Chairman of the International Business Aviation Council (IBAC) Governing Board.

TP connects with Saudia

Saudi Arabian Airlines (Saudia) has appointed technology solutions provider, TPConnects, to manage IATA's New Distribution Capability (NDC) standard platform.

NDC enables the travel industry to transform the way air products are retailed to corporations, leisure and business travellers.

Strata on track

Strata has completed the first article inspection (FAI) of aileron and flap track fairing (FTF) shipsets for the Airbus A330neo.

In 2015, Strata was awarded the sole-supplier contract to provide ailerons to Airbus for the A330 and A330neo.

The contract named Strata as the single-source supplier of ailerons to Airbus for its A330 family of aircraft.

The successful delivery of the first aileron and FTF for the A330neo were completed ahead of schedule.

Qatar school

Qatar Airways officially opened its new Oryx International School in November, a premium education facility dedicated for the children of the airline's employees.

Oman Air opens training centre

Oman Air has opened its new training centre in Muscat following the delivery and qualification of two new full flight simulators (FFS) from Textron subsidiary, TRU Simulation + Training. The simulators are for the B737 and A330 aircraft operated by Oman Air, along with a flight training device and virtual cockpit classroom for the B737NG aircraft.

Captain Ali Hassan Sulaiman, executive vice president & chief operations officer, Oman Air, said: "Our investment in this training facility – the first of its kind in Oman –adds an important milestone in the airline's contribution towards the development of the sultanate."

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AL BAKER TO THE FUTURE

In little more than two decades since it began operations, Qatar Airways has become one of the most formidable airlines in the world. It regularly wins awards for its quality of service and its CEO has a reputation of being one of the toughest bargainers in the business. **Alan Dron** *caught up with Akbar Al Baker at the Arab Air Carriers' Organization annual meeting in Casablanca to ask about cancelled Airbuses, future expansion, and whether he still wants to launch a domestic carrier in Saudi Arabia.*

There is a story – perhaps apocryphal – that sums up the top-down attention to detail that has propelled Qatar Airways to the leading echelon of airlines.

It goes thus: A journalist was interviewing group CEO, Akbar Al Baker, in his office overlooking the ramp at the old Doha International Airport. Midway through the interview, Al Baker, glancing occasionally at the aircraft docked at the terminal, seemed to be becoming distracted. After a few minutes he stopped the interview, picked up the telephone on his desk and punched in a number. When his call was answered, pleasantries were minimal: "It's late," he said down the line. "Why is it late?"

Al Baker, the story goes, had such an encyclopaedic knowledge of his airline's operations that he knew one particular flight was five minutes behind schedule in pushing back from the gate.

Whether true or not, it exemplifies the ethos behind the airline – a relentless focus on details to provide a product capable of attracting passengers from around the world to transit through Doha, the Qatari capital, on their journeys.

Since taking over the airline following a 1997 re-launch, Al Baker has gained a reputation among aircraft manufacturers as being one of their most demanding customers. He is prepared to buy huge quantities of aircraft – Qatar Airways has an astonishing 350-plus on order at present, to add to its current fleet of around 190 – but insists that everything meets his exacting requirements.

Continued on Page 22

He has publicly castigated both Boeing and Airbus when problems have arisen with

CONTINUED FROM PAGE 21

aircraft destined for his fleet, and he has been prepared to invoke the 'nuclear option' of simply walking away if they do not meet his standard.

The handover of the first Airbus A350-900, for which Qatar was launch customer, was delayed by a fortnight in December 2014 because of a last-minute hiccough involving a cabin equipment supplier. And 2016 saw him cancel the first four A320neos from an order of 50 (34 A320neo and 16 A321neo) because of a problem with the new Pratt & Whitney PW1100G turbofan.

The issue was that the PW1100G's start-up times were longer than specified. In June, Pratt & Whitney executives insisted that the glitches had been fixed, but an unconvinced Qatar Airways nevertheless cancelled its second pair of aircraft in September.

"We will walk away from more aircraft as they become due," Al Baker said. "I can't answer when the problem will be resolved [but] we have confidence in Airbus. We are negotiating a contract with them for us to mitigate the issue."

The airline has also faced problems with slower-than-expected deliveries of its fleet of Airbus A350s: "We have 12 A350s at the moment," Al Baker said at the end of November. "We should have had 19 [by the end of 2016]. Three more are promised [by year-end]. We think only one will arrive."

Combined shortfall

The combined shortfall of the two Airbus types has led Qatar Airways to cancel up to 800 flights and Al Baker estimated that the problems would cost the airline $400 million in the current financial year.

The airline is also due to take delivery of the larger A350-1000, but it has not yet decided how to deploy them, said Al Baker. "We need to see the weight and range of the aircraft. It may be heavy. It may have payload issues." In general, however, it will be earmarked for ultra-long sectors.

At the top of the market, Qatar Airways has three options for A380s, as well as the 10 already ordered and being delivered. Will those options be exercised? "We're still not sure. We still have time to decide."

Fed up with the A320neo problems, in October 2016 Qatar Airways signed a letter of intent for up to 60 Boeing 737 MAX 8s. However, these will not be used by Qatar Airways itself: "We won't operate the A320 with the 737. The 737 is to cater for investment in other airlines."

One of those airlines is likely to be Italian carrier Meridiana, in which Qatar Airways has a pending deal to take a 49% shareholding. This was due to be finalised as *Arabian Aerospace* was going to press.

The decision to get involved with Sardinia-based Meridiana, which has been in the works for a year, surprised observers. While neighbouring Gulf carrier Etihad has a track record of taking a stake in failing airlines that it feels nevertheless hold promise, such as Alitalia, Air Serbia and Airberlin, Al Baker is on record as saying that he would never get involved with an airline that required a lot of money or management time to turn around.

Plans for a subsidiary, Al Maha, to operate domestic services in Saudi Arabia have not materialised. However, Qatar Airways Group CEO, Akbar Al Baker, seen here with Airbus president and CEO, Fabrice Brégier, at the handover of the first four A320s in Al Maha colours, believes another opportunity for Saudi services may arise.

However, despite Meridiana having made consistent losses in recent years and flying a heterogeneous, increasingly elderly fleet, he felt it was a worthwhile investment.

"Meridiana shouldn't be in the state it's in. If we didn't have confidence that we could turn it around quite quickly, we wouldn't be interested. We see there's huge potential in Meridiana: it's the second national carrier of Italy and it's not burdened with as much debt as people think."

A major problem at the Italian airline has been its over-manning. However, said Al Baker, the airline's trade unions had accepted that the only way it could survive was by shedding several hundred personnel. This process had started, but Qatar would not make a final commitment to invest until an agreed staff level had been reached.

Once the final contract had been signed, Qatar Airways would lease new aircraft to replace Meridiana's existing fleet, he said. Although he did not spell it out, it seems likely that the Italian carrier would be the home for some of the new Boeing 737 MAX 8s, for which Qatar has placed a commitment.

The intention was to increase Meridiana's size and the airline would continue to operate as an independent airline, he added. There would be very little or no overlap in its activities with those of Qatar Airways and it would not directly feed Qatar's Doha hub, but some transfer of passengers was possible at Milan or Rome.

Meanwhile, Al Baker also foresees considerable expansion in Morocco. Qatar Airways has had a codeshare agreement with Royal Air Maroc (RAM) since August 2015 and intends to increase its current thrice-weekly Marrakesh service to daily, using Boeing 787-8s.

It wants to become much more closely involved with RAM, take a stake in it and expand both its size and reach. "We need to get involved with RAM to develop the company. We feel there's a huge potential there."

The north African airline "should be ready to start serious negotiations with us to offer us a stake in the company. The amount [of the shareholding] depends on the Moroccan Government, but we're very keen, both as an airline and on the political level, to help Morocco develop its aviation industry.

"We want to take a stake in RAM to develop the airline into an even bigger carrier, to serve Africa with a much expanded airline network and as a major hub to North and South America."

Africa was still the poor relation in terms of long-haul services, he said. "Qatar Airways sees Africa as a very important continent that's badly

The Airbus A350-900 (left) and A380 are major components of Qatar Airways' current fleet.

underserved by international carriers. Carriers that serve Africa are taking advantage of the low frequencies by overcharging passengers." His airline would like to remedy that, he said: "We're not going to be cheap but when you pay a fare on Qatar Airways you get value for money."

He also regarded Casablanca as an important hub – but warned that the city's airport facilities had lagged behind the expansion of RAM and needed investment to increase capacity and improve facilities.

"We're also going to invest in real estate – hotels – to boost the tourism industry in Morocco."

Further afield, he said he did not intend to increase Qatar Airways' 20% stake in International Airlines Group – which includes Aer Lingus, British Airways, Iberia and low-cost carrier Vueling – "at the moment". Similarly, he was happy, at present, with the recently acquired 10% stake in South America's LATAM group.

Concern has been expressed by some Gulf airlines that the election of Donald Trump as US president could lead to a resurrection of US airlines' claims that Gulf carriers have an unfair competitive advantage over European and US airlines through alleged subsidies. Certainly, Trump has made it clear he intends to protect US jobs and his neo-protectionist views have caused alarm in some quarters.

However, Al Baker was more sanguine over the incoming president's stance: "He's a very shrewd businessman. I think Mr Trump is wise enough not to be baited by the American carriers. We bring the US millions of dollars in benefits and millions of passengers. So much tourism and [many] businesses depend on passengers travelling on business, leisure and to see families. Tourism is a vital industry in the US, so I don't think president-elect Trump will be swayed by protectionist policies. I'm sure he will look at the bigger interests."

Qatar Airways and other Gulf carriers have expressed concern in recent years that air traffic control restrictions in their home region are having a detrimental effect on services. One study in 2016 found that the average delay to flights in the region because of ATC bottlenecks was 29 minutes and that that figure was likely to double in the next few years as fleets grew and airspace became steadily more congested.

Airlines, governments and air navigation service providers have pooled their efforts to try to find a solution. Al Baker said that the problem was now being recognised, but that there was some way to go before a solution was in place. Such a solution would have to involve the region's air forces.

"I think people have started to realise that there's airspace congestion in the Gulf. This is not because we have a lack of airspace but because a lot of that space is blocked by the military and we need to be able to open that up, for us to be able to fly more efficiently."

Al Baker is a man used to getting his way on issues, but one goal recently eluded him. Qatar Airways had, for two years, been planning a new, domestic airline for Saudi Arabia, Al Maha Airways, to get a share of the Gulf's largest national air travel market.

The first Airbus A320s were bought and there were plans for a fleet of up to 50 aircraft. However, a licence to start operations was not forthcoming from the Saudi regulatory authorities and Al Maha was quietly dropped.

"Yes, I'm disappointed that we were not able to launch that airline. We hope we will have another opportunity to fulfil our wish to serve the Saudi nation."

A recent change of leadership at the Saudi transport ministry would help, he believed. However, capacity improvements also had to be put in place at Saudi Arabia's airports to cope with increased traffic flows. "Once all those problems are resolved, we will reinvigorate our interest in operating a domestic Saudi airline."

Like that departing aircraft at Doha International, for Al Baker and Qatar Airways, the timing has to be right.

TOP TABLE: Abdulwahab Teffaha, Secretary general of AACO (2nd left) welcomed industry leaders to the stage for the opening salvo to governments.

Beware the threat

The Arab world's major airlines met in Morocco for the Arab Air Carriers' Organization (AACO) annual meeting, with clouds on the horizon after several years of rapid growth. **Alan Dron** *watched proceedings.*

Carriers from across the Middle East gathered in Casablanca for the AACO's annual meeting at the end of November.

In his 'state of the industry' address to representatives of more than 20 airlines, OEMs and suppliers, AACO secretary-general, Abdul Wahab Teffaha, drew comparisons with the last time the organisation had met in the Moroccan city, 20 years previously.

In 1996, he noted, Arab carriers flew just 6% of international airline passengers, with a fleet of around 400 aircraft. "This year, we have statistics we could never have imagined then. Our share of the international industry is 14.3% and there are 1,215 airliners in the Arab world." That fleet was the youngest of any world region.

The number of passengers passing through the region's airports had also mushroomed, from 48 million in 1996 to 325 million in 2015.

That number reflected the strategy of Arab nations, particularly in the Gulf, of transforming previously modest airports into hubs, through which a large percentage of the world's air passengers transited, making use of the region's strategic position between Europe, Asia-Pacific and Africa.

However, while the Arab air transport market grew by 5.3% in 2015 compared to 2014, reaching 258 million passengers, Teffaha expressed concerns that the re-appearance of protectionism could have an adverse effect on the future of the organisation's member airlines.

He reflected that in the days before liberalisation, which initially took off in the US in the 1980s, "airlines and governments agreed on everything. They agreed on seats; they agreed on the tariffs of those seats, the distance between those seats and the food on the 'plane."

Shielded from stresses

National carriers were shielded from the stresses of competition. "Despite this, they registered a great loss, but governments had to bear this because they considered it important for the economy."

A variety of protectionist practices also severely limited consumer choice and artificially boosted prices, which were, in real terms, three times more expensive than today, said Teffaha.

Liberalisation had opened up the marketplace, initially in the US and Europe, developments that led to global passenger numbers rising from 700 million annually before deregulation to more than 3 billion today, he said.

As these numbers had risen, so the airline industry's centre of gravity had started to move eastwards from its traditional 'homes' in North America and Europe to the Middle East and Asia-Pacific regions.

This could be seen, said Teffaha, by the fact that the US and Europe today accounted for just 51% of air transport. Developing nations handled 42% of air traffic in 2015 and that figure was expected to rise to 52% by 2025.

However, the recent reappearance of calls for protectionism was "one of the big threats to this industry" and represented a risk to job opportunities.

President Donald Trump has called for greater protection for US workers' jobs against what some in the US perceive as unfair foreign competition in a variety of industries.

In the past few months, some US airlines have renewed their calls for action to be taken against the Gulf 'big three' airlines – Emirates, Etihad and Qatar Airlines – apparently confident that they have more chance of receiving a sympathetic hearing from the president than his predecessor, President Obama.

International Air Transport Association (IATA) director-general and CEO, Alexandre de Juniac, told the meeting he "fully agreed" that risks to the industry existed due to the re-emergence of protectionism in several areas worldwide.

He was not necessarily forecasting a

Left: Abdul Wahab Teffaha: The recent reappearance of calls for protectionism was "one of the big threats to this industry".

Far left: Abdelhamid Addou: Political instability everywhere in the world meant a "huge hit on sales" due to the decline of tourism.

# of protectionism

downturn, he said, but uncertainties remained in front of the industry due to macroeconomic issues and political trends.

He added that, despite the popular image in the US and Europe of Middle East carriers being seemingly unstoppable forces in the world airline industry, "In this region there are two growth realities. In the MENA region outside the Gulf, growth has been 2% to 3% annually over the past five years, below the global average." The Gulf carriers were growing at more than five times the MENA rate, he said.

Slow growth

He put the slow growth in areas such as north Africa down to several factors, including the decision of several nations to block the repatriation of funds to foreign carriers and also to political instability in the region.

Among other issues of concern, said de Juniac, was the risk of the privatisation of airports going wrong: "ironclad regulation" was needed to prevent such privatisation becoming an out-of-control monopoly.

Privatisation had often not been as successful as its backers had hoped, he said, pointing to plans by Saudi Arabia to privatise 27 airports in the kingdom.

"We understand the desire to harness commercial discipline in managing airports but, despite many privatisations in Europe, Australia and South America, we haven't seen any examples of privatisation that have truly met expectations."

The bill for improving airports was ultimately paid by the airlines using them and that bill was not declining, said de Juniac. Privatisation had to be accompanied by real consultation with the people who used the facilities.

And all the investment in world-class hubs in the Middle East would be wasted, he added, if problems of air traffic congestion were not resolved. Delays due to traffic congestion were now costing an average delay of 29 minutes per flight and that figure was forecast to double to 59 minutes by 2025 if nothing was done to resolve the increasing logjam.

Airlines across the region also faced what he described as "an unprecedented rise in taxes and charges".

An additional $700 million in various levies had appeared in the past year. Most of that figure had appeared in the UAE and Qatar, but other nations, such as Egypt and Tunisia, had contributed to it.

There was a risk that if charges spiralled out of control, aviation's beneficial effects on local economies could be lost: Every dollar spent in the region provides employment; every dollar collected in charges is an incentive for travellers to go elsewhere. We must work to reverse this trend."

Finally, there was the on-going problem of security. Although the airline industry had been successful in facing up to challenges, there remained problems such as the threats of 'insiders' breaching security or flying over conflict zones. "It's not enough to keep ahead of people who would do us harm," said de Juniac. "Governments must do more, upping their game in intelligence gathering, sharing information, both among themselves and with the industry."

A panel discussion into strategic issues facing the region's airline industry found three company chief executives listing what they regarded as the single greatest problems they face: "Political instability everywhere in the world," said Royal Air Maroc boss Abdelhamid Addou. Such instability meant a "huge hit on sales" due to the decline of tourism.

Main risk

For Qatar Airways' group CEO, Akbar Al Baker, the main risk was protectionism: "We are expanding airlines and we need market access."

Although one of the Gulf 'big three's' greatest US opponents, Delta Airlines' CEO Richard Anderson, had now retired, he had left behind a group of protégés who were pursuing the same policy of protectionism.

Picking up on that point and the risk of protectionism diminishing markets, Addou added: "I'd rather have 40% of a large cake than 100% of a small one."

For Air Arabia CEO, Adel Ali, those problems were compounded by more taxes on passengers and more airport charges: "Those two things are driving the industry nuts," he said. Airport charges that rose 20 to 25% year-on-year were not sustainable and when taxes and charges were more than the actual price of a passenger's ticket, "it becomes destructive to the business".

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Despite a brutal civil war raging just over 80km from its home base of Beirut, Lebanon's national airline continues to carve out a profitable path. **Alan Dron** *reports.*

WHY MEA'S FLEET PATH IS YOUNG AT HEART

Middle East Airlines (MEA) has completed its fleet renewal plans with the decision to acquire four new aircraft for its long-haul services, replacing its current Airbus A330-200s.

Two of the new aircraft will arrive in 2019, with the second pair in 2020. As *Arabian Aerospace* went to press, the formal announcement of the selection was imminent.

MEA currently has a fleet of five A330-200s, plus two A321s and 13 A320s.

The long-haul choice follows on from 2016's decision to amend a 2012 order for 10 Airbus A320-family aircraft from an even split between the A320neo and A321neo to opting to take the entire order as the larger model. Five will arrive in 2019, with the remainder the following year.

The two equipment decisions were made to allow MEA to continue its policy of keeping fleet age down, said the airline's chairman and director-general, Mohamad El-Hout. "We have a policy at MEA to not keep any plane longer than 10 to 12 years, maximum. We like to keep the average age to six or seven years, in order to compete with the rich Gulf carriers."

Revised design

The decision to opt for the A321neo was taken following Airbus' revised design for the aircraft's fuselage. The current A321ceo typically accommodates 185 passengers in a two-class configuration (16 in business class and 169 in economy), with a maximum capacity of 220 in a single-class, high-density layout for charter airlines or low-cost carriers.

From 2018, however, an optimised use of cabin space, increased exit limits and a new cabin door configuration, will enable new standard capacities for the A321neo of 206 in a two-class configuration and 240 passengers in high-density.

Under this Airbus cabin flex (ACF) concept, the manufacturer is offering a new, optional exit-door configuration in which door 2 is removed and replaced by a double-overwing exit. Door 3 is moved aft. Among other benefits, this allows a larger premium cabin to be installed.

"The change they've made with the exit doors gives the plane a lot of flexibility," said El-Hout. "As long as we have a large business-class cabin for our passengers, it suits us."

"The change they've made with the exit doors gives the plane a lot of flexibility."
MOHAMAD EL-HOUT

Improved fuel economy was the second major factor behind the switch to the larger A321neo, he said: "The saving on fuel on the A321neo is much greater than on the A320." That improved fuel consumption also gives the aircraft outstanding range capabilities.

MEA's current A321s have a two-cabin layout seating 31 in business-class and 118 in economy – 149 in all. The new cabin on the A321neo will allow that to be increased to 160.

However, the A320 will continue to play a significant role for MEA, said El-Hout. "We'll keep the A320ceo that we have. We have options for eight [A320 family] aircraft and if we exercise those, we'll go for the A320neo."

If that deal goes ahead, by early in the next decade MEA will have a fleet of four of the new aircraft, six to eight A320s and the 10 A321s.

Syria's brutal civil war

Meanwhile, Syria's brutal civil war continues to rage just 50 miles (80km) from Beirut and many airlines detour round Syrian airspace. However, El-Hout said this had never been a problem for MEA.

The carrier conducted a major risk assessment around five years ago, looking at what weapons the opposing sides possessed, took advice from Lebanese governmental, security and intelligence bodies "and we didn't see any risk in over-flying. I don't know why other carriers have stopped flying over Syria."

However, one problem MEA does face is the difficulty of repatriating currency from several nations on its route network. It has decided to cease services to Khartoum until Sudan allows foreign currency to be taken out of the country and provides a reasonable exchange rate. MEA faces similar problems in both Nigeria and Egypt.

Despite such problems, MEA has announced a profit every year since 2002 and looks set to continue to do so.

Guests clear the way for the first A321 to join the Iran Air fleet in Tehran. PICTURE: SHAHRAM SHARIFI.

New Airbus signals new era for Iran... or does it?

After two years of speculation, consternation and controversy, Iran Air finally took delivery of its first new aircraft in decades. **Alan Peaford** *reports.*

There was great excitement at Tehran's Khomeini International Airport as a brand-new Airbus A321 touched down on its delivery flight from Toulouse – and not surprisingly so, as the 189-seat narrow-body heralded a new era in Iranian aviation.

Iran had been subject to economic sanctions since the revolution of 1979 and had been unable to receive aircraft or spare parts for much of that time. But, almost a year to the day when many sanctions were lifted following an agreement over nuclear activities, the first new aircraft arrived.

Airbus had a provisional agreement in place as the sanctions were lifted and, in December, the order was firmed up for 100 aircraft – 46 single-aisle and 54 wide-body jets – to renew and expand the Iranian carrier's fleet.

Iran is forecast to require some 400 to 500 new aircraft to modernise, as well as to grow, its existing passenger fleet to catch up with years of pent up demand on domestic as well as international routes. The latest generation of fuel-efficient aircraft will also allow new routes and markets to be exploited

"This significant milestone marks the first practical step in Iran Air's ambitious passenger aircraft fleet renewal and its stronger presence in international civil aviation," said Iran Air chairman and CEO, Farhad Parvaresh,

Stretching the frequencies

Parvaresh told *Arabian Aerospace* that the strategy involved firstly "stretching" the frequencies on existing routes, then resurrecting routes that were lost during the period of sanctions, and finally entering new markets.

His airline faces stiff competition from carriers now operating daily flights to Tehran from Europe and Asia, as well as, of course, from the Gulf carriers, which currently carry the majority of Tehran-bound passengers. Repatriating traffic from Dubai, Abu Dhabi and Doha is a strategic necessity for the Tehran airline.

As well as the Airbus contract, Iran has an order in place with Boeing for 80 aircraft, including 50 737 narrow-bodies and 30 777 wide-bodies. Boeing will also be delivering 29 'lease contract' 737-800s to kick-start the airline's domestic and regional fleet renewal.

The A321s will be used to test new long-thin routes into Europe and Asia, while A330s will be the general workhorse of the fleet as Iran Air recovers previously valuable routes such as Geneva, Copenhagen, and Bangkok.

The A350s and 777s will operate in the Far East routes, such as Tokyo and Seoul, and, vitally, the US market, where some two million ethnic Persians live.

But there are concerns. Finance has been found for almost half of the Airbus orders, while there has been only single-digit success for funding aircraft for the Boeing order due, primarily, to the uncertainty in the United States.

Reinstate sanctions

There are question marks as to whether new President, Donald Trump, will revoke the nuclear agreement and reinstate sanctions. Already US financial institutions are wary of involvement and, Airbus too, with more than 10% of its aircraft component parts manufactured in the US, will require US approvals.

Boeing will be lobbying the Trump administration, arguing that tens of thousands of jobs will directly depend on this $10-billion deal and possibly 100,000 jobs through the rest of the supply chain, but the president has already targeted Boeing over the cost of a replacement for the presidential aircraft.

Domestically in Iran, the deal is viewed as a crucial political test for the government of pragmatist President Hassan Rouhani, who has been criticised by hardliners opposed to opening up to the west, ahead of May's elections.

Meanwhile, the European turboprop manufacturer, ATR, was due to be finalising a contract for 20 aircraft with Iran as other Iranian carriers begin the process of renewing their fleets.

For Iran, the potential benefits outweigh the challenges. Many believe Tehran could develop a hub point between Europe and Asia, and, with almost 80 million Iranians, and millions more living outside the country, Iran Air increasing its fleet tenfold could make it a major player on the Middle Eastern stage.

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The purchase of new aircraft by Iran has become a controversial debate in the aviation industry but manufacturers are keen to progress the deals. **Mohammad Razzazan** *was in Tehran to see Embraer make its pitch. Pictures by* **Shahram Sharifi**.

Embraer opens Iran's window of opportunity

Brazilian company Embraer is one of several manufacturers seeking to sell its products to the Islamic Republic of Iran.

The company believes that Iran's market has room for 150 small-sized aircraft ranging from 70 to 130 seats, although it acknowledges that selling such aircraft into the country requires a measured approach in order to tackle the financial challenges, as well as to train crews and mechanics.

Embraer recently sent a delegation to Tehran to spend several days making a case for its aircraft. The team included vice-president Arjan Meijer, plus Stephan Hannemann, market manager for Middle East and Africa, and Nico Martiniello, airline manager at Embraer Commercial Aviation.

The first day was an educational session featuring discussions with personnel from Iranian carriers such as Aseman Airlines, Iran Air, Kish Air and Zagros Air, plus representatives of the Civil Aviation Organization of Iran (CAO).

Develop our airlines

In a welcome address, Ali Abedzadeh, president of the CAO, which hosted the event, said: "Aviation in Iran has progressed a lot in the past few years, despite all the problems that existed. We have been able to develop our airlines, airports, training systems, MROs and all other aspects of aviation.

"Nowadays, we're in another international environment and all of the manufacturers try to come to our market and we welcome that, because we believe that aviation is a cooperation."

Hannemann thanked the CAO for its support. "We got the message from Mr Abedzadeh very clearly that Iranian airlines' professionals are very eager to further increase and update their knowledge in different fields of commercial aviation and have more contacts with international manufactures like Embraer," he said.

Mehrad Jaberansari, manager airline strategy at Aerotask, a Dubai-based global aviation consultancy and financial advisory firm, then discussed airline business models.

Other speakers included Hugo Pinard, associate consultant from Lufthansa Consulting, who talked about network planning, and Kendy Pholeli, managing director from XYZ consulting, who discussed the benefits of airline partnerships.

"With 48 million passengers annually, of which 75% are domestic, and with more than 50 commercial airports, Iran is a very attractive market for domestic and foreign airlines," said Pholeli.

He added that, because the major Gulf airlines and Turkey had close proximity to Iran, and already boasted the high frequency, good connectivity and large networks to take non-stop international traffic, he would recommend that local Iranian airlines quickly develop a strong and large domestic and regional network with lots of nonstop connections and the right size of aircraft.

The educational session ended with Martiniello discussing aircraft performance and economic evaluation.

The following day, an official Embraer conference was held in the Espinas Gulf Hotel. Meijer welcomed participants and said: "Our mission is to help Iran develop into the market. There are 70 regional airports in Iran and just half of them are active. Embraer can help with regional flights. We want to propel Iran into the future."

Meijer unveiled a case study about the similarity of Iran and Turkey in population and their difference in domestic flights and passengers. At the end of his speech, he also discussed the new E-2 jets.

Historical relationship

Minister Gilda Motta, who is based at the Brazilian Embassy in Tehran, discussed the historical relationship and friendship of Iran and Brazil. "Post-sanctions, Iran has an increasing demand for business jets and aircraft. It is a very promising sector for cooperation between Iranian airlines and Embraer."

Mehrad Jaberansari, manager airline strategy of Aerotask, discussed Iran market assessments. "The average age of aircraft in Iran is very much higher than the average in the world," he said.

Martiniello further introduced E-Jets, pointing out that, in recent years, 30 F100s had been

Far left: The Embraer team and special guests arrive in Tehran. Left: An old Mahan Air 747 shows the opportunities that exist for replacement programmes in Iran.

replaced by E190s. "It means a 17% reduction in fuel burn, a 52% reduction in maintenance cost and a €40 million ($42m) fleet saving per year," he added. Iran is one of the biggest operators of the F100.

The main part of the conference was delegated to Faith Akola, CEO of Borajet, who explained his company's experience in operating E-jets.

In 2008, Borajet Airlines was established in Istanbul, Turkey. In 2014, it introduced the regional airline and regional jet concepts. It was the first and only regional airline in Turkey. By last year, Borajet was operating 13 Embraer and two private jets. It has, on average, 100 daily flights to 80 different destinations in Turkey, Europe and the Middle East.

Financing is the most critical challenge for Iranian airlines to buy new aircraft. Nicola Checcacci, Embraer director customer finance EMEA, looked at possible sources and said the Brazilian Development Bank (BNDES) had already confirmed its interest in supporting sustainable growth of air transportation in Iran by financing the potential deal between the two sides.

Alexander Manakos, from Lufthansa Consulting, pointed out: "Air transportation in Iran is a key driver of economic growth.

"Iran has a broad infrastructure network, with 67 airports and more than 10,000 kilometres of railway. However, the country's infrastructure offers enormous potential for improvement caused by a lack of investment during the period of sanctions.

"The development of Iran's civil aviation sector will have a significant socio-economic impact, supporting GDP growth directly and indirectly. Iran needs a modern civil aviation system operating by global standards to allow a sustainable growth of the air transportation sector."

Embraer also operated two demonstration flights around Tehran the following day using an Embraer E190 model, a double-engine 100-seat capacity regional jet.

After the event, Meijer said he was "very positive" about the outcome. "We have been talking to several airlines individually and we promised them that we would come to Iran and have a big Embraer day to explain about our products and organisation. Today it finally happened," he said.

Meijer estimated that Iran would need around 150 new aircraft over the next five years.

"The attraction is the comparison with Turkey," he said. "I think the size is comparable and the Embraer E-jets, in terms of size and flight length, are ideal vehicles for the market here. Also, the growth of the market is very positive. We see the numbers of aircraft that need to be replaced because of aging; this is positive and we see the potential in the Iranian market.

"We have different types of aircraft for different demands, in terms of seat counts and take-off performance, which is restricted in some airports. What we typically do is to work with the airlines to optimise performance and look at which aircraft is specifically the best. It really depends on their requirements, so there is no one type fits all solution."

Tough competition

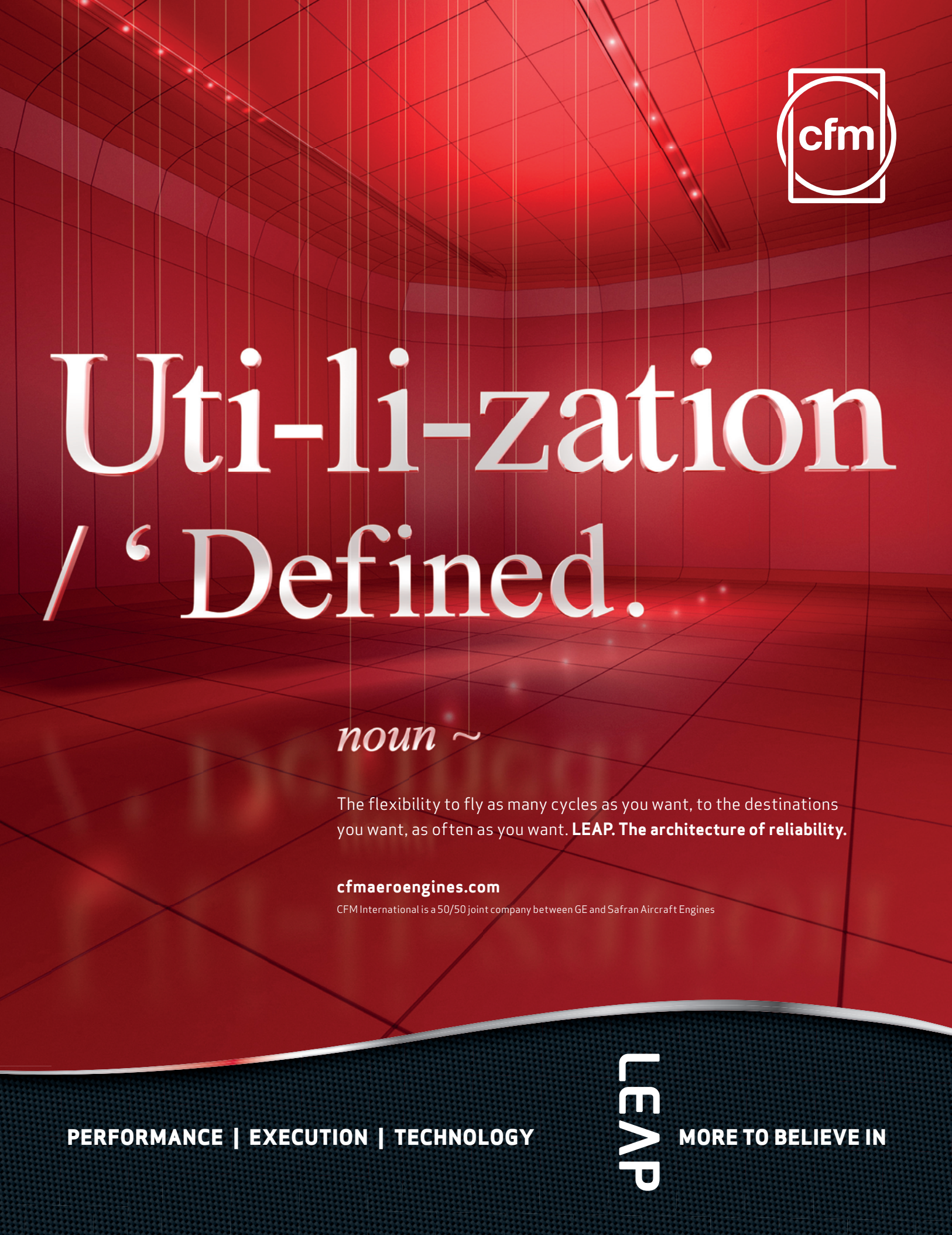
Meijer admitted that there was tough competition from the likes of the Mitsubishi MRJ, the Sukhoi Superjet and Bombardier, but believed his company had the edge.

"I think the biggest thing is the two and two abreast seat configuration with no middle seat, which is a major advantage over the competition, plus the large bin size that we offer. That's a lot of luggage space for customers," he said.

"If you look out our 30-plus segments, we offer the most efficient aircraft with the best cost per seat when comparing the total sum of the maintenance costs, fuel burn, etc."

Finally, Meijer said there were no immediate plans to establish an MRO in Iran.

"I think as soon as we get the aircraft here there will be enough reason for airlines to start maintenance locally," he said. "Sometimes we have agreement with airlines that they can establish their own MRO, purchase equipment and parts so they are not our own. We train them and give them the licenses they need. One of our biggest MROs is OGMA, in Portugal. That is where we do our maintenance. If any Iranian airlines would like to have support, let them talk to OGMA for maintenance."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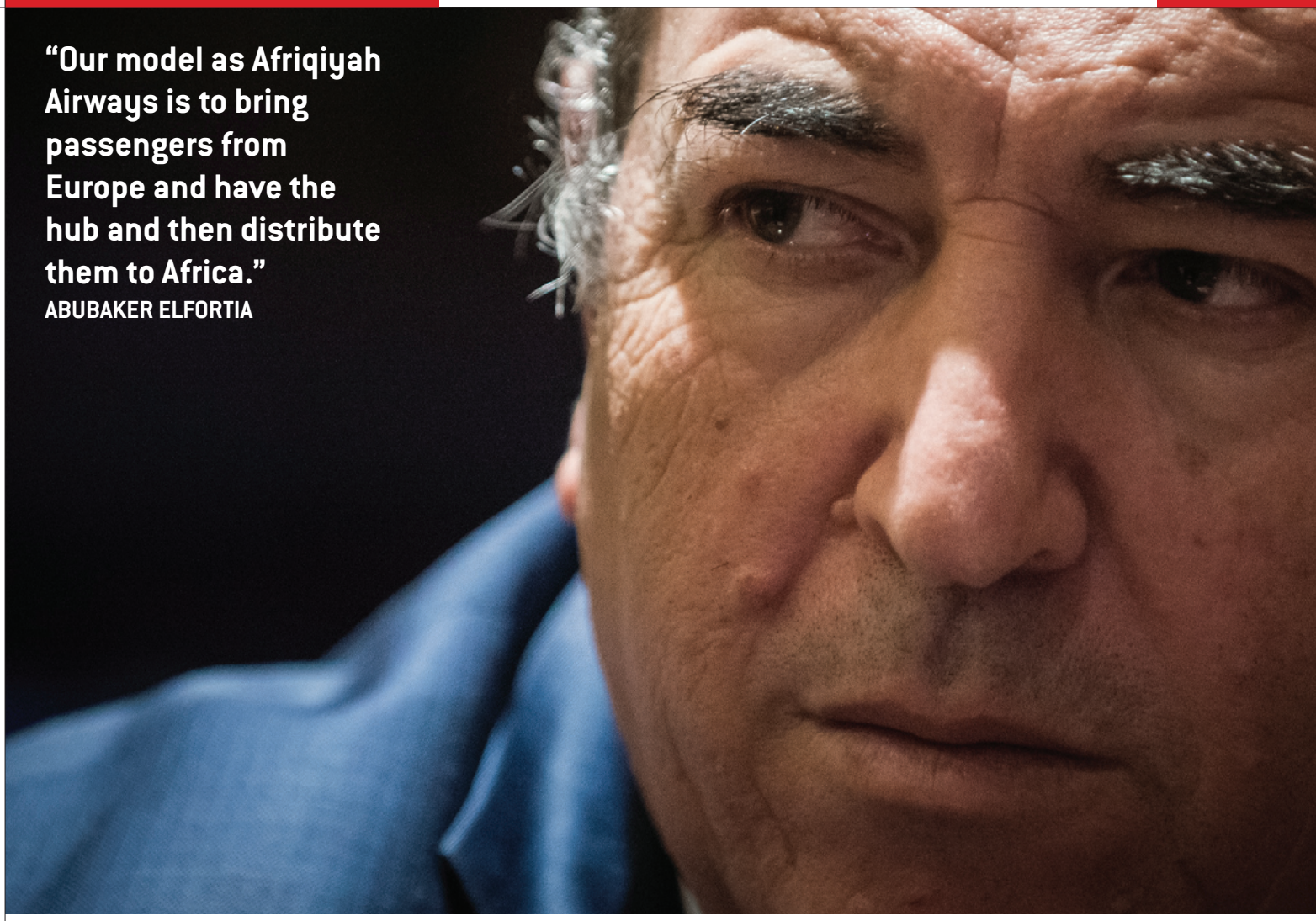


"Our model as Afriqiyah Airways is to bring passengers from Europe and have the hub and then distribute them to Africa."
ABUBAKER ELFORTIA

Afriqiyah shoulders the burden for Libya

Faced with intolerable challenges in its home market, Libya's Afriqiyah Airways is defying the odds to stay airborne and even set up a new subsidiary in Malta. **Martin Rivers** *talked to chairman Abubaker Elfortia.*

When Libya's globally-recognised Government of National Accord (GNA) was signed into existence in December 2015, the United Nations hailed its "clear plan for rebuilding a strong, united and peaceful Libya" after five years of unrest split the country down the middle with two competing governments.

The 12 months that followed saw the Misrata brigades, a band of militias loyal to the GNA, drive Daesh from its strongholds in Libya – liberating thousands from the ultra-hardline terrorists and securing a key victory for the fledgling government.

But, beyond that all-important military success, there are few reasons to look back on 2016 as an encouraging year for Libya.

Hopes for unity have unravelled in the face of continued opposition from power-brokers in the east of the country, who flexed their muscles this summer by voting against the GNA's mandate and seizing oil terminals. One western group responded by seizing premises in Tripoli and trying to restore executive powers to Khalifa Al-Ghwell, the former prime minister.

Continued on Page 34

The reality is that today's Libya is a deeply divided country – as it has been since

CONTINUED FROM PAGE 33

the overthrow of Muammar Gaddafi in 2011 – with power spread thinly between myriad armed groups, who shift allegiances regularly and show no deference to the democratic process.

For the country's two state-owned carriers, Libyan Airlines and Afriqiyah Airways, survival comes at a cost. Their shared home base, Tripoli International Airport, was all but destroyed in 2014 when western Islamists drove the then UN-backed government from power. More recently, both parastatals have been targeted by militiamen apparently eager to settle scores: Fathi Al-Shatti, the chairman of Libyan Airlines, was held by kidnappers for 47 days last year; while one of Afriqiyah's A330s has been impounded by gunmen operating with impunity at Tripoli's surrogate gateway, Mitiga International Airport.

With few Libyans splashing out on air travel, and still fewer foreigners willing to visit the country, Afriqiyah is now deploying just six of the 16 aircraft under its ownership.

"There are still difficulties. It's no easier," chairman Abubaker Elfortia told me during the annual meeting of the Arab Air Carriers' Organisation (AACO) in Casablanca in November. "Why? Because the government is not completely formed – we don't have ministers yet – and this is not helping at all. And the other thing which is affecting Afriqiyah and the airlines is the cost of hard currency."

The Mitiga-based carrier currently flies to four domestic points (Misrata and Zintan in the west, Bayda in the east, and Sebha in the south west) plus six regional destinations (Alexandria in Egypt, Amman in Jordan, Istanbul in Turkey, Khartoum in Sudan, and Tunis and Sfax in Tunisia). It also operates west African charter flights to Accra in Ghana, and Niamey in Niger.

Tribal allegiances

Elfortia insisted that Afriqiyah is welcomed in all corners of the country, irrespective of tribal allegiances. "The political [situation] has no effect [on our domestic network]," he said, highlighting plans to begin serving Kufrah in the south east. "We are flying all the time from west to east to south, regardless of any political situation."

Nonetheless, the fragmented state of the fleet speaks volumes about the airline's day-to-day troubles. Alongside its six operational units – three Airbus A320s, two A319s and one A300F – Afriqiyah has five aircraft in storage, most of which are damaged (two A330-200s, two A320s and one A319); two A320s leased out to Lithuania's Small Planet Airlines; and one A330-300 leased out to Turkish Airlines.

It also owns the A330-300 blockaded by militiamen in Mitiga, plus the infamously extravagant A340 that Gaddafi acquired as a private jet for use on his diplomatic trips.

With one damaged A330-200 (5A-ONP) now undergoing repairs in Hamburg, and the A340 sitting on the tarmac of Perpignan Airport in southern France, almost one-third of the fleet is currently stationed outside of Libya.

"The target is to upgrade Afriqiyah and the employees of Afriqiyah."
ABUBAKER ELFORTIA

There is also no guarantee that the damaged A320-family jets will be returned to service. "[We have to decide] is it feasible to fix them or not," Elfortia said, adding that engineers are still inspecting the aircraft – more than two years after they were riddled with bullets during the Islamist assault on Tripoli. Three additional planes were destroyed by aerial bombardments in 2011 and 2014 (one A300, one A320 and one A330-200).

Asked about the A330-300 impounded in Mitiga, the chairman admitted that some stakeholders in the country object to the strategy of leasing out metal to foreign operators. Afriqiyah managed to transfer one of its wide-bodies to Turkish Airlines in 2015 under an eight-year lease (5A-ONQ / TC-JOM), but attempts to relocate the second unit (5A-ONR / TC-JON) were unsuccessful.

"The contract was for the two aircraft, and the other one has been stopped from going," Elfortia said, confirming that vehicles are being used to physically block the plane. "Of course, leasing the aircraft is the proper solution for the time being. The A330 is a big aircraft. It's supposed to be operated for long distances. And what makes it even more urgent now is the need for hard currency, which the airline needs [in order] to keep operating."

Dismissing calls by some parties for the wide-body to be deployed within Afriqiyah's network, he stressed: "There's no embassies in Libya! Really you cannot fly [it]. There's no routes that are suitable for it."

An order for 10 next-generation A350-900s, meanwhile, remains active with Airbus, though deliveries are inconceivable in the current climate.

On the narrow-body side, the two A320s placed with Small Planet are the same units that Afriqiyah deployed under an Irish flag of convenience in 2014 to bypass the EU's blacklisting of Libyan carriers. Those aircraft have been re-registered with a Lithuanian licence (LY-ONJ and LY-ONL) and are now being flown by the charter and wet-lease specialist within Europe. "Because they are Europe-registered they are easy to lease out," Elfortia said, describing the income they generate as "compensation" for low activity within Libya.

Build connectivity

While there are no plans for Small Planet to operate the aircraft between Europe and Libya – as Ireland's Air Contractors did, briefly, in 2014 – they may help build connectivity in a more roundabout way.

Afriqiyah last year set up a subsidiary airline, PanAfriqiyah, in the nearby Mediterranean island of Malta, appointing former Air Malta boss Louis Giordimaina as a non-executive director. Though he was cautious about discussing the business model, Elfortia made clear that the subsidiary – which is seeking a European air operator's certificate (AOC) – would take over responsibility for its parent's long-held hub aspirations.

"Our model as Afriqiyah Airways is to bring passengers from Europe and have the hub and

One of Afriqiyah's A330-200s (5A-ONP) awaiting repair work in Hamburg.
PICTURE DIRK GROTHE

then distribute them to Africa," he explained, recalling the company's glory days before the Arab Spring, when it served 18 destinations in Africa and eight in Europe. "We see that our model is being disturbed due to the recent trouble, so really we are changing the hub from Tripoli to Malta. We are focused on starting [PanAfriqiyah] with two aircraft, and in three years we should have about six aircraft.

"We will be leasing. If the situation in Libya stays the same way as it is now, and we still have the two aircraft registered outside with Small Planet, we could start with them."

Elfortia denied that the subsidiary is an attempt to get around the EU ban, which Brussels imposed in 2012 amid concerns about Libya's post-war oversight capabilities. To the contrary, he said, Afriqiyah wants to restore its north-to-south hub in a stable environment, while also enhancing training opportunities for staff. "The target is to upgrade Afriqiyah and the employees of Afriqiyah," he reiterated. "This means that they can come and do on-the-job training in Malta." Long-term, the subsidiary may even "deploy wide-bodies for flying from Malta across the Atlantic".

Whatever the strategic motivation, it seems inevitable that PanAfriqiyah will include Libyan points in its African network – thereby improving the experience of Libyans, who must presently self-connect to Europe over hubs in Tunisia and Turkey.

There are no foreign airlines serving Libya today. Although several carriers restored flights after the overthrow of Gaddafi – among them British Airways, Lufthansa, Alitalia, Turkish Airlines, Qatar Airways and Etihad – all withdrew due to security concerns.

In October, Elfortia's outward-looking investment strategy also saw Afriqiyah acquire 20% of the Aviation Training Centre of Tunisia (ATCT). The chairman said the move would cut costs at the airline by allowing its pilots to obtain European-standard simulator training without travelling to Germany. It should further provide a new revenue stream for the cash-strapped company.

Turning to the stalled merger between Afriqiyah and Libyan Airlines – which had been nearing completion around the end of Gaddafi's rule – Elfortia said consolidation remains the "target" but is not considered an immediate priority. "At the moment, to merge the two airlines means we are merging the problems of the two airlines," he explained, pointing to staffing issues at the sister carrier. "Merging definitely is coming, but it will not be very soon. First of all we have to have a government, because this needs government support and it's a government decision … It will not be before three years."

With "cultural" differences hampering efforts to form "a true alliance", the chairman said joint network planning should be the first step. "We fly to the same destinations," he noted. "We are trying now to organise more – at least to have our flights to the one destination on separate days."

Eighteen months ago, when *Arabian Aerospace* reported from the burned-out shell of Tripoli International Airport, officials spoke hopefully about the prospects for reconstruction and a long-overdue return to stability. Neither has come to pass.

"There is nothing going on there yet, to be honest. There is no repair work," Elfortia said of the once-bustling gateway. Admitting that his company can no longer even provide safe passage for journalists, he repeated: "Everything needs the government, and the government is not there yet."

Libyan Airlines boss freed

A rare glimmer of hope emerged from Libya at the time of writing, with news that Fathi Al-Shatti, the chairman and chief executive of Libyan Airlines, has been freed after 47 days in captivity.

Saad Bukhatwa, a spokesman for the flag-carrier, confirmed that Al-Shatti was released on 7 December and "he is very well".

The airline boss, who was also formerly the director of Tripoli International Airport, had reportedly been kidnapped by armed men on his way home from work on 20 October. Bukhatwa told *Arabian Aerospace* that a ransom was paid in order to secure his release.

Asked about the situation in late November, Abubaker Elfortia, chairman of sister carrier Afriqiyah Airways, said there were no suspects in the kidnapping and no ransom demands had been made public. "We believe he's safe, but if they [the kidnappers] make contact it will be [with] his family," Elfortia remarked. Abdul Wahab Teffaha, the secretary general of the Arab Air Carriers' Organisation (AACO), also drew attention to the plot, calling for Al-Shatti to be released during his opening address at the group's annual meeting in Casablanca.Two days after the abduction, the flag-carrier had released a statement vowing to gradually shut down operations if its chairman was not freed. Elfortia confirmed that efforts were made by employees to end the kidnapping, but he said that flights ultimately continued as normal.

Libyan Airlines was rocked by internal divisions last year, when former chairman, Khaled Taynaz, reportedly objected to decisions taken by his successor, Ahmed Elkedairi. It is not clear whether Al-Shatti's appointment during the summer ended the dispute, but according to The *Libya Herald* the airline "has been effectively split into two parallel organisations" since the civil war escalated in 2014.

SaudiGulf has finally taken off with its A320.

SAUDIGULF FINALLY DELIVERS

The next stage in liberalisation of Saudi Arabia's domestic flight market has been launched with the start of operations by SaudiGulf Airlines. **Alan Dron** *reports.*

SaudiGulf Airlines, based at Dammam in the east of Saudi Arabia operated its first service to the capital, Riyadh, on October 29, after a gestation period that has seen its launch date repeatedly delayed.

The airline, whose list of early destinations will be completed by Jeddah, Saudi Arabia's commercial centre, is beginning services with four Airbus A320ceos.

Equipment plans

The carrier planned to launch its services with the Bombardier CS300, but switched its initial equipment plans to the A320 when delays to the CSeries programme began to mount. SaudiGulf has 16 CS300s on firm order, plus 10 options, although the precise delivery dates remain unclear.

A few months ago, the carrier said that it would start to add a further six aircraft to the fleet from the second quarter of 2017, with six more due in 2018 and total numbers anticipated to reach 26 "within the next three years".

However, a briefing note issued to mark the launch of services, merely said that new aircraft would arrive "by the end of 2017".

The airline plans to connect Dammam to Riyadh and Jeddah with two flights daily to each destination, with plans to service the busy Jeddah-Riyadh route with up to seven flights a day by March this year.

The first international service, also planned for the first quarter of 2017, will be Dammam-Dubai.

"The primary reason behind the launch of SaudiGulf Airlines is to meet the increasing demand for air transport services in the kingdom, due to the rapid growth of the Saudi Arabian economy," explained SaudiGulf chairman Tariq Bin Abdelhadi.

"The main driver behind the birth of the project was to contribute towards boosting air transport capacity, both domestically and internationally, at exceptional service levels for the entire travel cycle," he added.

Full-service offering

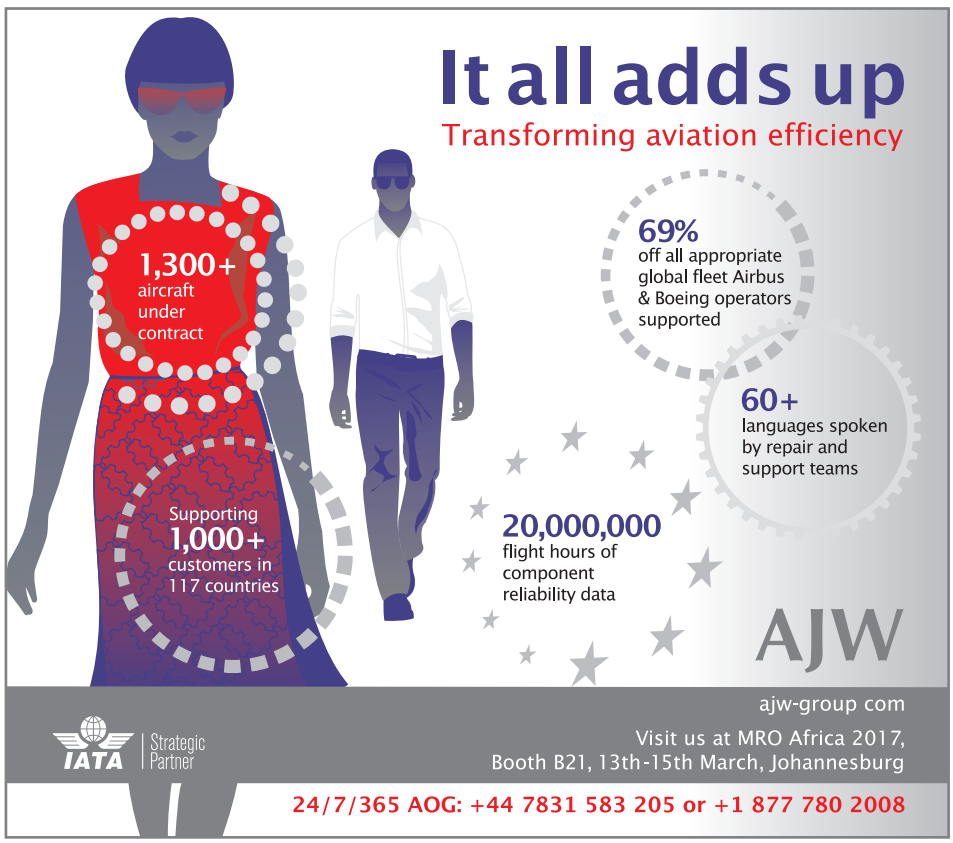
SaudiGulf plans to differentiate itself from competitors with an upscale, full-service offering.

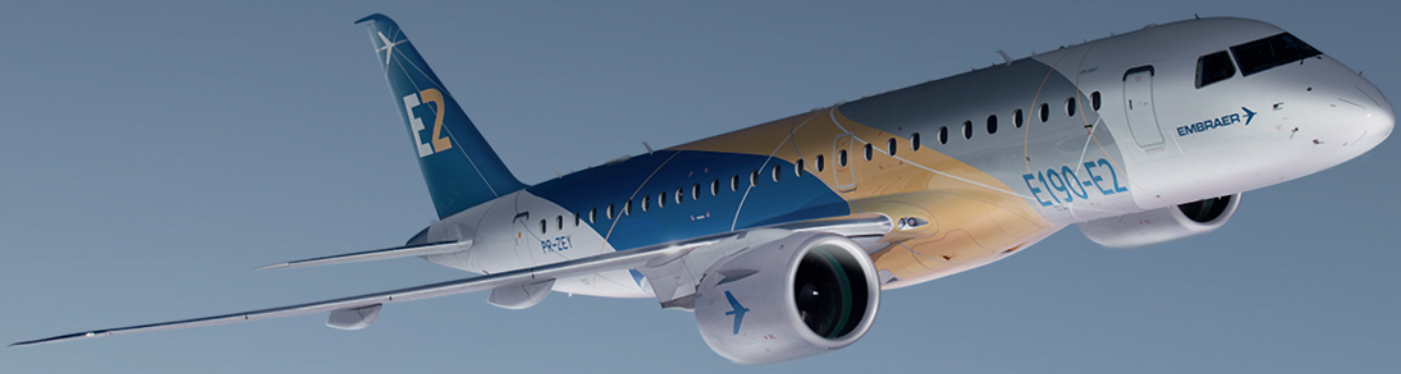
"On board, the airline is investing in the passenger experience in terms of equipment and service delivery, with latest in-flight entertainment systems, Hollywood movies and games, leather seats, complimentary hot meals for all classes, full connectivity and hi-speed WiFi," said CCO Karim Makhlouf.

"On the ground, the experience will include Arabic coffee service at the airport and dedicated ground service personnel."

The A320s will operate in a two-class configuration, with the premium cabin having four-abreast seating.

The licencing process for new airlines competing with flag-carrier Saudia and hybrid carrier Flynas on Saudi domestic routes has been lengthy; plans to enter the market by another potential major player, Qatar Airways' subsidiary Al Maha, have come to nothing.





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Every year, millions of Muslims make their way to Mecca on the Haj and Umrah pilgrimages. As **Alan Dron** *reports, these two events now constitute a major challenge for both the airlines and the airports that serve this massive flow of people.*

THE HOLY LANDINGS

In 1937, the first pilgrim flight to Jeddah arrived from Cairo. Historically, the faithful had arrived by overland caravan, with the arduous journey naturally limiting the number of people who could fulfil one of Islam's five basic tenets.

Numbers increased with the arrival of steamships in the 19th Century, but it was air transport that triggered the mushrooming numbers that now head each year for Mecca.

The Haj, in fact, has become the world's greatest annual gathering of people. Even more people arrive for Umrah, or 'lesser pilgrimage', which takes place outside the period prescribed for the Haj.

The Haj 'season' runs for around two-and-a-half months, while Umrah stretched from November until the start of June, by the western calendar, in 2016.

Typically, pilgrims stay for a minimum of two weeks, although the duration of their visit can be as long as 40 days.

Major role

Unsurprisingly, Saudi Arabia's airlines play a major role in transporting Moslems from around the globe to King Abdulaziz International Airport in Jeddah and Prince Mohammad Bin Abdulaziz Airport in Madinah, both of which have dedicated terminals for pilgrims.

National carrier Saudia has a special Haj department, which comes under the airline chief commercial officer for commercial purposes, while a special 'mass movement department' looks after ground arrangements as part of the airport services department.

If Saudia does not serve a particular nation with scheduled services, it typically leases in aircraft to handle Haj and Umrah flights, said Sameer Khayyat, general manager, sales and revenue management for Haj and Umrah.

"We lease aircraft to serve those markets, because each market has its own characteristics and volume."

Each country from which the pilgrims come has its differences. People often come at different times, depending on factors such as their nations' school holidays. Some pilgrims also travel on specific dates, as performing their devotions on particular days is deemed to earn them additional credit.

In addition, flights from different countries will be stocked with foods with which passengers are familiar. Many pilgrims will not speak either Arabic or English, so Saudia staff or crews accompanying the leased aircraft who can speak the relevant languages are used.

Typically, Saudia will use between 26 and 36 aircraft for Haj flights and around 18 for Umrah services.

Modern security considerations mean that all pilgrims have to be fingerprinted when they arrive in Saudi Arabia: "The current situation – especially in certain countries – is very critical so we have a very high standard of safety and security, especially in airports and aircraft," said Khayyat.

Saudi hybrid carrier Flynas, meanwhile, has what CEO Paul Byrne described as "an airline within an airline". The subsidiary, Flynas Hajj & Umrah, uses Flynas' air operator certificate (AOC) but operates in very different markets from the main airline.

Whereas Flynas flies scheduled flights mainly within Saudi Arabia and to regional neighbours such as Egypt, several Arabian Gulf states, Jordan and Turkey, Flynas Hajj & Umrah specialises in flights to regions such as Africa, Europe, southeast Asia, the Middle East and CIS countries in central Asia.

It serves, for example, several destinations in Kazakhstan; no fewer than eight points in Nigeria and roughly the same number in India, flying pilgrims directly into Jeddah and Medina.

"In addition to the Flynas fleet, we use wide-bodied wet-leased aircraft," explained Ahmed Sultan, deputy CEO Flynas Hajj & Umrah. "We only engage with operators who are experienced, reliable and are familiar with Umrah and Hajj operational requirements.

Last year, for Hajj operations only, Flynas Hajj & Umrah wet-leased 11 high-density aircraft: three Boeing 747-400s, five B767-300s and three Airbus A330-300s, which were operated from early August to mid October 2016.

Flynas Hajj & Umrah has managed to steadily increase the number of airlifted passengers, year after year, in the pilgrimage season. When it started such flights in 2009, it airlifted around 25,000 pilgrims. However, by 2016, that figure had grown to around 120,000.

Companies such as Flynas Hajj & Umrah offer giveaways to pilgrims heading to Saudi Arabia, such as prayer mats and umbrellas, and make special provisions, including the distribution of

Far left: The height of the Haj season sees tens of thousands of pilgrims arriving at Jeddah and Madinah airports daily. Jeddah airport's Haj terminal (left) is the world's largest, cable-stayed, fabric-roofed structure.
Above: With many pilgrims being elderly, special services are provided to help them complete their religious duty.

booklet/flyers on board, written in the pilgrim's own language, giving directions as to the correct way of performing Haj and Umrah rituals or simply providing the pilgrim with information about the allowed size/weight of the hand luggage.

To help the pilgrims in concentrating on performing their Haj rituals, airlines such as Flynas also provide assistance with baggage. Pilgrims who are scheduled to depart, after their completion of Haj, have their baggage collected from their places of residence in Mecca and Madinah 24 hours prior to the departure of their flights. The baggage is transported to the airport, where it is security-checked and made ready for carriage along with the pilgrim aboard his flight home.

Taking the bulk of the pilgrims who pour into Saudi Arabia each year is Jeddah's King Abdulaziz International Airport, which is the site of one of the world's most unusual terminal buildings.

The Haj Terminal Complex, which is separate from the main terminal, is immediately recognisable from its extremely unusual layout – the building has no walls, with natural convection being used to cool the interior. The roof is designed to resemble Bedouin tents – 210 of them, making it the world's largest cable-stayed, fabric-roofed structure.

Because the fabric – Teflon-coated fibreglass, to be exact – has low heat transmission, it allows the sun to cast a warm light over the interior, while at night, the roof acts as a reflective surface, allowing uplights to bounce light off of it to the passengers below.

It is designed to be capable of handling 5,000 arriving passengers an hour at peak times, and more than 4,000 on departure. During peak days in the Haj season, around 65,000 pilgrims pass through the terminal, which is open 24 hours a day, with pilgrims moving through 14 arrival and departure lounges.

1.6 million passengers

The airport's figures for 2015 record that around 1.6 million passengers arrived or departed on Haj, while 5.2 million passed through the terminal for Umrah. In 2016, more than 13,000 flights brought Umrah pilgrims to Jeddah.

Madinah's Prince Mohammad Bin Abdulaziz Airport, although smaller than Jeddah, is in some ways even more dedicated to religious tourism, with 84% of international passengers passing through it being on Haj and Umrah flights.

With the Saudi authorities investing heavily to expand Islam's holiest sites, Madinah Airport expects to see a steadily increasing number of pilgrims passing through.

An indication of growth at Madinah – not just from religious, but general, traffic – can be seen in the fact that annual capacity, which is today 8 million annually, is scheduled to jump to 18 million under the next phase of development.

Like Jeddah, Madinah has a special Haj terminal, adjacent to the main terminal, which operates throughout the pilgrimage seasons. The airport also has six Haj pavilions that function as waiting areas for passengers.

As at Jeddah, special arrangements are in place for pilgrims using the terminal, said Engineer Sofiene Abdessalem, managing director of TIBAH Airports Operation Co.

"Since most of the passengers coming to perform pilgrimage are elderly, a special golf cart service is provided round the clock for their comfort.

"Similarly, the terminal is equipped with sufficient elevators and a sufficient number of escalators and travelators to facilitate those passengers with reduced mobility and to decrease the distances they need to walk. Dedicated 'ask me' teams are present to guide and help the pilgrims.

"During the high season, extra seasonal staff are employed by TIBAH, as well as all the other governmental and aviation organisations operating at Madinah Airport, to ensure smooth operations and meet pilgrims' requirements."

AIRBUS ORDERS TO KEEP AIR ARABIA ON TARGET

UAE budget carrier, Air Arabia, has announced plans to enlarge its fleet as it seeks additional capacity to continue its expansion programme.

Alan Dron *reports.*

Air Arabia plans to fly more passengers, further, with its two recent deals to increase its fleet size, according to Group CEO Adel Ali.

The Sharjah-based low-cost carrier (LCC) has now received all the aircraft from its original order for 44 Airbus A320s.

In the autumn last year it went back into the market to top up its fleet with two new orders.

First was a long-term lease agreement with US lessor, Air Lease Corporation (ALC), for six Airbus A321neos. The aircraft will come from ALC's existing backlog of orders, with deliveries to Air Arabia due between January and October 2019.

That was followed last November with Air Arabia's conversion of five options for A320s into firm orders. These will be for the current A320ceo version, with deliveries anticipated to be completed by the end of this year.

Adel Ali: the additional capacity provided by the A321neo was more important to Air Arabia than longer range.

"We had an option to buy and we thought it was the right time," Ali told *Arabian Aerospace* on the sidelines of the Arab Air Carriers' Organization annual meeting in Casablanca, Morocco.

"We need capacity," he added. "The A321 gets us 40 to 50 more seats [compared to the A320], which is what we need on certain routes."

It also, he said, gave Air Arabia slightly more range, to help cope with some destinations on the edge of its current capabilities.

The airline, for example, began services to Urumqi, in northwest China, in 2015 and the new aircraft – which will be the long-range variant of the A321neo – will help with flying to China, certain central Asian and eastern European destinations.

However, said Ali, the additional capacity provided by the A321neo was more important to Air Arabia than longer range; services to Bangladesh, Egypt and Russia were at the point where the airline would require greater capacity, either in the form of additional frequencies or larger aircraft.

The newly confirmed A320s will bolster the carrier's capacity in the short term, before the A321neos start to arrive in early 2019.

"An A321 would take us a little bit further in Africa. Tanzania is the type of place we would like to go," said Ali.

China, with its rapidly expanding middle class, which increasingly seeks overseas holidays, is also a good market for the carrier. Russia and Ukraine, whose harsh winters make sunshine breaks in the Gulf an enticing prospect, have suffered recently from devalued currencies and concerns over security in the Middle East, but both markets are gradually returning.

Multi-hub organisation

Air Arabia is unusual among Arab carriers in having a multi-hub organisation. Sharjah remains the headquarters, but the airline is the de facto 'national carrier' for Ras Al Khaimah and also has hubs in Casablanca, Alexandria and Amman. No expansion into new hubs is currently planned, said Ali, but "we're open-minded about this".

The LCC has continued to make progress, despite concerns of over-capacity in some markets. For the first nine months of the 2016 financial year, the latest period for which figures were available at the time of writing, its net profit climbed 15% to AED542 million ($147m) compared to the same period in 2015.

It succeeded in increasing its profits on revenues of AED2.96 billion, up by just 3% compared to the first nine months of 2015.

By the end of September 2016, the airline had carried more than 6.3 million passengers, a 14% year-on-year increase, while maintaining its load factor at 80%.

The figures were achieved, said Air Arabia's chairman, Sheikh Abdullah bin Mohammed al Thani, "Despite challenging trading conditions driven by excess capacity in the market, political instability in some markets and the effect of lower oil price in the regional economies.

"We remain confident about the long-term prospects for the low-cost industry in the region and our ability to continue with our growth plans, while delivering our value-for-money promise to our customers every day," he added.

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As Omani low-cost carrier, Salam Air, takes to the skies, it must find a balance between not over-extending itself, yet ramping up sufficiently quickly to cope with an expected leap in tourist traffic to the country. **Alan Dron** *reports.*

SALAM'S PIECE OF THE ACTION

Over the past 15 years, low-cost carriers (LCCs) have made a substantial impact in the Gulf and beyond. Air Arabia, Jazeera Airways, Flynas and Flydubai have all established themselves on the local airline scene.

Now, new Omani LCC Salam Air is aiming not only to take a slice of that market, but also to grow it in the sultanate.

Salam Air's CEO, François Bouteiller, is convinced there is still a lot of room for growth – double-digit growth, he believes – in the GCC region. "I don't think we will take a lot of business from our competitors; I think the size of the pie will increase."

This is not the first time that consideration has been given to setting up a LCC in Oman.

Flag-carrier Oman Air previously looked at setting up its own LCC subsidiary, but decided against doing so in 2014 on the grounds that it would distract management and could cannibalise its own traffic.

Correct decision

That was the correct decision for the national carrier, believes Bouteiller, a former CEO of Saudi hybrid carrier Flynas. It is extremely difficult, he says, for a full-service airline to set up a budget operation – the 'DNA' of low-cost operations is simply not embedded in staff.

The obvious question facing Salam Air is whether the Omani domestic market is large enough to support both national carrier Oman Air and itself. Oman, after all, has a population of just 3.5 million

"It's a small market but I believe there's strong demand, particularly on the Muscat-Salalah route," said Bouteiller. Additionally, the planned major expansion of the tourism and hospitality industry over the next few years will enlarge the air travel market considerably."

Over the past 20 years, Oman has plotted its course in the tourism sector carefully, catering mainly for upmarket guests in a limited number of hotels. However, the next few years will see three-star, as well as more four-and five-star hotels, being constructed as the government goes for growth, with an ambitious plan to increase tourist numbers by 40% by 2019.

Salalah and its surrounding region will play a major part in this. Oman's second city, some 550nm (1,020km) southwest of the capital, Muscat, and close to the Yemeni border, experiences the edge of the Indian Ocean monsoon every summer.

This phenomenon, the khareef, brings mist, drizzle and temperatures in the mid-20C range, compared to the scorching 50C heat further north in the interior. It attracts many Gulf tourists, who come to look in wonder at the lush greenery and streams that suddenly appear all over the region's hills and wadis.

The Salalah-Muscat route will be the new airline's initial breadwinner and it plans to operate multiple daily frequencies on the sector. It is likely to complement Oman Air's flights on the sector.

Cooperation, not competition, is favoured by both airlines. In spring 2016, Oman Air's CEO, Paul Gregorowitsch, acknowledged that discussions were under way on "where and how we can cooperate, wherever it makes sense for both of us".

Bouteiller wants to take the same approach: "We're very open with this. Paul, the chairman of Salam Air, and I are into very open discussions on where and how we can cooperate."

Such cooperation may extend to areas such as ground-handling and training, as well as on routes.

On the subject of routes, "The GCC is obviously a priority for us," said Bouteiller. "It matches our aircraft's capability. At the end of last year, for example, negotiations were under way for flights into Dubai International and Dubai South: We may serve one, or both." Jeddah and Madinah are other early possibilities.

Important role

The Indian sub-continent may also play an important role and east Africa is also being investigated, especially given Oman's historic maritime ties with areas such as Zanzibar, "but those markets are regulated by traffic rights in terms of frequencies. They are also getting close to the limits of our financial model in terms of hours-to-cycle ratio."

Iran, just across the Straits of Hormuz, is another obvious target, given Oman's careful political positioning as an intermediary between Arab states and Tehran. However, said Bouteiller, Oman Air had already launched several routes into Iran and, while he believes the country, with its large population, has considerable potential "it may be a little bit early to go into this market".

Three Airbus A320s, leased from South American airline group, LATAM, will initially operate Salam Air's route network.

Both the A320 and Boeing 737 were evaluated as initial equipment, said Bouteiller, but several factors, including market availability and an operational performance that more closely matched Salam Air's 'hours per cycle' ratio,

What's in a name?

Salam Air is a privately owned company. Muscat National Development and Investment Company (ASAAS) is the major shareholder and what Bouteiller describes as the mother-company.

Although its name has a governmental ring, it is a private organisation that runs certain assets on behalf of government bodies; other investment organisations make up Salam Air's other shareholders.

The airline's name was chosen by a public online poll. "The beauty of the word Salam is that it is a homonym," said Engineer Khalid bin Hilal Al Yahmadi, CEO of ASAAS.

"It means safety, which is of fundamental importance in the aviation industry, but also peace. Part of our Arabic greeting, the word 'Salam' is also very well known by people from around the world. It is simple, memorable and meaningful and that is exactly what we were looking for in a name."

"I don't think we will take a lot of business from our competitors; I think the size of the pie will increase."
FRANÇOIS BOUTEILLER

swung the deal in favour of the European type. Maintenance will be contracted-out to an external organisation, at least initially.

There are already plans to increase the size of the fleet, but Bouteiller is understandably cautious about Salam Air trying to run before it can walk: "We're planning to expand, but before we talk about expansion plans you have to realise we're still a start-up."

The visiting friends and relatives (VFR) market is of particular interest to a LCC like Salam Air "and something that will definitely grow from what it is today". He foresees attracting traffic into Oman for weekend breaks.

But business travellers are also on his radar, with the intention of offering timings that will allow them to conduct business in other Gulf cities and get home the same evening.

Passenger service

Bouteiller, speaking before Salam Air launched its services, said that its approach to passenger service would be closer to that of UK LCC EasyJet, rather than that of ultra-LCCs such as US airlines Frontier and Spirit, or Ireland's Ryanair.

Despite the presence in the Omani market of regional LCCs such as Flydubai and Air Arabia, local customers are not yet particularly accustomed to budget carriers. They understand the LCC concept, said Bouteiller, but an educational exercise would still be required to familiarise them with the details of the LCC product.

One of Salam Air's priorities is to offer employment to local people. Speaking in late November, Bouteiller said Omanisation levels were already around 60% and he expected this to rise further by the time the first flights started.

"Having said that, we still need to find the right competencies and skill sets and today it's still very difficult to find those skills in aviation. We will train and organise [Omanis] but it will take a bit of time."

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Three into one adds up to huge sales opportunity

The Abu Dhabi National Exhibitions Company (Adnec) is looking forward to staging its most successful defence shows – the International Defence Exhibition & Conference (IDEX 2017) and the associated Naval Defence Exhibition (NAVDEX 2017), together with the Unmanned Systems Exhibition and Conference (UMEX 2017). **Jon Lake** *looks forward to the events, which will run from February 19-23.*

The 2017 show will be the 13th edition of the biennial arms and defence technology sales exhibition, which was first held in February 1993.

Adnec organises the exhibition in cooperation with the UAE Armed Forces. It is held under the patronage of HH Sheikh Khalifa bin Zayed Al Nahyan, president of the UAE and supreme commander of the UAE Armed Forces.

The organisers claim that IDEX is the most strategically important tri-service defence exhibition in the world, representing a unique platform for major players from the regional and global defence industry to establish and strengthen relationships with armed forces, government departments, and related businesses throughout the MENA region.

At the same time, NAVDEX has become the pre-eminent regional naval defence and maritime security exhibition.

The UAE Armed Forces in general, and the UAE Air Force and Air Defence (UAEAF&AD) in particular, have a number of unfulfilled requirements, some of them long-standing and now becoming extremely pressing. IDEX has frequently provided the stage for major procurement announcements, though the Dubai Air Show can sometimes provide a similar platform.

With the UAE's armed forces actively engaged in combat operations on several fronts (in Yemen, Libya, and Iraq/Syria), and with many neighbouring nations involved in the same operations, this is naturally a good time for manufacturers and suppliers to be showing their wares – especially when what they offer is relevant to asymmetric and counter-insurgency warfare and/or counter terrorism, and to the kind of air operations being undertaken in Yemen.

The air forces involved in the Saudi-led coalition operating against Houthi targets in Yemen have expended on large numbers of weapons, and replenishing and updating their stocks of precision-guided missiles, in particular, is a priority for a number of regional air arms.

In some cases, air forces will simply seek to directly replace the weapons they have used, though this will not always be possible as some older weapons may no longer be in production, or may not be available for other reasons. In other cases, there will be a desire to replace older-generation weapons with new, more accurate, more lethal or more cost-effective weapons in broadly the same class.

Thus, the progressive reduction of stocks of the GEC/MBDA Al Hakim glide bomb (which has been out of production for many years) will be compensated for by the acquisition of new weapons like the Tawazun Al Tariq.

Turkey's Roketsan has long been a pillar of the IDEX exhibition, and Emirati orders for some of its weapons have been announced at previous editions of the show, including the $196.2 million first export order for the company's

Continued on Page 46

CONTINUED FROM PAGE 45

innovative Cirit 70mm laser-guided rocket system.

It is not known whether the UAEAF&AD has used its MBDA Black Shaheen cruise missile (a variant of the Storm Shadow/Apache/KEPD 350 family) in Yemen, but acquiring very-long-range, longer reach weapons in this class is problematic, thanks to the rules imposed under the Missile Technology Control Regime (MTCR) – an informal and voluntary partnership among 35 countries – which prohibit the export by signatory states of cruise or ballistic missiles that have a payload/range greater than 500kg/300km.

It would not be surprising, however, if the UAEAF&AD were found to be quietly sitting down with potential suppliers to discuss the acquisition of such weapons – possibly behind closed doors at IDEX!

One possible focus for the UAE's interest could be Roketsan's stand-off missile (SOM) family of cruise missiles – though their 300km range and 230kg warhead puts the weapon perilously close to MTCR limits. The weapon has been shown in model form at previous editions of IDEX.

Already is serial production, the SOM has been integrated on Turkish Air Force F-16C/Ds – perhaps making integration on the UAE's F-16E/F Desert Falcons a realistic aspiration. A version of SOM, known as SOM-J is already under development for internal carriage by the F-35 Joint Strike Fighter, and external carriage by other types, adding to the weapon's potential appeal to the UAE.

The UAE airforce demonstrated midair fuelling at the last edition of IDEX.

Similar dilemma

A similar dilemma surrounds unmanned aerial vehicles (UAVs), with the export of larger, longer-range armed unmanned systems subject to much the same restrictions. The UAEAF&AD has ordered the unarmed Predator XP version of the General Atomics RQ-1 Predator, but has been unable to acquire the armed MQ-1 Predator, or MQ-9 Reaper (Predator-B), and has, instead, been forced to acquire the Chinese Chengdu Wing Loong, also known as the Pterodactyl I, to meet its requirements for an armed system.

China's CATIC is marketing an astonishing array of unmanned aerial vehicle designs, and exhibited models of some of them at the last IDEX, including the Wing Loong.

The UAE is acquiring eight examples of the Piaggio P.1HH Hammerhead unmanned air vehicle as part of a $361 million deal that was signed in March 2016 at the second UMEX exhibition – UMEX is an annual event, with only alternate editions coinciding with the biennial IDEX.

Majority-owned by Mubadala, Piaggio Aero displayed a full-scale mock-up of the P.1HH in the first UMEX exhibition, and the type is sure to be a highlight of this year's exhibition, now that it is flying in prototype form.

The UAE's own unmanned system companies, including ADCOM and the Abu Dhabi Autonomous Systems Investments Company (ADASI), are sure to be vying for attention at UMEX. ADASI's Al Sabr (a licence-built derivative of the Schiebel Camcopter S-100) has been combat-proven in Yemen and Libya, while ADCOM continues to progress its disparate range of aerial targets and advanced UAV and UCAV designs.

At the previous IDEX show, ADCOM showed its United-40 medium-altitude long-endurance (MALE) UAV in a new 'Block 6' configuration, developed in cooperation with Leonardo company Whitehead Alenia Sistemi Subacquei (WASS). It is equipped with sonobuoys and armed with a single lightweight torpedo.

ADCOM and WASS said that the two companies were working to integrate the antisubmarine warfare (ASW) payloads, and that they planned to carry out drop testing from the United-40, culminating with a torpedo drop demonstration for the UAE Naval Forces. The two companies may give more details as to progress at this year's IDEX/UMEX.

Heavy involvement

Operations in Libya, Egypt, Yemen and against the so-called Islamic State in Iraq and Syria have seen heavy involvement by Emirati special forces aviation, and further investment in these forces seems inevitable.

IDEX 2015 saw the local debut of the NorthStar Aviation Model 407MRH – a dedicated special forces support helicopter based on the Bell 407GX and ordered by the UAE Armed Forces' Group 18. The helicopter has now seen operational service in Yemen (and possibly in Libya), and it will be interesting to see whether the next IDEX exhibition reveals any further 'new toys' for the Emirati special forces.

But the UAE also has requirements for equipment and capabilities that are unrelated to the on-going struggle against Islamist insurgent forces in the region.

The UAE has a long-established requirement for a new advanced trainer aircraft – and, indeed, selection of the Leonardo Alenia M-346 Master to meet this need was announced at IDEX in 2009, but no contract for the 48 aircraft has been signed due to shifting procurement priorities and disagreements over contract specifications. There have even been reports that the UAE has re-opened negotiations with other potential suppliers, including KAI.

There is also a UAE requirement for a new maritime patrol and anti-submarine aircraft, over and above the capability provided by its two modified DHC-8 Q300s and the Piaggio Aerospace multirole patrol aircraft (MPA) now under development by Piaggio and Abu Dhabi Autonomous System Investments (ADASI), a subsidiary of Tawazun.

The UAE's proximity to Iran, its strategic location on the Straits of Hormuz and the economic importance of offshore oil and gas, lends particular importance to maritime patrol capabilities at the best of times and, with growing tension between the GCC and Iran, the maritime domain has assumed even greater importance. In times of conflict, Iranian submarines and surface vessels would pose a major threat to Emirati oil and gas infrastructure in the Gulf, and to the shipping on which the UAE relies to export its oil, and to import a whole range of products.

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It is likely that longer-reach

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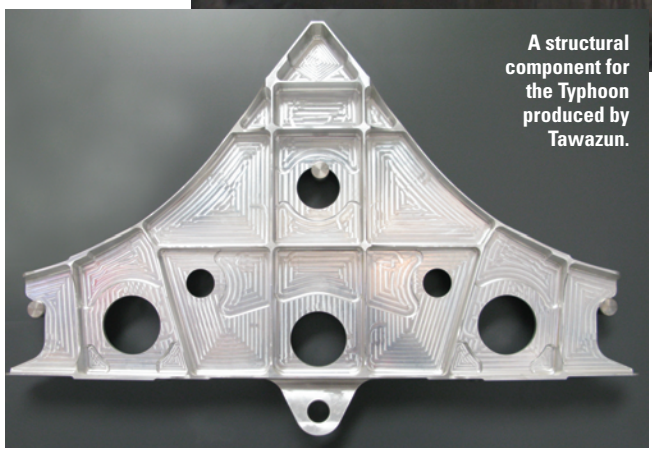
maritime patrol capabilities will increasingly be sought by Gulf air forces, probably with expanded offensive anti-surface warfare (ASuW) and ASW capabilities.

Following the UAE order for two Bombardier Global 6000 business jets, equipped with the Saab GlobalEye airborne early warning and control (AEW&C), maritime and land surveillance and electronic intelligence sensor suite, which includes the new Erieye ER AEW&C radar, there may be a potential opening for Saab's Global 6000-based Swordfish long-range, multi-role maritime patrol aircraft (MPA) mission system in the Emirati inventory. However, any advanced MPA requirement will be hotly contested, with Boeing likely to offer the P-8A Poseidon, Airbus Military the C295 MPA, and Leonardo the ATR72MP.

Saab, itself, also offers the Swordfish mission system on the Dash 8 Q400 airframe – something that might be of interest to the UAE, which already operates a pair of highly modified Q300 MPAs converted by Provincial Aerospace following a 2009 order.

By late 2016, both Q300 MPAs were operating from Eritrea's Assab Airport, alongside special forces aviation assets and nine Dassault Mirage 2000-9 fighters. They are assumed to be supporting UAE operations in southern Yemen, which have seen extensive involvement by the UAE Navy, including a Baynunah-class corvette and various landing and support ships.

The Russian BMP-3 armoured infantry fighting vehicle (IFV) operated by the UAE Army illustrates IDEX's unique demonstration track.



A structural component for the Typhoon produced by Tawazun.

The UAE has also been actively seeking a new fighter to replace its Mirage 2000-9s for more than a decade, having successively courted (and jilted, and sometimes then courted again) Dassault, Eurofighter, Lockheed Martin and Boeing. But the evolving Iranian threat has led to a shift in emphasis, with the UAE increasingly turning away from fighters with purely or primarily defensive air-to-air capabilities to aircraft with a really robust offensive air-to-ground capability.

The UAE's dogged (and to many inexplicable) pursuit of the Lockheed Martin F-35 Joint Strike Fighter makes more sense when seen in this context, since it would provide a real capability to strike back against Iranian targets, if required.

Though IDEX continues to represent an excellent platform for companies wanting to sell equipment or services to the UAE's armed forces, and to other Gulf militaries, the show has increasingly come to also be used as a showcase for local defence companies.

The UAE has regularly featured on lists of the world's biggest arms importers, and was ranked fourth (behind India, Saudi Arabia and China) by the Stockholm International Peace Research Institute (SIPRI) in 2016. A desire to reduce the UAE's dependence on foreign weapons through 'import substitution' has helped encourage the growth of an indigenous arms industry. This has had the beneficial effect of creating high value jobs locally, and arms exports could help the UAE in its drive to diversify away from oil production.

To facilitate such activities, the UAE has established the Emirates Defence Industries Company (EDIC), which is intended to bring together the combined capabilities of the UAE's defence industries into a single integrated platform, enabling the sharing of key facilities, technology and support services.

EDIC was established via the integration of assets owned by Mubadala Development Company, Tawazun Holding, and Emirates Advanced Investments Group, and incorporates companies across the manufacturing, MRO, armaments, autonomous systems, mapping, communications, logistics and technology development sectors.

Even before the formation of EDIC in 2014, some Emirati arms companies had scored lucrative export customers – Tawazun's NIMR Automotive has exported its Nimr armoured vehicle (the first piece of military hardware to be built entirely in the UAE) to Algeria, Lebanon, and Libya, and has contracts in Bahrain and Qatar, and ambitions to export to South East Asia, where the company is targeting Thailand, Malaysia, the Philippines, and Indonesia. The company is also targeting eastern Europe.

Similarly, the export success of Caracal International, which produces a wide range of modern firearms – from pistols to sniper rifles, pre-dates the establishment of EDIC. The company's customers include Algeria, Bahrain, Germany, Italy, Jordan and Libya.

In the aerospace sector, the Advanced Military Maintenance, Repair and Overhaul Centre (AMMROC) is a leading provider of military MRO services across the region, and its customers include a number of Gulf air forces. Similarly, the Horizon International Flight Academy already has commercial and military customers across the South Asia, Middle East and North Africa region.

Tawazun has announced a succession of deals to supply components to western manufacturers, including parts for the German-made Skyshield air-defence system, and an airframe component for the Eurofighter Typhoon – the latter being proudly displayed at the previous IDEX.

Another product previously exhibited at IDEX is Tawazun's Al Tariq glide bomb. Now that initial deliveries to the UAE are complete, South African partner, Denel, has started an international marketing campaign, and has admitted that it is already in discussions with South Korea aimed at integrating the new weapon on the Korea Aerospace Industries (KAI) FA-50 advanced trainer and light fighter aircraft.

Initial discussions have also been opened with Saab, to examine the feasibility of integrating the weapon on the Saab Gripen to meet an expected South African Air Force (SAAF) requirement for a guided stand-off weapon.

Al Tariq has already been integrated on the SAAF's BAE Systems Hawk Mk 120 lead-in

Northstar Aviation Bell 407MRH on display.

fighter trainers, which were used for testing – including live drops – on the Overberg test range. It is also on the UAEAF&AD Hawk Mk 102s and Mirage 2000-9s.

Manufacturing of the weapon was due to move to the UAE at the end of 2016, after which the South African partner would focus on the development of new versions.

The Emirati state, itself, also has some experience as an arms exporter – having frequently transferred surplus equipment to allies.

The UAE transferred 19 surplus Mirage III/5 fighters to Egypt, and nine Hunters and four Islanders to Somalia.

More recently, in 2007, it delivered nine SA342L Gazelle helicopters to the Lebanese Air Force, which also took delivery of IAR-330 Puma transport helicopters.

Plans to transfer 10 BAE Hawks stalled, but not before eight pilots had received training in the UAE in 2009. In the end, 13 Emirati Hawk Mk 63 advanced trainers were transferred to the Royal Jordanian Air Force and, according to some sources, six more are expected.

Ex-Emirati helicopters have been transferred to Oman (eight Agusta-Bell and Bell 205s), Jordan (six AS350B3 Ecureuils) and possibly Pakistan (an unknown number or IAR 330s).

The delivery of Iomax Archangel Block 3 border patrol aircraft (BPAs) has allowed the transfer of older Block 1 and Block 2 BPAs to be transferred to Yemen (three), Jordan (six), Egypt (up to 12) and perhaps to Libya.

One unusual feature of IDEX is the live demonstration element, which uses a purpose-built demonstration track, in addition to the on-water and airborne demonstrations.

Following a grand opening ceremony, with marching bands from the UAE and often from the visiting warships, there is usually a live demonstration by the Emirati armed forces, who re-enact a fictional scenario in which friendly forces are pitted against an enemy (often terrorist) force. This will typically include drive-bys by armoured vehicles and heavy guns, fast jet and UAV flypasts (the latter streaming live video to the friendly force commander and the watching VIPs) and troop insertions by various means, including fast-roping from helicopters, sometimes on to land, and sometimes on to boats.

In previous years, the demonstration has afforded an opportunity for spectators to see newly acquired equipment, and it was at IDEX that the UAEAF&AD debuted its Saab 340 Erieye airborne early warning aircraft, for example.

In 2015, the Al Fursan formation aerobatic display team closed the show, leaving a smoke trail in the colours of the national flag.

Sold all exhibition space

In early January, Adnec announced that it had already completely sold all available exhibition space at the two exhibitions in the purpose-built Abu Dhabi National Exhibition Centre (ADNEC), which provides 133,000sqm of event space in Abu Dhabi. This space is spread across 12 connected exhibition halls, as well as a large concourse and atrium, while the outdoor Capital Plaza accommodates outside displays, exhibitor chalets, more stands and the media centre.

The halls include a dedicated first-time exhibitor zone (FTEZ), which provides a high level of exposure at a cost-effective price. The FETZ has always attracted a great deal of interest from visitors eager to view technology and products they have not seen before.

The NAVDEX site lies on the other side of Al Khaleej al Arabi Street, and is accessed via a pedestrian footbridge. It includes its own indoor exhibition space, jetty-side, together with mooring for up to seven ships.

Selling out this massive space is a remarkable achievement, especially since the decision to hold a separate, dedicated event for UMEX 2017 had "opened up much-needed space for exhibitors", according to Saeed Al Mansouri, the director of IDEX and NAVDEX 2017. UMEX was launched in 2015 and occupies a separate temporary building.

Humaid Matar Al Dhaheri, acting group chief executive of Adnec, welcomed the overwhelming response to the 2017 events. "It demonstrates the high relevance both expos have to the global defence industry," he said.

The IDEX exhibition will be preceded by a one-day conference held at the National Archive on February 18. This will include keynote speeches on disruptive emerging technology and innovation, cyber warfare, and the contribution of defence and security control to mitigating 'multiple disruption'.

IDEX 2015 involved participation by more than 1,200 national, regional and international exhibitors from 57 countries, with 42 national pavilions. The exhibition attracted more than 101,000 visitors from 143 countries, and 150 official delegations from around the world, while more than 500 senior defence executives and senior officers attended the accompanying conference.

The exhibition reportedly generated deals worth in excess of AED 18.3 billion ($4.98 billion), a total that has more than doubled in 10 years. The organisers expect the 2017 show to do even better.

Though IDEX will doubtless continue to flourish, its position as the only tri-service defence exhibition in the MENA region will come to an end later this year with the launch of the first Bahrain International Defence Exhibition and Conference (Bidec), which is scheduled to take place from October 16-18 2017 under the patronage of His Majesty King Hamad bin Isa Al Khalifa and chairmanship of HH Shaikh Nasser bin Hamad Al Khalifa, commander of Bahrain's Royal Guard.

It has been an impressive couple of months for Middle East air forces. The US Government approved deals with Qatar for 72 F-15QAs and also Kuwait for 40 F/A-18E/F Super Hornets in mid-November, but in early December came a bonanza of possible helicopter sales valued at more than $7 billion. **Alan Warnes** *reports.*

MORE HELOS – GOOD BUYS

A request by the United Arab Emirates Air Force and Air Defence (UAEAF&AD) for 37 AH-64E Apache helicopters was approved on December 7, while the same day saw the Royal Saudi Air Force (RSAF) given the go-ahead to purchase 48 CH-47F Chinook helicopters.

It has been an impressive few weeks and looks like a bid by the current US Government to wrap up foreign military sales before the new Trump administration took office on January 20.

It would appear that the GCC air forces are taking plans to strengthen their air forces seriously.

The war in Yemen has highlighted the need to work together and *Arabian Aerospace* was told at Bahrain International Airshow (BIAS) in January that it would happen "soon". These deals illustrate that the GCC nations are taking care of their own tactical inadequacies, in the light of the operations in Yemen as well as any increased threat from Iran.

A proxy war has been raging in Yemen since 2014 between Shiite Iran and the Saudi Arabian allied force, supported by most of the Sunni-led GCC countries. These intended acquisitions will support all their needs.

The proposed $3.5 billion Apache sale includes the remanufacture of the UAEAF&AD's 28 existing AH-64Ds into AH-64E configuration, together with production of nine new AH-64Es. It comes after several years of negotiations over the purchase of, arguably, the best gunship in the world. The UAE originally operated 30 AH-64As, which were later upgraded to AH-64D Block II standard.

On November 4, 2010, the Defense Security Cooperation Agency (DSCA) had notified the US Congress of the planned contract to upgrade all 30 of the UAEAF&AD AH-64Ds to the AH-64D Block III (now AH-64E) but nothing progressed until now.

The Apaches were delivered between 1993-96 and modernised from AH-64A to D standard between 2008-10. The 2010 notification also indicated the UAE's intention to buy an additional 30 new-build examples.

While the announcement on December 7 confirmed the upgrade is finally moving ahead, only nine are being purchased as new builds. It is unclear if there is still a need for 30.

The intention to upgrade just 28 would indicate there have been two attrition losses. One of these was involved in a crash during operations in Yemen on June 13, 2016, which resulted in two fatalities. It is unknown when the other loss occurred.

In addition to the helicopters, the contract will see many other major items including 76 T700-GE-701D engines (56 remanufactured and 18 new with two spares) as well as 39 AN/ASQ-170 modernised target acquisition/designation sights (28 remanufactured, nine new with two spares).

Tactical heicopters

The UAEAF&AD's Joint Aviation Command (JAC), based at Sas Al Nakheel Airbase, operates the majority of tactical helicopters in the UAE, including all the AH-64D Apaches. It took on the aviation assets of the UAE Land Forces, Special Operations Command and Naval Squadron in mid-2012.

According to the JAC, this was done for better command and control reasons as well as logistics support, and is based on the UK's Joint Helicopter Command. Senior officers serving the JAC and educated in military leadership at the UK's acclaimed Royal College of Defence Services (RCDS) Shrivenham, Oxfordshire were impressed with the way the JHC operates.

Meanwhile, the Advanced Military Maintenance Repair and Overhaul Centre (AMMROC), which has recently built a state-of-the-art MRO at Al Ain, could remanufacture the helicopters.

The other proposed helicopter deal announced on December 7, valued at $3.51 billion, was for the sale of 48 CH-47F Chinooks to Saudi Arabia. It marks the biggest foreign military sale to date, with the only other country in the region operating the CH-47F being the UAEAF&AD, which took delivery of 20 during 2012-2014.

Why the LAF is getting a bit Moody

US Air Force officials announced on December 8 that Moody Air Force Base in Georgia will host a stateside mission to train Lebanese Air Force (LAF) pilots and maintenance personnel on the A-29 Super Tucano aircraft.

This temporary programme will fall under the 81st Fighter Squadron; the existing A-29 Light Air Support training squadron that currently trains Afghan Air Force (AAF) personnel.

It ensures the LAF receives the support and training it needs to safely and effectively employ the A-29.

Lieutenant Colonel Ryan Hill, 81st FS commander, said: "The 81st Fighter Squadron enables our international partners to work with the United States to achieve strategic objectives. The light air support capability is critical to the Lebanon Air Force and, when fully trained, these pilots and maintainers will provide an effective tool for the Lebanese national security forces to combat terrorism."

AAF A-29 training has been conducted at Moody since 2014. The new mission is anticipated to bring an additional 80 personnel to Moody, including Lebanese military, civilians and contractors required to support training on six new aircraft. The initial proposed commitment for this training mission projects a limited presence at the base through until 2018.

The additional A-29 aircraft, procured by the Lebanese Government, will fly alongside Afghan aircraft to make a total 14 aircraft from both countries during peak training in 2017. Under current plans, the aircraft could arrive at Moody AFB in early 2017 and the first Lebanese personnel are expected to begin training in February 2017.

Sierra Nevada Corporation was awarded a contract on October 30, 2015, to provide six A-29s for the LAF. Contract completion is anticipated by July 31, 2019.

❑❑❑❑❑

The programme will train an initial cadre of Lebanese personnel to include 22 maintainers and 12 pilots, who will become instructors. After returning to Lebanon, they will, in turn, train additional personnel on this weapons system to conduct offensive and defensive firing operations plus reconnaissance and surveillance operations throughout Lebanon to combat terrorism.

Mirroring the current Afghan training, US Air Force advisors will provide flying training to the Lebanese student pilots.

US Air Force and contractor maintenance personnel, including aircraft maintainers, maintenance instructors, and ground training device instructors and operators, will conduct maintenance training.

The UAEAF&AD's current fleet of 28 AH-64Ds will be remanufactured to the AH-64E under the December 7 DSCA notification, while it will also acquire nine brand new AH-64Es.

PICTURE: ALAN WARNES.

According to a US Army spokesman, the sale will help to bridge the gap between the end of the CH-47F Block I production in 2018 and the initiation of CH-47F Block II production in 2021.

The contract also includes 112 4,733hp Honeywell T-55 engines, as well as common missile warning systems (CMWS) and M240H 7.62 machine guns.

The helicopters are to be operated by the Royal Saudi Land Forces Aviation Command (RSLFAC).

The CH-47F will increase its interoperability with US forces and advance the development of a heavy-lift helicopter capability, which, oddly enough, Saudi Arabia does not possess. Until now they have concentrated on using the Sikorsky UH-60 to transport troops. However, with the Yemen conflict showing no sign of ending, and the need to transport equipment and troops as quickly as possible, an alternative was required.

Most of the RSLFAC aviation assets, which comprise Bell 406CS Combat Scout, Schweizer 333s, S-70A-1 Black Hawk, UH-60L Black Hawks and AH-64 Apaches, are headquartered at Hafr Al-Batin in King Khalid Military City, although they deploy all over the country.

The CH-47Fs will undoubtedly join them there, as well as up to 60 US Government and contractor representatives for up to 60 months, for equipment de-processing, fielding, system checkout, training and technical logistics support.

The CH-47F is the latest derivative of the hugely successful Chinook and has a payload of around 21,000lbs (9,500kg). When fitted with an extended range fuel system it has a mission radius of more than 400 miles (644kms).

After a failed coup attempt and a series of subsequent purges, Turkey's air force has undergone a major reorganisation, with several units disbanded and large numbers of personnel arrested. As a result, the force now faces serious pilot shortages. **Jon Lake** *looks at the coup attempt and its aftermath.*

PILOT LIGHT

On July 15 2016, a faction within Turkey's military, including Army, Air Force and Gendarmerie personnel and units, attempted to overthrow the government of President Tayyip Erdogan, leader of the Islamist AKP party.

Before mobilising their forces, the plotters, apparently led by generals calling themselves the 'Peace in the Country Council', attempted to neutralise important government figures. At around 21.00, army special forces units set off to arrest the military's senior command.

One or two air force AS532AL combat search and rescue (CSAR) helicopters from the 6 AJÜ, carrying air force commandos, raided the wedding ceremony of a high-ranking general in Istanbul and kidnapped a number of senior officers, including the Chief of the General Staff, General Hulusi Akar. The officers were taken to the Akinci Airbase, some 20 kilometres (12 miles) from Ankara, which served as the coup's operations centre.

Attempt to arrest

An attempt to arrest President Erdogan, who was holidaying in the resort of Marmaris, proved unsuccessful. The president's vacation had forced a last-minute change of plan – he had originally been due to be captured by Underwater Offence Team (SAT) and Underwater Forces (SAS) commandos in Istanbul before being transferred to Akinci on an S-70A, refuelling at Milas.

Instead, around 25 soldiers in three Army Aviation S-70A helicopters from Samandira, rappelled on to the hotel, in an apparent attempt to seize the president. But Erdogan had fled 20 minutes before, and this part of the mission failed.

One of these helicopters subsequently flew to Alexandroupoli, in Greece, where its eight occupants were arrested.

Meanwhile, Army units (including tanks), had moved on to the streets of Ankara and Istanbul, closing down Istanbul's Bosporus and Fatih Sultan Mehmet bridges.

Tensions remain high at Turkish bases.

At least four rebel F-16C Block 50 fighters (from the 141 and 143 Filo at Akinci and the 181 Filo) took off and flew high-speed low passes over Ankara, beginning at about 22.20, reportedly breaking the sound barrier and releasing flares. They were supported by up to four KC-135 tankers operating from Incirlik air base.

Interestingly, one of the F-16 pilots was the officer who shot down the Russian Su-24 'Fencer' that had violated Turkish airspace back in November 2015.

An S-70A and two Bell AH-1Ws, from the Taarruz Helikopter Tabaru (Assault Helicopter Battalion), took off from Ankara's Guvercinlik Army Aviation Base and began overflying the city at 22.25, and may have been joined by T129 ATAK attack helicopters, according to some sources.

After the coup, the Turkish General Staff said that the rebels had used 35 aircraft (including 24 fighters) and 37 helicopters (including eight attack helicopters).

The aircraft and helicopters supporting the coup apparently attacked a number of ground targets – the F-16s using 500lb GBU-10 laser-guided bombs, and the helicopters using cannon and machine gun fire.

These targets included the Police Special Operations Forces headquarters, the Police Aviation Division headquarters and the TurkSAT (state satellite operator) headquarters at Golbasi, as well as the Turkish Grand National Assembly building (TBMM), the Turkish Police general headquarters, the Presidential Palace at Bestepe and the MIT (national intelligence organization) headquarters at Yenimahalle.

Fired on crowds

Some reports suggest that attack helicopters fired on crowds of demonstrators, and there were reports that at least one rebel helicopter was shot down by a loyalist F-16. F-16s flown by loyalist pilots reportedly took off from Dalaman, Erzurum and Balikesir and there were unconfirmed reports of inconclusive dogfights between rival F-16s.

Early in the morning of July 16, F-4E 2020 fighter-bombers from 2MJB Eskisehir bombed the main runway at Akinci to prevent further rebel F-16s from taking off.

Istanbul's Ataturk airport was taken back from the rebels shortly before the president's aircraft returned and he was able to broadcast to the nation, on a reporter's iPhone, appealing for support and exhorting the people to defend democracy.

People began taking to the streets in large

F-16 fighters were used by both sides during the coup attempt.

numbers, answering the call of the president and the religious affairs Diyanet Ministry, depriving rebel forces of movement and mobility.

Civilian vehicles blocked the runway at Kayseri (12th Main Transport Base) to prevent an A400M Atlas and five other transports from taking off, after single A400M and Transall aircraft had begun to airlift ammunition and supplies for the rebels at 7 MJB Malatya, planned to be the main rebel centre in the east of Turkey.

Whatever their motives, air force officers played a leading role. Former Turkish Air Force chief, Akin Ozturk, who led Turkey's air force between 2013 and 2015 before retiring, has confessed to plotting the failed military coup, and his son-in-law, Lieutenant Colonel Huseyin Karakus, the commanding officer of 141 Filo, is alleged to have led the F-16 bombing raids during the coup.

The failure of the coup further entrenched Erdogan's position, allowing him to undertake a series of purges, arresting, suspending or dismissing judges, teachers, police officers, civil servants and thousands of Turkish Armed Forces (TSK) personnel. It was even hinted that Turkey might reinstate capital punishment, abolished in 2004, to punish senior figures behind the coup.

About 35% of Turkey's generals were dismissed, together with about 8% of the officer corps. Special forces units were affected disproportionately, as was the air force, which lost several base commanders, and more than 270 pilots, representing just under half of the total number of about 600 combat-ready, operational pilots.

Of 170 pilots dismissed in the first round of purges, 110 were from the 4th Main Jet Base at Akinci, 29 from the 12th Main Transport Base at Kayseri, 23 from the 2nd Main Jet Base at Cigli, and eight from the 8th Main Jet Base at Diyarbakir.

About 20 Army assault and attack helicopter pilots have also been dismissed, and a reported 30 KC-135 pilots from the 101st squadron were also discharged for alleged involvement in the coup attempt.

Deployment base

Akinci has reverted to its original name, Murted, and will now become a deployment base with no based aircraft. It may close altogether, perhaps becoming a "democracy park". Its three F-16 Squadrons have been disbanded, their aircraft reallocated to other bases, including Merzifon, where a new, third F-16 unit has been established. Another new unit is the 113th Filo at Eskisehir, which is equipped with ex142 Filo F-16s and their DB-110 reconnaissance pods. Unconfirmed reports suggest that the 6th Main Jet Base at Bandirma will also be closed.

In an effort to combat the ensuing pilot shortage, the THK has extended the length of service for pilots from 15 to 18 years, and has publicly appealed for recently retired pilots who left the force between 2010 and 2015 (most of whom are now working for civilian airlines) to rejoin and return to the cockpit.

Unfortunately, only a tiny proportion of the several hundred pilots who would be eligible have actually re-registered, and numbers were acknowledged as being below official expectations. Though one press report suggested that as many as 140 former combat pilots were preparing to return to service, the state-owned Anadolu Agency reported that just six pilots had expressed any interest in returning to the military.

In the face of such apparent disinterest, the air force is reportedly considering a reserve system that would allow ex-military airline pilots to return on a part-time basis, while continuing their lucrative commercial careers.

But, however many pilots decide to return, their military skills will have atrophied, and they will require extensive training to re-acquire certain competences.

Turkey also plans to recruit university students (dropping the normal precondition that they must have attended military school to attend the Air Force Academy) and will put them through an accelerated two-year flying training programme.

Even with these measures, it has been estimated that the air force will need at least two years to recover from the purges, and in the meantime readiness, availability and combat effectiveness will all be severely curtailed.

"In two years time, you will see, our air force will be stronger than before," the Turkish Air Force commander, Abidin Unal, optimistically predicted to the *Vatan* newspaper in late October.

However, investigations into the coup continue, raising the prospect of more dismissals.

In recent years, the UAE has embraced a more active military role on the world stage, deploying forces in the Balkans and Afghanistan, as well as in Libya during the 2011 civil war. As **Jon Lake** *reports, the nation has also played a major role in operations against Daesh and in the Saudi-led Pan Arab coalition fighting Islamist and Iranian backed Houthi forces in Yemen.*

UAE SHOWS ITS STRENGTH IN DEPTH

In the long-running second civil war that broke out in Libya during May 2014, the UAE has provided (often tacit) support to the new Libyan National Army, led by General Khalifa Haftar and allied to the democratically elected government of the Council of Deputies, also known as the 'Tobruk Government'.

Haftar's Libyan National Army (LNA) has taken on Libyan Dawn – a wide-ranging coalition of Islamist and extremist groups, including Libya's branch of the Muslim Brotherhood, Ansar al-Sharia, former al-Qaeda jihadists, Berber, Tuareg, Misrata and Zawia militias, who are broadly allied with the Tripoli-based Government of National Accord, which enjoys support from Qatar, Turkey and Sudan.

From August 2014, Egypt and the UAE launched a number of airstrikes against Islamist militias, though both countries denied direct involvement. *Arabian Aerospace* understands that, for some of these missions, UAE Air Force F-16s operated from Siwa, an Egyptian military base close to the Libyan border.

In April 2015, the UAE donated armoured personnel carriers and at least two Schiebel S-100 Camcopter UAVs to the LNA Air Force.

More direct involvement began in June 2015, when the UAE deployed at least one, and probably two, Iomax AT-802U Border Patrol Aircraft to an unidentified Libyan air base, subsequently establishing a military base at Al-Khadim Airport in Marj province in eastern Libya, around 100km from the port city of Benghazi.

The new UAE facilities were up and running by March 2016, and have progressively grown in size. Transport aircraft have frequently been seen at the base, including chartered Il-76 and turboprop-powered Il-18 transport aircraft.

From here, the UAE Air Force and Air Defence (UAE AF&AD) has operated at least six Air Tractors (apparently with their national markings hidden), using them in attacks against Benghazi's Shura Council Islamist militants, and providing close air support for LNA forces, and almost certainly for UAE special forces operating on the ground.

It seems that the UAE AF&AD Air Tractors were more feared by the enemy, though they flew fewer missions, and delivered fewer weapons, than the LNA's own MiG-23 fighter-bombers. What they did drop, they dropped with greater accuracy, and they were also able to loiter longer, waiting for fleeting targets to 'pop up' and be attacked.

Emirati Sky Tractors carried a range of weapons.

In September 2016, Shura Council of Benghazi Revolutionaries (SCBR) published an infographic showing the types of aircraft that had been attacking them in Benghazi. According to the infographic, the LNA's MiG-23s flew 320 missions; Mi-17 helicopters flew 87 sorties, while the AT-802Us flew just 27 bombing missions in the same period. It also listed 235 reconnaissance flights by the S-100 Camcopter, and 364 performed by 'MQ-9 Reaper' drones, though this may have been a misidentification of the UAE's Chinese-supplied Wing Loong unmanned combat aerial vehicles (UCAVs).

Weapons used by the Emirati Air Tractors in Libya include Turkish-supplied Mk 82 bomb bodies fitted with GBU-12 laser-guidance kits. It is not known whether the aircraft have used the AGM-114 Hellfire missile, GAU-19/A .50-caliber gun pod, or DAGR or Cirit laser-guided rockets, all of which can be carried by the type, and all of which are known to have been used in combat (though this may have been in Yemen, where the Air Tractor is also in action).

Satellite imagery shows that the Air Tractors have been supported by at least two helicopters (probably Sikorsky UH-60 Black Hawks), and a number of unmanned aerial vehicles (UAVs), including Camcopters and Chinese-built Chengdu Wing Loong armed drones.

The Wing Loong (also known as the Pterodactyl I) was first exported to the UAE in 2011, and has subsequently been supplied to Egypt and Saudi Arabia. The aircraft is a medium-altitude long-endurance (MALE) UAV, primarily intended for intelligence, surveillance and reconnaissance (ISR) duties, with a relatively modest 200kg payload, but weaponised to allow the carriage of BA-7 air-to-ground missiles, YZ-212 laser-guided bombs, YZ-102A anti-personnel bombs or 50kilogram LS-6 miniature guided bombs.

Growing controversy surrounds UK-supplied weapons in Yemen

The British Government has said that it is "deeply concerned" by reports of the Saudi use of UK weapons against civilian targets in Yemen, though Foreign Secretary Boris Johnson said he did not believe the "threshold" had been crossed, which would demand the suspension of arms sales to Saudi Arabia. **Jon Lake** *reports.*

Hysterical media coverage and calls for arms embargoes from charities such as Oxfam, Amnesty International and Human Rights Watch, has put pressure on the UK Government to halt arms shipments to Saudi Arabia.

This would constrain the operational effectiveness of Royal Saudi Air Force (RSAF) Tornados and Typhoons, which tend to rely on UK-supplied weapons, and would also affect some other air forces in the coalition.

Any such embargo would also be damaging for the UK, since Saudi arms purchases account for a third of Britain's global arms exports.

It has been reported that weapons worth more than £3.3 billion have been sold to Saudi Arabia since the Yemen campaign began in March 2015.

The UK has strongly supported Saudi Arabia and its allies in the war in Yemen. Britain shares the Saudi view that Yemen must be stabilised in order to prevent the failed nation from being used to launch terror attacks against the west. Britain has sold Saudi Arabia equipment and munitions, and has used British military personnel to help train Saudi forces in targeting, as well as to give "general advice" – including ways of avoiding civilian casualties.

Tornados have been put to use in the conflict - and seen here firing a Brimstone missile.

Despite this, the United Nations has reported "widespread and systematic" attacks against civilian targets, which would be in violation of international law.

A different analysis might be that the relative inexperience of the air forces in the Saudi-led regional coalition has resulted in some inaccuracy, coupled with some poor targeting intelligence, resulting in significant collateral damage, and a relatively high civilian death toll.

There is also no doubt that the extent of civilian casualties has been highlighted and emphasised (and quite probably exaggerated) by the enemy propaganda machine, precisely in order to try and cut off the supply of weapons to the coalition.

In response to a Parliamentary written question, British Defence Secretary, Michael Fallon, confirmed that a number of British-supplied weapons have been used in the Yemen, including the MBDA Storm Shadow long-range cruise missile, the MBDA dual-mode Brimstone (whose integration on Saudi Tornados had not hitherto been officially confirmed), BAE ALARM anti-radiation missiles (withdrawn from service in the UK in 2013), and UK Paveway II laser-guided bombs, as well as the Raytheon UK Paveway IV dual-mode (IN/GPS and laser-guided) bomb.

Fallon also listed the PGM500 (also known as the Al Hakim), a modular powered glide bomb used only by the UAE Air Force and Air Defence.

A number of these weapons are legacy systems, supplied some time ago, and no longer being manufactured or sold. This includes the most controversial UK weapon that may have been used in Yemen, in the shape of the Hunting BL-755 cluster bomb.

The cluster bomb has not been exported since 1989, though both Saudi Arabia and the United Arab Emirates are known to hold stocks of the weapon.

And, while the UK is a signatory to the 2010 Cluster Munitions Convention, committing it to disposing of its own cluster munitions and working to prevent their use by anyone else, Saudi Arabia is not a signatory.

Evidence of the use of BL-755 in Yemen is sketchy, and there have been suggestions that the single bomb found by Amnesty International could have been left over from a previous conflict since the last delivery of this weapon to Saudi Arabia was in 1989, and weapons like these do not have an unlimited shelf life.

There is no evidence of the weapons having been returned to Hunting for any refurbishing or re-lifing programme. This has not prevented Abdulaziz bin Habtour, the leader of the rebel Houthi government, from accusing Britain of war crimes by supplying cluster bombs to Saudi Arabia.

The then foreign secretary, Philip Hammond, undertook to investigate fully and promised to seek concrete assurances from Saudi Arabia that it had not used British-made cluster munitions during the current conflict.

Many must be wondering what the fuss is all about. Cluster bombs are of little use in an air campaign like that being waged in Yemen and, in any case, Saudi Arabia and the UAE have plentiful supplies of more recently-supplied, US-provided cluster munitions in the shape of the CBU-97 Sensor Fused Weapon and its guided counterpart, the CBU-105 Wind Corrected Munitions Dispenser.

Syria boosted by more upgraded Su-24M2 bombers

The Syrian Arab Armed Forces are receiving 10 examples of the Sukhoi Su-24M2 'Fencer-D' attack aircraft from Russia, augmenting an unknown number of existing 'Fencers'. **Jon Lake** *reports.*

Before the on-going deliveries began, Syria had received 22 Su-24s in total. Some 20 downgraded Su-24MK export versions were delivered from the Soviet Union in 1990, and these were augmented in the mid-1990s by single examples of the Su-24MK and the Su-24MR reconnaissance aircraft, which were donated by Libya after Syria provided support for Libya's own 'Fencer' fleet.

The aircraft are operated by 819 squadron at T4 (Tyas) Airbase in Central Syria, though they have been detached to operate from other airfields, and have been seen in the south.

A contract to upgrade all 21 bomber versions to the latest Russian air forces Su-24M2 standard was signed in 2009 and work at the 514th ARZ (aircraft repair plant) at Rzhev began in 2010. The contract also covered the training of Syrian pilots and maintenance personnel on the new variant and its systems.

The upgrade will bring the aircraft up to the same standard as Russian 'Fencers' that have been modernised under the 'Gefest' and 'Sukhoi' programmes, which began in 1999 and 2000, and completed in 2009.

The upgrade will significantly enhance the capabilities of the Syrian Su-24s, and promises to improve availability and maintainability, as well as combat effectiveness.

Highlights of the upgrade include a new weapons control system, allowing the carriage of a greater range of weapons, including modern precision-guided missiles, a new SVP-24 navigation and weapons aiming system incorporating both GPS and global navigation satellite systems (GLONASS), and a new ILS-31 head-up display (HUD).

Though the upgrade allows a significant improvement in bombing precision and accuracy, in practice, the Syrian Su-24M2s continue to rely most heavily on unguided freefall FAB, OFAB and RBK series bombs.

The Sukhoi Su-24 Fencer is a supersonic, all-weather attack aircraft developed in the Soviet Union. The aircraft has a variable-sweep wing, twin-engines and a side-by-side seating arrangement for its two crew.

It has been reported that most of the upgrades were completed in 2013 and that "more than half of the 21 upgraded Su-24s made it back to Syria", though it has also been reported that up to 10 aircraft were not re-delivered, thanks to international embargos against Syria.

Satellite photos showed between five and eight aircraft in Syrian camouflage parked on the flightline at Rzhev, swathed in tarpaulins, late last year.

It remains unknown as to whether the 'new' deliveries are actually additional aircraft, or whether they are simply the balance of the aircraft upgraded under the 2009 contract.

One Su-24M2 has already been lost in action, being shot down over Daret Izzah in the Aleppo province on November 28 2012. Despite this setback, the Su-24M2 has become the most important type in the Syrian inventory, with other aircraft being increasingly 'war weary' and lacking in relevant capabilities.

On September 2 2013, Syrian Su-24s attempted to probe British air defences at Akrotiri on the island of Cyprus, but were turned back. They were also used to probe Turkish air defences the following month. This was hazardous work.

Rules of engagement

After the shooting down of a Turkish jet by Syrian forces in 2012, Turkey changed its rules of engagement so that any "military elements" approaching from Syria would be considered as a threat and would be dealt with accordingly. Subsequently, Turkey shot down a Syrian Mi-17 helicopter in September 2013, and destroyed a MiG-23 fighter-bomber in March 2014. About one year later, on November 24 2015, a Russian Sukhoi Su-24M2 was shot down by a Turkish Air Force F-16 fighter jet near the Syria-Turkey border.

With growing US pressure, Russia stepped down its attacks against the 'moderate' insurgent groups supported by the west, and the supply of more Su-24M2s to Syria could be seen as a deliberate effort to help the Assad regime to circumvent US and NATO attempts to confine its attacks to the so-called IS (Daesh) and Al-Nusra Front.

The Syrian Air Force has certainly significantly stepped up its involvement in the fighting, undertaking up to 30 sorties a day.

In August 2016, Syrian Su-24M2s, attempting to engage targets in north-eastern Syria where US special operations forces were operating alongside Kurdish forces, were intercepted by US F-22A Raptors and turned away. While the US supports the Kurds, who have been heavily involved in operations against so-called IS, the Syrian regime has been fighting against Syrian Kurdish groups.

On two occasions, the Syrian 'Fencers' were simply turned away, but there must be a real chance that they will be engaged and shot down, should they continue to provoke the US Air Force.

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Al Tariq guided bombs in UAE service and combat-proven

Denel Dynamics' annual report has revealed that 600 Al Tariq guided weapons have now been delivered to the United Arab Emirates, under a programme that was earlier delayed by technical challenges.

The Al Tariq precision-guided munition is a modular IN/GPS-guided glide bomb kit, a derivative of Denel's Umbani precision-guided bomb kit. Abu Dhabi-based Tawazun Holdings and South Africa's Denel Dynamics jointly produce the weapon.

The Al Tariq bomb kit is designed to fit the Mk 80 family of 500lb to 2,000lb bomb bodies, with pop-out wings and moving control surfaces and using GPS/INS guidance, or semi-active laser or imaging infrared seekers.

The guided bombs have been successfully launched from a UAE Mirage 2000.

Bolt-on propulsion

The standard Al Tariq has a range of up to 40km (depending on release height), but the company offers bolt-on propulsion options that can boost its range to 200km. This makes the weapon a direct competitor to Sagem's AASM and Boeing's JDAM-ER.

The weapon can use a normal dumb bomb pylon and does not require MIL STD 1553B or 1760 databus connections, as it can be wirelessly programmed from the cockpit.

The Denel annual report, published in October, revealed that 250 full weapons kits and 350 full weapons kits had been delivered respectively under the Mbarc I and Mbarc II programmes. However, confusingly, the report also said that a total of 350 full weapons kits plus 320 sub-kits had been delivered to date.

The Denel report also confirmed that integration of the weapon on to the customer's platforms had been completed, and that it had been successfully assembled and tested in the United Arab Emirates and deployed in operational conditions with, what Denel called, "very positive feedback from the users".

In November 2013, Tawazun Dynamics announced that the Al Tariq had been successfully integrated on to the UAE Air Force and Air Defence (UAE AF&AD) Mirage 2000-9 aircraft in association with Dassault, manufacturer and supplier of the Mirage 2000 fighters.

During 2015, Denel revealed that the weapon had also been integrated and was, by then, operational on the UAE's Hawk 102 trainers.

In October 2015, news reports showed the wreckage of what was purported to be a UAV that had been 'shot down' in Taiz, Yemen. The accompanying photos clearly showed an Al-Tariq wing kit, demonstrating that the weapon had made its combat debut!

JORDAN TO FILL ITS RADAR GAP

The US Air Force, acting on behalf of Jordan, has awarded Lockheed Martin a foreign military sales (FMS) contract to procure, deliver, and install undefined 'gap filler radar' systems.

The deal with the Syracuse, New York-based firm, was announced in October 2016 and has a firm, fixed-price, not-to-exceed $41.7 million.

Under the terms, Lockheed Martin is to supply two new long-range radar systems, but will also upgrade three existing long-range radar systems that are currently in use in the kingdom. Lockheed Martin will integrate all the systems into Jordan's existing command, control and communications set-up.

The term 'gap filler radar' is a broad and rather loose one, and is believed to describe several different versions of a Lockheed Martin active electronically scanned array (AESA), three-dimensional air search radar.

The baseline version is the fixed-site AN/FPS-117, originally designed in the mid-1980s for use in the USA and Canada's North Warning System.

The system is a low-power, long-range (200-250nm), frequency-hopping, L-band pencil beam search radar, with a solid-state transmitter and beacon interrogator. Jordan received a single AN/FPS-117 during 2002.

Germany is believed to be the only operator of the closely related RRP-117, which incorporated some offset input from Siemens.

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Lockheed Martin subsequently developed a transportable, mobile truck-mounted variant of the FPS-117, known as the AN/TPS-77, and Jordan received two of these in 2004. This system is similar to the AN/TPS-59 developed for the United States Marine Corps, and also supplied to Egypt and Bahrain, and in its GE-592 form, also to Taiwan.

It has not been revealed which systems are being supplied under the current contract, though the mobile TPS-77 would seem best suited for Jordan's requirements.

The US Air Force Life Cycle Management Center, at Hanscom Air Force Base, is the contracting authority, and all work is expected to be completed by April 30 2018.

Gain of drones

The Iranian Ground Force unveiled three new drones during a military exercise in December.

The first two drones are said to be capable of carrying out combat and reconnaissance missions.

The first, can carry new domestically-built air-to-ground missiles while the reconnaissance UAS called 'Oqab (Eagle), has 24-hour durability.

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Iran also unveiled the third new drone named 'Farpad' during these wargames.

The hand-launched drone is run by autopilot and can fly maximum 45 minutes with a range of 20km.

In another development, upgraded Iranian-made Toufan missiles were fired by helicopters and successfully hit simulated enemy targets.

QATAR LINES UP OSPREY FOR SAR

Reports are circulating that the Qatar Emiri Air Force could become the first air arm in the Middle East to order the Bell Boeing V-22 Osprey tiltrotor.

The suggestion is that the Emir of Qatar, Sheikh Tamim Bin Hamad Al Thani, is personally interested in acquiring the type to meet the search and rescue (SAR) requirements of the air force, and that Khaled Al-Atiyyah, the Qatari Minister of State for Defence Affairs, has been involved in negotiations and that the V-22 is "among his top priorities".

Certainly, the V-22, with its ability to combine the high speed of a fixed-wing turboprop with the vertical take off and landing and hover capabilities of a helicopter, would bring new capabilities to the Qatar Emiri Air Force – particularly in the SAR, combat search and rescue (CSAR) and special forces roles.

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But there may be other options and, as time goes on, these may start to gain more traction.

The United Arab Emirates has often been mentioned as a potential customer for the V-22. However, in November 2015, the UAE Air Force and Air Defence's Joint Aviation Command selected the smaller rival AgustaWestland AW609 to meet its requirement for a tiltrotor SAR aircraft.

The V-22 on desert trials - toted for Qatar.

Bell reports continuing Emirati interest in the V-22 to meet "a different capability" requirement – including CSAR and special forces support, but the AW609 decision does demonstrate that the V-22 is no longer the only credible tiltrotor option.

And, in the future, the choices facing Middle Eastern air forces will become even more difficult. Bell's V-280 Valor, being developed for the United States Army's future vertical lift programme, promises to be longer-ranged than the V-22, just as fast, and significantly cheaper (about one third of the unit price), while carrying half the payload or number of passengers.

The V-280 also uses a simpler rotor-tilting process, and promises less downwash, much less blast damage to ground surfaces (on the V-280 the rotors and drive shafts tilt, but the engines and exhaust nozzles do not), together with rapid emplaning and deplaning via the side door, where the Osprey has to use its rear ramp.

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The An-32B seen as interim solution for bomber requirement by Iraq.

Iraqi An-32s pressed into service as bombers

When operations by the so-called Islamic State (also known as Daesh) began to ramp up in 2014, the Iraqi Air Force was sorely lacking in close air support and ground attack capabilities.

The Lockheed Martin F-16s that had been ordered from the US remained undelivered and rapid Daesh advances around Baghdad led to concerns about basic security. Consequently, Washington postponed the delivery.

Iraq had purchased three AC-208 Combat Caravans and three C208 Caravans in 2008, and the AC-208, which could then carry a pair of AGM-114 Hellfire missiles, made its combat debut in January 2014 when the Iraqi Air Force began using it against insurgents in Anbar province.

But there was a clear and urgent need to augment these lightly armed aircraft, and an interim solution was found in the shape of the six Antonov An-32B tactical transport aircraft delivered from February 2011 to augment the C-130 Hercules operating with the 23rd Transport Squadron at New Al Muthana Air Base.

Subsequently, in May 2013, Iraq formed a new unit, the 33rd Transport Squadron, to operate the An-32s.

Daesh insurgents captured several major cities in Anbar province and, so, in July 2014, the Iraqi Air Force launched an emergency programme to convert two of the six An-32Bs into makeshift bombers, using a stockpile of Chinese-made 500lb bombs delivered to Saddam Hussein's air force years before.

Removable roller

This was not the first time that the An-32 had been used as a bomber – Indian Air Force An-32s pioneered the use of a removable roller conveyor on guide rails in the cargo bay, carrying four 500lb/250kg bombs. This system was proved during India's Iron Fist exercise in February 2013 at the Pokhran Test Range in western India.

Meanwhile, Ukraine had also converted similar An-26s to bomber configuration in May 2014, using fuselage-mounted pylons and BDZ-34 bomb racks to carry a similar weapon load, and installing an NKPB-7 bombsight to allow more accurate delivery.

With the help of Ukrainian technicians, the Iraqi Air Force modified a pair of An-32Bs to serve as bombers. The first aircraft was fitted with external BDZ-34 bomb racks – as used by Ukrainian An-26s – while the second adopted the Indian approach, with an internal roller-conveyor.

The first photo depicting an Iraqi Air Force An-32B Cline transport aircraft carrying a bomb on an external pylon appeared on social media in July 2016, but combat use of the An-32B bombers cannot yet be confirmed.

JORDANIAN PC-21 DELIVERIES DRAW NEAR

The first of eight Pilatus PC-21 turboprop trainer aircraft being built for the Royal Jordanian Air Force made its maiden flight at the Swiss manufacturer's Stans production airfield on November 15 2016.

The type is due to be delivered from January 2017 and will replace 13 ageing CASA 101 jet trainers in the basic and advanced training roles with No11 Squadron, part of the King Hussein Air College at Mafraq.

Trainee pilots will fly the PC-21 to 'wings' standard, before undertaking lead-in fighter training on the recently delivered ex-Emirati BAE Systems Hawks (which serve with No17 Squadron at Prince Hassan Air Base, also known as H5).

Jordan originally signed a contract for the supply of nine PC-9M basic/advanced turboprop trainers in August 2015. But, in April 2016, it amended its production order, switching from a commitment for nine PC-9Ms to eight examples of the newer and more capable PC-21.

Pilatus chief executive, Oscar Schwenk, revealed the change in an interview published by the Swiss newspaper, *Neue Luzerner Zeitung*. The contract still includes a simulator, training equipment and a comprehensive logistics support package.

The last PC-9M deliveries were made in 2006, to Mexico, though the PC-7 Mk II has remained in production to fulfil orders from South Africa, India, and Malaysia.

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The PC-7 Mk II is, in effect, a PC-9 with the lower-powered 700shp PT6A-25C of the original PC-7, instead of the 950shp PT6A-62 of the PC-9. So, building a batch of PC-9Ms would not have presented any problem for Pilatus.

Jordan will join an expanding list of PC-21 customers and operators, including Qatar (24 delivered), Saudi Arabia (55 on order, more than 30 delivered), and the United Arab Emirates (25 delivered), as well as Singapore (19 delivered), Switzerland (eight delivered) and Australia (49 on order). About 130 of the 188 aircraft on order are now in service.

Jordan is also due to receive 10 Grob Aircraft G120TPs for elementary training, and these will replace about 24 Slingsby T-67Ms.

TYPHOON TALKS AS UK BOLSTERS BAHRAIN RELATIONS

While the opening of the new UK Mina Salman Support Facility (UK MSSF) in Manama has attracted all of the headlines, behind the scenes, Britain and Bahrain are understood to have been talking about the Gulf kingdom's ambitions to operate the Eurofighter Typhoon. **Jon Lake** *reports.*

More than four decades after its withdrawal from bases "east of Suez", Britain is increasing its defence engagement in the Gulf and Asia in the face of the region's growing global importance, and Bahrain is at the centre of this engagement.

Britain has global economic and strategic interests and is determined to pursue a defence policy that is global rather than narrowly European in outlook.

During a visit to Bahrain in December, British Prime Minister, Theresa May, pledged to deepen defence and security cooperation with Gulf countries, promising to "make a more permanent and more enduring commitment to the long-term security of the Gulf", and pledging to counter what she called Iran's "aggressive regional actions".

The opening of HMS Juffair by His Royal Highness the Prince of Wales on November 8 2016, was one of many events marking the 200th anniversary of the signing of a treaty of friendship between the Kingdom of Bahrain and the United Kingdom.

Naval base

Inaugurating the first major British naval base to be built east of the Suez Canal since 1971 reflects a continuing, on-going and expanding Anglo-Bahraini cooperation.

In a speech in Manama in December 2016, Boris Johnson, Britain's Foreign Secretary, acknowledged that the country's policy of disengagement east of Suez had been "a mistake", and recognised that Bahrain's military, economic, and political interests were intertwined with Britain's.

Bahrain has continued talks with the UK aimed at acquiring an unknown number of Eurofighter Typhoon fighters.

Johnson said that he recognised "the strong historical attachment between Britain and the Gulf", and underscored what he called "the growing relevance and importance of that relationship in today's uncertain and volatile world".

Finally, he talked about "building on and intensifying old friendships" and said that Britain was active in and deeply committed to Bahrain, and would be "for the centuries to come".

Plans for the new naval support facility in Bahrain began in December 2014, when the UK and Bahrain signed a landmark defence agreement. The then British Foreign Secretary, Philip Hammond, and Bahraini Foreign Minister, Sheik Khalid bin Ahmed Al Khalifa, ceremonially laid the cornerstone for the new base in November 2015.

Britain's Royal Navy has been conducting Gulf patrols for 30 years and has had four mine-hunter warships permanently based in Bahrain using the facilities of the US Navy Fifth Fleet, which is also based at the Bahrain Defence Force (BDF) Mina Salman Port.

The UK MSSF will provide basing for the four mine-hunters and a supporting Royal Fleet Auxiliary, and will support all Royal Navy ships that deploy to or pass through the region, as well as providing accommodation for around 80 UK military personnel based in Bahrain.

Bulk of the costs

Bahrain is understood to be paying the bulk of the costs for the construction of the new Royal Navy base with the UK contributing £9 million over three years.

Although Bahrain is expected to procure 19 Lockheed Martin F-16V fighter aircraft from the US under a proposed $2.8 billion contract, as well as upgrading its existing 21 F-16C/Ds to the same standards under a separate $1 billion deal, it has continued talks with the UK aimed at acquiring an unknown number of Eurofighter Typhoon fighters.

It is not known whether the Typhoons would replace the proposed F-16V purchase, or whether a small number of Typhoons would augment some, or all, of the F-16s. Forty F-16s would allow the retention of the two existing frontline F-16 squadrons, plus a training unit, or a strategic reserve, while the Typhoons could replace Bahrain's ageing and dwindling fleet of F-5E and F-5F Tiger IIs.

The proposed Typhoon procurement is understood to enjoy the support of Prince Salman Bin Hamad Al Khalifa, Bahrain's Crown Prince, deputy PM and deputy supreme commander of the Bahraini Armed Forces.

In November 2016, King Hamad reportedly ordered the Council of Ministers to transfer the file for the Royal Bahraini Air Force aircraft procurement programme to him and the RBAF air staff. Some observers took this as indicating that a Typhoon order might be imminent.

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Adel Mardini: "We are targeting 30 FBOs by the end of the decade. However, our aim is not to be the biggest, but the best."

The Ex Factor in FBOs

Jetex Flight Support CEO and president, Adel Mardini, says the company is looking forward to taking care of aircraft from its new VIP terminal at DWC.

Marcelle Nethersole *reports.*

Aircraft displaying at November's MEBAA show had the chance to experience Jetex Flight Support's capabilities first hand.

The company was the official FBO and handler for the business aviation show and provided full flight support services for business aviation flights through its newly built VIP terminal at the Aviation District in Dubai World Central (DWC).

The operator also provided bespoke FBO facilities for passengers and crew, in addition to customs and immigration services, visa arrangements, aircraft parking, and coordination of aircraft display areas at the show.

"We were thankful to the organiser, F&E Aerospace, and MEBAA, for this opportunity to further strengthen our reputation as one of the leading general aviation service providers across the Middle East," said Adel Mardini, CEO and president.

"Our skilled and friendly team of ground-handlers and customer service professionals is dedicated to ensuring the best possible personalised services for all our valued clients."

Quality standards

F&E said the agreement was "testament to the quality standards" that Jetex offers its clients.

Dubai has a special place in Jetex's heart as the company was launched at the Dubai Airshow in 2005. It then went on to establish its first FBO in Paris in 2009.

Since then, it has opened 30 locations throughout the world, including in Iraq and Jordan, and currently employs more than 300 members of staff.

It opened its facility at DWC at the 2013 Dubai Air Show and became the first international standard of business aircraft handling (IS-BAH)-certified FBO in Dubai.

Mardini said: "DWC marks Dubai's development as one of the world's leading aviation hubs. It made absolute sense for us to be present here and this general aviation terminal sets a new standard of excellence for our global customers."

The facility is part of the Dubai South VIP Terminal that also includes the first presence in Dubai for Abu Dhabi-based charter operator and maintenance provider Falcon Aviation Services. The central terminal lounge is hailed by the Jetex founder as a "showpiece" which he said is radically different to anything else on the market.

Global trip planning

"Jetex provides exceptional FBOs, aircraft fuelling, ground-handling and global trip planning services," said Mardini adding that the 1,500m2 facility is "the biggest in the region and, we're pretty sure, the world".

"In addition to the largest FBO lounge in the world, there is also 50,000sqm of dedicated ramp parking space.

"A state-of-the-art 5,000sqm hangar facility, currently under construction, will be available for aircraft storage and maintenance in 2017."

Mardini's ambitions continue. "We would like two more in Europe and are looking at Asia and Saudi Arabia. We are targeting 30 FBOs by the end of the decade. However, our aim is not to be the biggest, but the best."

The design of Jetex's Al Matoum lounge is inspired by upmarket international hotels, said Mardini, rather than the more traditional Arabian-influenced décor favoured by many FBOs in the region.

Aircraft operators that missed the chance to experience the Jetex service at MEBAA will get another opportunity in November – the company has been appointed official FBO provider for the Dubai Airshow.

A private jet online booking company is about to launch in the Middle East. But, before it does, the company's founder will be undertaking a unique recce. **Dave Calderwood** *reports.*

Scimitar to sharpen Stratajet plan

Jonny Nicol: "No other platform has collected this data and written the necessary algorithms to allow for its system to price up all of these fees and provide an accurate final cost."

Booking a private jet using an app on a smartphone is commonplace these days but is the customer seeing the full and final price and is the operator getting a good deal as well? That's the dilemma Jonny Nicol sought to remedy when he founded Stratajet five years ago and started the long and complex process of building an all-encompassing search and pricing engine.

Stratajet launched in Europe in 2015, in the US in November 2016 at the National Business Aviation Association (NBAA) event, and is planning to launch in the Middle East in the second quarter of this year.

And, just as he did with the European and US launches, Nicol plans to fly around the region in his trusty Piper PA31 Navajo piston twin, talking to operators, checking credentials and demonstrating his company's unique and powerful technology.

The Middle East recce will be code-named, just like the previous trips, reflecting Nicol's previous career as a British Army officer... and also his sense of fun. Europe was 'Operation Long Reach', the US 'Operation Mayflower' and the Middle East will be 'Operation Scimitar'.

"For the US launch, we flew the PA31 across the Atlantic and then on a 200-hour trip around the country," said Nicol. "We had 486 meetings in 196 different cities in 104 business days. It was a great ad for business aviation – and we signed up 99.5% of the operators."

These personal, face-to-face meetings are not only an effective way to promote Stratajet to operators. They also allowed Nicol to see the way the operators worked, their facilities, meet their staff and make sure they were reliable and safe.

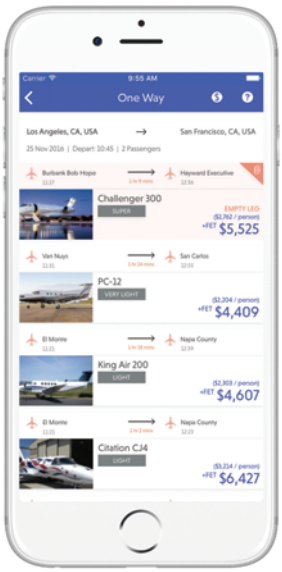
"Operators have to have been in operation for at least two years with an impeccable safety record," said Nicol. "All operators and aircraft that we work with are checked for compliance to operate charter flights and includes inspection of air operator certificates (AOCs) and insurance. Operators holding AOCs have to meet high safety, training and process requirements. Many of the operators we work with have further safety accreditation from Wyvern and BACA (private aviation audit companies)."

The difference between Nicol's company and other app-based booking platforms is that Stratajet considers every element of pricing a private jet for each individual flight.

"As well as providing the cost of the aircraft itself, Stratajet is able to remove the complicated pricing of the additional 14 sets of fees* outside of the operators' control," said Nicol. "We have a continually updated database of over 460,000 lines of data that enable the system to accurately calculate fees such as landing, parking, terminal navigation, noise surcharges, fire support upgrade fees, airways charges, tax, etc.

"No other platform has collected this data and written the necessary algorithms to allow for its system to price up of all of these fees and provide an accurate final cost, which is then instantly bookable, with no manual input from the operator."

This is why Stratajet took five years to develop, and why it has 14 full-time researchers constantly checking data to make sure it's up to date. "We guarantee that if a detail is wrong, we'll pay the difference," said Nicol.



The Stratajet app.

Offer to operators

The latest development is an offer to operators to help them build a branded website and mobile app to facilitate real-time pricing and take bookings from new and existing customers. Operators will also benefit from Stratajet's adaptive empty leg search algorithms, which provide improved margins.

"This new solution, alongside Stratajet's cutting-edge proprietary pricing and search engine, will allow operators and partners to accurately provide their customers with availability and costs of aircraft," said Nicol.

"With this information available in real-time at customers' fingertips, flights are then instantly bookable online, without the need for operators to perform manual quotes on any requests received. Having access to this software for free will allow operators to dramatically streamline their operations, removing inefficiency across the industry."

** Stratajet calculates: aircraft costs, landing fees, take-off fees, parking fees, terminal navigation fees, hangarage, passenger/cargo fees, noise surcharges, emission fees, out-of-hours fees, fire support upgrade, lighting fees, customs, airways charges, plus tax (VAT +/or passenger duty).*

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Where to sit? Gulfstream's Scott Neal in the G650ER, which is fitted with four living areas in the cabin.

STAIRWAY TO HEAVEN

The visit of the Gulfstream flagship G650ER to Dubai World Central allowed Scott Neal, Gulfstream's senior vice-president of worldwide sales, the chance to show **Dave Calderwood** *around the aircraft and explain why it is so vital to the Middle East.*

Walk up the airstairs to the entrance of Gulfstream's flagship G650ER and you enter a world of calm, comfort and amazing space.

There are four living areas, galley, bathroom, baggage area and, of course, the high-tech cockpit up front. And, remember, this $70 million aircraft is also the fastest, longest-range, biggest-cabin business jet available.

"The G650 has been extremely well received," said Scott Neal, Gulfstream's senior vice-president of worldwide sales. "There are more than 200 G650s and ERs in service, and 25 of those are based here in the Middle East. It is a very popular aircraft in the region.

"The G650 has helped grow Gulfstream. It's one of the most successful programmes we've ever had. The next available aircraft we can deliver to a customer is in the middle of 2018, so we have a strong backlog and a strong customer commitment.

"The Middle East is an extremely important market for Gulfstream and has been for 40 years. We have 120 aircraft based in the region."

Maintenance facility

Gulfstream and parent company, General Dynamics, have invested in Jet Aviation's (also a GD company) maintenance facility at Dubai International Airport and also $22 million in a parts centre at Dubai South.

"We want to make sure that we position support where our customers are based," said Neal. "We want to be available and capable of supporting aircraft at their home base."

Two all-new aircraft are on the way from Gulfstream, the G500 and G600. The G500 is well into certification flight-testing, with five aircraft taking part, and the G600 made its first flight in December. Both are as fast as the G650, with a Mach 0.925 top speed, so how will they fit into the range?

"The 500 and 600 will sit below the 650 and 650ER. The G500 will have a range of 5,000nm at Mach 0.85, and the G600 6,200nm – so different price points, different range. We won't be surprised if we have owners of the G500, G600 and G650 because they fill different missions," said Neal.

Gulfstream also showed off its the super mid-size G280 at the recent Middle East Business Aviation Association show in Dubai. "We're growing the fleet rapidly and we have more than 100 G280s in service. Importantly for operators in this part of the world and Europe, we have just achieved certification to fly into London City Airport with the G280," said Neal.

Having the fastest business jets clearly isn't enough for Gulfstream. It's investing in research for supersonic flight, with technologies such as 'quiet spike' to reduce the effect of sonic booms.

Supersonic tenchology research

Neal added: "Gulfstream has been very candid about continuing to invest in supersonic technology research. We don't have a supersonic aircraft programme but we continue to look at what's possible. If someone were to bring a supersonic aircraft to market, what would it look like, what would it have to do, what would be the regulatory considerations?

"I would like to think that a supersonic business jet will become a reality in the future... but it will be some time in the future."

Middle Eastern airlines have been stepping up their game by upgrading first-class cabins and services and argue that they are competing with business aviation with 'first-class plus', but Neal doesn't think it's a worry.

"The owners of business aircraft understand they will never achieve the utility and flexibility on an airline that they can by owning a corporate Gulfstream," he said. "They can fly when they want to, on their schedule, and not be subject to the whims of an airline, which may be carrying 200-400 people.

"They maintain the aircraft, they hire the pilots, and aircraft like the G650, G550 or G280 can get into the smaller airports that airliners can't."

What's clear is that Gulfstream will continue to push the aviation boundaries. "We continue to stay ahead of regulatory requirements around the world, whether it be fuel efficiency or emissions. We try to stay at the forefront, try to keep leading-edge technology and design aircraft that will be useful for many, many years," concluded Neal.

From the simplest of ingredients to offering a rare and expensive pineapple, nothing is too much trouble for Executive Gourmet – the exclusive caterer at the UAE's Al Bateen Executive Airport. **Marcelle Nethersole** *spoke to CEO, Joao Menezes de Aguiar, and executive chef, Thomas Harker.*

Air la carte cuisine

A division of Gate Gourmet, Executive Gourmet has hubs all over the world, including Geneva, Hong Kong, and Rio. But its stand-alone unit at Al Bateen Executive Airport in Abu Dhabi is something that makes Menezes de Aguiar and Harker, very proud.

"Al Bateen is the first and the only exclusive airport dedicated to private and general VVIP aviation in the UAE, and the region has seen tremendous growth in business aviation," said Menezes de Aguiar.

"We first opened here in 2011 and it has gone from strength to strength. We are now fully settled in at Al Bateen and happy to announce 30% of our business is in the UAE, with Falcon being our biggest customer."

While the company offers carefully designed guideline menus, it mainly lets the customers decide what they want.

"Our menu is just an indication, but the customer can ask and order whatever they want, and we do it," said Menezes de Aguiar.

Harker is at the helm of the kitchen, and has a natural flare and instinct when it comes to food and what a high-end customer expects.

Joao Menezes de Aguiar and Thomas Harker: The customer can ask and order whatever they want.

"I basically love food," he said. "I love everything from the smells, textures and the abundant flash of colour it delivers."

Harker has been a chef for 41 years, which has included being an executive chef for the last 16, to working all over the world. "As an executive chef you need a wear a million hats, it's not just about cooking," he explained. "You need to be a friend and a disciplinarian at the same time, you need to listen and advise, you need to be a mathematician and a scientist, an agony uncle and a peace-keeper."

Harker is currently working on his new menu for Executive Gourmet that will be complete in February.

He has the help of nine international chefs offering their own expertise.

"We are a 24/7 company and all of my chefs work over three shifts," he said. "We work closely with the jet crews to supply what the customer profiles are – and this order is usually within a day, but it can be just hours before."

Fresh Canadian lobsters

Harker said customer requests have included everything from caviar and fresh Canadian lobsters to hand-crafted Belgian chocolates and green tea ice cream from Japan. He added that healthier menus were also being requested more often now.

One item requested was something many of us will think we can just pop to our local supermarket for… a pineapple.

"There is a pineapple, a simple pineapple, that is grown in Cornwall in England," said Harker. "However, the growing technique dates back to the Victorian times and the fruit is nurtured in a special climate-controlled greenhouse. Needless to say, it was difficult to get my hands on the special fruit – you need to pre-order it a year in advance – and at a cost of $21,000 per pineapple. We managed it, though, and it pleased our customer."

Saying that, the company also makes sure it can deliver fast food as requested, down to a McDonalds that one particular royal client enjoys.

The company also provides other services to customers including flower arrangements, concierge services, international magazines and newspapers, and laundry services.

It recently launched its latest range in luxury amenity kits by designers including Bvlgari, La Prairie, and L'Occitane.

Asked if Executive Gourmet plans to expand anywhere else in the Middle East, Menezes de Aguiar said:" We are very comfortable here at Al Bateen, but we are open to all possible opportunities and have a few ideas. However, at present, there is nothing concrete.

"For now, we want to continue increasing our customer portfolio – we are currently in discussions with Dubai South and Emirates Catering – and extending our offer to other airports in the UAE working along with other stakeholders."

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Region must

The Middle East's major business aviation exhibition and conference took place in December as organiser, The Middle East Business Aviation Association (MEBAA) celebrated its 10th anniversary.

Alan Peaford, Steve Nichols, Dave Calderwood, Alan Dron, Ella Nethersole, Liz Moscrop *and* **Barbara Saunders** *report from Dubai. Pictures:* **Ian Billinghurst** *and* **Jeff Holmes.**

JetSmarter's Paul Grusevich and Vertis' Catherine Buchanan.

JetSmarter launches Dubai-London shuttle service

JetSmarter's has introduced a scheduled private jet shuttle service between Dubai and London on a 13-seat Embraer Legacy 650 operated by Empire Aviation.

The service will depart Dubai Al Maktoum International (DWC) for London Luton on Thursdays at 20:30 local time, returning the following day at 12:00 local time. According to JetSmarter, the two smaller airports will allow for speedy boarding and landing.

Dubbed Jet Shuttle, the route is the latest in the company's expanding network of around 70 scheduled services that it operates for its 6,000 online members throughout North America, Europe and the Middle East.

Meanwhile, charter operator Vertis Aviation has formed a strategic partnership with JetSmarter to build on the former's local knowledge and extensive network of contacts to support the shuttle's development and future business in the region.

Catherine Buchanan, the company's chief commercial officer in Dubai, said: "JetSmarter identified that a certain sector of the market demanded regular, cost-effective, intercontinental charter that links the UAE region, the UK and the USA. There is a growing demand in the region for this kind of service, so we are extremely pleased to be their local strategic partner and look forward to helping them develop here."

face up to the challenges

The business aviation sector must adapt – and consolidate – if it is to remain relevant and viable, the CEO of aerospace and engineering services of UAE investment and development company, Mubadala, said yesterday.

Giving the keynote address at the opening of the MEBAA Conference HE Homaid Al Shemmari detailed a list of issues that the business aviation industry had to overcome.

Costs, growing challenges from commercial airlines, increasing customer expectations and geopolitics were among the topics that had to be faced, said Al Shemmari.

Pressures from customers today were significant. When talking to customers, price was the main consideration. That included the price of a platform, operating it, as well as training and catering. "Customers want to go further and have better services – and, unfortunately, they want to pay less for it," he said.

The business aviation industry was fragmented, he said. "For customers, that's not a bad situation, but for the industry and investors it's a challenge.

"There has to be a bit of consolidation in this industry, at all levels – manufacturing, maintenance and service provision."

HE Homaid Al Shemmari: "Customers want to go further and have better services – and, unfortunately, they want to pay less for it."

Airlines such as Etihad, with its first-class service The Residence, were starting to eat into the traditional high-end business aviation market, added Al Shemmari.

Currently, business aviation maintained an advantage through the ability of passengers to turn up at a private terminal 10 minutes before take-off, but if airlines started to match that, then private aviation would have to up its game.

The industry also had to pay increasing attention to issues such as security (including cyber-security), on-board connectivity and to social responsibility matters, such as uneaten food thrown away at the end of flights.

The Middle East retained certain advantages, he said. The region was within six hours' flying time of two-thirds of the world's population. In particular, it was 2.5 hours away from India, with its 1.1 billion population. That made the Middle East a great place for business aviation companies to create their bases.

The industry also brought in valuable employment for Emiratis, particularly high-end jobs, which were valuable for the UAE's policy of diversification and Emiratisation, he said.

Ten great reasons to smile for Ali Alnaqbi

Ali Alnaqbi: "I am completely taken aback with how successful we have been."

There's nothing like a great birthday surprise and Middle East Business Aviation Association (MEBAA) chairman, Ali Alnaqbi, is delighted with the organisation's 10 years of existence.

"I am completely taken aback with how successful we have been," he beamed. "Look at the MEBAA show, it's now a must-attend on the international calendar with more than 460 exhibitors and 9,000 attendees from more than 50 countries."

The 10-year anniversary has seen his intention to put business aviation on the landscape for people in the Gulf pay off.

He added: "The market has reacted very positively. Business and private aviation is now accepted throughout the region and we have managed to present ourselves in a good way to the market and have a strong reputation."

MEBAA has campaigned tirelessly to raise awareness throughout EMEA, and has now separated its structure so that there are several divisions under the one umbrella."

Indeed, raising awareness of exactly how the industry works is one of the most important parts of MEBAA's remit.

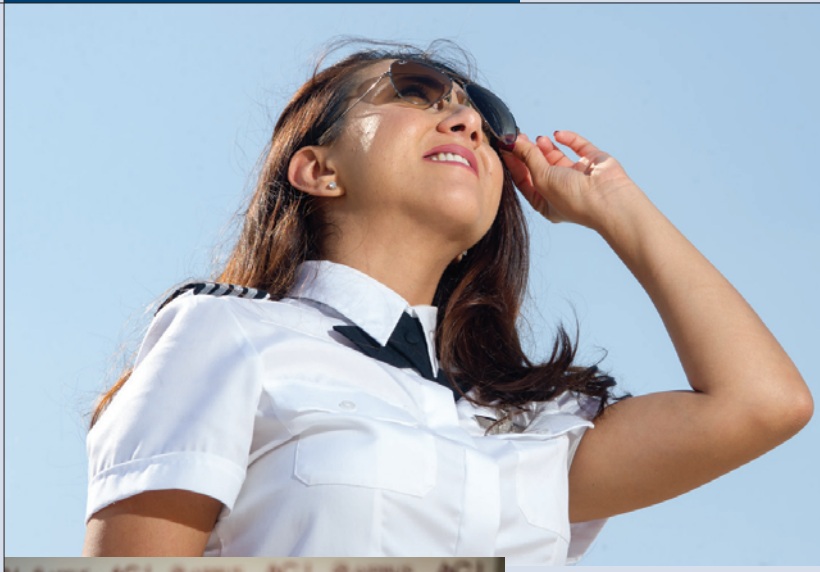
Alnaqbi is adamant that educating people is the way to develop the sector: choosing mission-specific aircraft that are appropriate for the trip can add a great deal of value to businesses.

In addition to working with government bodies to get a better understanding of the industry, the association has proved to be a real gem for its members, for instance by striking a competitive insurance package due to come into effect next year.

Water opportunity…

Dornier Seawings came to the MEBAA show for the first time to promote the advantages of its amphibious aircraft, the Dornier Seastar CD2.

Simon Schell, from the company's technical sales team, said: "The show is the ideal place for Dornier Seawings to connect with key clientele – VIP, corporate and governmental customers in the Middle East and Asian regions. The region has seen the demand for private business and luxury jets grow over the past three years at approximately 7%, confirming the importance of this market for Dornier's Seastar."



Dreams Soar for pioneering female pilot

Dubai-based flight services provider, Hadid, showed its commitment to pioneering female pilots by partnering Dreams Soar Inc to support Shaesta Waiz to become the youngest woman, and the first Afghani woman, to circumnavigate the globe.

Hadid is taking on all the flight planning and trip logistics of the flight as Waiz reaches out in 18 countries to inspire the next generation, specifically women, girls and minorities, to pursue science, technology, engineering and mathematics (STEM) and aviation education.

In all, Waiz, flying a 2001 Beechcraft Bonanza with communications enhancements courtesy of Honeywell, Garmin and Bose, is looking to fly more than 25,000 miles with 30 stops, over five continents in 90 days.

The 29-year-old aviator is the first certified civilian female Afghan pilot and a dual-graduate of Embry Riddle Aeronautical University. In 1987, she and her family fled to America to escape the brutal Soviet-Afghan war in Afghanistan. "Every time I open the door of an aircraft, I ask myself, 'How did a girl with my background become so lucky'? The truth is, anyone can be me," said Waiz, who was a guest of Hadid at the MEBAA show.

Benoit Defforge: contacting ACJ customers personally.

AIRBUS TO CLOSE COMPLETION CENTRE

Airbus used the MEBAA Show to confirm the closure of its corporate jet completion centre in Toulouse, with its ACJ range of aircraft in future being outfitted by external completion centres.

Benoit Defforge, president of Airbus Corporate Jets, said the business was transforming with the completion centre "re-orienting" to become an upgrade centre for existing aircraft, installing new features such as improved connectivity.

The company has six authorised completion centres around the world and these would now undertake the work done at Toulouse, he said. The ACJ organisation would continue within Airbus; moving the completions business was a "pragmatic business decision".

Defforge said he would personally be contacting ACJ customers to explain the move.

Talking about the ACJ products, Defforge also said that an A321neo had not yet been formally announced, but "It's something that will come later". It follows the announced plan for A319 and 320 new engine options (neo) aircraft

Among new features for the neo variants will be Airbus' new Melody cabin concept, which emphasises curves designed to mimic shapes of nature and make a more comfortable interior in which passengers or owners will feel at home.

The Middle East and North Africa is an area of great importance for Airbus' ACJ range, with 60 aircraft – one-third of the total worldwide fleet – operating in the region, Defforge said.

HondaJet looks to connect with Arabian peninsula

The "game changing" light business jet, the HondaJet, made its Middle East debut at the MEBAA Show. From its above-the-wing engines to the laminar flow wing and all-composite airframe, the HondaJet bristles with new technology. Result: high performance.

Not only is the max cruise speed of 422kt the fastest in its class, but it's also the most fuel-efficient by an impressive 17% more than its nearest rival.

"We were excited to display the HondaJet at MEBAA for the first time where its high speed, quiet and comfortable cabin, sporty styling and handling have appealed especially to savvy Middle East prospects and aircraft enthusiasts," said Honda Aircraft president and CEO Michimasa Fujino.

"With a range that connects the entire Arabian Peninsula, this region could benefit from this high-performance aircraft and our show presence helps determine the best timing of Honda Aircraft's entrance in the Middle East market."

The HondaJet has FAA and EASA type certification and Honda Aircraft Company is pursuing certification in other countries.

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First A-check milestone in Dubai

DC Aviation and Lufthansa Technik bring heavy duty MRO to Dubai.

Lufthansa Technik and DC Aviation Group joined forces to perform the first A-check for a narrow-body aircraft at Al Maktoum International Airport (Dubai World Central Airport) in Dubai.

The Airbus A319 belonged to an undisclosed customer from the region and underwent a 350 hours flight safety systems check, updating service bulletins and a ram air turbine test.

The cooperation between the German companies means they can provide regular checks, maintenance services, and unplanned repairs. They will also offer small cabin modifications and are planning to offer a dedicated aircraft to serve the region in the case of AOG situations, as well as for parts supply.

The offer is rounded off by extensive FBO services, including fuel, catering and transport.

Mohammed Khalifa Al Saif, left and Renato Vaghi, CEO Piaggio Aerospace.

JV expands helo training

Helicopter pilots in the Middle East requiring flight training can now take advantage of a new joint venture between Abu Dhabi Aviation and CAE announced at the MEBAA Show. CAE and ADA will be delivering training to regional operators at ADA's brand new eight-bay facility in Abu Dhabi, which is due to open soon.

Two state-of-the-art full-flight simulators, with new visual systems, will join existing CAE simulators for AW139 and Bell B412 helicopters, and be ready for training in 2018. CAE instructors will lead the courses.

IWG ups Middle East fleet

International Wings Group (IWG) has increased its fleet in two Middle East countries and is bolstering its maintenance capabilities.It has added two new, long-range executive jets to Arab Wings in Amman, Jordan – a second Embraer Legacy 650 and a third Bombardier Challenger 604. Both aircraft will be available for charter.

Meanwhile, UAE-based Gulf Wings has added a recent-model Legacy 600 to its commercial fleet, with the aircraft now available for charters from Dubai's Al Maktoum Airport, or Dubai World Central (DWC), along with three recent-model Challengers 605s.

Further Gulf Wings expansion is planned at this location, with a Global 5000 and another Challenger 605 due to be added this year.

Piaggio P180Evo "the right aircraft for region"

One delivered, another to come and, hopefully, many more to follow. New agent for the Middle East, Mohammed Khalifa Al Saif, took delivery of the first P180 Evo to come out of Piaggio's new factory during the MEBAA show, and he and Renato Vaghi, CEO of the Italian manufacturer, are working out the details for a second.

Al Saif said: "It's the right aircraft for the region, not as expensive as a jet but just as capable, and incredible inside."

The Al Saif delivery was described as an important milestone for Piaggio Aerospace – now 100% owned by Abu Dhabi's Mubadala Development Company – as it heads towards completing its restructuring by early this year.

Vaghi said: "Piaggio is going through the greatest transformation of its history and, with the support of Mubadala, we're setting the foundations for the future of this company."

Embraer president Marco Tulio and Cedar's CEO Fouad Fawaz.

Cedar's Legacy is growing…

Cedar Executive CEO, Fouad Fawaz, had plenty to celebrate at the MEBAA Show when his company announced that it is to take delivery of a second Embraer Legacy 500 early next year.

The Middle East Airlines (MEA) affiliate will base the aircraft at the Cedar Jet Center FBO, part of the general aviation terminal at Beirut Airport, Lebanon.

Despite regional woes because of lower oil prices and instability in the Gulf, Fawaz said that Lebanese demand for private-jet travel remains high.

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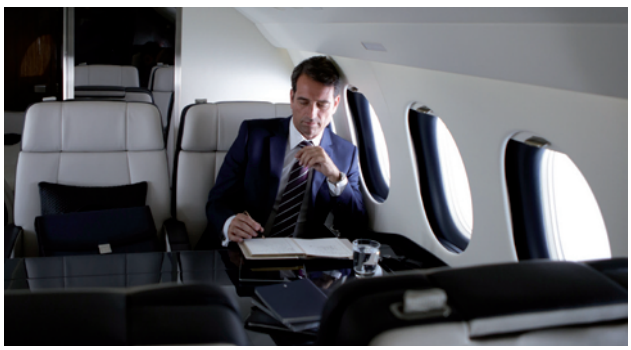

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ENGINEERED WITH PASSION

Investment in emerging airport technologies will be key to managing growth and meeting changing passenger expectations. **Keith Mwanalushi** *examines how IT will influence the traveller experience.*

FLY TECH

GCC airports are growing in size to cater for ballooning passenger and freighter volumes and technology is becoming central to improving operations.

The largest markets in terms of airport projects are the UAE, Saudi Arabia and Qatar, and much of the spend in new information technology (IT) will be at airports there.

"Technology is changing how airports and airlines interact with passengers," affirmed Eliot Lees, vice president at aviation consultancy firm ICF International. "We have already seen the impact of e-ticketing, text communication, radio-frequency identification (RFID) bag tracking, social media and push technology on the passenger journey through an airport."

Airports increasingly need to integrate technology into their operating strategy, management decision-making process, and service delivery to their users.

The use of sensor technology and performance optimisation software is changing the way airports plan new infrastructure capacity, deliver service, and interact with the passenger. "For example, Dubai Airports has installed a sensor system that advises passengers on wait times and is using this to improve service to the passenger," said Lees.

The UAE will lead Middle East passenger growth with more than 6.3% annual increase, according to new estimates by the International Air Transport Association (IATA). Dubai International Airport (DXB) has invested heavily in technology and engaged a staff of experts to manage and implement its IT strategy.

"Technology is changing how airports and airlines interact with passengers."
ELIOT LEES

Other airports in the Middle East and North Africa (MENA) region are also reviewing potential IT strategies. "However, while technology is a key ingredient to improving airport performance, equally important is the organisational and management changes that are needed to use technology to its fullest," Lees cautioned.

IATA states that the Middle East's aviation market is expected to grow significantly and will see an extra 258 million passengers a year on routes to, from and within the region by 2035. "The implementation of new IT solutions will enable airports and airlines to introduce new passenger processing procedures, which will improve customer experience," stated Iyad Hindiyeh, head of airport IT business development at Amadeus.

New technology will also significantly improve baggage-handling and reconciliation systems and reduce airport running and operation costs, Hindiyeh added. "With the three main airlines in the region competing for customer numbers, IT

Self-service continues to roll out at various airports.

is an important way for airlines to improve and differentiate their airport services for their customers."

Middle East airports are both increasing local market demand and transfer traffic. John Grant, senior analyst at air travel intelligence company, OAG, said that coping with such increases in demand not only requires significant infrastructure development but also staying ahead of the competition by delivering operational and passenger service advantages.

"IT development has been crucial in that growth and will increasingly be of importance in the coming years. Only by embracing IT, in all its various formats through the travel experience from reservation to in-flight service and arrival, can airports continue to meet the needs of the ever-demanding airlines and their passengers.

"IT advances also bring efficiency of scale to airports and, in an industry where operating margins for all parties are extremely small, those advancements are required daily," Grant said.

Self-service and automation have become the buzz words at airport technology exhibitions, with all the solution-providers pushing airport operators not to lag behind in adopting these technologies, or else face a decline in efficiency [and passenger numbers.]

"There is a clear linkage between technology and airport efficiency," Lees observed. For example, he said, e-ticketing was already feeling the impact of technology in terms of terminal space.

"Ticketing kiosks reduce the need for airline check-in desks, airline staff and passenger queuing areas. Not only does this upgrade the level of service to the passenger but it reduces the need for, and consequently the construction cost of, additional terminal space."

Pace will be even faster

Over the past five years, it's evident that the introduction of technology and automation has ramped up significantly, and over the next five it's probable that this pace will be even faster. Lees foresees that airports that are slow to adopt technology and automation into their planning and management strategy will face higher throughput costs because today's technology allows for greater throughput, given the same level of infrastructure resources and investment.

"So there is a direct payback of investment in technology in more efficient infrastructure, reduced need for future capital investment and enhanced service levels," he said. "Those airports that do not embrace and adopt new technologies will be left behind."

Grant is not entirely convinced that airports are slow to adopt such technology. He said, for every airport, any IT advancement requires a solid business case that looks not only at the cost of development but also the subsequent resource efficiencies achieved, and the improvements offered to their passengers. "Research tells us that happy passengers are more disposed to spend in concessions and, with that in mind, airports are always seeking to improve their overall passenger experience and IT is at the core of that objective."

The industry in general is moving towards self-service and kiosk bag drop. In Europe, self-service check-in and bag drop has become the norm but, Hindiyeh noted, due to technology constraints and a cultural reticence to adapt to a self-service model, this is not generally the case at Middle East airports.

"Many airlines still use their own check-in technology, while self-serve kiosks require a multi-airline common use systems. Kiosks also require additional physical space at departures terminals and this poses a challenge for some airports in the region," said Hindiyeh.

Beyond these technological and physical challenges, a further challenge for Middle Eastern airports is that passengers expect to be checked in and be given a personalised service by

Continued on Page 76

CONTINUED FROM PAGE 75

airline ground staff, as Hindiyeh pointed out.

Smart boarding gates and remote check-in are all concepts currently trending within the airport community, particularly at the busier gateways. UAE residents, for instance, carrying an Emirates identification document, are able to process through passport control in a matter of seconds. This is after DXB underwent a major upgrade on the airport's 127 smart gates, located in arrivals and departures across all three terminals at the airport.

Upon inserting the Emirates identification card into the smart gate, the system can quickly confirm the identity, travel plans and eligibility of UAE residents to enter and depart the country.

General Mohammad Al Marri, director general at the directorate of residency and foreigners affairs (UAE), said creating a system that enhanced both security and passenger convenience was a breakthrough for managing the borders in the UAE, and responded to calls from his leadership to provide services that made the passenger journey as smooth as possible.

Paul Griffiths, CEO of Dubai Airports, added: "With a transaction time that averages 10-15 seconds, this is clearly a smarter way to travel. It speeds up the immigration process significantly and shortens queues. Our focus, going forward, is to get more residents using it."

Smart boarding gates

Lees said new smart boarding gates and remote check-in systems had resulted in not only improving passenger throughput, but also to allow the airport to capture important information about passenger behaviour. "This wealth of information can be used to evaluate performance."

Lees added that technology was not just about replacing airport or airline manpower, or reducing physical infrastructure, but it is was fundamental in reshaping the future of airports. "New airport technologies generate a robust level of information about the passenger behaviour and actions, about how service is delivered, and provide a platform to support continuous process improvement," he said. "Through new technology and big data analytics, airports are increasingly able to 'view' the passenger movement through the airports and improve airport performance to enhance the passenger experience."

Because of technology, Lees feels the management of airports is undergoing a fundamental shift in how they are organised, how they deliver service, and how they interact with various stakeholders to improve the overall travel experience.

He advised that airport management needed to understand what emerging technologies and systems were being introduced around the world.

Amadeus technology now allows for remote check-in from anywhere – inside or outside the airport terminal, said Hindiyeh. "The same common-use technology also allows for gate changes, enabling airports to move airline departures from one gate to another seamlessly."

Airports across the Middle East are embracing new passenger processing technologies.

Remote check-in technology permits passengers to check in anywhere from conference centres to cruise ships, and has the ability to track passenger bags from an off-site airport location.

"Anything that simplifies the required passenger processes without compromising on safety and security requirements should be to everyone's benefit," Grant reckoned. Remote check-in has been operational for some years and smart boarding is already close to adoption in some markets. "If these advances can streamline waiting times, then everyone will welcome the development. But, perhaps of more interest, is the opportunities that biometric technology and especially micro-chip data can have on the industry over the next few years. This really is an area of huge IT opportunity," he added.

Automated tray return

Airports are also keeping up with new technologies to streamline every aspect of baggage-handling processes. In August last year, Abu Dhabi Airports installed a new automated tray return system (ATRS) to speed up the process of hand luggage screening at Terminal 3 in Abu Dhabi International Airport (AUH).

The new system allows more than four times the number of bags to be screened than conventional screening lanes, reducing wait times and congestion.

IATA announced a new resolution 753 for its member airlines, which comes into effect in 2018. Nick Gates, portfolio director at SITA, explained in his online blog that, essentially, it requires IATA member airlines to monitor and log the status of its passengers' bags through the major stages of the journey. One of the biggest consequences will be that inbound (arrival bags) will need to be more actively tracked/monitored.

Clearly, IATA's member airlines will be affected. But, so too, airports and ground handlers. By 2018, airports will need to have the IT systems and infrastructure in place to be ready to support the airlines that need to comply. This means that all airports (existing or new) will need to assess whether they have the appropriate baggage infrastructure to be able to support the requirements of this resolution.

Hindiyeh said Amadeus' baggage reconciliation system (BRS) was already compliant with the resolution. "We already have 100 airlines on the BRS. It is used at Abidjan International Airport (Ivory Coast) and we have had a lot of interest from other Middle Eastern airports," he added.

Baggage robot

Elsewhere, the now famous Leo, a fully autonomous, self-propelling baggage robot that has the capacity to check-in, print bag tags and transport up to two suitcases, is currently on a globe-trotting tour and has been spotted at airports ranging from Geneva to Marrakech.

The robot also has an obstacle avoidance capability and can navigate in a high-traffic environment such as an airport.

Leo provides a glimpse into the future of baggage-handling being explored by SITA Lab and is the first step to automating the baggage process from the moment passengers drop their bags to when they collect them.

Hani El-Assaad, SITA president, Middle East, India and Africa said: "Through the innovative work of the SITA Lab, we are able to tackle some of the key challenges that face airlines and airports today. Leo demonstrates that technologies, such as robotics, can help the air transport industry manage the growth in traffic in a more sustainable way, while offering passengers an unencumbered journey through the airport and on to the aircraft."

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Keith Mwanalushi *looks at the expansion of ground support operators and equipment in the Middle East region as the pressure mounts to remain competitive and maintain commercial viability.*

Do the ground work – it's key to expansion

Regional airport development is undoubtedly significant and much needed, with the major Gulf carriers expanding at a pace that continues to outstrip the airport and air traffic control (ATC) infrastructure needed to support their growth.

The link between airport expansion and the need for robust ground-handling operations is pretty clear.

Today the Middle East region boasts something like 150 million passengers. The International Air Transport Association (IATA) and other organisations predict this traffic to grow to 383 million within two decades. On top of this growth, airport infrastructure will be renewed and expanded in many airports and hubs in line with these predicted developments.

"Swissport plans to strongly grow in the region too," declared Mark Skinner, senior vice president for Middle East and the Africa region at Swissport International. "As a first step we set foot in Saudi Arabia in 2016; this start-up being one of the largest we have ever had," Skinner continued.

Swissport's Saudi Arabia operation and Gulf Air signed a comprehensive ground-handling services contract, including passenger and ramp-handling, baggage services, operations coordination and load control.

Mark Skinner: "Our plans are to grow our ground-handling business in the current three stations."

The agreement with Gulf Air followed a rigorous selection process and was effective from June 2016, making Bahrain's national carrier the second Gulf carrier to appoint Swissport for its ground-handling services in the kingdom.

To ready the organisation across the kingdom, Swissport Saudi Arabia had to invest in a sizeable amount of ground support equipment (GSE) and recruited an additional 250 experienced aviation staff, besides strengthening the current set-up with a number of key position appointments.

Business lines

"Our plans for this country are to grow our ground-handling business in the current three stations Jeddah (JED), Riyadh, (RUH) and Dammam (DMM), but also to expand into other business lines, such as cargo and further airports within the country," Skinner said.

Besides entering the Saudi market, Swissport has also won the licence to operate in Oman, where the company plans to launch in early 2017. Further Middle East start-ups will follow in the coming years. "Thus, both the traffic growth and also the development of modern airports will drive the demand for more and different GSE in the coming years," Skinner added.

Swissport's Saudi Arabia operation follows a joint venture agreement with the Al Jarwani Group for operations in Muscat, Oman.

Another interesting collaboration is the partnership between Satair Group and Dedienne Aerospace for GSE in the Middle East and Africa. Under the terms of the agreement, signed in 2016, Satair Group has become Dedienne Aerospace's marketing conduit into operators based in this area for the GSE products.

Market analysts at Visiongain assessed that the airport ground-handling services market was valued at $54.351million in 2016. The ground-handling industry is predicted to grow at relatively strong rates over the next 10 years as a result of forecast demand for air transport, which is driving airline and airport infrastructure expansion. This has a direct impact on companies in terms of expanding their service offerings to accommodate the additional passenger, baggage and cargo capacity.

Swissport is committed to introducing new and innovative GSE in the Middle East markets it is entering. "The Saudi Arabia market entry in 2016 was one of the largest for Swissport ever, seeing us invest in all-new GSE for airports at Dammam (DMM), Riyadh (RUH) and Jeddah (JED)," said Skinner.

He added that Swissport would continue to bring new GSE to the market in line with growth and as airport infrastructure was upgraded. "For instance, we are introducing environmentally friendly electric tractors and low-emission GSE to Saudi Arabia's airports," he said. "Oman will see us invest in all-new and environmentally friendly equipment too."

Electric GSE segment

The electric GSE segment is expected to witness the highest share of demand within the market. The favourable growth is attributed to increasing spending by aviation authorities towards adopting eco-friendly equipment.

"This area [ground-handling] has come under pressure to reduce costs, so, looking for alternatives in GSE is of high importance," commented Peter Martin, vice president for technical services at Dnata in Dubai.

Rental or operational leasing of GSE, though not as popular in the Middle East, can be a solution for some ground-handlers. Used GSE can also be used as an effective solution to replace or back-up equipment.

Martin indicated that Dnata is currently working closely with manufacturers in the GSE research and development phase to meet the company's operational needs. "Our investment will be in line with the requirements we have identified," he said.

Mehmet Nane: "Our own equipment allows us to run our ground service operations meticulously."

Many ground-support providers are looking to GSE leasing rather than outright purchase as a financial solution to support their requirements. Swissport uses various kinds of financing for its equipment. "The appropriate option depends on many factors, such as local legislation, financing costs, type of GSE and so on," Skinner explained.

Leasing equipment aims to reduce the high financial risk associated with GSE purchase. However, geographical and operational differences still play a critical role in determining the decision to buy or rent.

A frequent, and fairly straight forward response by GSE users, is to ask "why own, when you only want to use"? Understandably, owning GSE ties up capital and, if you make the wrong purchasing or maintenance decisions, this can have a negative impact on the bottom line. However, airport operators and ground-handlers will usually need solutions with a variety of plans, from short-term rentals to longer-term operating leases, with the flexibility to be tailored to specific needs.

"Leasing is definitely a way to go and we are currently investigating a central ownership model with leasing out to all stations," Martin confirmed.

In terms of upgrading GSE, Martin explained that this changes with the central ownership model as equipment that is due for replacement could be reused in other stations that require less utilisation.

An incident in Canada that led to the death of a ramp agent due to the lack of a seat belt on a baggage tractor has put the spotlight back on the safe operation and updating of GSE to more strictly meet safety requirements – which can sometimes vary from one location to another.

David Burgess, vice president, global fleet management at Swissport, said the company's GSE fleet in the Middle East (three stations in Saudi Arabia, with Oman effectively starting in April 2017) is brand new and meets International Air Transport Association (IATA) standards and local requirements.

Safe operable condition

"There has not been a need to upgrade GSE so far but when the need arises we do not foresee this being an issue as its imperative to maintain everything in a safe operable condition aligned to local regulations," said Burgess.

"We are actively recruiting a head of regional fleet management for the Middle East and Africa and one of his responsibilities will be to ensure that he stays alert to changes in local GSE technical requirements and to put in place upgrade plans to meet these requirements through country GSE managers."

Interestingly, in Turkey, low-cost carrier (LCC) Pegasus is now providing its own ground support with its own GSE, having been operating its own check-in, baggage and boarding services for its flights. This strategy is in contrast to most other LCCs that see cost benefits from outsourcing such services.

"We received our official licence from the civil aviation authority in August 2015 and, subsequently, started hiring and training our personnel. Since June 2016 we have been operating the full ramp services with our own personnel and equipment," said Pegasus CEO Mehmet Nane.

Pegasus took over the management of its entire ground operations for its flights at the main hub, Istanbul's Sabiha Gokcen Airport.

Nane said, as part of the project, the airline created 1,000 new jobs. "We have also purchased the latest and most advanced technological equipment for our operations, which has not been utilised in Turkey previously. This allows us to run our ground service operations meticulously and we have invested €20 million ($21.2m) in doing so."

Investment in new equipment saw the airline spend some €7.2 million ($7.6m) from a variety of suppliers. The list includes: 24 Durabus VivAir 104WL buses, five ambulifts (vehicles for carrying patients), as well as airstairs, conveyor belts, cleaning generators, baggage-carrying vehicles, and water and cesspit drainage equipment. Additionally, Pegasus purchased 13 pushbacks, five de-icing vehicles, 38 baggage trucks, 18 ground-power and two air starters, and air conditioners.

"By taking charge of all ramp services, we now offer our guests baggage loading and unloading, transfers between the terminal and aircraft, interior and exterior aircraft cleaning, cargo, de-icing, chute and all related services directly by our own personnel," Nane concluded.

The gateway to growth for Aqaba

King Hussein International Airport in Jordan has expanded to accommodate tourist demand in the popular Red Sea resort of Aqaba. **Marcelle Nethersole** *found out more from Kosai Talhouni, marketing and public relations manager, for Aqaba Airports Company.*

Aqaba is Jordan's gateway to the Red Sea, where tourists can swim and dive in its beautiful warm, clear waters while taking in colourful coral and marine life – including turtles and dolphins.

The port city is also an integral part of Jordan's 'golden triangle', which takes in the United Nations Educational, Scientific and Cultural Organization (UNESCO) site of Petra, Wadi Rum, and the famous Dead Sea, where you can cover yourself with rich minerals as you float in the salty water.

People have visited Aqaba for many years but, as the town slowly developed into a popular destination, with luxury beach resorts and hotels, visitor numbers increased significantly and its local airport needed to keep up with demand.

Located north of Aqaba, and about a 20-minute drive from the centre, King Hussein International (KHIA) borders Egypt, Saudi Arabia and Israel.

It first swung open its doors in 1972 with a single terminal building, one departure gate, and one baggage carousel.

Over the years, the facilities have been upgraded, including major renovation/refurbishment of the whole passenger terminal building in 2002.

Then the airport operator, Aqaba Airports Company, looked for outside help in expansion and a new land use development masterplan was adopted for KHIA by internationally renowned Changi Airport Consultants (CAC).

Boosting competitiveness

"The masterplan aims at enabling the facility to be developed in a sustainable and cost-effective manner, while boosting competitiveness of the airport in the region to serve the economic, tourism and investment sectors by improving the efficiency of procedures for passengers," said Talhouni. "The expansion was completed in 2016 and it will serve the airport until 2028."

Aqaba Airports Company research revealed that, based on a passenger and cargo volume forecast, the recommended land use plan encompasses all the 'important' functional areas of the airport.

"The masterplan facilitates efficient airport operations, provides the flexibility to adjust to unforeseen changes, allows for forecast growth until 2028, and provides safety and security for aircraft operations," added Talhouni.

"The total airport site is 24.5 million square metres, where a quarter of the area is reserved for further development."

Development of new facilities or upgrading/expanding of existing facilities is being undertaken in a series of phases to match the actual growth of air traffic and to maintain a required level of service.

The airport currently handles two million passengers yearly, with airlines coming in from all over the world – mainly European carriers and Jordan's flagship Jordanian Airlines.

"KHIA is a 24/7 operational airport capable of accommodating all aircraft from small up to a B747 aircraft," said Talhouni.

Commercial use

The functional areas being developed in phase one include those designated for commercial use. This includes an aerospace industrial park, which includes assembly of aircraft parts; warehousing and distribution; production, repair and testing of aircraft avionics components; and research and development of aerospace technology.

There's also a logistics park including freight offices and warehouse distribution, as well as car rental offices and travel agents.

"Other aviation-related businesses and non-aviation businesses which prefer to be located near the airport will include educational establishments, such as training schools for aspiring pilots, as well as for experienced pilots, and training schools for airport engineers and technical personnel," said Talhouni.

"There will also be a hotels and recreational zone, and a real estate development zone, where developers are welcome to invest in all the above-mentioned investment opportunities."

The open sky airport also accommodates the ever-increasing demand for private aviation.

"We have great VIP companies and FBO facilities at KHIA, including Ayla Aviation Academy, the Royal Jordanian Academy, the Aero Wings for Industry's assembly plant for light planes, the Jordan Private Jets Services private jet terminal, and the Al Baddad International Group's maintenance centre," said Talhouni. "Aqaba is the place to be, either for tourists or business people, and KHIA is proud to serve all visitors."

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Fokker introduces
Electronically Dimmable Window

Last year Fokker Services proudly announced the new Electronically Dimmable Window (EDW) concept at the AIX in Hamburg. The innovative EDW is able to block out 99.95% of light coming through, and can generate all types of intermediate dimming modes, such as opaque windows.

We have teamed up with GKN and partners to bring the Electronically Dimmable Window technology as a retrofit solution to the aftermarket. Fokker Services, member of GKN Aerospace since 2015, is always pushing the boundaries by applying new technologies on all aircraft types. As an experienced aircraft MRO re-delivery and engineering company we have performed large modification projects for Special Mission Aircraft and VIP conversions. Besides that, through continuous innovation we introduce solutions to improve operator revenue potential, decrease operating cost and increase passenger appeal for all commercial aircraft. Recent examples of our innovations are the Skyview Panoramic Window™, lightweight passenger seats, LED lighting, WIFI in the cabin and avionics upgrades, such as the ADS-B out system which is mandated by 2020 in Europe and the US. We are part of the GKN Aerospace family since 2015, which opened a whole new world of exciting technologies that we have added to our aftermarket product portfolio.

For more information please contact Fokker Services +31 88 6280000 or email info.fokkerservices@fokker.com

The 2016 World Space Risk Forum (WSRF) took place in Dubai in November with wide-ranging discussions around innovation and risk management within the space sector. **Steve Nichols** *reports.*

THERE'S NO SPACE FOR RISK...

The WSRF brought together nearly 400 satellite operators, manufacturers, launch providers, space agencies, risk managers, insurance brokers, underwriters, lawyers, and capital providers.

They heard that the space insurance sector has played a major role in the growth of the space industry by facilitating much-needed investment capital.

As the industry has evolved, the nature of risks has also changed. High on the agenda at the fourth event were discussions on the need to understand and mitigate these evolving risks, share thoughts on promoting business development, and exploration in space.

The event was further strengthened by strategic partnerships with Dubai's Mohammed Bin Rashid Space Centre (MBRSC) and Euroconsult, the global consulting firm specialising in space markets.

Chairman Chris Kunstadter said: "With space changing so rapidly, it is essential that risk be handled in the right way. And that's not just from an insurance perspective. The technical, financial and regulatory elements are equally important.

"Evaluation is the key and points of view from everyone along the value chain have to be considered to synthesise a vision that will promote successful programmes for the future."

Special awards

Highlights of this year's forum included special awards that were presented to the industry.

John Celli, president of SSL (formerly Space Systems/Loral) was recognised for 'Outstanding Service to the Industry', while Eutelsat received the award for 'Industry Innovation'.

The MBRSC was also honoured for 'Industry Inspiration', on the day when the final design of its Hope Martian space probe had just been approved.

Hope will launch in July 2020, arriving at the Red Planet seven months later, in time for celebrations that will mark the 50th anniversary of the UAE's foundation.

Once in orbit, Hope, which was named after a public campaign, will explore the Martian atmosphere using scientific instruments that include visible, infrared and ultraviolet spectrometers.

Its data should help scientists build a holistic model of the planet's daily and seasonal cycles, and may explain why Mars lost a lot of its atmosphere to space.

Hope is an example of how Dubai is embracing space and forging ahead in the sector.

"What's impressive is that there is such a strong focus on getting young people to get involved in space. This seems to be unique to the UAE and the MBRSC, in particular, has found a way to ignite interest in the sector that is great for the future of the satellite industry," added Kunstadter.

"It is essential that risk be handled in the right way."
CHRIS KUNSTADTER

Keynote speeches included the 2016 WSRF chairman's opening speech on mitigating risks and an address from Dr Michael Menhart, Munich Re chief economist, on the global economic outlook.

Other keynote speeches were delivered by SSL president, John Celli, on the forces that drive today's commercial satellite market; Dr Hans Koenigsmann, SpaceX, vice president for mission assurance, on the future of re-using rockets; and Stéphane Israël, chairman and CEO of Arianespace, on how the company is leveraging a culture of experience, reliability and gradual innovation.

The WSRF also launched a new dynamic short-talk lecture series. With a duration of less than 15 minutes and on topics ranging from 'The Mean is Meaningless' to 'Is the Moon still there if we close our eyes?' the so-called 'Space Powwows!' were hosted by Swiss Re Corporate Solutions and were well-received by the delegates.

The fifth WSRF conference will take place in Dubai in 2018. Looking to the future, Kunstadter concluded: "The world will be a different place by 2018. Space activity will be well beyond where it is now and it would be safe to say that many of our current dreams will be a reality by then.

"It's exciting to anticipate that, by then, we will be discussing things such as space mining and new rockets as realities."

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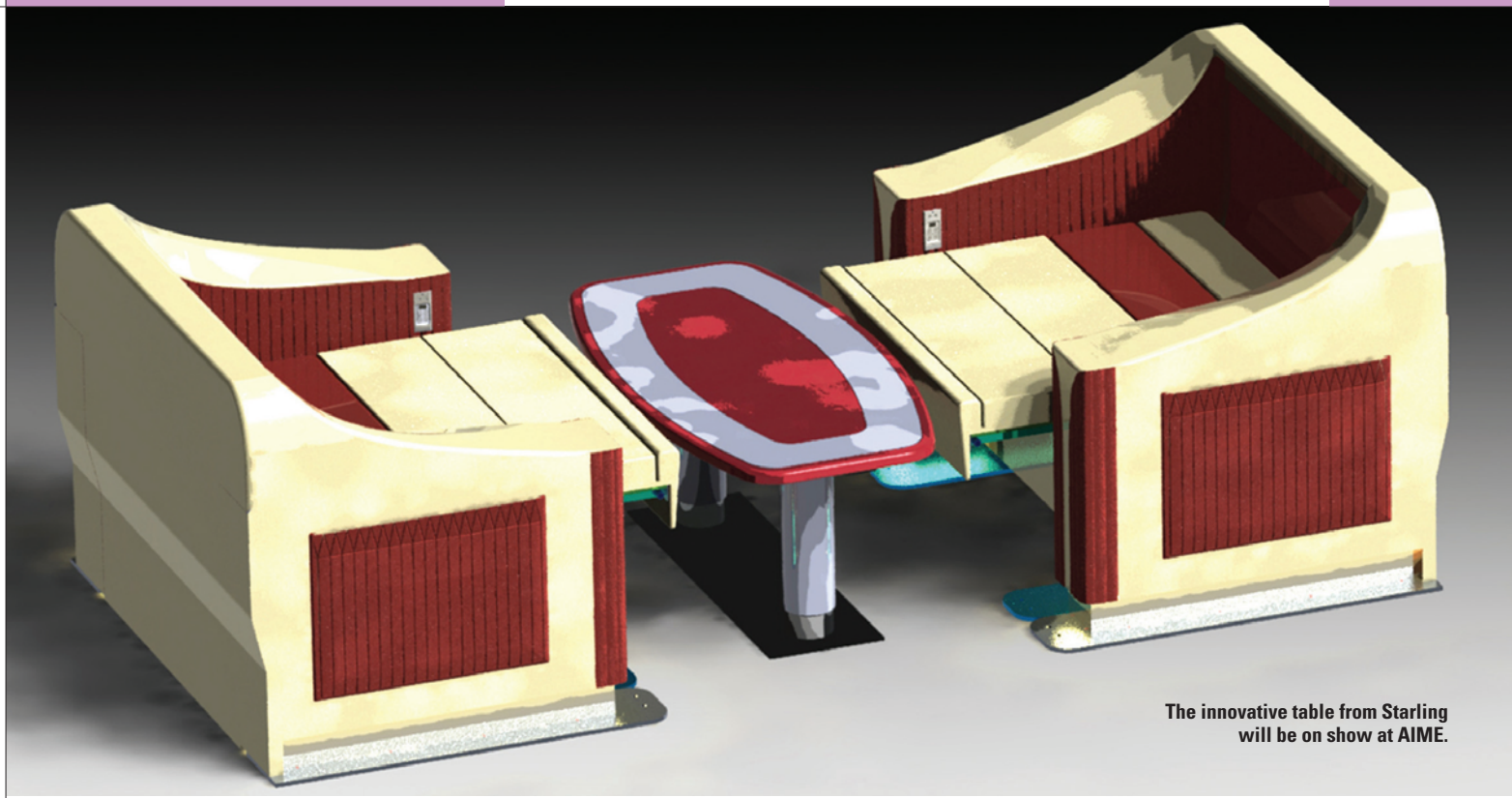


The innovative table from Starling will be on show at AIME.

RAISING THE BENCHMARK

One of the first big aviation events in the region to kick-start 2017 is AIME/MRO and this year sees a growth in new exhibitors.

Marcelle Nethersole *finds out what visitors can expect.*

The Middle East aircraft interiors and MRO markets are now mega business in the aviation industry and, once again, show organisers are taking the opportunity to co-locate two events at Dubai World Central on February 8-9.

The Middle East aircraft interiors market is a $6.9 billion industry. It is estimated that it will grow 7.0% annually until 2020.

The region has been at the forefront of advances, as Middle East carriers are constantly striving to enhance and improve the passenger experience.

Statistics from Frost & Sullivan show that, by 2020, Middle Eastern, Chinese and Indian markets are predicted to jointly command 27.3% of global demand for cabin interiors.

Aircraft Interiors Middle East (AIME) organiser, F&E Aerospace, says Dubai's geocentric location makes it an ideal place to meet those markets and is within convenient travel time of two thirds of the world, including Europe.

This year, AIME will feature more than 280 international exhibitors, as well as hundreds of airlines, allowing companies to showcase their latest interiors innovations while offering a platform for suppliers and buyers to network and make new contacts.

F&E Aerospace MD, Michele van Akelijen, said: "We have seen an incredible increase in new exhibitors ahead of the 2017 event. With the growth predicted in the region, it's no surprise that the show is cementing its reputation as an important part of the industry's calendar."

While visitors will see regular AIME exhibitors at the show, this year also brings new names and faces.

Among those exhibiting for the first time are UK companies Beadlight and Starling Aerospace.

"We design, engineer and manufacture the ultimate aerospace reading lights, using a unique patented diffusion system, which creates the perfect reading light," said Gina Amies, director of Beadlight. "The Middle East is a rapidly growing market and we think AIME is a great chancer to exhibit our products and demonstrate our commitment to the market."

Starling Aerospace will be showcasing its latest cabin solutions, including the Berthable divan, working with the Hilo table, and a new 'glitzy' tea table, which has the appearance of solid gold or silver but is made from lightweight aluminium with a semi-precious stone top.

Continued on Page 86

CONTINUED FROM PAGE 85

The recently launched Berthable divan as a single (club 2 configuration) can be used in conjunction with the Hilo table to form a single flat bed. This new seating solution, also available as three or four-seater that converts into a 91inch long by 35-inch wide flat bed, can be styled and upholstered to suit a variety of aircraft interiors.

The table can be manually adjusted to two height points so it becomes part of the divan.

"AIME is a fantastic opportunity for Starling Aerospace to showcase our products but also tell customers more about our one-stop facility in the UK, which provides a design and development service and certification in-house," said Coralie Wigg, the company's principal and co-founder.

"A lot of our clients still don't know that we have the expertise and functionality in-house for refurbishment and overhaul. We are going to really show off our upholstery and decorative trim skills by styling our products on the stand with green, gold and pearl white – every detail will be covered, including a model aircraft finished with aqua transfer printing."

Also exhibiting for the first time is Saudi Arabia-based Sabic, and Kadifeteks, from Turkey.

A regular exhibitor at the show is French company, Stelia Aerospace.

"We design and produce aero-structures, pilot seats and business and first-class passenger seats. With a turnover of €2.1 billion ($2.2bn) in 2016 and more than 6,500 employees worldwide, our company is a world leader," said Thierry Kanengieser, VP for cabin interiors.

This year the company will exhibit the Celeste, its medium-haul seat for single-aisle platforms.

"With customers in three different regions, and deliveries starting early 2017, this futuristic seat offers exceptional comfort through its unique swinging cradle recline motion," said Kanengieser.

The company is also keen to highlight its latest Opal product, which launched at the Hamburg Expo 2016.

"Opal has been designed for efficiency and, through innovative industrial design, can be extensively customised, while meeting customers' programmes constraints – 3D curves, new technologies (polycarbonate outer skins allowing injected colour and possible laser printing decoration), and an additional 15% weight reduction. It also provides more revenue-paying passengers (2 to 4 additional PAX)," explained Kanengieser.

The company already has strong links to the region. One of its biggest customers is Etihad Airways. "We've been partners with Etihad for almost a decade and it's been wonderful sharing their amazing journey," said Kanengieser.

"We are also looking forward to meeting customers, old and new. We are particularly excited to be back in the region after the successful entry into service of our latest product, the first-class suite for Kuwait Airways on the 777, but equally happy to show off our regional business-class seat, Celeste, which can be experienced by visitors to our stand, and which already has a launch customer in the Middle East."

Seating is always a highlight at AIME and Stelia's Opel and Celeste seats will draw crowds.

It's not all just about seats, interiors and lighting either as Piotr Nowaczyk, export manager at Modus, is looking forward to showcasing the company's clothing for cabin crew and pilots.

"We produce and supply clothing for pilots and cabin crews and uniforms for more than 200 institutions in Europe. We export our products to 15 countries all around the world," said Nowaczyk.

The Polish company has been a producer of garments for more than 70 years.

"The Middle East is important because we can see that it is a growing market, so we feel AIME is the ideal place to showcase our uniforms to the region," said Nowaczyk.

Global airline passenger communications system analysts forecast the market will grow by 8.65% annually from 2016-2020.

According to MarketsandMarkets, the global in-flight entertainment and connectivity (IFEC) market will be worth $5.8billion by 2020.

With that in mind, the IFEC pavilion will be returning to AIME and it, too, has several new exhibitors, including Latecoere and Pascall Electronics.

Phil Brace, from IFEC & airborne power solutions at Pascall Electronics, said: "We decided to participate as we are expanding our focus in the in-cabin power systems market beyond the conventional IFE and connectivity systems that we support today. The Middle East is important to us, as it is a region where our products have been used by a number of the premium airlines and low-cost carriers. It is a growing market area, as more airlines offer bring-your-own-device (BYOD) IFE and connectivity services."

The company plans to exhibit its capabilities as a supplier of custom power solutions for civil aerospace applications, and showcase next-generation high-efficiency, lightweight power line-replaceable units (LRUs), focused on providing high-power USB charging for customer personal electronic devices.

Co-located with AIME is MRO Middle East, the leading conference and trade show for commercial aircraft maintenance in the region. It is hosted by Aviation Week.

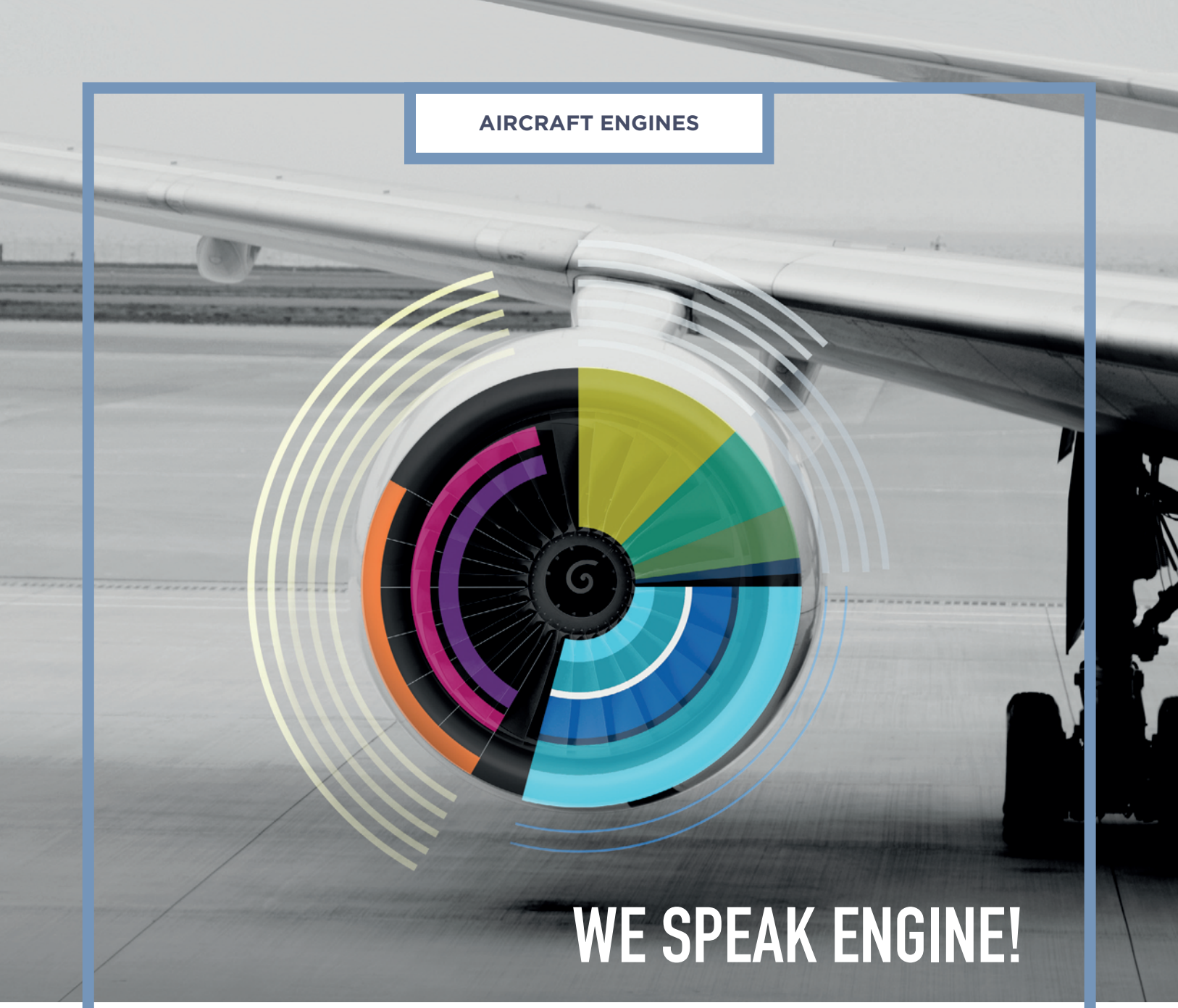
A full conference runs alongside the exhibition, with keynote speakers including Hisham Hassan Nasser, chairman and consultant for Egyptair Maintenance and Engineering, the Cairo-based MRO facility, which offers third-party services across the region.

There are a number of speakers giving their views on the changing demands for services from the region. These include engineering specialists Husham Osman, from Royal Jet, and Luigi Fernando, from AJA Private Jets.

From the airlines come Jordan Aviation Airlines CEO, Captain Zuhair Mohammed Al-Khashman, and Jazeera Airways COO, Abdulla Al-Hudaid.

The leadership panel will consider strategies and opportunities for the future, as panellists address key topics such as manpower and the perceived skills gap, key relationships in the market, and what can be learnt from other industry players.

The service from OEMs also comes under the microscope with discussions on manufacturer-managed parts solutions, looking at how technology, information and airline business models are shaping parts support.



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Daniel Hulme: "We are not a catering service, we are a culinary concierge service."

HULME PRIDE

With more Middle East clients visiting the UK than ever before, On Air Dining is already taking over London as the number one 'culinary concierge service'. Now founder, Daniel Hulme, has set his sights on international expansion. **Marcelle Nethersole** *finds out more.*

When it comes to good food and taste in the air, Daniel Hulme knows his stuff. After spending his formative years as a chef in some of London's famous Michelin-starred restaurants, he then travelled the world offering his culinary skills on board luxury yachts and to private houses.

It was during this time that one thought came to him – what is the food like on business jets?

"So I looked into it and was quite shocked at what people were being served," said Hulme. "What I realised was that there was no reason that the discerning palates of the world's wealthiest people could not have the quality of food they are used to in the air.

"I also looked at how food was being packaged and delivered to the aircraft, and I just thought that people who pay to travel by business jet deserved better and more for their money."

Once back in the UK, Hulme spent four years building up his expertise in the in-flight cuisine arena in partnership with On Air before, in 2014, launching his own private aviation catering company – On Air Dining – with the help of two major investors.

Private catering

Today, the company dominates the private catering aviation services at Stansted Airport in the UK, and last November it acquired Emily's Inflight Food Services, a catering company for private and business aviation, at Farnborough International Airport.

"We want to take over private aviation catering in London and we are very close to doing that. Then we can expand," said Hulme. "We were actually approached by Dubai's DWC a few years ago, but the timing just wasn't right."

Hulme said the company offers a 'bespoke' service. "I designed a system that is simply unique," he said. "It allows the flight attendant to deliver to the end-user at the same level of Michelin-starred food being served in a top restaurant.

"That is from our special menus, which can be tailored to the customer's need, to the packaging, making sure the heat and freshness is retained, to the swift service on one of our many loaders to the aircraft, which can operate on aircraft up to a B747.

"We also offer a full concierge service. We are not a catering service, we are a culinary concierge service."

Hulme has 30 chefs and a team of 50 working at his two facilities. Many of the chefs come from Michelin-starred backgrounds around the world.

He and his team are constantly trying to create the perfect menu, which can take two to three months.

"Besides being down to the perfect produce, it is all about keeping creative," said Hulme. "We have one of the most advanced kitchens in the world, able to create any dish – even the chocolate covered crickets that were once requested."

As we know, flying at altitude changes our taste buds by reducing flavour, particularly with salt, where we lose 50% of its taste in the sky.

However, Hulme and his team have a secret ingredient that he is prepared to tell all about – umami.

"It is like a salty effect on the mouth and generates saliva," Hulme explained. "Umami basically keeps the flavour of the food as if you were eating on the ground. So we use techniques to extract it from certain products. It is particularly great with sushi and our miso cod dish, which took us months to develop."

The company is also proud of its high-end halal credentials.

"A huge number of our clients are from the Middle East, so it is paramount to have our halal certification," said Hulme. "There is one other company with the certificate but we are actually now starting to pick up a lot of their clients – as we are simply the preferred culinary servicer."

The company also provides free culinary training courses for flight attendants and anyone else with an interest.

"We have engineers and FBO people coming in for the course," said Hulme. "I want to put my money where my mouth is and show everyone just how different we are."

FOOD FOR THOUGHT AT 30,000FT

In-flight cuisine is often seen as a key differentiator for selecting an airline or getting the best from a business aviation experience, but Sarah Wilson, director and registered nutritional therapist at The Aviation Nutritionist tells **Marcelle Nethersole** *that it all comes down to your DNA.*

When it comes to what food to eat in the air, Sarah Wilson has the simple recipe: "It's all in our DNA."

Wilson should know. She has been working as an aviation nutritionist with commercial airlines, business jet operators, and with in-flight caterers for a number of years.

These days, it's no longer about just grabbing a sandwich on your flight. The more sophisticated answer is for the perfect menu to be created after you have had a DNA test.

"On-board catering used to be just a marketing tool but now people are more aware of their health," said Wilson, who runs a clinic in London's Harley Street.

"Flying is stressful and demanding, so you need to meet the challenges. We are all well aware of the need to be healthier now and this very much applies to people flying, particularly on a regular basis, and on long-haul flights, when your energy can be compromised."

So what is the right food to eat at 30,000ft?

"Eating on long-haul flights, while crossing different time zones, can cause havoc with your digestion and sleep patterns," explained Wilson.

Sarah Wilson: "Eating on long-haul flights, while crossing different time zones, can cause havoc with your digestion and sleep patterns."

Timing and hydration

"If you have to eat at all, timing and hydration is key. I suggest, with a night flight, you eat before the flight, and then rest on board. But for those regular premium passengers Wilson says you should consult with The Aviation Nutritionist to understand what is right for you "We are all individual and have very different needs," she said.

Wilson added that science is a key factor for operators and in-flight caterers. "When we fly, our taste buds decrease slightly as the nasal passage dries out, which is often why we find commercial flights serving stronger tasting foods, such as curries, and also why we might not taste our favourite food and drinks as well as we can at home, such as a robust red wine," explained Wilson.

"Digestion shuts down slightly in the air, too, as you're not burning any energy and the body may be under stress. So people should really limit their sugar intake, as it is an inflammatory. This includes alcohol, which, besides being full of sugar, can be further dehydrating at altitude if you have too many. Water is your friend."

What about flying with children? "In-flight caterers shouldn't offer menus laden with sugar for children, or else they will be bouncing down the aisle," said Wilson. "It's better to use sensory types of food to stay engaged with it."

And then there are medical concerns that operators should also take in to account.

"Diabetes type 2 is absolutely prevalent in people from the Middle East, due to their diet. So menus should be created to meet the customers' health expectations," she said.

And, speaking of medication, Wilson added that operators needed to be aware of any medication the passenger was taking as this could really play a part in jet lag and well-being in the air.

While this may sound like extra hard work for operators and in-flight caterers, Wilson said one "quick and easy" way to decipher the right menu was by taking a DNA test, which could highlight health issues and intolerable foods to the client.

Saliva test

Wilson explained: "I do DNA testing at my clinic to see what is best for the client to eat while flying. This can be an easy saliva test, which shows deficiencies, such as Iron, Omega 3s, B12, Vitamin D, gluten intolerances, or caffeine metabolism.

"Some people can't metabolise coffee but actually don't realise this and knock it back on the flight, causing havoc with the body and mind. Results are back within two to three weeks.

"I then help manage a menu with the in-flight caterer to suit the client. We also factor in that it's important not to make the food bland and add some fun to it using ingredients that the customer enjoys."

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Gulf carriers using Panasonic Avionics' in-flight connectivity solution are set for increased data speeds thanks to a new modem developed with Belgian company Newtec. **Steve Nichols** *reports.*

Newtec's new tech speeds Panasonic in-flight connectivity

A new satellite modem will offer Panasonic's aero customers up to 20 times the bandwidth of its current solution. It will be exclusive to Panasonic Avionics, is capable of exceeding 400 Mbps, and can scale to meet the evolving needs of airlines and their passengers.

According to Newtec, the modem's headline speed of 400Mbps is achieved by utilising or bonding three 133Mbps channels together. Panasonic will be able to use one, two or three channels independently or bonded.

Panasonic says it will facilitate the increasing bandwidth coming on stream over the next two years as high-throughput satellite (HTS) and extreme-throughput satellite (XTS) services continue to be layered over the company's existing global network.

This will expand network capacity from 2,300MHz today to 15,000+MHz by 2017.

High-throughput satellites, such as Intelsat 29e (I-29e), are the latest generation using narrower spot beams to deliver more power to the aircraft. When coupled with the Newtec modem, the result will be faster connection speeds, enabling a better web surfing and video streaming experience.

Intelsat says its new EpicNG HTS Ku-band platform is already delivering a 165% to 330% increase in spectral efficiency with ground platforms and modem technologies.

It is also giving up to 300% improvement in throughput when using next-generation antenna technology.

Intelsat 29e has been joined by Intelsat 33e, the second of its seven planned EpicNG high-throughput satellites. Other Ku-band satellite providers also have plans to launch HTS.

Paul Margis, CEO of Panasonic Avionics Corporation (left) and Serge Van Herck of the Newtec board of directors.

Paul Margis, chief executive officer of Panasonic Avionics Corporation, said: "As we continue to optimise our second generation global communications network, we are constantly looking for new pieces of critical technology that will enable our customers take full advantage of HTS and XTS technology.

"Newtec's broadband modem, which is based on the innovative DVB-S2X standard and customised to our requirements, allows us to access much larger blocks of frequency and better support high bandwidth platforms across all of our vertical markets."

Serge Van Herck said on behalf of the Newtec board: "Newtec has a proven track-record in delivering high-quality and reliable satcom solutions.

"Our partnership with Panasonic will combine next-generation ground segment and satellite technology to deliver the most efficient high-throughput solution to customers across the world."

Three receivers

Dave Bruner, Panasonic Avionics' VP global communication services, added: "The modem's three receivers allow us to dynamically allocate them according to requirements. It also means we can handle satellite and beam hand-offs more efficiently for high-speed data connections, with a 'make before break' arrangement.

"Because of its high spectral efficiency, the technology can also handle much lower signal-to-noise ratios."

According to Bruner, the company will start rolling out the new modem technology in mid 2017, although it is not backwards compatible with Panasonic's existing modems.

"We will add the new modem technology to satellite transponders, but ensure that both the new and old technologies are available. Then, as the roll-out gathers pace, we can scale our capacity to match demand around the world," he explained.

"Airlines would like to install equipment that will last for 20 years, but technology isn't like that. The new modem has a field-programmable gate array (FPGA) that will allow us to perform real-time software upgrades when it is in service, so we can handle mid-cycle updates."

Panasonic says its global communications network now covers 99.6% of all aeronautical traffic routes.

Cedric Rhoads, executive director, corporate sales and product management, Panasonic Avionics, said at the Apex Expo in Singapore that the company's Global Communications Services (GCS) business now has a 47% market share with 77 airlines.

Around 3,500 aircraft are committed to installing the system with more than 1,350 delivered.

In terms of its eXTV product, it says 770 aircraft are committed with 419 already equipped.

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The ground log book (GLB), a paper-based document, has been replaced with the electronic ground log (eGL), saving tonnes of paper a year.

GROUND LOG DAY

Lufthansa Technik, one of the world's leading MRO organisations, has introduced yet another step in the inevitable advance towards digitisation.

Geoff Thomas *reports.*

German company Lufthansa Technik is pioneering paperless maintenance following on from, and linking with, the paperless cockpit – otherwise known as the digital flightbag.

Now introduced at its maintenance sites in Germany for its entire fleet of Boeing 747-8 and Airbus A350 aircraft, all documents involving the resolution of defects on aircraft from parent company Lufthansa Airlines, and its freight offshoot Lufthansa Cargo, will be stored and actioned purely in digital form, eliminating paper.

Over the coming year, the project will result in the elimination of all current computer writing devices and enable a simple overview of MRO operations throughout the Lufthansa fleet, with the same inputted real-time data being visible worldwide from Frankfurt or Munich to New York and from Sydney to the Philippines.

An electronic job sheet (eJobcard) has already been introduced throughout Lufthansa's German line maintenance operations and the ground log book (GLB), a paper-based document, has been replaced with the electronic ground log (eGL), saving tonnes of paper a year.

By initiating this project, the world's largest MRO provider is already saving hundreds of thousands of pages of paper each year, and over the coming couple of years this will save many millions of sheets.

The electronic initiative is enabled through an application called 'maintenance log', developed by Lufthansa Technik. It assists aircraft technicians in recording and outputting data, and it can be used on various mobile devices including smart 'phones and tablets.

Lufthansa Technik claims that electronic documentation, when used in combination with mobile devices, requires one-off data entry by the maintenance personnel directly at the site when the information is acquired. It will also facilitate the technicians' work by introducing, over time, in-cockpit data entry directly into their hand-held devices, meaning that they will no longer need to sit in the pilots' seats to ascertain what a specific issue is and how to solve it.

Linking in with the electronic job card – the next stage of the project – it will eliminate the risk of 'Chinese whispers', where information is passed by word of mouth from person to person and then re-entered by hand.

Continued on Page 94

CONTINUED FROM PAGE 93

Gerald Frielinghaus, head of the MRO's 'paperless maintenance' programme said: "With paperless maintenance, Lufthansa Technik is not only saving paper, environmental resources, time and money; it is also accelerating the provision and transmission of information globally.

"It also makes some work processes fully obsolete and others, thanks to electronic documentation, more streamlined, clearer, and less prone to error. Superfluous data entry is also no longer necessary.

"Our colleagues working on the aircraft appreciate the new application, as it brings noticeable improvement in terms of unnecessary documentation and allows personnel to concentrate more on their technical work."

The entire project is now being taken over by Dr Rainer Sebus, who assumed leadership of the project on Frielinghaus' recent retirement.

Over the coming months, more than 2,000 technicians in Frankfurt will be equipped with smartphones and tablets as part of the project. This will enable them to document their findings directly where they're working, in just about every work situation.

Other advanced steps in the project include individualised digital ordering and the more comprehensive integration of complaint management support processes, for example when documenting delays or damage.

Over the coming years Lufthansa Technik will, subject to regulatory approval (particularly regarding e-signatures), launch its paperless maintenance project worldwide, simplifying the work of its more than 25,000 employees globally where its work encompasses the entire spectrum or MRO activities including maintenance, repair, overhaul, modification, conversion, engines and components.

Sign-off on the project

The European Aviation Safety Agency (EASA) still has to sign-off on the project, although Boeing has agreed to paperless MRO operations; the only exception, for obvious reasons, is work undertaken within fuel tanks, where electronic devices are unlikely ever to be acceptable.

According to Lufthansa Technik, its technicians already love what the programme is bringing, as it reduces the need for multiple data-input and also, potentially, links directly with Lufthansa Technik's and each of the airlines' planning and engineering departments.

Currently, more than four million .pdf job cards are created and then printed-out annually, so this project is saving vast quantities of paper, along with printer ink and time.

Some airlines have yet to agree the introduction of the paperless era but the Lufthansa Technik team is confident that they will see the cost and time benefits over the coming months.

In 2015, British Airways received operational approval from the UK's Civil Aviation Authority to use Boeing's electronic logbook (ELB) on its 787 fleet, making it the first Dreamliner operator to go paperless for technical and cabin logs.

Developed in partnership with Ultramain Systems, the ELB is intended to enable improved – and more efficient – communication between flightcrew, cabin crew and ground-based maintenance and engineering staff.

The ELB software runs on the 787's integrated electronic flightbag and on-board server system to gather both automatically collected flight data and crew-observed fault input.

Information is shared with ground-based personnel and maintenance systems while the aircraft is still airborne, enabling ground maintenance crews to be ready at the gate with parts and documentation.

HOME-GROWN TALENT BOOSTED BY REBORN ALSALAM

Saudi Arabia's military MRO specialist Alsalam Aircraft Company will have a new look, a new approach and a new name following a change programme to reflect the technical advancements the company has made.

It will now appear under the identity of Alsalam Aerospace Industries following its development from its core capabilities of the maintenance, repair modification and upgrade of aircraft to the assembly of military aircraft and the manufacture of major military components.

❑❑❑❑❑

Alsalam's president and CEO, Yahya Bin Hamoud Al Ghoraibi , said, "Changing the company name, introducing the new corporate brand identity and transforming the company to include manufacturing reflects our continuous efforts to develop the aircraft industry in the Kingdom".

The first direct result of the new advanced capabilities came in the shape of the conversion of an RSAF F 15S to F 15SA configuration using F-15SA wing assemblies and forward fuselages manufactured in-house by Alsalam. The conversion was completed at Alsalam's Riyadh facility and made Saudi Arabia only the second country outside the USA with this capability.

Al Ghoraibi said the development would boost for the prospects of young Saudi engineers. "We will develop our national talent base and attract young Saudis who have ambition and relevant skill sets.

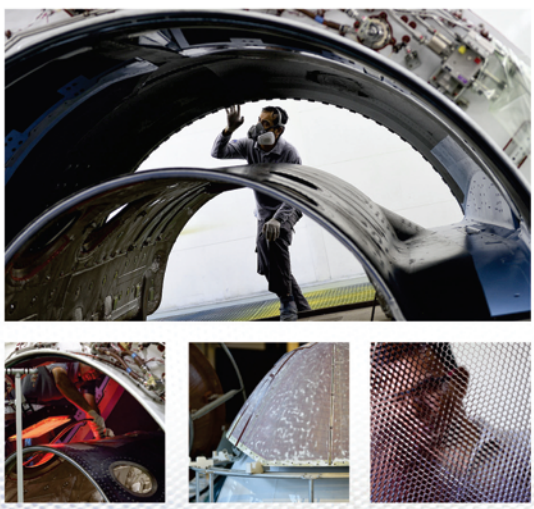
"We will train, develop, and qualify them to contribute not only to Alsalam's diverse activities but to ensure progress in our sector and our contribution to our beloved country", he said.

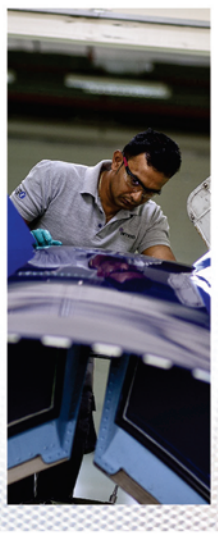
Yahya Bin Hamoud Al Ghoraibi: "We will develop our national talent base and attract young Saudis who have ambition and relevant skill sets.

ames

AEROSTRUCTURE EXPERTISE RIGHT WHERE YOU NEED IT

A 50-50 joint venture between AFI KLM E&M and Safran Nacelles, AMES provides maintenance and repair services for all engine nacelle types, radomes, winglets and composite flight controls, serving airlines operating out of the Middle East region. AMES operates a state-of-the-art repair shop located in Dubaï Jebel Ali Free Zone and offers repair, on-wing inspection, access to a pool of spare parts and maintenance schedule optimization.





AIRFRANCE INDUSTRIES KLM Engineering & Maintenance SAFRAN

AMES is back at the MRO-ME show to demonstrate its latest offers.

AMES on target with its time machine

Barbara Saunders

reports as AMES prepares to fire up the Gulf's first commercial autoclave composite repair offering.

Aerostructures Middle East Services FZCO (AMES), the engine nacelle and aerostructure maintenance joint venture between Safran Nacelles and Air France Industries KLM Engineering & Maintenance (AFI KLM E&M), is taking a stand-alone booth at MRO Middle East 2017.

It will be the company's fourth MRO Middle East outing and the booth will focus heavily on its new autoclave composite repair offering – the first of its kind in the Gulf.

The company has installed an autoclave at its state-of-the-art repair shop in Jebel Ali, Dubai, which will become operational in March, raising the regional benchmark on highly effective rapid-response aircraft maintenance solutions. It also gives the region its first radome repair solution.

"This removes the need to outsource to Europe or the USA," said Vincent D'Andrea, SVP engineering & maintenance components products for AFI KLM E&M.

D'Andrea said the autoclave could help save as much as 10 days off major repair schedules, resulting in huge transportation and scheduling savings for clients. "This greatly improves our operation for airlines in the Middle East with significant saving on local turnaround times."

Full retrofit

The autoclave, which was proven in previous service with AFI KLM E&M at Le Bourget, France, and has undergone a full retrofit and modification programme, will also, according to Philippe Couteaux, vice president, customer support & services, Safran Nacelles, allow AMES to expand its product offering. It marks a strategic growth era in the company's support activity and positions it for new work with airframe components, he added.

Building on a new Federal Aviation Administration (FAA) certificate, along with the new autoclave for composites and its skilled on-site repair engineering team, AMES can now accommodate a growing volume of nacelle MRO work, while also creating capabilities for composite repairs on aerostructure parts such as radomes, winglets and flight control surfaces.

Its executives also haven't ruled out the use of the autoclave for outsource manufacturing should demand and capacity allow.

Complementing AMES' core business portfolio of services for Safran-produced nacelles and thrust reversers on Rolls-Royce Trent 700 and Trent 500 engines that equip Airbus A330s and A340s, as well as the A320 family's CFM International CFM56 power plant, are capabilities covering Safran Nacelles' latest products. These include the nacelle system for the Airbus A320neo version, and the future introduction of the company's nacelle system on the A330neo.

Thrust reverses

"AMES is also uniquely positioned to accommodate the very large nacelles and thrust reversers for General Electric's GE90 engines on Boeing 777s, along with the Engine Alliance GP7200s and Rolls-Royce Trent 900 engines that power Airbus A380s," said Couteaux.

The joint venture has also successfully developed on-wing support activities that involve the deployment of its teams to serve clients across the Middle East and Indian sub-continent, while its turnaround for small repairs has shortened following the signing of the delegation of authority (DOA) for its in-house engineering, which allows it to validate minor engineering repairs at the workshop, making redundant the need to refer to the HQ in France. "We now have a certain degree of autonomy on the validation of smaller repairs," said D'Andrea.

AMES opened in 2010 and currently employs 20 staff with a 50% increase envisaged by 2020, according to Couteaux.

Meanwhile, the company, which can also serve India from Jebel Ali, can foresee a similar operation elsewhere if demand requires. "Proximity to the customer is our value proposition," said D'Andrea. "Inventory is now too expensive for airlines."

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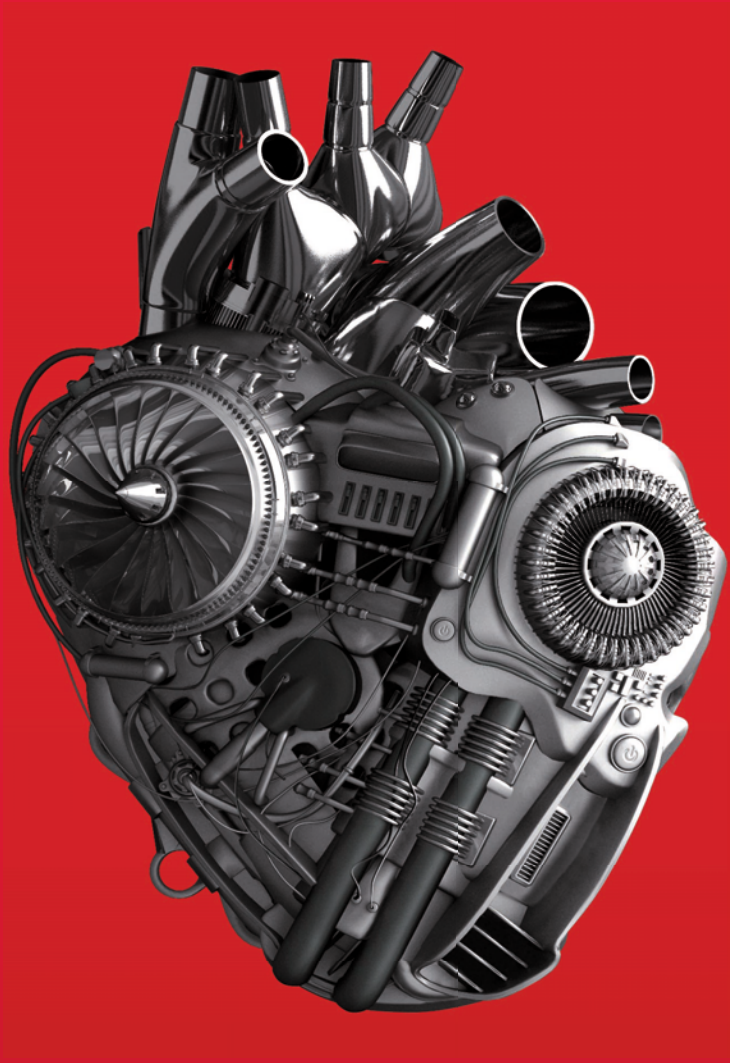

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Emirates Airline is in the final stages of testing a new software system that should control its operations for the next 50 years. **Steve Knight** *found out more at the IFS World Conference in Gothenburg, Sweden.*

FAMILY PLANNING...

Emirates Airline is currently scheduling total lifecycle maintenance for many of its aircraft that have not yet been built.

That was one of the staggering revelations to come out of a case study looking at the way a trailblazing customised new software system will affect the company.

The product – IFS Tail Planning Optimization and Assignment – was jointly launched in Gothenburg and at the Airline & Aerospace MRO & Flight Operations IT Conference in Bangkok.

The need for such a system is obvious, because optimising fleet utilisation and allocation within a broad set of constraints, such as routes, schedules, maintenance, aircraft type and disruptions, is hugely complex.

How do you, for example, minimise inefficiencies in aircraft allocation, drive effective aircraft planning, integrate unplanned maintenance constraints, cope with capacity variability, operational changes, short-term maintenance, route restrictions and disruption problems that are beyond your control?

Dynamic disruptive events

Currently, a typical large airline like Emirates, could have a team spending some three-to-four hours to prepare a single day's optimised plan and a 24-hour shift to cope with unplanned variability and dynamic disruptive events. Complexity can quickly compound with each interlinked, unfolding issue. It means that tightly planned schedules can quickly be thrown out of kilter by last-minute impacts – weather, airport delays, airframe or engine failures, or crew non availability – which jeopardise the airline's cost base, bottom line and operations.

IFS' new software solution was developed in collaboration with Emirates and its impact was described by the airline's manager operations planning, Andy Jones, in a case study at Gothenburg.

"When we look at aircraft planning, Emirates starts very early," he explained. "We're planning for 2050 now – because we need to look at airport infrastructure. The new Dubai airport has a bigger footprint than the whole of the city.

"When you think about capacity planning, you need to think about fleet mix – what aircraft will you be looking at?

Dark art

Seat capacity calculations are also really hard to do – it's a dark art. Capacity adjustments around countries is a big issue. How much access are you going to be allowed to different counties and continents?"

The planning is not just about resources – it covers maintenance as well.

"We have maintenance planning for aircraft that haven't been built yet – and we've planned for their whole operational life," said Jones.

Slot planning is also one the airline's biggest concerns. "You can fly anywhere, but if you haven't got the slots to land when you need them, you have a problem. That's why airlines trade slots," he explained.

Step forward IFS, the global enterprise applications company, with its new 24/7 tail planning and maintenance allocation solution for the global civil aviation industry.

"IFS Tail Planning, Optimization & Assignment maximises aircraft allocation efficiency, supports aircraft planning and optimally schedules maintenance events – allowing operators to make informed decisions faster," explained Graham Grose, the company's industry director for aerospace and defence.

The system is designed to "provide full visibility and dynamic optimisation" within a single solution, well in advance of planned flight tasking and maintenance events. Planners can now handle a wider planning window and manage both hard and soft constraints that affect aircraft scheduling, such as destination or maintenance requirements, and analyse the impact of these events on the flight schedule.

"The solution maximises fuel savings by reducing maintenance inefficiency through better allocation of aircraft to long-haul routes and assigning an aircraft for maintenance, within the ideal window," said Grose. "It will play a key role in helping airlines achieve business goals and grow even further in what is an extremely competitive market."

Smith explained that when Emirates first started talking to IFS, scalability was a key concern.

"We needed a solution that scaled everything, from a lightbulb in the cabin to the whole of European airspace shutting down because of a volcanic eruption. We currently have a 20-strong team just looking at the reliability figures of our aircraft," he said.

"There are more than 250 aircraft. We have A380s and 777s. But these are divided into 19 sub-fleets.

"We have aircraft with low flight cycles and

Graham Grose: "New system allows airline operators to make informed decisions faster."

Left: An Emirates A380 in for maintenance.

high flight hours, and those with high flight cycles and low flight hours. That makes maintenance uneven, so you need to manage your fleet to balance that.

"We do have some predictable disruption: we get bad fog in Dubai, but it is predictable. We have back-up plans there, ready to go. But there are unpredictable ones, like stand changes, where you end up with aircrew and passengers in the wrong place.

"Unrest and political situations can also create problems that erupt at any moment. We fly to Kabul and Baghdad. Disruption there can start propagating through the schedule, unless you react quickly."

Smith explained that it currently takes the tail planners up to four hours to prepare an optimised schedule against flights and planes, taking into account disruptions and maintenance.

"In 1985 they hand wrote the tail planning schedule. It looks much the same in 2016 – but it's built in Excel and is 12 pages long. When we went to the board with the proposal to automate the tail planning, they saw the manual sheets and approved straight away," he said.

"IFS came up with a tail planning solution for us. The dynamic scheduling engine (DSE) is at the heart of what we do.

COGS IN THE SYSTEM

Optimising the utilisation of an aircraft fleet is, according to IFS, like synchronising six cogs in a gear system. It includes:

- **Commercial planning – frequency determinations, managing fleet allocation, seat capacity calculation, slot planning, seasonal flight schedules.**
- **Operational planning – accommodating the complexities of crew planning and rostering, and ground support equipment planning.**
- **Constraint management – accommodating long-term maintenance schedules, sector- and destination-based constraints, definition of connection and minimum ground times, aircraft restrictions, and aircraft type swap rule definitions.**
- **Tail allocation – optimised allocation of tails to flight, optimisation of tails assignment based on fleet preference rules.**
- **Maintenance planning – calculation of mid-term maintenance requirements, dealing with short-term planned and unplanned maintenance.**
- **Disruption management – dealing with preventive actions, aircraft recovery, crew rescheduling, passenger rescheduling and delay propagation.**

"The tough part of this job was change management – the guys in the tail-planning department have been working in one way since they joined. Stopping them leaping to the giant chart again is a big task. They get 150 change requests on a single day.

"We needed a workflow management tool to manage those requests in a sensible way. The solution gets the guys focused on the exceptions, rather than the whole schedule – the DSE does that for us."

Smith said the built-in business intelligence was vital. "We have utilisation key performance indicators (KPIs), ground time KPIs and compliance KPIs. The ever-changing nature of the industry means we use the configuration capacity. We're being asked to do different things every day – and the configuration capacity allows us to do that.

"The service level agreements (SLAs) we've got are key. Every single maintenance event we've got across those 253 aircraft is run through this SLA. There's a sweet spot for regular maintenance, which we can run everything around.

"The algorithms that IFS has presented us with for many of the scheduling challenges we're dealing with are looking good."

Abu Dhabi-headquartered Falcon Aviation Services has reported a 20% uplift in its third-party MRO business in 2016 and has set an ambitious target of a further 30% growth for this year. **Barbara Saunders** *reports.*

Falcon takes the FASt track to growth

Nicolas Tejera, a 45-year-old Spaniard, is the company's director of maintenance, who is leading a full remoulding of the FAS technical department.

Tejera said the boost was due to a "significant restructuring" of Falcon's MRO offering, a greater focus on sales and client relations. "It has resulted in our busiest year yet for third-party business on the maintenance side," he said.

"We have competed on client satisfaction and on increasing the type and depth of our services. We have sent people for additional training and invested heavily in our planning department, increasing the staff count three-fold over the past seven months.

"Our target for 2017 is ambitious but very realistic. Our constraint now is not with client requirements, but with space."

Nicolas Tejer: "Our target for 2017 is ambitious but very realistic."

Falcon's space constraints are likely to end in 18 months' time, when its 15,000sqm multi-purpose hangar, being built at Al Maktoum International in Dubai, opens for maintenance and parking of VIP jets.

The hangar is 250% larger than its current Abu Dhabi facility and will have an adjoining wash bay and backshop.

Tejera said Falcon's reputation as an approved Embraer service centre, along with certification from Bombardier and Gulfstream, has stood it in great stead, particularly for the growing business jet market.

"We are cooperating closely with the manufacturers, who realise that it's not only about selling aircraft these days but also about providing the service requirements. That's where we come in because we can manage the warranties," explained Tejera.

FAS, which has its own corporate jet fleet of two Embraer Legacy 600s, a Gulfstream 450 and Embraer Lineage 1000, in addition to a substantial rotor-wing fleet, is now looking to forge strategic alliances with engine and component manufacturers and aircraft interior specialist companies.

"We are very close to finalising an agreement with an aircraft interior specialist to represent it for refurbishment, repairs and modifications," explained Tejera. "The whole proposition will be to reduce downtime for owners and operators."

On the Falcon drawing board is the possibility of rolling Falcon Engineering out into a separate branded service offering.

"The idea would be for this to service the GCC market, where there are various aircraft management companies requiring these kind of services." said Tejara.

He added that the company has been receiving a string of requests from the Saudi and Indian markets and is now pursuing approvals certification from the relevant authorities in both countries.

Falcon, which also has a fleet of six Dash Q400s, is also hoping that its 2016 record of operating the turbo-props to 96% reliability will enable it to escalate its capabilities in providing higher level of maintenance services for the twin-engine series in the near future.

IFS PROPELS INTO MEPC RIYADH BASE

Entering a new era of cooperation (from left): Ashraf Abdulfattah, director finance; Abdulaziz Al-Shahrani, director engineering & programs; Rifai Wahid, business development manager IFS; Gary Carcadden, IFS sales manager; Abdullah Al-Omari; Bandar Al-Sowaid, manager shared services & IT); Ahmed Fareed Uddin, supervisor IT; Saleh Al-Wabil, director QA & compliance; Ali Al-Zahrani, manager, HR & admin.

The Middle East Propulsion Company (MEPC) has selected global software specialist IFS to help manage key operations at its Riyadh facility.

The software company's IFS Applications will be used to control areas such as MRO, finance, supply chain, document management, HR, and payroll.

The state-of-the-art 194,000sqft MRO facility was opened in 2012 close to the city's King Khalid International Airport. MEPC is the sole military engine shop in the Kingdom of Saudi Arabia and provides support for the Pratt & Whitney F100 engines powering the Boeing F-15 fighter aircraft operated by the Royal Saudi Air Force (RSAF).

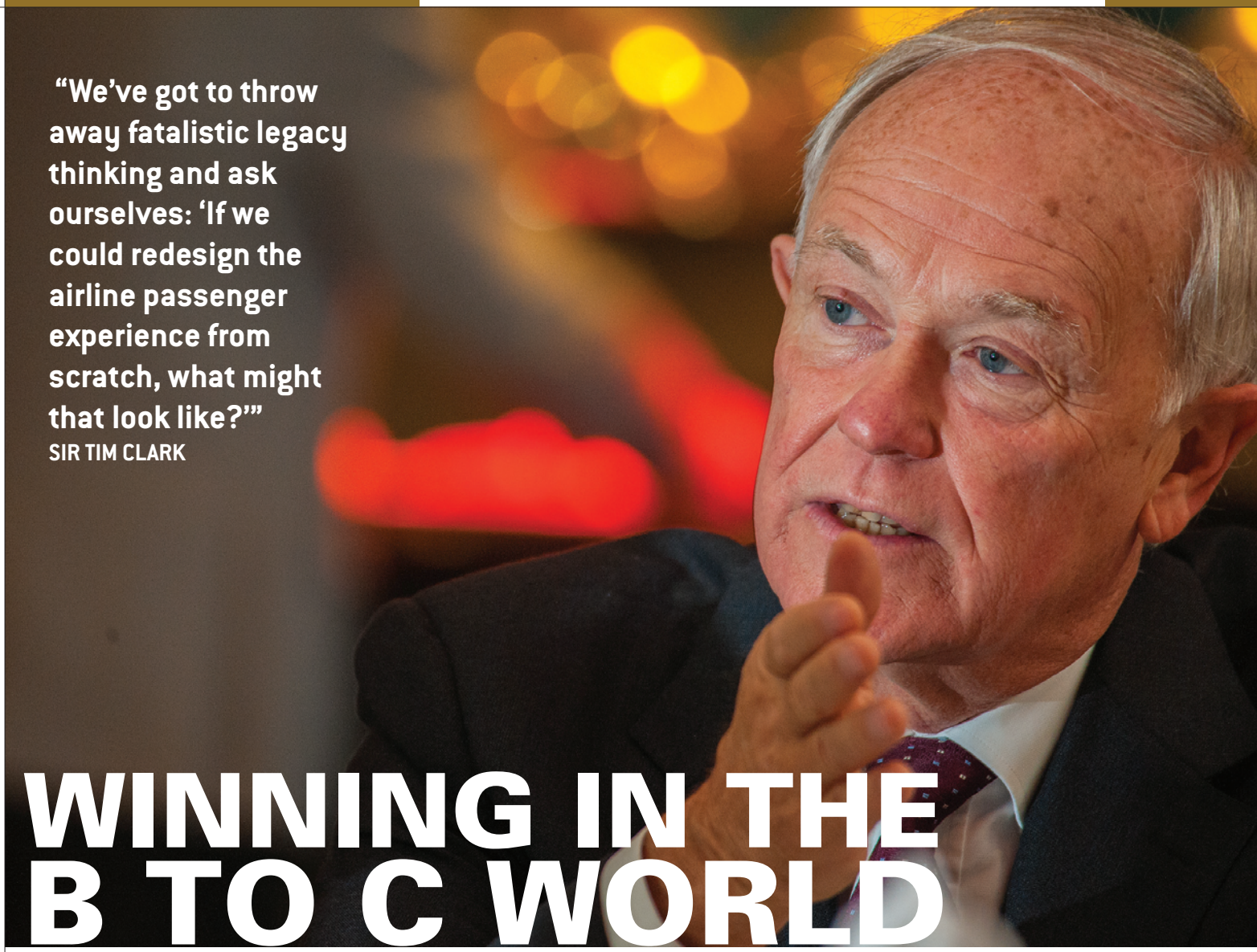
The IFS solution will allow MEPC to execute all aspects of its MRO operations, from hangar entry to exit – with integrated support for finance and HR.

End-to-end visibility will extend across personal areas of responsibility, ensuring focus is kept on what is strategically important. Business intelligence is built into IFS Applications, enabling operators to analyse key performance indicators, using predictive analytics to show the full impact of processes on overall MRO performance, as well as the effect a decision has on operations in real-time.

"Rather than continuing to use a combination of different business systems, we required a single, integrated solution to manage our complete business operations at the critically important Riyadh facility," said MEPC chief executive officer Abdullah Al Omari.

"The 360-degree visibility provided by IFS Applications allows us to maximise maintenance efficiency and react quickly to potential performance issues, which is important in the fast-paced military support environment."

Luis Ortega, IFS MD Middle East, Africa & South Asia added: "The RSAF is one of the most advanced fighting forces in the world and we are delighted to be supporting MEPC with our market-leading engine MRO solution to keep its aircraft operational around the clock."



"We've got to throw away fatalistic legacy thinking and ask ourselves: 'If we could redesign the airline passenger experience from scratch, what might that look like?'"
SIR TIM CLARK

WINNING IN THE B TO C WORLD

Emirates Airline president Sir Tim Clark is a man rarely given to stating the obvious yet, as **Barbara Saunders** *reports, he believed it opportune when addressing the recent International Air Transport Association (IATA) World Passenger Symposium in Dubai.*

Nobody needs reminding that it's a B to C world we're in now and the days of legacy intermediaries are rapidly coming to an end.

Those were the words of Emirates Airline president, Sir Tim Clark, as he called into focus the industry's mounting preoccupation with ensuring it lives up to ever-growing customer demands – one which has given rise to supersonic-speed innovation with technology in the cockpit.

IATA CEO, Alexandre de Juniac, in his opening remarks, sounded a warning for all in the industry to fasten their safety belts for a startling speed of change.

"Keeping up is a major challenge for an industry whose first priority always must be safety. Safety is not measured by speed. And our excellent record on safety is the result of a mind-set focused on global standards and years of experience. Passenger needs, however, evolve much more quickly. And it is a real race to meet their expectations," he said.

It's also a race to meet growing passenger numbers. IATA's latest 20-year passenger forecast says 7.2 billion people will by flying in 2035 – about twice as many as now. The forecast holds out huge growth opportunities, and enormous challenges.

Clark knows that only too well. Dubai has the world's busiest international airport, handling 82 million passengers by September of this year – with Emirates carrying more than 51 million.

"Here in Dubai, we have high passenger numbers combined with the pressures of limited real estate at the airport… plus, we have strong competition from regional airports, and an economic imperative to develop air connectivity," he explained. This led to his airline's "unrelenting impetus to continually innovate, and find solutions to deliver the best possible travel experience".

Emirates read the writing on the wall ages ago. It now has an active pipeline of innovation projects,

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ranging from operational efficiency enhancements, to product development and service delivery, and the in-house capability to design and develop the technology solutions to support them, but that, said Sir Tim, is no longer enough.

"With the speed and scale at which technology is developing, we also increasingly tap on external partnerships to help us with our innovation agenda."

For the industry, he said, it meant a whole rethink. "We've got to throw away fatalistic legacy thinking and ask ourselves: 'If we could redesign the airline passenger experience from scratch, what might that look like? And then, what does our business have to look like, to deliver on that passenger experience'?

"For starters, I can picture a passenger journey – from home to airport to boarding gate – without any stops."

That picture is shared by de Juniac. It includes: online check-in with personal data uploaded before the passenger leaves home with 'approval to fly' from all authorities and the flight data being automatically transmitted to smart luggage tags. Passenger bags are dropped off in automated sorting bins and the passenger goes straight through a much smaller check-in hall. Biometrics or other smart technology continually tracks the passenger through the airport, with customised messages being sent to screens, smart watches or personal mobile devices, directing passengers to their departure gates or other checkpoints.

No gate lounges

"There would be no gate lounges and minimal staff to complete the biometric-controlled boarding process," Clark envisioned. "Central search could be hugely simplified and the process accelerated by using artificial intelligence-assisted, high-tech screening machines, which screen passengers and hand baggage at the same time, eliminating the need for multiple clothing and accessory removal and the resultant queues."

The result, he said, could be a passenger with more time to spend in airport duty-free, fast food and merchandising offerings.

Clark believed the industry has things all about face. "When airports are being built, the tendency is to look at how things are done today rather than what could be done for the future. Buildings are built, and the passenger experience is then force-fitted into the structure, rather than the other way around. And… by the time approvals are received to start building anything, we'll be looking at facilities that are outdated in another 10 years."

De Juniac concurred and pointed to IATA's new distribution capability (NDC) as helping change models by evolving the customer experience while the 'one order' initiative promised itineraries with a single reference number connecting to budget carrier networks,

Alexandre de Juniac: "We must be prepared for fundamental change in the back-office – replacing not just legacy systems, but also legacy mind-set."

adding customer value and opening up business opportunities.

Its success, he said, depended upon a completely overhauled approach. "We must be prepared for fundamental change in the back-office – replacing not just legacy systems, but also legacy mind-set."

Next up, said de Juniac, would be the 'one identity' vision, which could be achieved "through close collaboration between airlines, airports and governments".

IATA joined forces with global IT provider, SITA, to ram the message home with a study that said worldwide deployment of radio frequency identification (RFI) technology, which can accurately track passengers' baggage in real time, could save the industry a fortune over the next seven years by reducing the number of mishandled bags by up to 25%.

The study claims RFID capabilities could be deployed for as little as $0.1 per passenger on average, while generating expected savings of more than $0.2 per passenger.

The innovators, however, aren't waiting for the new mind-set, forcing the agenda with ever-smarter technologies.

SAP and Dubai Technology Partners (DTP) are working together on a suite of products to optimise airport and airline efficiency. Version one of the, as yet, unbranded suite will launch imminently.

Abdul Razzak Mikati, managing director, DTP, explained: "Using SAP systems integration we are providing a platform that will process data in real time, enabling airport and airline decision-makers to make more-informed decisions."

He claims the 'made-in-the UAE' solution is unique. "It takes up to 20 individual sub-systems and collates the data in real time using a high technology platform like SAP HANA to get one view. Take turnaround times – we can decrease them. We can also manage specific processes with a fast, in-memory platform, which can forecast scenarios based on historic data going back up to four years," he said.

He doesn't say when other suite versions will go to market; just that the partners "have a road map". He does, though, explain that it has multiple functions in forecasting, using historical data and SAP's model to predict what any flight's behaviour will be.

"This is important for the airport to plan and equally important for the customer experience," he added.

Tayfun Topkoc, managing director, SAP UAE, says the partners are already talking to various airports about the solution, which can enhance passenger experience and make the throughput of millions of travellers so much easier.

"The platform can be enriched with data to deliver management processes, to manage historic-based forecasts, to manage flight delays and queues," he said. "Data-analytics allows the operators to make more informed decisions and provide some machine-learning technology – the latest trend for which the algorithms can predict and forecast the extent of crowds, loads, baggage handling and delays. Operators can then optimise resources and meet demand efficiently.

Operational savings

"We can deliver up to a 64% reduction in down time for airlines, which equates to operational savings for airlines and airports of up to 76%. It also allows the more efficient management of incidents at airports."

Version one of the suite is a test bed. "Once launched we will get feedback and make any required changes, which is proof of our agility to adapt to customer requirements," said Abdul Razzak.

DTP and SAP see massive potential for the suite. "The market is huge," said Abdul Razzak. "We're looking at the UAE yes, but also to the region and then global. Saudi Arabia, for example, has 25 local airports to be remodelled, then there's redevelopment in Kuwait, Bahrain and Oman. Travel demand everywhere is increasing the need for optimisation."

Of course, to deliver the streamlined travel experience passengers are now demanding requires a synchronised agenda across the entire aviation ecosystem – a prerequisite not lost on Clark.

"That includes getting our suppliers, airport operators and security providers, immigration and customs, to buy into our vision of air travel experience and to provide the quality systems, infrastructure and support that airlines need to deliver on that vision," he said.

Operators go app market to improve efficiency

Key players are leveraging their flight planning expertise to make it easier for operators to take control of their flights from anywhere in the world.

Dave Calderwood *has been finding out more.*

It's not easy being a business aviation operator. There are so many variables, often with tight time constraints, plus weather, aircraft performance and international borders to contend with. One mistake and the flight's profit could evaporate.

Now, however, help could be at hand.

At last year's European Business Aviation Convention & Exhibition (EBACE), we saw a teaser of the upcoming all-in-one trip planning and weather UAS FlightEvolution mobile app and website, and at the US National Business Aviation Association (NBAA) event in November, the product was launched by UAS International Trip Support.

Jay Ammar Husary, UAS executive vice-president said: "UAS FlightEvolution is truly cutting-edge technology that has never been seen before. The advancements in flight planning and mapping technologies brought to the industry by this platform will completely change the way users construct and execute their flight plans. It puts a three-dimensional view of your mission in the palm of your hands."

UAS FlightEvolution was designed as an app for the Apple iPad and iPhone, but can also be accessed by laptops and desktop computers via a dedicated website, meaning it can be accessed from anywhere with an internet connection. However, the mobile app can also be used without a connection – that's only essential when it's time to file a flight plan.

Flight plans

"It provides access to flight plans, weather, charts, procedures, and global position on a high-definition moving map, as well as synthetic vision technology. Hazards, special events, and restricted areas are well defined, and the platform provides the users with unprecedented situational awareness," said UAS.

"Users can run optimised routes based on time, speed, and ride quality, as well as choose routes from an extensive route catalogue. Graphical manipulation of routes ('rubber-band routing'), and worldwide weather and weather depictions are integrated seamlessly into the flight planning process and available throughout the entire flight.

"The solution will soon provide advanced features such as equal time points (ETPs), drift down calculations, extended range twin operations (ETOPS), runway analysis, weight, and balance, reclearances, and much more," continued the UAS spokesman.

Also having its public debut at NBAA was Jeppesen Operator, which takes flight planning a stage further, claiming to be a 'one-stop-shop' for business aviation operators.

Specifically, Jeppesen Operator integrates flight planning, runway performance, weight and balance, crew scheduling and management, aircraft scheduling, domestic and international trip planning and reporting (financial, maintenance and custom, customer account management, real time pricing and cost accounting.

Compliance with regulations

Operator also ensures compliance with regulations, business policy and procedures, and provides a trip check list, which is automatically generated and provides insight into the complexity and requirements for each trip and determines if additional resources are needed.

It's the result not just of Jeppesen's 40 years' experience of flight planning and international trip planning, but also a collaboration with BoldIQ, a provider of on-demand flight operations management.

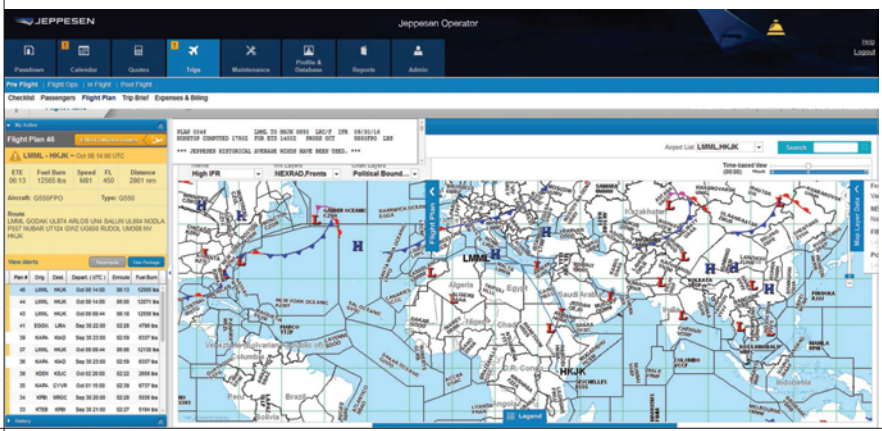
"The introduction of Jeppesen Operator represents the culmination of years of meticulous research and proven in-production software, understanding customer-driven requirements and design work performed to create the next generation business aviation tool," said the company's Mike DiDonato.

Jeppesen is aware that international trip planning can be difficult and there's a button called 'concierge' to summon extra help from its global experts. They can assist with flight plans, permits, and handling arrangements, or to establish a line of credit. The idea is to eliminate anything that could jeopardise the flight.

Just in case you were wondering about the apps you may already be using, Jeppesen says Operator will work with leading mobile apps for navigation, electronic flight bag (EFB), and pilot operations.

Airport, FBO, and vendor data for Operator's systems is generated by the Jeppesen aviation database, arguably the most comprehensive in the aviation industry.

"The complexities and real-time dynamic nature of on-demand aviation operations are significant and much more than many other industries we have seen," said Roei Ganzarski of BoldIQ. "The combination of sophisticated industry-proven technologies with in-depth experience-based know-how are what make the Jeppesen solution so powerful and applicable."



The introduction of Jeppesen Operator represents the culmination of years of meticulous research.

DANS controllers will see greater flexibility with the new system. Inset: How the APO works.

THE NEXT ARRIVAL – PEAK PERFORMANCE

Dubai has introduced new procedures that look likely to reduce peak-time arrival delays by up to 40% at the world's busiest international airport.
Alan Peaford *reports.*

With the likelihood of becoming the world's busiest airport – it is already the most used international airport – Dubai has a responsibility to ensure that it also leads the way in environmental improvement.

Now Sheikh Ahmed bin Saeed Al Maktoum, head of the Dubai Civil Aviation Authority (DCAA) and its air navigation services, as well as Emirates and Dubai Airports, has announced the implementation of an initiative called the approach peak offload (APO) procedure.

This is set to reduce CO2 emissions by up to 447 tonnes on a monthly basis and increase arrival traffic by an additional 1.6 aircraft per hour.

Mohammed A Ahli, director general of DCAA and CEO of Dubai Air Navigation Services (Dans) said: "We are committed to, and continuously striving to, transform the sky by developing and launching several key air traffic movement capacity enhancement projects in Dubai

"Developing and implementing innovative procedures, such as APO, have enabled us to deliver enhanced air traffic management services and accommodate the rising demand of our prestigious clientele. We have significantly invested our resources in thoroughly assessing the procedure in live operations through fast time and real time simulation exercises. This, in turn, has reinforced our efforts in building the safety case of the procedure, which has been approved for implementation by the General Civil Aviation Authority (GCAA)."

Several solutions

Exclusively designed and developed by the Dans operations team, the APO procedure was created for the Dubai operational environment and is one of several solutions being implemented to drive further efficiency in the aviation sector as it increases the volume of air traffic movements, while reducing possible delay timings for airlines.

Since implementation, the APO procedure has reduced peak arrival delay for Dubai, which is proven to lead to fuel consumption and cost savings for the airlines.

The APO procedure is based on the possible re-allocation of lighter wake-producing category aircraft to runway 30R during arrivals peak periods, thus accommodating the arrival flow more efficiently with the use of both runways at Dubai International Airport.

One of the key components of this unique procedure permits lighter category aircraft to maintain a horizontal separation of 4.5nm behind the A380 super aircraft while landing. Experts at Dans reached the new wake separation minima levels between aircraft based on the results of the safety case, which included an in-depth quantitative and qualitative wake data analysis.

Speedier utilisation

Saj Ahmad, chief analyst at StrategicAero Research said: "We're seeing the fruits of that runway work come to the fore. Not only are we seeing better and speedier utilisation of DXB's runway use, it is benefitting airlines who can now better schedule flights to leave/arrive closer to their published times, despite the fact that the airport is handling more passengers and flights than ever before.

"It means non-A380 aircraft can land faster and with possibly reduced separation, as they don't create wake vortices behind them to the magnitude that the A380 does. This allows for faster runway clearance and taxi to the terminal, thereby allowing flights to land quicker from the queue behind."

Ahmad said that the UAE Government could improve the procedures even further.

"As we know, almost 60% or more of the UAE airspace is dedicated for military use – so if runway and flight changes like this bring about a better degree of fluid and functional efficiency, imagine just how more efficient the system would be if the military airspace was diluted more in favour of commercial flights.

"Looking further out, when DWC becomes the main city airport, these airspace allocation, runway use and aircraft separation minima have to be matched with a sizeable growth in commercial airspace allowance too – otherwise Dubai runs the risk of simply shifting congestion from one airport to the other."

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With the burgeoning growth of the unmanned aerial systems (UAS) market comes an increased demand for flight-testing of new systems and operator training. **David Oliver** *looks at a new player in the market.*

Maltese cross into aerospace innovation

Malta's NAC flight-test and training facility at Xewkija on Gozo Island.
PICTURE: NAC.

Malta has launched an initiative that it hopes will see the island nation become a major aerospace centre of excellence.

The vision of Malta's National Aerospace Centre (NAC) is to become a sustainable agency operating as a centre of aerospace research development and innovation (RDI) in technology areas of value to national industry and European competitiveness. This will be achieved through R&I excellence in science and technology.

The NAC was set up as a separate legal entity and is capable of entering into contracts, employing personnel and managing property for its operations. Furthermore, it will assist in the development of a national aerospace policy, represent the government on matters relating to the aerospace industry, and ensure necessary coordination in the implementation of aerospace policy.

The Netherlands Aerospace Centre (NLR) has agreed to share its technical know-how and provide its support and capabilities to assist the NAC, which will aim to deliver high-quality, low-cost, and practical training courses in a geographic location that can be easily reached by European, African and the Middle Eastern customers.

The training facilities are centred at Xewkija, on the island of Gozo, in Malta.

Formally known as Gozo Heliport and used for scheduled helicopter flights from Malta International Airport until 2006, it has a 174 metre (571ft) 10/2 runway, two 22 metre wide aprons, a hangar and fire station.

The NAC facility is ideal for UAS flight-testing due to Malta's operational environment, stakeholder community, logistics and communications. These assets include its geographical location in the centre of the Mediterranean, together with the favourable climate throughout the year.

The flight-test facility is available for original equipment manufacturers (OEMs), universities, research institutions and UAS operators.

At Xewkija, NAC provides services and support for UAS flight-testing including hangarage, workshop and maintenance facilities, offices for flight-test instrumentation and post-flight data analysis, and UAS training courses.

Being close to the sea, the facility enables its clients to perform flight-testing over land and water. In addition, it allows for a very quick and easy transition between the launch site and for beyond visual line of site (BVLOS) operations at a variety of altitudes.

The NAC enables short and long flight tests, depending on client requirements.

It caters for small to medium-sized fixed-wing UAS, using the airstrip, and all ranges of rotary-wing UAS.

Visual line of sight

The facility allows visual line of sight (VLOS) flight-tests as well as BVLOS tests through NAC's extensive segregated airspace in Maltese territorial waters, reaching a peak altitude at FL155, depending on the distance from the shore.

Such an extensive segregated airspace is ideal to test multiple UAS technologies and applications, such as sense-and-avoid technologies, maritime search and rescue applications, and integration of UAS with commercial aircraft.

NAC's facility, coupled with NLR's long-standing research in UAS operations involving integration into civil airspace, makes it the ideal location for testing.

The organisation aims to create a portfolio of training courses in aerospace-related topics. It will also provide theoretical and practical training for new UAS pilots in the form of courses accredited by the Maltese and Dutch Civil Aviation Authorities.

The NAC also offers individual technical assessments, consisting of a review of all UAS documentation, ground inspection, and flight inspection.

It offers manufacturers the possibility of utilising its facilities to demonstrate their products to their own clients, which may include fixed-wing or rotor-wing UAS types, or UAS systems and other related technologies. In addition, should a client procure a new UAS and would like to practice piloting it, NAC can provide that opportunity at Xewkija.

Drones fitted with cameras are increasingly popular, but pose risks to aircraft if the owner tries to use it to get close-ups of aircraft on approach to airports.

DISASTER DRONE

IS IT JUST A MATTER OF TIME?

Drones, or unmanned air systems (UAS), are starting to make their presence known in the Gulf – and not in a good way.

Alan Dron *assesses the problem and looks at what can be done to stop a potentially serious accident occurring.*

You're in the left-hand seat of a Boeing 737-800 on final approach to an airport. Everything is nicely lined up, the approach is stabilised, you're about 1,000 feet above the ground, with 30 degrees of flap, doing 160kts.

Suddenly, your co-pilot utters a sharp exclamation. You glance up and catch a fleeting glimpse of a small object in the 1 o'clock position just in front of your aircraft. A fraction of a second later, there's a 'bang!' and power from the No2 engine starts rolling back. You've just ingested a drone.

It's one of the most basic tenets of airworthiness that a twin-engined passenger aircraft should be able, not only to maintain height but also climb away, should it lose one engine. And pilots train regularly in the simulator for losing one engine at a critical moment. But coping with an incident like that when flying low and slow is no pilot's idea of a good day at the office.

And – possibly worst-case scenario – what happens if that drone hits not an engine but the flightdeck window? A small UAS is typically twice as heavy as the dead chickens fired at cockpit windows to test their resilience against bird strikes. Would that window hold, or could the quiet concentration of an airliner flightdeck a few seconds away from touchdown be shattered by a smashed window and a sudden blast of air, distracting or even injuring the pilots and potentially causing a catastrophic accident?

Those are the type of issues that pilots and regulatory officials are grappling with as more hobbyists take to the air with a radio-controlled UAS, or drone.

While most drone operators have the necessary common sense not to fly their new toy close to an airfield or airport, others do not. In fact, one of the increasingly common uses of drones is to act as aerial platforms for cameras, to take shots of airliners on final approach from new, 'exciting' angles.

This means that, increasingly, those UASs are intruding on to

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The 80-minute closure of airspace around Dubai International on October 29 resulted in the diversion of 22 inbound flights.

CONTINUED FROM PAGE 107

flightpaths and into airspace close to airports.

Dubai International Airport, for example, had to shut down all operations on at least three occasions during 2016 because a drone was spotted in the vicinity. On each occasion, the closure lasted around an hour and resulted in dozens of flights being diverted or delayed.

In a statement following a September incursion, Dubai Airports reminded all UAS operators "that any and all activities are not permitted unless authorised by regulatory authorities and are strictly prohibited in restricted areas including within 5km of any airport or landing area".

Dubai Airports CEO, Paul Griffiths, has also indicated the need for greater awareness of the problems and better enforcement measures against drone operators who cause disruption.

One of the airlines to have suffered most heavily from the problem is Emirates Airways, whose home base is at Dubai International. Flight diversions and network disruptions due to unauthorised drone activity in the airspace around the airport has cost the carrier millions of dirhams on each occasion, and had an impact on thousands of passengers.

"Flight diversions and extensive holding are costly," said Adel Al Redha, Emirates' executive vice-president and chief operations officer.

"Financial aspects aside, there is huge inconvenience to passengers, and also a negative impact on Emirates' reputation.

"Sending an aircraft to an alternative airport and managing delays to arrivals or departures are not as straightforward as it sounds. There is always a ripple effect on the rest of our hub operations in terms of securing our passengers' flight connections, ensuring our disrupted customers are cared for, planning the return of aircraft to support other scheduled flights, and a myriad other arrangements to manage the disruption from crew to catering to ground handling."

The 80-minute closure of airspace around Dubai International on October 29, for example, resulted in the diversion of 22 inbound flights, including 11 operated by Emirates.

Number one priority

Al Redha added: "Safety is always the number one priority in our business. Ensuring safe flight operations by closing the airspace when there is unauthorised drone activity, or other airspace incursions, is the right thing to do. However, the safety risk from unauthorised drone activity, and the resulting disruption to customers and operations, is unacceptable.

"We request the authorities to take strong measures and impose penalties to discourage future occurrences, and also consider implementing drone detectors at the airport."

In both North America and Europe, close encounters between UAVs and airliners are becoming increasingly common occurrences. Multiple incidents in the UK, for example, have been rated by the UK Airprox Board, which examines such incidents, as being in the highest category of risk for collisions.

Although radio-controlled model aircraft have been used for decades by hobbyists, there is a considerable difference between the people who fly them and the people who buy drones today.

"It's my strong belief that model aviation enthusiasts are aviators," said Captain Thomas Mildenberger, the expert on remotely-piloted vehicles for the International Federation of Airline Pilots Associations (IFALPA). They typically have considerable knowledge of aviation and operate responsibly.

"They know they're performing something that might be potentially dangerous and have very strict rules. They don't fly above a certain altitude agreed with the authorities. They are of no concern, basically, as long as they do their hobby as they used to, whereas a typical drone operator just needs a different viewing angle for his photography."

The new generation of drone operators tend not to have a background knowledge of aviation and use their drones simply as toys. Many have little concern for what may be going on in the skies above them, either through ignorance of aviation or – more dangerously – deliberate disregard for the risks of flying close to airports.

The possible effects of a drone being sucked into the blades of a turbofan are not yet well understood, said Mildenberger. "We need to establish data on drone strikes because it's all assumptions at the moment. We have experience of bird strikes. Birds being mainly soft, the impact on engines or the tail rotors of

Aerial views of Dubai's busy international airport have been a draw to RPAS enthusiasts.

helicopters, or windscreens is understood. We need the same data for drones. We're demanding that some authorities should conduct 'drone shooting' against structures to establish the severity of the impacts.

"The drone industry says it's not dangerous at all, so we need data to establish the risk. We're trying to establish links with UAS operators' organisations who are professionals, basically to formulate regulations so they're not a danger."

Ironically, somebody who has joined an operators' organisation is, almost by definition, likely to take their use of UASs seriously and responsibly. It is the unregulated individuals, with no concept of the problems they may cause to commercial or private aviation, who are the main problem.

With this in mind, some regulatory authorities have imposed bans on the use of small drones, at least until proper regulations for their use can be established.

At least 30 nations have established rules for operating small drones, ranging from a complete ban to registering with the authorities and taking proficiency courses. In just one year, for example, 600,000 people in the US signed up to the Federal Aviation Authority's drone register.

In most countries, there are also common sense rules, such as always keeping the drone within line of sight and maximum altitudes at which they can be operated.

In the UAE, for example, the General Civil Aviation Authority insists that all drones be registered and there are extensive rules for operators, such as a ban on placing cameras on them and operating them below 400ft.

Also on the international front, the International Civil Aviation Organization (ICAO) in December issued a new unmanned aircraft systems toolkit, which offers information and resources, but which will also act as a platform for the exchange of global best practices, lessons learned and various approaches for regulating UAVs.

Toolkit resources

"The resources in the toolkit are designed to help UAS operators fly their aircraft safely and responsibly," said Olumuyiwa Benard Aliu, president of the ICAO Council. "The importance of recognising that these devices are aircraft and of integrating their use safely with existing manned operations, should not be underestimated."

Integrating the use of drones – which have been held out as an inexpensive, fast way of delivering packages or medicines, for example – with existing operators is a major task and one that is expected to take some time to achieve.

One possible solution to help de-conflict drones with manned aircraft is to equip the unmanned devices with electronic 'geo-fencing', built-in software that senses the drone's location and will not allow it to be flown in sensitive locations, such as within several kilometres of airports.

While some people have advocated much stronger penalties for those caught operating drones in a dangerous way, the problem is tracking down the controllers on the ground. "It doesn't make sense to have very hard penalties if you can't enforce them," said Mildenberger. "Catching the people responsible is the trick."

It is a trick that is notoriously difficult to achieve. At present, there are no systems in use that can pinpoint the location of a drone operator. This means that, even if police are sent to the area close to where a drone is operating, they have no real way of tracking down its controller.

Currently, several systems are undergoing trials that can variously jam or take control of drones in the vicinity of airports, with some having the capability of intercepting the line-of-sight commands from the operator, thus pinpointing his position and allowing police to be directed to his position to arrest him.

In the UAE, the GCAA is also understood to be the lead agency in multi-stakeholder teams working in a joint effort to improve awareness, prevention and detection. These involve the GCAA, airports, airlines, the Dubai Police and others.

Requests to the GCAA for more information were not answered.

Whatever solutions are arrived at, they will need to be imposed swiftly in nations around the region and further afield, before that scenario of a drone hitting an airliner at a critical point of its flight plays out for real.

WE MUST NEVER TIRE OF

Business aviation's safety record isn't bad but it needs to improve to match commercial air transport, and the Flight Safety Foundation (FSF) is working to achieve that. FSF's Greg Marshall talks to **Dave Calderwood**.

Business aviation has a long way to go to become as safe as commercial air transport and the Flight Safety Foundation (FSF), along with other organisations and partners such as the Middle East Business Aviation Association (MEBAA) and National Business Aircraft Association (NBAA), are highlighting the specific threats to business aviation, wherever it takes place.

Comparing accident numbers per hours flown is commonly used but that favours commercial air transport because of the generally longer time spent in the cruise, traditionally the safest part of a flight. So, these days, another measure to look at is the fatal accident rate per departures – the reasoning is that the greatest threats to flight are during take-off, approach and landing.

Boeing's much-respected annual accident report shows that scheduled commercial air transport has a global fatal accident rate of 0.033 per 100,000 departures. That's an incredible one in three million chance.

For business aviation, turn to the 2015 safety report by the International Business Aviation Council (IBAC) and the corresponding global fatal accident rate is 0.40 per 100,000 departures for all business aircraft, jets and turboprops. That's one in 250,000, a much higher accident rate. These figures are averaged over a number of years to iron out any 'bad years'.

Greg Marshall: "Using a fatigue risk management system, you can actually forecast what a fatigue rate might be for individual crew members and you can roster accordingly."

Dive deeper

However, it's not all bad news. Dive deeper into IBAC's figures and corporate aviation jet traffic is achieving a very similar figure to commercial air transport, with 0.03 accidents per 100,000 departures. So, business aviation can be just as safe as commercial air transport.

The FSF is an international non-profit organisation whose sole purpose is to provide impartial, independent, expert safety guidance and resources for the aviation and aerospace industry. Vice-president of global programmes, Greg Marshall, said: "In commercial aviation, the risks are very well known. However, in business aviation, it's quite different as it's obviously on-demand services in support of a corporation's activities.

"There are a number of areas where we have concerns. One is 'rates of effort', which looks at how much flying activity is being undertaken by an organisation and the utilisation of crews. So, when you have a high rate of effort, you're basically maximising the use of the airframes and the crews that you have available.

"High rates of effort can be fine provided they're adequately managed but problems can occur if you have a number of changes that affect crew scheduling," continued Marshall. "If you have crews rostered for certain flights and you have a number of short-notice changes to those flights that affect rostering, then you introduce the potential for fatigue issues. The trick is to have adequate systems in place so you are managing the fatigue that's associated with high rates of effort.

"We know that a number of business aviation operations are running under fairly high rates of effort. There's more demand on crews to operate long-haul, where they are required to operate fairly frequently to and from various destinations in the world. That can result in a number of issues, including fatigue for crew, but also it can mean management pilots are not spending enough time administering the business because they're required to fly more often. The other consideration is that there are time pressures put on crews to operate at relatively short notice.

"One of the biggest risks we see in business aviation is within a company that might have a small flight department and there might only be a limited set of crews. The potential demand [for flights] outstrips the ability of the company to adequately provide that service. In one way that's a good thing because we're seeing some flight departments increase the numbers of crews. But if you don't have enough crews, it can have a longer term effect in terms of fatigue."

So what can an operator do to make sure the crew about to fly is fresh and not suffering from fatigue?

"Under normal regulations there is a requirement that pilots are rostered such that they don't incur excessive duty hours and excessive flight time hours, within a 7-14-28 day period,"

SAFETY IMPROVEMENTS

explained Marshall. "That is essentially there to make sure crews cannot be used at any particular time of the day or night irrespective of their previous duty period. The whole basis is to regulate and help to manage fatigue for those crews.

"Fatigue risk management systems have been around for a while and continue to evolve. What they recognise is that the previously rigid regulatory impositions on flight and duty times is not always the most effective method of managing fatigue. Studies have been conducted on fatigue risk management processes so that, for certain operations at certain times of the day, a crew needs to have a certain amount of rest time. Therefore, you can actually measure a person's fatigue level through a system of scores.

"So, if you're operating a very early morning flight, you might have a higher fatigue risk score than if you're operating a late morning or early afternoon flight, simply because you have to get up early in the morning. You might be up at four or five in the morning for a wheels-up time of 6am. That is more fatiguing because it could potentially interrupt your normal sleep patterns.

"Using a fatigue risk management system, you can actually forecast what a fatigue rate might be for individual crew members and you can roster accordingly. It's also very useful in short-term applications where you have to find a crew to operate a particular service at short notice.

Factor in the hours

"You can enter in the details of the proposed duty times, it will factor in the hours that the crew has been awake, then give you a forecast fatigue score, which will tell you whether or not you can use that particular crew member or crew set.

"Fatigue risk management systems are becoming an alternative method in a number of states. You can either utilise the prescriptive regulations that currently exist or you can adopt a fatigue crew risk management system as part of your operation to manage the operational tempo of your crew. In fact, I'm part of an International Civil Aviation Organization (ICAO) working group looking at fatigue risk management systems for rotary operations, which we're hoping to introduce at some stage."

Of course, modern business aircraft are playing a role in fatigue management too. Marshall points out that the sophisticated flight management systems fitted to the latest aircraft help the crew manage operational risk. Features such as enhanced ground proximity warning systems are a huge aid to the crew, particularly when operating to a 'difficult' airport.

"Any time you can alleviate or help manage a pilot's workload, you will also be reducing fatigue levels and helping the ability to concentrate on key areas of the flight. It's not directly related to fatigue management, there's still the requirement for certain long-haul flights that you carry another member of crew, but certainly modern aircraft are less fatiguing to operate than say, 30 or 40 years ago."

First class: The cabin with the winning ways.

HOW SEVEN-UP ETIHAD HAS RE-IMAGINED FLYING

Steve Nichols *looks at the reasons behind Etihad Airways' most recent batch of industry awards.*

Etihad Airways was named the region's leading airline at September's World Travel Awards Middle East, where it also won awards for 'Leading Airline - First Class', 'Leading Airport Lounge' (for its first class lounge and spa at Abu Dhabi International Airport), and the region's 'Leading Cabin Crew'.

Back in May 2016, it was also presented with the title 'Most Innovative Airline of the Last 10 Years' at the *Telegraph* UltraTravel Awards in London.

So how does the airline, which has grown from 22 aircraft flying to 43 destinations and supported by 4,369 staff in 2006, to a fleet of 123 aircraft serving 117 destinations with nearly 27,000 multi-national staff today, keep winning and differentiating itself from the opposition?

At an Apex Expo educational event in Singapore, Linda Celestino, Etihad's vice president of guest services, outlined what the company has done to make it the first choice for its passengers.

"We've had an incredible 13-year journey as one of the fastest-growing airlines in commercial history," said Celestino. "Double digit growth – year, on year, on year.

"We're very proud of being recognised as the world's leading airline seven years in a row. Our vision to be the best airline in the world is only overtaken by our mission to deliver remarkable travel experiences. We don't sell transportation, we sell feelings and we deliver that through remarkable brand values.

"And this is driven from the top down and is woven into everything we do."

Celestino has spent more than 25 years in the airline industry and held senior positions in her native Australia and the Middle East, as well as being a former president of the Airline Passenger Experience Association (APEX).

She said that Etihad has "absolutely re-imagined the in-flight product", adding that the Abu Dhabi-based airline has become synonymous with the highest standards in products and service. These include the best first class offering in the world, the first apartment aboard the Airbus 380 (The Residence) and the first suite on the Boeing 787 Dreamliner.

Etihad says The Residence, with its elite butlers, is in a league of its own within the Airbus A380 community.

"What we do in flight is transforming hospitality in the air," Celestino said. "We don't benchmark against other airlines, we benchmark ourselves against the finest hotels and fine dining restaurants worldwide, such as establishments like London's Savoy.

"We also have flying nannies, trained at Norland College, the establishment that trains nannies for Buckingham Palace and the kings and queens of Great Britain. So our flights can include face painting, finger puppets or karaoke – whatever the children want.

"Our in-flight chefs, who provide a private dining experience in the first-class cabin, also come from the finest dining establishments around the world. And our butlers deliver a private, exclusive, discrete service to guests travelling in The Residence, the airline's exclusive private three-room cabin," she said.

Relies on innovation

Celestino added that Etihad's journey to "re-imagine everything it does" relies on innovation, and the airline has a five-year digital roadmap to transform the way it does its business with a single platform, but with "limitless touch-points for its guests".

But she said that it isn't just about the passenger experience in the sky. "We are also going to totally transform the airport experience for our guests," she added.

"Abu Dhabi's new Midfield Terminal will be the largest structure in the United Arab Emirates, capable of supporting 30 million guests per year and servicing our flagship A380 fleet.

"While we are passionate about our product and our airline, we are even more passionate about our people. We believe they'll transform our industry," Celestino concluded.

Readers wanting to find out more about the Etihad way of doing business could do worse than watch its latest virtual reality film "Reimagine", starring academy award-winner Nicole Kidman. It won 'Best Original Video' at the 2016 APEX Awards

The film takes viewers aboard an Airbus A380 on a virtual flight between Abu Dhabi and New York.

Linda Celestino: "We're very proud of being recognised as the world's leading airline seven years in a row."

Key ways to improve passenger service

Gurbinder Nijor, *(above) technical director EMEA for technology firm Avaya, argues that technology could help carriers deliver a first-class customer experience for all passengers.*

With fluctuations in oil prices, increased competition and general uncertainty about the European economy in the wake of the UK's Brexit vote, the airline industry is clearly facing some challenging times.

CEOs of most airlines are, consequently, looking at improving efficiency and enhancing the customer experience, as they aim to reduce costs, while continuing to increase customer lifetime value and the size of their customer base.

While this is sensible enough in theory, how airlines actually achieve this is not so straightforward.

With such complex businesses, knowing where to start can be extremely daunting and I've seen several boards paralysed by their inability to agree a starting point.

One area that is in particular need of attention, and could be improved relatively simply, is increasing efficiency in actually getting passengers on to aircraft in good time to meet their take-off slots, and then getting those aircraft in the air.

Why am I focusing on this? Well, according to the Federal Aviation Administration (FAA), delayed flights cost the industry $22 billion per year in the US alone.

Fortunately, good progress is already being made in this area through the successful creation of specific mobile applications, which have introduced features such as remote check-in by mobile device.

Others have implemented radio-frequency identification (RFID) tags on hold and hand luggage so that they can locate baggage both on planes, and in the airport before take-off, to try and find out exactly where passengers are before they board.

But more can be done, and here are my top three suggestions:

AVOIDING DUTY FREE DISTRACTION

A common cause of delayed flights is passengers who checked in on time but have spent too long in the shops and restaurants airside and, therefore, are late to the departure gate. Creating an app that automatically sends an SMS to passengers not yet at the gate, or even calls their mobile phone with a pre-recorded message that says they need to go to the gate right away, could solve this problem.

It could even be coded to require a response back to ensure the passenger has received the message. It could also push a map showing where the gate is located.

And how about if it sent a smartphone message to all airline staff in the vicinity, with the passenger's current location and a photograph of them?

ACCOMMODATING THE TRAFFIC JAMS ON THE AIRPORT SLIP ROAD:

Pretty much every flight has booked passengers who do not arrive at the airport by the stated check-in time, usually due to heavy traffic or other transport delays on the way to the airport.

By matching geo-location data of passengers with information on who has checked in for a particular flight, a smart application could automatically contact those not yet at the airport. It could, for example, offer these passengers a "click-to-call" option to reach specific airport staff ensuring they are directed to a specific latecomers' desk as soon as they arrive at the airport.

MAKING THE MOST OF THE EARLY BIRDS:

These days there are also many passengers who arrive at the airport so early they could actually catch a prior flight, on which there well may be empty seats.

In this case, an app could be built that would automatically contact these passengers and run them through a pre-defined process for getting on board the earlier flight quickly.

As well as providing an enhanced customer experience, this app would also improve seat management for the airline.

However, in order for these apps to work and to ensure their development is cost-effective, airlines need an appropriate underlying technology platform. Oceana is a good example.

It's important that customer experience apps are built on the common architecture, so they work together rather than standalone, and be integrated with other initiatives already in place, such as RFID baggage tags.

Oceana works on a template approach and, for the aviation industry, it enables airlines to create and manage multi-touch customer 'journeys', while an analytics component delivers a single, comprehensive view of customers across all sources.

From managing costs to managing digital-savvy customers, airline bosses certainly have plenty on their plates. However, technology-enabled customer experience can have a real impact on the bottom line and not just in terms of growing a passenger base.

The Middle East Three – or ME3, a common collective term for Qatar Airways, Etihad Airways, and Emirates – are on a roll, as Lufthansa Consulting's **Guillaume Schmitt** *(left) and* **Arvind Chandrasekhar** *report.*

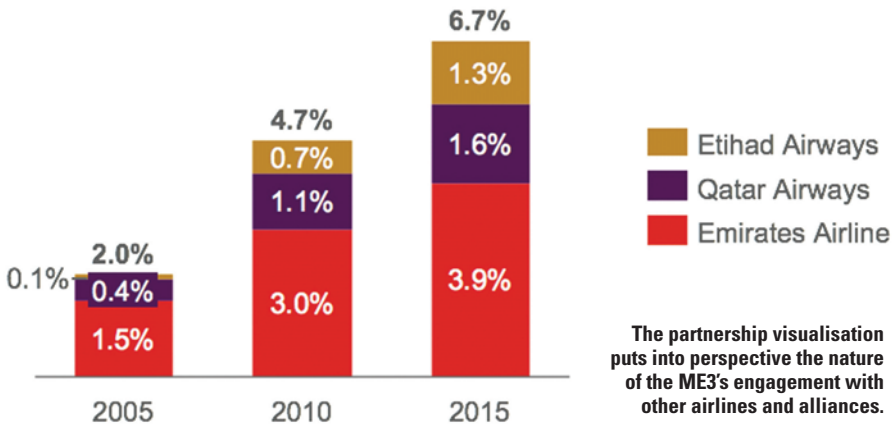
THREE TALES OF BREAKNECK GROWTH

In the course of summer 2016, Qatar announced it would take a 10% stake in the LATAM Airlines Group, – the deal completed in January – acquire a 49% shareholding in Meridiana and raise its stake in IAG to 20%. Etihad confirmed it would invest further in Virgin Australia in order to maintain its 22% stake and strengthen its foothold in the Americas by entering into codeshare agreements with Air Canada and Avianca. Emirates, which announced a number of changes to capacity deployment across its network (including several new A380 routes), set up a new codeshare agreement with Copa Airlines, while expanding cooperation with codeshare partners Malaysian Airlines and WestJet.

As the share of global traffic carried by the ME3 continues to rise, it is instructive to see how each of these airlines has pursued breakneck growth.

The manner in which these airlines have expanded their global presence over the last decade is remarkable. There are two clear components: organic growth (from a collective 2.1 billion available seat kilometres (ASKs) and 80 destinations in 2005 to 10.9bn ASKs and 175 destinations in 2015); and inorganic growth, which encompasses a variety of partnership models within the global airline ecosystem.

The simplest of these inorganic options is interline or codeshare agreements, typically with small carriers serving a network of secondary cities or large carriers that can provide significant feed. More complex, however, is the wide swathe of 'higher order' relationships, such as joint ventures, strategic agreements and equity investments these airlines have undertaken to accelerate expansion.



The partnership visualisation puts into perspective the nature of the ME3's engagement with other airlines and alliances.

As airlines around the world increasingly pursue such relationships, it is interesting to note how the ME3 has chosen to follow approaches distinct from each other and, in doing so, have begun to upend the traditional view of alliances and build cross-alliance bridges.

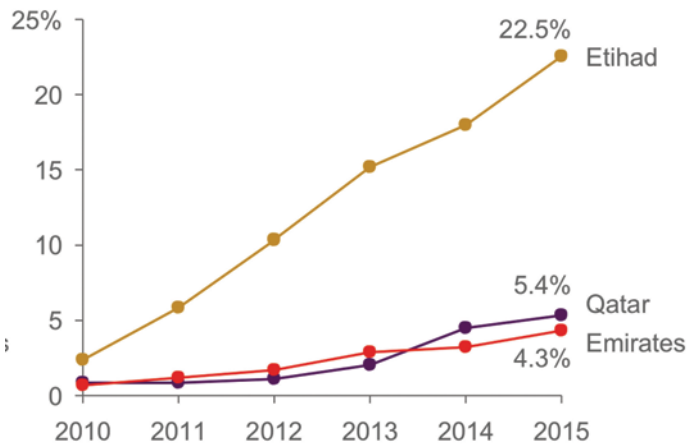
The partnership visualisation (shown in graphic form, above) puts into perspective the nature of the ME3's engagement with other airlines and alliances. Each node represents an airline (where size reflects the ASKs it flies) and the connectors indicate a relationship between airlines weighted by the depth of the relationship.

In particular, it highlights the distinct approaches favoured by each ME3 airline: Emirates has been very selective in pursuing partnerships, while Etihad has built a dense network of partnerships that bridge alliances and Qatar has strongly embedded itself in the Oneworld ecosystem.

It should be noted that the image does not reflect a geographic network map; the relative position of an airline arises from the strengths of the different relationships it has built with other airlines.

Emirates, a pioneer of the aggressive international hub-and-spoke model built on the geographic advantages of the Middle East, has achieved growth largely through organic expansion. This is in keeping with its long-standing

Emirates, Qatar Airways, and Etihad Airways: The manner in which these airlines have expanded their global presence over the last decade is remarkable.



Share of flights using partner.

positioning vis-à-vis legacy carriers. Where necessary, codeshares or interline agreements have been established to ensure feed at vulnerable points in its network – the relationship with JetBlue in the US being a prime example.

The airline recently established two large strategic agreements, with Qantas (May 2013) and Malaysia Airlines (December 2015). These arose from situations where the partner faced severe financial and strategic pressure, and chose to align with Emirates to achieve broader access to lucrative markets in Europe and elsewhere by funnelling traffic through Dubai, while optimising capacity to more profitable 'core' markets – Southeast Asia for Malaysia Airlines, and Asia and the US for Qantas.

Interestingly, both are members of Oneworld, but saw more value in partnering with Emirates rather than with alliance members; Emirates' strong connectivity through Dubai and the airline's dominant market position clearly encourage opportunistic extra-alliance cooperation.

Etihad, being the last of the ME3 to launch, needed to rapidly build scale to emerge as a viable alternative in the congested Middle Eastern hub-and-spoke environment. Alongside ambitious organic growth, therefore, Etihad has relied heavily on inorganic growth – extensive codeshare agreements to build network scale complemented by strategic agreements (with Air France-KLM, for example) and equity investments in airlines around the world. In effect, this has allowed Etihad to build a global presence at significantly lower cost than an organic rollout.

The endgame was the establishment of the Etihad Airways Partners ('EAP') alliance in 2014, an independent Etihad-centric alliance of eight airlines collaborating on network and commercial deployment. EAP also ensures sharing of best practices and resources across the alliance, as evidenced by aircraft from Jet Airways and crew expertise from Alitalia being used to launch Air Serbia's transatlantic service.

Remarkably, Etihad's assertive partnership strategy seeks to extract synergies with prominent members of global alliances such as Alitalia, Air France-KLM (SkyTeam) and Airberlin (Oneworld). This, with Etihad's extensive codeshares with Star Alliance members, allows the airline to create 'bridges' across alliances.

Qatar, from its relaunch in 1997, initially pushed for aggressive organic growth comparable to the Emirates' hub-and-spoke model operations before shifting to broader cooperative structures.

It surprised the industry in 2013 by joining Oneworld, becoming the first ME3 carrier in a global alliance.

Qatar is now well embedded in the Oneworld ecosystem, with a majority of its equity or strategic partnership activities linked to alliance members. It has also signed a strategic agreement with Royal Air Maroc to broaden its access to central and west Africa.

Of more interest in recent times, however, have been the equity

Continued on Page 116

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investments – mentioned earlier – in IAG and LATAM Airlines Group (20% and 10% stake, respectively), both of which are large Oneworld partners. This cements existing alliance relationships and offers room to explore further cooperation that could deliver financial, commercial and strategic value.

Although it is yet unclear exactly how Qatar will act on these investments, they are likely to generate significant value by increasing Qatar's grasp on strategic positions (transatlantic routes and major European hubs with IAG, and the competitive South American market with LATAM). These are, of course, in addition to the basic financial benefits from stock appreciation.

However, the recent investment in Meridiana and a possible investment in Royal Air Maroc indicate a potential pivot to an Etihad-like model based on turning around a smaller airline with close operational and commercial synergies.

The nature of the ME3 airlines' growth through partnerships provides several insights to the industry and some indication of how this may evolve further.

Twin drivers

Scale and profitability are twin drivers for evolving cooperation models. The global ambitions of the ME3, particularly Etihad and Qatar as they play catch-up with Emirates, are causing them to increasingly penetrate the global ecosystem of relationships for inorganic growth. The objective has clearly been to achieve market access at a reasonable cost – an impulse that will continue as competition intensifies. Carriers around the world seek the opportunity for financial, commercial and strategic benefits from ME3 partnerships through joint value creation.

There is, prima facie, a case for mutual value addition by ME3 alliance membership. Qatar has seen a strong rise in traffic through Oneworld partners, and the addition of Qatar has allowed Oneworld an expanded footprint into areas of relative weakness, such as the Middle East, South Asia and Africa.

Etihad is generating strong revenue flows from, and to, EAP partners and drawing ever closer to SkyTeam.

There is, however, a possibility that alliance structures might prove to be restrictive for the ME3 in the light of their independent expansionary aspirations, as evidenced by occasional reports of tensions between Oneworld members Qatar and American Airlines.

Traditional alliances are not going away anytime soon, although emergent parallel alliances/partnerships will distort the ecosystem.

There are still strong commercial and operational incentives to alliance membership; the majority of the world's most heavily trafficked routes remain the domains of key alliance members and their joint ventures (JVs).

While there may be some conflicts within alliances, the cost and complexity of exiting alliances will give airlines pause. Airlines not already in an alliance, though, may choose to keep their options open.

Deals like Qatar's with South American LATAM are a clear demonstration of the Doha airline's intent.

Extended ME3-centric alliances or partnerships, building on network scalability and commercial alignment, are likely to provide viable alternatives to existing alliances for some airlines and passengers. The ME3 have steadily built these alternate spheres of influence to capture increasing passenger flows.

Carriers are drifting towards engagement with the ME3 outside alliances, and will continue to pursue opportunistic, multi-pronged cooperation agreements. In many cases, a carrier's decision to partner with an ME3 airline may arise from a 'if you can't beat them, join them' position – Emirates' strategic agreements being prime examples. In others, the ME3 airline might play the role of a white knight, as in the case of Etihad's investments.

While there is a clear value for both parties in such agreements, the ME3 often engage from a position of strength, backed by strong network connectivity and financial resources.

Traditional forms of cooperation

In general, airlines will continue to seek profitable growth, even if that entails acting 'outside' traditional forms of cooperation such as alliances, in consort with the ME3.

Should margins come under pressure again in the coming years, there will be an even stronger incentive to pursue partnerships to sustain momentum. Carriers will enter multiple relationships to cover all commercial and strategic bases optimally.

The current trend of elevating partnerships from codeshares to JVs, strategic agreements and equity engagements, will continue apace across the industry, with the ME3 being equally opportunistic in taking advantage of market developments.

This will strain traditional alliance structures and relationships. Qantas scaled back long-standing relationships with British Airways at Singapore and Cathay Pacific at Hong Kong in favour of a partnership with Emirates through Dubai.

Carriers are, thus, clearly seeking a strategic and operational path that is likely to generate the most sustainable profit over and above, or in addition to, alliance considerations.

By offering deeper cooperation outside the alliances (within which most legacy airlines' JVs still reside), the ME3 is creating parallel spheres of influence. Etihad, in particular, will continue to effectively 'bridge' members across alliances.

Equity investment further deepens the ME3's impact on alliances, and will continue to grow as a vehicle for expansion.

While the ME3 is not the only active dealmakers, the scale and breadth of Qatar and Etihad's investments increase their penetration into key alliance members and raise their ability to drive the targets' commercial and strategic moves more substantially in order to support or strengthen an ME3-centric model.

An equity stake also allows an investor to capture additional value through appreciation in the target's stock price or enterprise value – upside that would otherwise be 'lost' to the shareholders of the target. In general, these airlines will expect equity investments to deliver value across three dimensions: financial (growth in enterprise/stock value), commercial (access to valuable and/or growing markets through preferred partnerships) and strategic (greater synergies and mutual benefits).

Global competition – including equity investments by American and Chinese carriers – will spur further investment to lock in strategic assets across the industry, particularly those that provide a strong regional presence and feed. This will also encourage more distressed regional airlines, or their governments, to actively court ME3 capital and restructuring support.

For an industry constantly in flux, these are particularly exciting times. With profit margins soaring, global traffic rising and ever more capacity coming into the market, many airlines will seek partnerships for growth and sustainability. And the ME3, with their global ambitions, strong connectivity and financial strength, will undoubtedly have a significant role to play in the evolution of the industry.

FLY HIGHER

Airways Aviation is proud to announce the launch of a unique partnership with Emirates Aviation Services.

We will be working together to provide high-quality airline pilot training for aspiring students from Dubai and the GCC states. Students will undertake their PPL in the UAE before gaining a fATPL in Australia or Europe.

Utilising the exceptional quality of training programmes and senior teaching staff of both organisations, we're confident that this partnership will produce some of the best pilots in the UAE.

If you would like more information, please contact Ian Cooper, Group CEO, Airways Aviation
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Kotil leaves Turkish to lead TAI

Turkish Airlines CEO, Dr Temel Kotil, resigned in October to take up a new role heading up Turkish Aerospace Industries (TAI), the centre of technology in design, development, manufacturing, integration of aerospace systems, modernisation and after-sales support in Turkey.

The airline has appointed Bilal Eksi as the new general manager to succeed Kotil.

Powell steps up for Travelport

Travelport has appointed Matthew Powell as managing director in the Middle East and South Asia.

Powell said: "I'm so pleased to have the opportunity to continue to lead the team in the Middle East and South Asia as we redefine travel commerce in the region.

"During my time as acting managing director, I have gained a deep understanding of our customers' needs in the region and I'm thrilled to continue on working with them in leveraging Travelport's industry-leading suite of products so they have the advantage they need to meet challenges ahead and grow their businesses."

KHAN EXCITED BY YAHSAT CCO JOB

Al Yah Satellite Communications Company (Yahsat) has appointed Farhad Khan as its chief commercial officer (CCO) to be responsible for the company's overall customer operations, marketing and sales management activities.

Khan said: "I am delighted to be joining Yahsat at such an exciting time. Its achievements in less than five years of operations, with the launch of two satellites and serving many communities across the Middle East, Africa, central and south west Asia, has been nothing short of remarkable. During this next critical growth phase I shall concentrate on establishing new partnerships, work on the launch of Yahsat's third satellite – Al Yah 3 – and drive the business as we enter more than 20 additional markets."

Falcon swoops for Smith

Falcon Aviation, based in Abu Dhabi, has announced that Pauline Smith has joined the company as FBO manager.

In her past role at Marshall Aerospace, she was head of customer services and terminal manager for four years, where she was responsible for establishing a new Marshall-branded FBO at Birmingham Airport and created and designed a bespoke commercial passenger terminal for business passengers at Cambridge Airport, UK.

Smith said: "I am excited to start a new challenge within Falcon Aviation and look forward to working with the team to further develop this new and exciting project. I am fortunate to be joining such a respected company that prides itself on top quality service."

AJW Aviation goes for Smith

AJW Group, which has offices in Dubai, has appointed Ian Smith as vice president commercial. He will act as the focal point for commercial projects with responsibility for AJW Aviation's contracted business activities.

Embraer names Meijer as CCO

Embraer has named Arjan Meijer as chief commercial officer, Embraer Commercial Aviation, reporting directly to president and CEO, John Slattery.

"Since joining Embraer earlier in 2016, Meijer has already demonstrated strong values and leadership, coupled with deep market knowledge, which will be key in his new role, supporting the teams leading our sales campaigns throughout the world," said Slattery.

EMEA challenge for Birlenbach

Lufthansa has appointed Heike Birlenbach as vice president sales EMEA Lufthansa Group Airlines. She started the role in January 2017.

Birlenbach will be responsible for all sales and commercial activities in Europe the Middle East and Africa. With this extended responsibility she will lead the newly merged sales area, EMEA, which, as of 2017, will combine the two former sales areas – Europe and Africa/Middle East.

TWO NEW VICE PRESIDENTS FOR DNATA

Dnata has made two new appointments to its senior management team.

Steve Allen (left) will take over as divisional senior vice president, UAE airport operations, and Mark Gibb (right) has been appointed as senior vice president, Dnata safety and standards, responsible for the company's safety culture globally and the 'one safety' programme.

Allen has 15 years of experience in British Airways, and helped design Heathrow's Terminal 5 before joining Dnata in 2008 as vice president operations, where he was instrumental in the birth of the 'one Dnata' strategy.

Prior to joining Dnata, Gibb held senior leadership roles in the energy sector, most recently with Veresen, and before that with Nexen and Shell.

Delivering the definitive viewpoint for regional aerospace developments

Providing key market coverage for the Middle East and Africa are two industry leading magazines – both quarterlies – which are produced by award winning journalists led by aviation expert and five times Aerospace Journalist of the Year, Alan Peaford and complemented by daily online news services.

Award winning **Arabian Aerospace** magazine – now in its ninth year of publication, has become the premier title for the aerospace industry across the Middle East, North Africa and Turkey.

African Aerospace – launched in 2013 to focus on the exciting potential offered by markets in Africa – provides comprehensive Continent-wide coverage, in both English and French.

Our mission is to provide news and features about the entire industry and its activities in these regions, for those people in the industry whether they are locally based or have an interest in business in these areas.

We also report on global aerospace developments that could impact operators, airlines or air forces in these regions and publish **SHOW BUSINESS** airshow dailies for events such as the Dubai Airshow, Bahrain International Airshow, Aero Expo Marrakech, MEBAA and many other regional events, all supported by daily online news services.

ARABIAN AEROSPACE | AFRICAN AEROSPACE | SHOW BUSINESS ARABIAN AEROSPACE | AVIATION AFRICA

Hans Rosén

Marcelle Nethersole *speaks to the head of Saab's market area Middle East and Africa.*

1

Saab has not been too active in selling fighters in the Middle East. Will that change?

We are in a position that few companies can match of being able to offer customers a choice of the current Gripen C/D aircraft with the latest MS20 operational capabilities and that of the next generation E model, which is in development for Sweden and Brazil.

The company's plans for the Gripen are focused where we see the best potential for sales of the aircraft.

2

What is Saab's goal for the Middle East region?

Growth. We see Saab's strength as being able to give our customers an edge, whether it be in the technology and products development we offer, the operational capability we can provide or by partnering together with local companies.

We see those resonating with the needs of the customers in the region and we have shown that Saab is a company that is truly part of the region.

As of January 1, the Middle East with Africa has been a market area in its own right with its headquarters in the UAE, where I am located.

3

How are the Middle Eastern Saab 340 and Saab 2000 civil fleets doing?

The regional aircraft business is an important part of our aeronautical story and we produced 522 of these aircraft before the last one was completed in 1999.

We have an on-going support business for the existing civil fleets and our strategy is that we are very much committed to supporting those customers and their fleet operations now and for many years to come.

4

What is the state of play on efforts to sell the Swordfish MPA in the region?

We see the Swordfish Maritime Patrol Aircraft as offering a compelling package, given its state-of-the-art surface and sub-surface surveillance capabilities, with the ability to deploy sonar buoys, missiles and rescue packages.

For competitive reasons we do not identify with whom and at what stage our campaigns are at, but the need to secure national waters and freedom of navigation are all criteria that we see as having a strong regional priority.

We believe Swordfish is, therefore, the right answer for many of the coastal states in the region.

5

Where in the Middle East do you see the most likely applications for the company's 'Remote Tower' concept?

The Remote Tower provides airports with an opportunity to take their first step into the revolution that is the digitalisation of data within airport operations, and Saab is right at the forefront.

This will have important ramifications for operational efficiencies, which stand to benefit airlines, the airport operators and, importantly, passengers. The importance of the Middle East region as both an international hub and destination, combined with associated growth forecasts, means that significant benefits are there to be reaped.

6

What does a typical day involve for you and what challenges do you face?

It is all about understanding the needs of our customers and meeting them. So I am often out discussing business with procurement offices around the region or meeting with current and potential new partners.

There is also of course a close dialogue with my colleagues back in Sweden, working with the production and development of future products.

As for challenges, we have some strong industrial competitors in the US and other European companies and we cannot overlook the role their governments play in supporting their activities when it comes to winning business. Success in the Middle East depends on both a strong industrial package and often the support of one's national government.

We believe our track record shows that we have understood those challenges and that, through close working relationships and by doing business as we do to the highest of standards, we can succeed in bettering our competitors and winning business.

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