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ARABIAN AEROSPACE

INTERNATIONAL AEROSPACE PUBLICATION OF THE YEAR

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

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THE POWER OF TEN

ARABIAN AEROSPACE'S 10TH ANNIVERSARY ISSUE

AIR TRANSPORT

Why the A380 failed to make the grade

PAGE 29



DEFENCE

Kuwait renews its air fleet

PAGE 56



EVENTS

Saudi show's dream debut

PAGE 74



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TIMES Aerospace Limited
3-4 Rumsey House
Locks Hill, Rochford
Essex, SS4 1BB, UK
Tel: +44 (0)1702 53 0000
Fax: +44 (0)1702 53 3088

Regional Office
PO box: 371391
Dubai Airport Free Zone
Building 6EA, Suite 222,
Dubai
United Arab Emirates
Tel: +971 4 603 3364

Website: www.arabianaerospace.aero

Directors:

Mark Brown & Kevin Sammon

Publisher:

Mark Brown
mark.brown@arabianaerospace.aero

Display Advertising:

Dave Winship-Evans
david.evans@arabianaerospace.aero

Grant Lee

grant.lee@arabianaerospace.aero

Production Coordinator:

Ethan Cobbing
ethan.cobbing@arabianaerospace.aero

Circulation Dept:

Clare Brown
clare.brown@arabianaerospace.aero

EDITORIAL

Editor-in-chief: Alan Peaford
alan.peaford@arabianaerospace.aero

Editor: Steve Knight
steve@knighttrain.co.uk

Deputy Editor: Marcelle Nethersole
ella@aerocomm.aero

Defence: Jon Lake, Alan Warnes, Beth Stevenson

Air Transport: Alan Dron, Martin Rivers,
Tom Pleasant (cargo).

Business Aviation: David Calderwood

Helicopters: Paul Derby

General Aviation: Dave Calderwood

Space & Technology: Steve Nichols

Interiors: Marcelle Nethersole

MRO: Chuck Grieve

Propulsion: Geoff Thomas

Picture Editor: Ian Billinghurst

Photographers: Paul Merritt,
Tom Gordon, Mark Wagner, Jeff Holmes

Design: Chris Murray, Allsortz Ltd

Production Editor: Rick Haden

Sub-Editors: Steve Knight, Kathie Jones

Regional Correspondents:
Jill Stockbridge (UAE – English);
Peter Shaw-Smith (UAE- English); Vincent Chappard
(Francophone North Africa); Shahram Sharifi (Iran)

Contributors: Contributors: Anuradha Deenanaray,
Kevin Riordan, Tom Westcott

Editorial head office:

Aerocomm Ltd,
Norths, Rectory Road, Orsett, Essex RM16 3JU UK.
email: info@aerocomm.aero
For news stories: news@arabianaerospace.aero

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Side-by-side for our decade of growth

It seems incredible that *Arabian Aerospace* has clocked up 10 years bringing you news, views and images for the whole aerospace and defence business across the Arab world.

When we first came up with the idea there were a lot of people arguing that the Middle East market would never be able to sustain a magazine, that there was no industry as such.

But people like MEBAA's Ali Alnaqbi, Emirates' Maurice Flanagan and many others in the region – manufacturers like Boeing, Airbus, Bombardier and Embraer – were all supportive.

And they were right.

The industry has grown right across the region. Manufacturing is growing. The UAE is building aerostructures and developing a space business; Tunisia and Morocco are making major contributions to the supply chain. Maintenance, repair and overhaul (MRO) services are growing across the whole area, while aviation finance and leasing expertise is firmly established as a core service across the Gulf.

In the defence sector, we are seeing the development of training and light attack aircraft as well as manufacturing support from Saudi Arabia.

The airlines have grown into market leaders and often the game-changers with the latest technologies or aircraft types.

There has been a remarkable safety record and also a great support for backing the latest thinking in environmental performance, the development of alternative aviation fuels for example.

Of course, there have been controversies, disputes,

good times and bad, but we have learned through this decade that there is a resilience and a commitment towards the long game.

Aviation is now firmly embedded in the economic fortune of the region in a way that used to be held by the oil and gas sector. Aerospace is a driver for economic growth in many of the Arab League nations and we are proud to have been working alongside those who are making it happen.

In 2018, *Arabian Aerospace* was voted the industry's "best international publication". It was a great honour to have been judged so by the industry but it also reflected the importance that the region holds in the global aerospace market.

We are thrilled to have been supporting your efforts through the ups and down of the past decade and look forward to being by your side for next 10 years.

Safe landings,

Alan Peaford, editor-in-chief



COVER: The 40 issues over the past ten years. PICTURE: BILLYPIX

Advertisers

ADB Safegate	32	Dubai Airshow 2019	79	Safran Aircraft Engines	7
Airbus	21	Embraer Commercial Aviation	9	SAUDIA	77
AJW Group	78	Falcon Aviation	4	SBRETC	47
Alsalam Aerospace Industries	66	FlightSafety International	31	SEGMA	54
AMAC Aerospace	IFC	Frequentis AG	70	Sprung Instant Structures	49
Aviation Caucasus & Central		Jet Aviation	53	Texel Air	25
Asia 2019	58, 103	Joramco	OBC	TP Aerospace	39
Avtrade Ltd	92	Lufthansa Consulting	17	Turkish Aviation Academy	20, 43
Bombardier	19	Lufthansa Technik	28	University of South Wales	100
Bose Aviation	2, 3	Luxivair SBD	47	Vestergaard Company	94
CAA International	48	MEBAA Show Morocco 2019	51		
CFM International	26	MTU Maintenance	72		
Collins Aerospace	108, IBC	NEXUS Flight Operations Services	14, 15		
CTT Systems	82	NH Industries	13		
DC Aviation Al-Futtaim LLC	45	Pratt & Whitney	35		
DFS Aviation Services	10, 11	Russian Helicopters	61		

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08 **business brief**

A round-up of the region's news.

AIR TRANSPORT

22 Maltese crossing

Medavia chief executive, Rammah Ettir, explains why the company is looking to add scheduled flying to its offering.

27 Too busy at home

Flyadeal postpones the start of international services because it is so busy coping with a flood of domestic traffic.

29 Toppling of a giant

It was popular with passengers, so why did Airbus decide to pull the plug on the A380?

33 Nesma regroups

The airline finds new opportunities in its home markets of Egypt and Saudi Arabia.

36 Introducing a flexible friend

It's increasingly rare for new aircraft models to appear. Texel unveils its 'experimental' new model.

38 Beirut start-up

Alexcina aims to make its mark in the Levant with the Sukhoi SSJ100 regional jet.

40 Summit exciting

Aviation Aeropolitical & Regulatory meeting provided plenty of controversial talking points.

42 Out of Africa

Akbar Al Baker expressed some strong views when interviewed at the Aviation Africa summit.

BUSINESS AVIATION

44 Just plain good sense

Royal Jet is the world's largest operator of the Boeing Business Jet – and plans to add more.



46 Charting the way forward

ExecuJet Middle East vice president, Mike Berry, analyses the charter market.

48 The \$3 billion connection

Iridium's Certus satellite-based in-flight connectivity system is ready to go live.

50 Buoyant Middle East

The region is set to play a major part in aircraft buying worldwide over the next decade.

52 East meets west

A preview of business aviation's annual gathering at EBACE in Geneva, Switzerland.

Continued
on Page 6

FOCUS ON . . .

DEFENCE



55 UAVS IN ALGERIA

Two Emirati-developed drones are now in service with the Algerian Air Force.

59 SNAPPING THE CROCODILE

The Kamov Ka-52 helicopter has officially entered service with the Egyptian Air Force.

63 TAKING GUARD

Apache arrives in Qatar as Egypt orders 10.

56 KUWAIT ALL ABUZZ

Time runs out for legacy Hornets as fleet modernises.

60 THE BIG HELLO

RJAF and UAE unveil new aircraft.

64 QATAR MODERNISATION

A look at the QEAF's ongoing fighter recapitalisation and its new Twin Otters.

58 MAKING SENSE OF SENSORS

Leonardo targeting the market with ongoing developments.

62 FLYING HIGH

Aircraft boost for Iraq and Tunisia.

67 Done deals

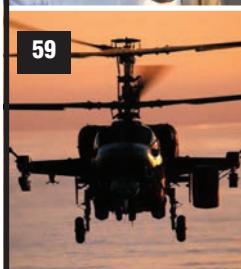
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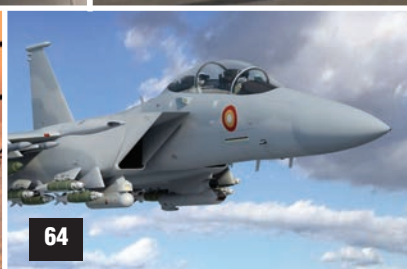
60



55



59



64



62

TECHNOLOGY

71 Stream leaders

Avionics, connectivity, cyber security, air traffic management and e-enablement – all was on show at the Connected Aircraft event in Munich.

EVENTS

73 Paris preview

A look forward to the Paris Airshow, the world's largest aerospace event.

74 Jewel in the desert

The first Saudi International Airshow had 267 exhibitors and 14,750 delegates representing 57 countries. It was unquestionably a great success.

AIRCRAFT INTERIORS

80 Interiors AIME high

The aircraft interiors market is set to reach \$40.2 billion by 2025. AIME is the ideal platform for companies to meet with airline representatives.

84 Experiencing comfort

The Passenger Experience Week took place in Hamburg incorporating Aircraft Interiors Expo [AIX].



TRAINING

101 Spatial awareness

Spatial is delivering training devices to match next-generation aircraft.

102 Towering skills

Kuwait's budding air traffic controllers learn the skills to take up positions in the nation's control towers.

REGULATORY

104 Rubble risers

After the defeat of Islamic State (IS), Iraq is getting back on its feet and looking to its aviation potential.

SPACE

106 The satellite lowdown

Report from the Global Space Congress in Abu Dhabi, where the UAE boosted its chances of space flights.

MRO

86: A NEW LEASE OF LIFE

The leasing market offers MRO providers new opportunities as well as challenges.

88: THE NEW VISION

Joramco is attracting attention in civil aviation circles, thanks to a well-planned transformation programme.

90: SHOWING ITS METTLE

The MRO Middle East summit and exhibition presented delegates with a range of solutions to keep pace with the burgeoning growth in the region's aviation sector.



AIRPORTS



95: EYE IN THE STORM

A new tracking system boosts Saudi airports.

98: SOAR-AWAY SUCCESS

We report from The Airport Show 2019, in Dubai.

96: SECURING THE FUTURE

How technology is changing aviation security.

99: COMMERCIAL POTENTIAL

How airports can exploit non-aeronautical revenue.

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Fuelling progress for the A400M CHT

Airbus successfully completed the certification flight tests for the A400M cargo hold tanks (CHT) refuelling unit in February, taking a step towards the full certification of the aircraft for air-to-air refuelling operations as a tanker.

The campaign, performed together with the Spanish Air Force Test Centre (CLAEX), featured a total of nine flights where 90 tonnes of fuel were dispensed to Spanish Air Force F-

18 receivers and to another A400M prototype as a representative heavy aircraft receiver.

The test campaign included the development and certification of the CHT with the latest fuel quantity management system software, to be certified during 2019, enhancement of the night refuelling vision system, and preliminary testing of helicopter air-to-air refuelling capabilities.

Turkish sees the light

STG Aerospace has announced that Turkish Airlines has begun a retrofit programme installing STG Aerospace liTeMood LED lighting across its Boeing 737-800 fleet.

Marcus Williams, STG's director of global sales, said: "With its quick and simple installation process of under eight hours, liTeMood is an easy and affordable way for Turkish Airlines to replace fluorescent lighting with the latest LED technology. This will narrow the gap in cabin appearance between their legacy aircraft and those installed with the latest Boeing Sky Interior (BSI)."

Raising the bar

TCI Cabin Interior, a joint venture between Turkish Airlines and Turkish Aerospace Industries (TAI) has reached an agreement

with Airbus to be a bar unit supplier for Airbus A350 XWB aircraft.

The land Beyond...

Qatar Airways has launched 'Beyond Business by Qatar Airways', a corporate rewards programme in Europe and the Americas. The new programme introduces a new currency, Qrewards, and allows business travellers to take advantage of exclusive benefits. Beyond Business by Qatar Airways will launch globally later in 2019.

Vertex arrives in the UAE

Vertex Aerospace has opened a regional office in Abu Dhabi.

The company received its licence to practice business in the UAE on March 5, 2019, under its Vertex Global Aerospace (VGA) business line.

Steve Suttles, senior

director VGA Middle East and Africa, said: "Abu Dhabi is modern, business friendly and perfectly positioned within the region for easy access to more than 75 countries. We believe the security, stability, and economy in the UAE are strong and we are happy to support strategies and policies that promote the region."

Carbon control

Abu Dhabi Airports has received a certificate acknowledging Abu Dhabi International Airport's (AUH) level of 'reduction' under the Airports Council International (ACI) airport carbon accreditation programme. The programme provides a unique common framework and tools for active carbon management at airports, covering operational activities that contribute most to carbon emissions.



ADAFZ to promote Abu Dhabi as a financial centre

Abu Dhabi Airports Free Zone (ADAFZ) has signed a memorandum of understanding (MoU) with the Registration Authority of Abu Dhabi Global Market (ADGM) to promote Abu Dhabi as a financial centre. The MoU was signed by Rowan Michael Kelly, senior vice president of ADAFZ, and Dhafer bin Dhafer Al Mheiri, CEO of ADGM Registration Authority.

Kelly said: "Customers will be offered a variety of leasing options, such as warehousing units, commercial offices and land plots, where facility management services are offered."

Al Mheiri added: "The MoU is a strategic collaboration that complements Abu Dhabi's extensive and growing commercial facilities and services portfolio. It will offer seamless and integrated solutions for investors with a focus on streamlining business set-up. The agreement is aimed at boosting the UAE's vision to transform the country's economy by diversifying the range and depth of economic activity, and driving in more growth from emerging sectors."

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DFS GROUP EXPANDS ITS MARKET POSITION

DFS Aviation Services Bahrain has been responsible for the **supply of personnel** for Air Traffic Management (ATM) to the Bahrain CAA since 1 January 2019. This responsibility also covers **standards, training, safety, electronics, engineering and regulatory personnel**. The newly founded subsidiary of DFS Aviation Services is also responsible for contributing to the **overall development of air navigation services** to meet the existing and future challenges in the air navigation field.

DFS Aviation Services Bahrain provided a **smooth and seamless transition** without any interruption to guarantee the continuation of the safe, orderly and expeditious handling of air traffic for the service provider. In addition, the DFS Group is providing **added-value services** to its client to strengthen their market position and growth strategy. After **London Gatwick and Edinburgh**, this was the third transition of personnel and operations that went smoothly.

The agreement comes as part of the Kingdom of Bahrain's strategy to develop an **aviation sector of international standard**, which can fulfil its role of efficiently connecting Bahrain to the rest of the world. The continued development of this industry stems from His Majesty King Hamad bin Isa Al Khalifa, King of the Kingdom of Bahrain. His valuable directives have led to the Kingdom's **pioneering position in the industry**. An example of which is the Bahrain Flight Information Region (BFIR), which is a key factor in facilitating the movement of civil aircraft to and from Europe and the Middle and Far East. One of the critical **success factors** in reaching this position has been the skilled Bahraini workforce, with a team of **highly qualified air traffic controllers**, who have been trained to the highest international standard.

DFS Aviation Services is a subsidiary of the German air navigation service provider DFS Deutsche Flugsicherung (DFS). DFS – and its predecessor organization – has been responsible for controlling air traffic in the Federal Republic of Germany for over 60 years. Today, DFS manages one of the most complex airspaces in the world with more than 10,000 flights per day and over 3.3 million flights per year (2018). DFS Aviation Services is responsi-

ble for the **Group's commercial activities across the globe** and offers a wide range of products and services. The extensive portfolio comprises the following areas: **air traffic services (ATS) & apron management, consultancy, aeronautical data, engineering & systems as well as training**.

In addition, DFS Aviation Services provides **air traffic control at regional German airports**, and is responsible for the provision of air traffic control at **London Gatwick** (the UK's second largest airport and one of the busiest single runway airports in the world) and **Edinburgh airport**. DFS Aviation Services is delighted to serve customers such as ANSPs, airport operators, airlines and aeronautical authorities from all over the world.

To strengthen its leadership in innovation and technology, the DFS Group is backing **remote tower control (RTC)**. **Saarbrücken Airport**, in the west of Germany near the border to France, was selected as the **first site for remote tower control**. A camera tower with sensors was erected at the airport in 2017, while hundreds of kilometers away to the northeast in Leipzig, a **Remote Tower Control Centre** was equipped with the necessary technology. Training on the new system began at the beginning of 2018. Live operations started at the end of 2018, with the first aircraft taking off from Saarbrücken Airport was controlled by an air traffic controller sitting hundreds of kilometers away in Leipzig. **Two more German airports** will be phased in later – first Erfurt and then, following another validation phase during which the remote tower control concept will be reviewed, the much busier Dresden Airport. Dresden is the largest of the three, with more traffic than Saarbrücken and Erfurt combined. **RTC** offers the potential of providing air traffic services at airports with **low traffic more efficiently** while still maintaining the **high safety level** our industry demands.

DFS Aviation Services is proud to actively take part in the **Middle East ATM market** with a leading role in providing **services, consultancy** and the delivery of **in-house ATC systems**.

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Airbus Helicopters sales stay strong

Airbus Helicopters delivered 356 rotorcraft and logged gross orders for 413 aircraft in 2018 (up from 350 gross orders in 2017). The company also booked 148 orders for light twin-engine helicopters of the H135/H145 family and secured 15 orders for the next-generation H160. At the end of last year, the overall backlog increased to 717 helicopters.

“Our commercial performance in 2018 demonstrates the resilience we have developed as a company to help us navigate a challenging environment,” said Bruno Even, Airbus Helicopters CEO.

G650 coup for Nexus

Nexus, a Middle East aviation service provider, has won a mandate to manage a Gulfstream G650 for an undisclosed Middle East client.

“We are very excited to add the Gulfstream G650 to our managed fleet, which has elevated us as one of the largest G650 operators in the Middle East,” said Abdullah M Al-Sayed, president.

A soothing SPA

Gulf Air and Royal Air Maroc signed a special prorated agreement (SPA), which became effective from 22 January 2019.

The agreement builds upon the current travel opportunities for passengers of both airlines beyond the hubs of Bahrain International Airport and Casablanca Mohammed V International Airport.

This new SPA agreement supports facilitating travel for passengers of both airlines, who wish to explore cities and regions that are not directly served by the home carrier – including domestic points in Morocco, west Europe and the GCC.



Sheikh Mohammed at the hub

Sheikh Mohammed bin Rashid Al Maktoum, vice president and prime minister of the UAE and ruler of Dubai, saw the unveiling of the Mohammed bin Rashid Aerospace Hub and the new e-commerce zone within Dubai South's Logistics District, the EZDubai.

With a total of AED 17 billion (\$4.6bn) of government and private sector investments, the hub is designed to create an effective value chain for the aerospace sector and increase the

GDP contribution of advanced industries to the emirate's economic growth. The 6.7sqkm hub includes the commercial strip, plus maintenance and technical support, business aviation, education and research and development facilities.

Sheikh Mohammed also witnessed the launching of EZDubai, a 920,000sqm purpose-built e-commerce zone within Dubai South's Logistics District set to unlock vast potentials in online commerce.



GCAS is star performer

The Gulf Centre for Aviation Studies (GCAS), the training arm of Abu Dhabi Airports, was recognised in February by Airport Council International (ACI) as the best performing ACI training centre in the Asia-Pacific Region. It had the highest number of students trained in 2018.

Zamzam Al Hammadi, general manager GCAS, who received the award from Kevin Caron, director, capacity building programs at ACI, said: “It is an honour to be recognised by the ACI. We are dedicated to raising aviation standards around the world and working to support the aviation sector through the provision of a comprehensive range of training, including the ACI's portfolio of safety, facilitation, economics, environment, management and technical courses.”

Insurance backing

Turkish Airlines has become the first airline to use the brand new insurance-backed aircraft financing product ‘Balthazar’ combined with a French lease, with the financing of its A321neo aircraft arranged by BNP Paribas.

The product was developed by Airbus, with the cooperation of an insurance consortium consisting of several highly rated insurance companies, to address the need of new products in the aircraft financing market.

Turkish Airlines successfully combined a French lease advantage in this 12-year transaction together with insurance cover, leading to an innovative and cost-effective product.

Intelligent move

Etihad Airways has announced a strategic partnership with Microsoft to launch the first ever in-house AI academy in the region, which will revolutionise the way the airline serves its customers by upskilling its workforce, optimising operations and creating alternate revenue streams.

All Etihad employees will be given access to an online training programme, and instructor-led classes, to drive companywide AI literacy, empowering every employee to deliver more value to the company and its customers. Microsoft specialists will also conduct a series of AI business workshops and hands-on technical lab sessions to help identify business challenges that can be optimised with AI.

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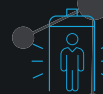
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New facility for DXB

FL Technics, a provider of integrated aircraft maintenance, repair and overhaul services, has signed a joint operations agreement to open a European Aviation Safety Agency (EASA)-certified line maintenance station in Dubai International Airport (DXB).

The newly established station in DXB will be operational in April 2019. It will be providing line maintenance services to foreign and local airlines with work scope of up to DY/WY check and defect rectification.

“It is extremely important for us to have a presence in one of the most rapidly growing aviation centres in the world,” said Zilvinas Lapinskas, CEO at FL Technics.

Egis wins Riyadh contract

Egis has been awarded a contract with Riyadh Airports Company for design and project management consultancy services to replace hold baggage screening (HBS) machines in terminal 5 at King Khaled International Airport, Saudi Arabia.

Aviation Middle East director, Jacques Khoriaty, said: “Through this new contract, Riyadh Airports Company is restating

Rolls Royce Ghost is no apparition at DXB



A 2019 Rolls-Royce Ghost has been added to the aircraft transfer fleet at Dubai International's (DXB) Al Majlis VIP service at Terminal 3.

The car will be used to transfer royalty, VIPs and celebrities directly from Al Majlis to the aircraft, ensuring they experience the ultimate in luxury.

The car was delivered by AGMC, the authorised dealer of Rolls-Royce Motor Cars in Dubai, Sharjah and the northern Emirates.

Mamdouh Khairallah, general manager of AGMC said: “We are delighted to be partnering with Dubai Airports. The partnership not only marks a significant milestone in luxury travel, it means VIP guests can now move around in comfort aboard the Rolls-Royce Ghost at the world's number one international airport.”

confidence in our extended capabilities on both airside and terminal projects and full-range expertise from consultancy, design, procurement support, and project and construction management.”

An upgrade for pilots

Pegasus is expanding both its fleet, with new environmentally friendly aircraft coming into operation in 2019, and its cockpit teams, in line with the increasing size of its fleet and rising market demand.

The airline is restructuring its orientation processes in order to maximise satisfaction and value for pilots during the training and initial working periods.

The programme offers the

cockpit team the chance to work part-time, European-level salaries, substantial benefits and continuous opportunities for self-development through training that focuses on safety and quality.

Egypt living the Dream

EgyptAir's B787-9 Dreamliner arrived in March at Cairo International Airport.

Minister Younis El-Masry said: “This is an achievement carried out by Egyptian Civil Aviation personnel, who are willing to accomplish more success for the progress of the air industry in Egypt.”

He added: “I am pleased to witness this moment when EgyptAir looks forward to resuming its

leading role in the region, bringing customers to the world in innovation, comfort, and style.”

Ethihad signs technology MoU

Ethihad Airways and Elenium, a provider of automation technology solutions, signed a memorandum of understanding (MoU) in March for cooperation to develop a variety of innovative solutions in both passenger and freight processing services.

Under the MoU, the companies will develop a long-term relationship which enables both to continuously identify potential opportunities to develop state-of-the-art travel solutions.

Comlux's first ACJ320neo

Comlux took delivery in March of the first of three ACJ320neo1 aircraft, which will now enter VIP cabin-outfitting by Comlux Completion in Indianapolis. It is the largest customer for the ACJ320neo family, which has already won a total of 11 orders.

“Comlux Completion will install a unique VIP cabin interior, using the most advanced technologies to offer the best comfort and luxury to our customer,” said CEO Richard Gaona.

Dassault acquires ExecuJet MRO

Dassault Aviation has snapped-up ExecuJet's MRO network.

The French company acquired the facilities from business aviation services provider Luxaviation, which bought ExecuJet in 2015 – its largest ever purchase.

The acquisition, which was scheduled for completion by the end of the first quarter of 2019, adds to Dassault's global support footprint with the addition of 15 bases across the world, including in the Middle East, as well as Africa, Asia-Pacific, and Oceania.

EFTA signs training MoU with Saudi academy



Emirates Flight Training Academy (EFTA) has signed a memorandum of understanding (MoU) with the National Aviation Academy (Tayaran) in Saudi Arabia. The organisations will promote their training programmes and exchange cadet pilots and aircraft maintenance technicians between the two academies.

The MoU was signed by Captain Abdulla Al Hammadi, vice president EFTA, and Mohammed T Al Subaie, director general of the National Aviation Academy.

“This collaboration will help develop the talent pool supporting the future growth of the aviation industry in our region,” said Al Hammadi. “We look forward to working closely with the Tayaran to provide our expertise and share our advanced state-of-the-art technology and curriculum, as well as create a platform for a mutually beneficial exchange between aspiring young aviation professionals, from cadets pilots to maintenance technicians.”



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New stars for Weststar

Weststar Aviation Services, a regional offshore helicopter transportation services provider, and Leonardo have signed a contract – valued at around 50 million euros (\$56.4m) – for three new-generation AW169 and two AW139 helicopters for offshore operations in west Africa and the Middle East.

“The AW169 and the AW139 twin-engine helicopters are the most successful new generation models in their class worldwide, and the most demanded helicopter types in the oil and gas industry. We are pleased to purchase yet more helicopters from Leonardo to support our offshore helicopter operations,” said Tan Sri Dr Syed Azman Syed Ibrahim, group managing director of Weststar Group.

QE special destinations

Qatar Executive (QE), the private jet charter division of Qatar Airways Group, can now fly to Samedan, Switzerland; Chambery, France; and Innsbruck, Austria. These destinations have a special designation as they require additional certification, including full-flight simulator training, to prepare the flight crew because of the mountainous environment.

QE executive vice president, Ettore Rodaro, said: “We are pleased to announce that Qatar Executive has enhanced its investment in additional crew training for our modern state-of-the-art fleet to serve these unique destinations.”

Skywards boost

Emirates Skywards, the loyalty programme of Emirates and Flydubai, has celebrated the opening of its new Emirates Skywards



Emirates' 15 years of Ghana operation

Emirates celebrated 15 years of operations to Accra, Ghana, in January.

The first Emirates flight flew into Kotoka International Airport in January 2004, and the airline has, since, carried close to 1.6 million passengers between Accra and Dubai and its network.

Africa is one of Emirates' key growth regions in its global network and Ghana is an important market. In 2018, Emirates carried more than 180,000 passengers between Accra and Dubai. “We are committed to facilitating trade, tourism and cargo exports in the years to come,” said Cathy Wesley, Emirates country manager.

Centre in Terminal 3 at Dubai International Airport (DXB).

The centre will function as a one-stop customer touchpoint for all new and existing members of the Emirates Skywards loyalty programme and will provide assistance across a wide range of services, including programme enrolment, profile creation and luggage tag printing.

Growth spurt

Gulf Air was awarded the fastest-growing airline in the Middle East region accolade at the 19th Airline Marketing Workshop organised by Athens International Airport in March.

Vincent Coste, Gulf Air's chief commercial officer, said: “The upcoming summer season will see increased flights to and from Athens as it is a popular route for many of our passengers. We thank the organising committee of this event for recognising the hard work for the airline and we will always work hand-in-hand to further strengthen our position in the Greek market.”



VIP version: The Superjet could be headed for a base in Beirut.

Lebanese start-up firming up on Superjet

Sukhoi Civil Aircraft Company (SCAC) is “in advanced negotiations” with Lebanese start-up airline, Alexcina Airways, to firm up its order for up to 12 Superjet SSSJ100 regional airliners, SCAC president, Alexander Rubtsov, said at the show.

“Negotiations are moving ahead quite well. We could start to deliver next year. We have slots available,” he said.

At least some of the aircraft could be delivered in an all-business configuration of 58 seats, he added. The aircraft has an all-economy layout of 100 seats.

Alexcina hopes to start services this year. That could be possible if the airline acquires used examples from lessors, said Rubtsov.

The Beirut-based airline is aiming for a 22-destination route network in the Middle East and Europe.

SCAC brought its VIP version of the Superjet to the show and conducted demo flights for interested parties.

500th Phenom 300 delivered

Embraer delivered the 500th Phenom 300 series business jet in March. The Phenom 300 is the only business jet model to reach this milestone in the last 10 years.

“The Phenom 300 has fascinated customers since it entered the market and its tremendous popularity only challenges us even more to continue to deliver the ultimate customer experience,” said Michael Amalfitano, president. “This landmark delivery to a current Phenom 100 customer with prior fractional ownership experience further validates the true innovation that the Phenom 300 delivers to private owners, corporations and operators.”

Quality move

Royal Air Maroc has become the latest airline to join Cargo iQ.

Cargo iQ is an International Air Transport Association (IATA) interest group with the mission of creating and implementing quality standards for the worldwide air cargo industry.

“Becoming a Cargo iQ member aligns with the values of Royal Air Maroc and our mission to offer a high-quality service to our customers,” said Salim Quouninich, director cargo, Royal Air Maroc.

A320neo approval

Joramco announced in February the addition of the A320neo to its Federal Aviation Administration (FAA) approval after adding this capability to the European Aviation Safety Agency (EASA) approval.

Jeff Wilkinson, Joramco's CEO said: “These additions come in line with the vision of the majority shareholder, DAE, which is investing to expand Joramco's services.”



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Safety milestone for Flynas

Flynas has accomplished the IATA operational safety audit (IOSA) programme registration, which is an internationally accepted evaluation process of an airline's operational management and control systems.

IOSA is an established standard in the airline industry, and registration is synonymous to an airline's commitment to safety.

To achieve the registration, Flynas has set in place a sound and cohesive corporate safety and quality management system that continuously monitors operations to ensure they remain compliant with safety requirements.

Seating market boom

The aircraft seating market is predicted to jump from \$12 billion in 2018 to more than \$18 billion by 2025, according to a 2019 Global Market Insights report.

Increasing aircraft



Turkish Airlines plays it cool

Turkish Airlines has signed a master rental agreement with DoKaSch Temperature Solutions, the provider of climate-controlled equipment for air cargo.

The company's Opticooler can keep pharmaceuticals exactly within their temperature range, regardless of a tropical summer or arctic winter. It has a high fail-safety and is considered by many to be the most reliable solution for pharmaceutical transportation.

Just like in a normal warehouse, a constant temperature can be maintained if the Opticooler is occasionally connected to the power grid.

"Turkish Airlines serves more destinations than any other airline. This means that our Opticoolers are now available to many more clients that need reliable temperature-controlled air freight," said Andreas Seitz, managing director of DoKaSch Temperature Solutions (pictured).

demand owing to rising air passenger traffic across the globe will drive the market. Airlines are upgrading their aircraft fleet and introducing new routes to cater to the leisure and corporate travellers.

Advancements in seats, along with enhanced ergonomic designs, are contributing significantly towards improving the air travel experience.

Additionally, major airlines are focusing on utilising maximum space in their aircraft by optimising

legroom to accommodate the high number of passengers.

Trenchard's double

Trenchard Aviation Group has secured dual accreditations – European Aviation Safety Agency (EASA) and the recently awarded General Civil Aviation Authority (GCAA) – for its Dubai facility located in the DAFZA Free Zone at Dubai International Airport.

Lassaad Yousfi, general manager of the group's

daughter company, Aero Technics Dubai, said: "With our customised services, high-quality products and competitive pricing, we are already providing our customers with an exemplary offer. Gaining the new GCAA accreditation will help to boost customer confidence even further."

Qatar converts

Qatar Airways will convert 10 of its 50 Airbus A321neo aircraft on order to the Airbus A321LR (long range) variant.

The A321LR has extra fuel tanks as well as a higher maximum take-off weight to give the aircraft additional range.

Qatar Airways will use the A321LR to connect Doha to new growing markets where today's demand is not sufficient for wide-body aircraft or where current narrow-bodies are unable to reach.

Alternatively, the new aircraft will be adopted to provide additional frequencies on existing Qatar Airways routes.

PIA inaugural Peshawar flight lands at Al Ain

Pakistan International Airlines (PIA) landed into Al Ain International Airport from Peshawar for the first time in February. PIA has begun flights on Fridays and Sundays.

Maarten De Groof, chief commercial officer of Abu Dhabi Airports, said: "Pakistan has always been one of our largest and most significant areas of operations and we are pleased to welcome these new bi-weekly flights carrying passengers to and from Al Ain and Peshawar.

"This new addition further expands the network of Al Ain International Airport, providing our passengers with enhanced services and connectivity."





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Innovation. We make it fly.

Libyan-owned Medavia has a varied business model encompassing charter operations, wet-leasing, and maintenance, repair and overhaul (MRO) services at its Malta hub. Now chief executive, Rammah Ettir, is looking to add scheduled flying to the mix. Martin Rivers reports.

Maltese ready to cross a new bridge

Until 2014, when Tripoli International Airport was razed to the ground by warring militias, Mediterranean Aviation Company Ltd (Medavia) conducted most of its aircraft maintenance work in Libya's capital.

Relocating its operational facility to Malta, the Mediterranean island situated 350km north of Tripoli, was a difficult but logical response to the security crisis.

Medavia had been set up in 1978 by the governments of Libya and Malta, and the European island already hosted its management headquarters as well as a base maintenance station.

Despite losing one aircraft to the violence and sacrificing much of its revenue for evacuation flights, the company has adapted well to the challenges of recent years.

Financial losses coinciding with the outbreak of Libya's civil war were reversed and Medavia now has more requests for work than its 210 employees can accommodate.

Alongside technical arm Medavia Technics –

which has European Aviation Safety Agency (EASA) approval for Part 145 maintenance, Part-M continuing airworthiness management organisation (CAMO) and Part 21J design work – Medavia Operations Ltd (Medops) is thriving in the charter and wet-lease market.

Medops currently has one Bombardier Dash-8 300, one Dash-8 100 and two leased Beechcraft 1900s in its fleet. Another two aircraft – a Dornier 328 and a Cessna Citation – are under management for third-parties, while four Bombardier CRJ-1000s are operated on a wet-lease basis for Binter Canarias. The CRJs belong to Air Nostrum, the Spanish regional airline that bought 51% of Medops in 2017.

Necessity rather than design

Medavia's chief executive, Rammah Ettir, admits that the Air Nostrum partnership came about by necessity rather than design.

The Spanish firm only stepped in when the European Union (EU) threatened to revoke Medavia's air operator's certificate (AOC), arguing that it violated the bloc's foreign

ownership laws for airlines. That reflected an earlier decision by state-owned Air Malta to sell its stake in Medavia – a move that left the Libyan Arab Foreign Investment Company (LAFICO), a subsidiary of Libya's sovereign wealth fund, as sole owner.

"The main driver really was to comply with the European regulations," Ettir confirmed. "It was not a commercial transaction; we were obliged by law to change the ownership."

"But [the reason] why we went to Air Nostrum [specifically] was commercial. We saw opportunities with Air Nostrum. We saw that there are strategic benefits, that we can complement each other in many areas. In actual fact, the first time that we came across Air Nostrum was during our strive to add the ATRs to our technical capabilities."

As well as pursuing more wet-lease and maintenance contracts with its Spanish partner, Medavia is now doubling down on the charter side of the business.

Libya, which is still home to a quarter of its workforce, remains an inevitable focal point.



Medavia Technics has rapidly scaled up its MRO activities in recent years. Alongside its EASA accreditations, it is recognised as an approved repair station by the FAA.

“Our biggest challenge at the moment is manpower. It’s not very easy for us to attract even third-country nationals to work here.”

RAMMAH ETTIR

Medops is best known for operating five weekly charter flights from Malta to Mitiga International Airport – now Tripoli’s main gateway – on behalf of Maltese travel agencies. That route, which is served by both the 19-seat Beechcraft 1900 and the 37-seat Dash-8 100, has become a lifeline for Libyan travellers.

“It’s the only channel between Libya and the European Union at the moment,” Ettir noted, citing the EU’s ban on Libyan carriers entering European airspace.

Other, less frequent charter flights are also operated to Benghazi in the east and numerous oilfields in the southern desert.

Hampered by poor security, political instability and financial uncertainty, Libya’s own airlines have struggled to stay airborne. State-owned Afriqiyah Airways and Libyan Airlines provide most of the seats in the market, while privately owned Libyan Wings, Buraq Air and Rahila Air also have scheduled operations. Tunisia and Turkey are the main overseas destinations.

Five years after the assault on Tripoli International Airport, no foreign airline has yet

resumed flying to the country – isolating Libyans precisely when their need is greatest.

That explains why Ettir classifies the Malta-Mitiga link as a “humanitarian” service that is helping Libya “get back on track”.

Even without direct competitors, though, he believes there is limited scope for adding capacity at present.

Demand is increasing

“The demand is increasing, and we have responded to that. The number of flights has increased. But it still doesn’t justify having a bigger aeroplane,” he shrugged. “The demand on this operation is very linked to the economic conditions in Libya, the exchange rate, and also to the visa requirements. It’s a little bit easier for the Libyans to travel, for example, to Tunis or to Istanbul than to come here to Malta.”

As well as flying to Mitiga, Medops is now active in a range of specialist charter markets.

The airline’s historic business model focused on charter flights for the energy sector – catering both for Libyan oil companies and, more

recently, western firms that had been building up a presence in the country.

That changed when the overthrow of Muammar Gaddafi, Libya’s former ruler, prompted rival militias to battle for control of the state’s assets in 2011, kick-starting the civil war. Few western oil companies now venture into Libya for fear of violence and kidnappings. As a consequence, the energy sector accounts for barely a quarter of Medops’ charter business.

“In 2011, after the Libyan revolution, we opted to diversify because the oil companies that we were serving in Libya pulled out and their operations were very low,” Ettir affirmed.

In their place, humanitarian flights on behalf of non-governmental organisations (NGOs) have become Medops’ bread and butter. It currently has contracts in Libya, Tunisia and South Sudan, while previous missions supported aid agencies in Mauritania and the Philippines.

“I think our most challenging operation is South Sudan,” Ettir said. “We go to unpaved strips in the middle of the jungle.”

Continued
on Page 24

CONTINUED FROM PAGE 23

More routine charters are also operated, such as holiday flights to the Pelagie Islands – located midway between Malta and Tunisia – and contracts with Italian football teams. But these represent only a “very small” part of the business.

On the maintenance side, Medavia Technics has rapidly scaled up its activities in recent years and now generates almost as much revenue as Medops’ charters.

The subsidiary specialises in technical work on Bombardier Dash-8 and ATR 42/72 turboprops, while also being licensed for the BAe 146, Beechcraft 1900 and 200, CASA C-212, De Havilland DHC-6 and Dornier 328. Alongside its EASA accreditations, Medavia Technics is recognised as an approved repair station by America’s Federal Aviation Administration (FAA).

It also has approvals from the relevant authorities in Libya, Aruba, Bermuda, Ghana, Guernsey and Kenya – essential documentation for servicing its foreign customers.

All base maintenance work is carried out in the Maltese hangar, while four overseas line stations are maintained in Mitiga, Tunis (Tunisia), Juba (South Sudan) and Accra (Ghana).

“The line stations have very small teams,” Ettir confirmed. “But in Mitiga we have a large number, because in Mitiga we are offering not only maintenance – we are also offering ground-handling services to third parties.”

Related transport services

With four decades of industry experience, the company is opportunistic when it comes to offering related air transport services. It works with external partners to source specialist aircraft, for example, including VVIP jets, cargo types and air ambulances. It also provides flight support services, such as computerised flight planning and help with short-notice overflight and landing permits.

Ettir credited Malta’s geographical location and skilled workforce for enabling Medavia to spread its wings across the sector.

But, he noted, demographic and economic conditions in the country are not always favourable.

Malta’s small population – just 460,000 – means that attracting foreign investment and migrant labour has been a priority for successive governments. Yet the pace of growth is causing some to worry about long-term sustainability.

“Our biggest challenge at the moment is manpower. It’s not very easy for us to attract even third-country nationals to work here,” Ettir complained. “Malta is becoming expensive. Rents are increasing; it’s really dangerous to the whole industry. The competition to attract people is increasing and this puts up wages, which has a negative effect on the competitiveness of the country.”

Medavia Technics would hire 30 new employees this year if it could find the right staff



Clifford Chetcuti: “We are actively looking at Libya.”

Air Malta eyes transit role

Medavia is not the only Maltese airline with an interest in the challenging but potentially lucrative Libyan market.

Flag-carrier, Air Malta, is also now eyeing a resumption of flights.

The state-owned airline pulled out of Libya in 2014 as violence spilled into the country’s airports, joining an exodus of foreign carriers. None has yet returned.

But, with politicians in both Libya and Malta now pledging to re-open the air corridor, and with Libyan carriers still banned from Europe, Air Malta is considering its options.

“We are actively looking at Libya,” confirmed Clifford Chetcuti, Air Malta’s chief executive.

“We are doing some studies from a risk assessment point of view – from a financial risk to a safety risk to an operational risk. No decision will be taken to operate into Libya unless our customers’ safety and security are protected.”

Flights to Libya would fit with the flag-carrier’s new hub-and-spoke strategy, which aims to make Malta a bridging point between Africa and Europe. It is a model that was toyed with by Afriqiyah three years ago, when the Libyan airline incorporated a now-defunct Maltese subsidiary, PanAfriqiyah.

However, Medavia’s Ettir is downbeat on the prospects of Malta becoming a transit point for Libyans.

“Malta is not optimised to be a hub for the Libyan travellers,” he warned. “Most of the time there is no direct flight to where they want to connect, so they have to stay overnight. The potential is there, but in practice the connections that are available are not optimised.”

at the right price, he added, but the target is unlikely to be achieved.

Instead, it is now scaling back the types of aircraft it services in order to focus on the most profitable contracts. The Beechcraft 200, the CASA C-212 and the De Havilland DHC-6 will be the first casualties.

Ettir, a former chief executive of Afriqiyah, is also turning his gaze back to Libya with a brand new scheduled airline venture.

The subsidiary, called Medlib, for Medavia Libya, is in the process of obtaining a Libyan AOC and aims to launch domestic flights next year with three leased Q400s or ATR 72s.

“The overall idea is to offer more frequent, reliable services between the Libyan cities,” he said of the planned operation, which will be based at Mitiga.

“The services that are being offered at the moment are not really good and the Libyan travellers deserve much better.”

Medlib’s route network is still under review, but Ettir wants it to include “all the main cities” in Libya, including Benghazi, Sebha, Misrata, Jufra, Zintan, Labraq, Kufra, Ghat and Tobruk. Regional expansion could follow if the domestic network is successful, with Malta, Djerba (Tunisia), and Alexandria and Luxor (Egypt) identified as possible targets.

Although Medlib, itself, will not be allowed to fly from Malta to Mitiga – due to the EU’s blacklisting of Libyan carriers – Medops’ existing service could be folded into the new network.

“Both fleets will complement each other,” Ettir predicted.

EU ban

Asked about the EU ban, he said the Libyan authorities made a miscalculation in 2012 when they voluntarily withdrew from European airspace. Billed as a temporary measure, the ban became permanent when Libya’s Civil Aviation Authority (CAA) failed to address Brussels’ concerns about poor regulatory oversight.

“We were told the Libyan CAA is lacking some resources, but the Libyan carriers – especially Afriqiyah and Libyan Airlines – were doing well,” Ettir insisted. “They were doing much more than the CAA was requesting. They were both International Air Transport Association (IATA) operational safety audit (IOSA) certified, so there is no danger with them flying to Europe. I think it was unfair to employ sanctions on these two Libyan carriers.”

Although Medavia is exempt from the ban due to its Maltese heritage, Ettir has no doubt that restoring connectivity with Europe would bring huge benefits to the Libyan people.

For now, however, he sees little evidence of the necessary steps being taken.

“The governments can do much more than what they are doing at the moment,” he said. “The CAA are not putting any effort into solving this problem. They’re just living with the sanctions now. They are living with whatever comes, day-by-day.”

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Flying on: Despite ordering the Boeing 737 MAX 8, Flyadeal's fleet of Airbus A320s will remain.

Left: Con Korfiatis: "The growth of the Saudi domestic market has been amazing."



Home-grown growth

Saudi low-cost carrier, Flyadeal, is so busy coping with a flood of domestic traffic that it has had to postpone the start of international services, says its CEO.

Alan Dron reports.

It's an indicator of how successful the liberalisation of Saudi Arabia's domestic air market has been that a new airline can confidently place an order for up to 50 airliners within 15 months of starting operations.

Flyadeal, the low-cost sister-company of national carrier, Saudia, began operations in September 2017. In December 2018, it signed up for 30 Boeing 737 MAX 8s, plus a further 20 options.

At present, the Jeddah-based airline operates a fleet of 11 Airbus A320neo aircraft.

The domestic market has been "amazing", said CEO, Con Korfiatis, at the first Saudi Airshow in Riyadh in March. "We could only have put out a request for proposals (RFP) for 30 plus 20 aircraft given our experience. In 2018, we carried 2.5 million passengers. We've carried 3.5 million now.

"It's a testament to the market's potential. We've achieved that in the context of our sister airline also growing its operations." Saudia flies on all of Flyadeal's routes.

That means, of course, that Flyadeal has not stolen passengers from its longer-established sister-company, but that the market has grown, as many more Saudis have taken to the skies.

"It's not just people who haven't flown before. We have [businessmen from] small and medium-sized companies who fly with us, who were infrequent flyers. For example, one passenger who works in Riyadh but whose family is in Jeddah told us that he used to fly back to see them quarterly. Now he does it on a weekly basis.

Young demographic

"There's a young demographic that's coming through as well, and we appeal to that demographic. We're seeing a huge number of repeat customers."

And Korfiatis is "very, very bullish" about the future of the market. At the time of writing, Flyadeal connected eight destinations (Riyadh, Jeddah, Dammam, Qassim, Jazan, Abha, Tabuk and Madinah) with 12 routes, but there are still many points in the kingdom Flyadeal does not serve, he noted.

The growth of domestic traffic for Flyadeal has been so strong that the airline is launching international services later than originally envisaged.

"If you'd asked me a year ago if we would be flying internationally by now I would have said yes," Korfiatis said. "But the domestic market has overwhelmed us with the volume that's there."

He now hopes that international services will start by the end of 2019. No destinations have yet been chosen.

The company's new 737 MAXs are not scheduled to start arriving from Boeing until 2023, but in the interim, it plans to lease examples of the type.

Korfiatis was speaking in the immediate aftermath of the loss of the Ethiopian Airlines 737 MAX 8.

He said the leasing plan was at the RFP stage. "We will take a breath while the next little time plays out to understand what's going on with the aircraft and then continue," he said.

Despite the switch to a new type, the airline will retain the A320s. "The intent was never to phase them out anyway as the market is still growing," said Korfiatis. "Any MAXs that come in this year or next will be for continued growth, not replacement."

The oldest A320 in the fleet is around 20 months old, while the youngest was only delivered in February.

Local customers

Low-cost airlines were unfamiliar to Saudi travellers when Flyadeal launched and some education was necessary to inform local customers about low-cost operations, he noted. "On early flights, people turned up with 45kg of luggage that others weren't charging for. We do charge for checked-in luggage."

However, an education campaign, particularly on social media, is showing effects, as can be seen by the queues at airline check-in desks at Jeddah Airport, Flyadeal's base: "Our customers are not pushing a trolley with six bags," he smiled.

He added that, with an untapped low-cost market for outbound tourism, plus the Saudi Government's stated intention to increase religious traffic for the Umrah pilgrimage from 8 million to 30 million by 2030, there was tremendous growth planned. "We see an opportunity here for us."

Plans are not yet confirmed, but the airline hopes to dip its toe in the religious travel market this year. ■



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The A380's flagship role at Emirates was a double-edged sword; the airline hugely boosted sales of the type, but the decision by the aircraft's biggest customer to draw back from its previous commitment sounded its death-knell.



Popular with passengers, but not accountants. With Airbus pulling the plug on the A380, Alan Dron looks at why the European manufacturer's double-deck giant failed to make the grade.

Why the giant was toppled

As the old saying has it, 'There is no stronger force than an idea whose time has come'. And Airbus must have felt that history was on its side when it formally launched the A380-800 in 2000.

The European airframer's economic logic seemed sound: globally, more people wanted to fly and the world's largest airports were becoming increasingly slot-constrained. The answer was surely to put the maximum number of passengers into a single aircraft, to maximise the use of those increasingly rare slots.

Airbus envisaged its aircraft carrying more passengers than a Boeing 747 between the world's major hubs, using modern technology to deliver a lower operating cost than the Boeing aircraft which, although steadily updated over the years, was essentially a 1960s design.

Airbus believed it would sell around 1,500 A380s over 20 years. In fact, just 313 had been contracted by the end of January this year.

There is no doubt that the aircraft is much-loved by the passengers who use it, for its feeling

of airiness and space, together with an almost unnaturally low noise level that makes it a pleasant environment for long-haul services between Europe, the Middle East and Asia.

So, what went wrong?

That interior space gave airline cabin designers huge scope. It meant that an aircraft whose capacity was, from the outset, touted as potentially as many as 800-plus passengers, in practise seated considerably fewer as airlines opted to give their passengers a more luxurious ride than in earlier wide-bodies.

Launch customer Singapore Airlines, for example, typically fitted just 379 or 441 passengers (the airline used several configurations) into the huge fuselage.

Densifying the layouts

Gradually, the accountants started to impose their strictures and airlines began 'densifying' their layouts (Singapore Airlines added between 30 and 90 seats), but even today many carriers provide generous onboard space. Etihad Airways, for example, operates its aircraft with 498 and Qantas, 484. Korean Airlines flies its A380s with a remarkable headcount of only 407.

The largest passenger load is borne on some of Emirates' A380s that are outfitted with a two-class interior carrying 615 passengers.

The biggest single reason for the demise of the A380 was the appearance and growth of the 'big twins' – the Boeing 777, 787 and, later, the Airbus A350. Although the 777 lags behind the A380 in both passenger capacity and range, crucially it has

Continued
on Page 30

CONTINUED FROM PAGE 29

the benefit of two engines rather than four, giving it a cost advantage not only in fuel consumption but also in servicing.

The 787, meanwhile, began opening up thinner point-to-point routes, avoiding the major hubs and also giving passengers an improved travelling environment in terms of better cabin pressure and lighting.

And the smaller passenger capacity of the two Boeings meant that their operators had to fill fewer seats than those flying the A380 to break even.

A380 sales were slower than Airbus had anticipated, especially when it became obvious that a single airline, Emirates, was largely responsible for keeping the A380 final assembly line ticking over.

Huge expansion

Emirates, in the throes of huge expansion, found the aircraft was a genuine attraction. Passengers would ask which flights were operated by the European behemoth specifically so they could fly on it and the airline found the aircraft to be a real differentiator with competitors.

Even Emirates, however, wanted more from Airbus. President Tim Clark repeatedly asked Airbus to stretch the aircraft, but Airbus could not make a business case for the billions of dollars such a project would require when so few carriers were likely to be interested in it.

An attempt by Airbus at the 2017 Paris Air Show to create an 'A380plus', which would have increased capacity by up to 80 seats through internal reconfiguration and given up to 4% reduction in fuel burn and a 13% cost reduction per seat, was not enough to entice Emirates – or anyone else.

The final straw arguably came with technical problems with the Rolls-Royce Trent 900 powerplant, which Emirates had chosen over the US-built Engine Alliance GP7200 in 2015 to power a batch of 50 A380s ordered at the 2013 Dubai Air Show.

There were durability issues in high-pressure turbine blades. And alleged performance shortfalls resulted in years-long arguments over compensation.

Although the two sides were said to be edging towards agreement late last year, in February the news broke that Emirates had decided to cut its outstanding order for 53 A380s to just 14 – a decision that led Airbus to announce it would cease production in 2021.

The writing was on the wall beforehand. Speaking just weeks before the decision was taken, Akbar Al Baker, Group CEO of Qatar Airways, which operates 10 A380s, said: "I'm sad that this aircraft is not going to be produced in the future. Keeping in mind that the A380 was a gamechanger, perhaps it came at the wrong time. Fuel prices skyrocketed after its

introduction and the 'stretch' didn't happen. It's been very successful in markets that have the demand and for airports where slots are constrained."

Leading UK aviation consultant, John Strickland, takes a similar view, believing that Airbus was unlucky by being overtaken by changes it could not have foreseen when it embarked on the project.

Drill down on costs

"Circumstances are so different from then. Boeing didn't have Dreamliners, Airbus didn't have the A350, we didn't have low-cost long-haul; that has all emerged in the last 10 years. Additionally, airlines have become more focused on the absolute essential need to drill down on their costs. Airline boardrooms have become much more conservative."

That was apparent in comments from Willie Walsh, CEO of International Airlines Group, whose British Airways subsidiary operates 12 A380s, at a February Oneworld alliance event in London. BA would be interested in buying more, he said... but only if Airbus significantly reduced the selling price.

Ironically, even today, after the decision has been taken to cease production, Airbus' website describes the A380 as 'The future of long-distance travel'. Not any more. The A380s time has gone. Perhaps it never really arrived. ■

ROLLS THROTTLES BACK AFTER A380 DECISION

When European airframer Airbus announced in early February 2019 that it was ending deliveries of its flagship A380 Superjumbo airliner in 2021, the knock-on effect on the commercial aircraft sector was huge, writes Geoff Thomas.

Along with thousands of smaller suppliers, the two major casualties are Britain's Rolls-Royce and the USA's Engine Alliance, whose Trent 900 and GP7000 powerplants are options on the four-engined airliner.

The two-deck Superjumbo airliner service only a dozen years ago and has struggled to find a secure foothold with the world's airlines, despite proving popular with passengers.

The decision came after Emirates, the largest A380 customer by far, cut its order for A380s and, instead, ordered more of the Toulouse-based company's A330 and A350 twin-engined airliners.

In its full-year results for 2018, published in February, Rolls-Royce recorded an exceptional item of £186 million (\$247 million) relating to Airbus' decision to end production of the A380. According to the company, the charge reflects "onerous contracts, tooling write-offs and the acceleration of depreciation and amortisation on associated Trent 900 programme assets".

Under an agreement reached with the A380's major operator, Emirates, Rolls-Royce will supply Trent 900 engines for a further 14 Airbus A380s, taking Emirates' total Trent 900-powered fleet to 33.

Chris Cholerton, Rolls-Royce's president of civil aerospace, said: "We welcome the news that Emirates is further extending its relationship with Airbus and Rolls-Royce. The addition of Airbus A330-



Still getting better: The Trent 900 engine fuel-burn has improved by around 1% and time-on-wing has also increased. ■

900 and Airbus A350-900 aircraft to the Emirates fleet will make the airline one of the largest users of Trent engines in the world and we look forward to continuing to support them and their customers."

Rolls-Royce will provide engines for the 17 remaining Trent 900-powered Airbus A380s to be delivered and will support the whole Trent 900 fleet in service throughout its lifetime.

Cholerton added: "The A380 is a world-class feat of engineering, much loved by passengers, and we are obviously saddened that deliveries will come to an end. We are very proud to have supported the aircraft

with our Trent 900 engine and we look forward to supporting the fleet as the A380 continues to delight travellers for many years to come."

When production ends, around 270 A380s will have been delivered and the final engines that Rolls-Royce will supply in two years' time will feature considerable improvements over the initial powerplants.

The giant engine OEM claims that fuel-burn has improved by around 1% and that time-on-wing has also increased thanks to improvements to components and software updates. ■

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Ashraf Lamoum: "It doesn't make sense for one route, Jeddah-Riyadh-Jeddah, to have around 30 flights a day."

*Nesma Airlines boss Ashraf Lamoum tells **Martin Rivers** the company is adapting and finding new opportunities in its home markets of Egypt and Saudi Arabia.*

NEW DOORS OPEN AS THE JEDDAH DOOR CLOSES

Ashraf Lamoum knew he was taking a risk in 2016 when he opened a base in Jeddah and launched narrow-body flights under the Nesma Airlines brand.

The chief executive was taking advantage of the long-awaited liberalisation of domestic air transport in the Kingdom of Saudi Arabia (KSA), which had for years been dominated by just two airlines: flag-carrier Saudia and Flynas.

Another two carriers – SaudiGulf and Flyadeal – were also granted licences around the same time.

From day one, Nesma KSA struggled to make a profit on the busy Jeddah to Riyadh trunk route.

Its six daily flights with Airbus A320-family jets lacked the frequencies and economies of scale needed to beat incumbents that already served the city-pair more than 30 times a day – often with wide-body metal.

The subsequent launch of Flyadeal, Saudia's low-cost subsidiary, only made things worse by pushing up capacity and dragging down fares.

It was, therefore, no great surprise when Nesma KSA quietly shut down its Jeddah base in October, retreating from a market that Lamoum now describes as a "money burner".

But the company is no stranger to reinventing itself and management already have their fingers in several other pies.

Growing political stability in Cairo has seen a return of the European charter flights that Nesma Egypt – a sister carrier and the original operator of the brand – first served when it launched in 2010. Its scheduled flights in the Egypt-Saudi country pair also remain active, albeit at slightly reduced frequencies. And Nesma KSA still runs a domestic network from the northern city of Ha'il.

Continued
on Page 34

CONTINUED FROM PAGE 33

Jet operations from Jeddah had, in truth, been something of an afterthought. The Saudi licence was originally granted for the Ha'il base, which deploys four ATR 72-600 turboprops and benefits from government subsidies because of poor connectivity in the region.

By contrast, flights from Jeddah were being operated on a commercial basis with wet-leased A320s and A321s – initially from Small Planet Airlines, then from Jetstar Pacific, and finally from Nesma Egypt.

“The Ha'il hub is the main project that we built the [Saudi] company on,” Lamoum affirmed.

“We are out of the market from Jeddah because of the competitors. Flyadeal, SaudiGulf, plus the increased frequencies of Nas and Saudi Airlines. It was useless to remain fighting there. It doesn't make sense for one route, Jeddah-Riyadh-Jeddah, to have around 30 flights a day. How to compete? How [when you have] round-trip tickets [costing] around 300 riyal (\$80)?”

Profitability is no easier to find in Ha'il, but the company's subsidy contract eases the pressure while Lamoum focuses on building brand awareness and network efficiencies.

“The Saudi Government is supporting our losses for a while,” he confirmed. “Hopefully, with time, it will make money. Still, we are promoting the routes with very low ticket rates, and still the load factor is not stable all year round.”

As of December, the Ha'il hub had spokes to 10 destinations in the northern half of the kingdom: Arar, Al Jawf, Qaisumah, Qassim, Qurayyat, Rafha, Tabuk, Turaif, Al Ula and Medina.

Maximum operation

That represents the “maximum operation we can achieve” in the city at present, though talks are under way with the General Authority of Civil Aviation (GACA), Saudi Arabia's aviation regulator, about basing turboprops at another domestic airport. The second hub could open as soon as this year if an agreement is reached, but Lamoum would not be drawn on its location.

The picture at Nesma Egypt is more complicated, owing to its oscillation between charter and scheduled flying.

Having started life as a charter operator linking the Red Sea and Nile Valley resorts with Europe, Nesma Egypt was thrown into turmoil by a succession of political and security crises in its home country.

An Arab Spring revolution, a military coup, the creation of a Daesh affiliate in Sinai, and the resultant bombing of Metrojet Flight 9268, sent Egypt's tourism sector into freefall between 2011 and 2016. The airline responded by diversifying with scheduled flights to Saudi Arabia – a market that eventually accounted for 100% of its operation.

By 2017, however, the situation was calm enough for charter services to resume. Nesma



Help to fly: Nesma deploys four ATR 72-600 turboprops from the Ha'il base and benefits from government subsidies.

Egypt now operates ad hoc flights to countries such as Spain, Germany, Italy, Hungary, Slovakia, Slovenia, Czechia and Armenia.

“There is no exclusive contract with any tour operator. We are open and ready to contract with the best options we may have,” Lamoum said. “Now we are increasing slightly our charter operation compared to scheduled [flying] ... We are planning to have around 60-65% of our operation as charter.”

The airline also ran flights between Riyadh and Sarajevo on behalf of FlyBosnia last year, though that partnership ended when the Bosnian start-up secured its own aircraft.

On the scheduled side, Nesma Egypt currently flies from Cairo to seven points in Saudi Arabia: Ha'il, Al Jawf, Jeddah, Qassim, Tabuk, Ta'if and Yanbu.

Applications for the right to also serve Medina and Dammam had not yet been approved by regulators as *Arabian Aerospace* was going to press.

Lamoum has a clear wish-list for regional expansion – Kuwait; Dubai's Al Maktoum Airport; Khartoum in Sudan; Baghdad, Basra and perhaps one Kurdish city in Iraq – but there is no firm timeline for the programme. “We are in a very unstable period,” he said, noting aggressive discounting by other Egyptian carriers. “So we prefer to keep the well-known markets with the well-known revenue, before investing and injecting more for new markets.”

Two A320s and one A319 are currently based in Cairo, following the withdrawal of a fourth aircraft last autumn. Both A320s will be replaced with younger models when their leases expire this year.

Though there are no plans to add more narrow-bodies, Nesma Egypt could be on the verge of becoming a wide-body wet-lease provider.

“We are seriously considering right now adding at least two Airbus 330s to our Egyptian air operator's certificate (AOC),” Lamoum said, expressing hope that the aircraft will arrive between June and September this year. “We will wet lease them to our Saudi company because

there is huge demand there almost all year round for Hajj and Umrah operations.”

The wide-bodies, which will be 2006-build or newer, will be deployed to the Far East and west Africa, including Indonesia, Bangladesh, the Philippines and Senegal.

Religious traffic is a major source of revenue for airlines in Saudi Arabia, with an estimated 8.3 million foreign pilgrims visiting the kingdom in 2017 for the Hajj and Umrah. Nesma KSA previously dipped its toes into the market by wet-leasing a Boeing 777-200ER from Malaysia's FlyGlobal for charter flights from Kuala Lumpur.

Sub-contracting its sister carrier should make the services more profitable, particularly given Egypt's low cost-base for maintenance and operations.

Wet-lease customers

Lamoum also did not rule out the possibility of finding other wet-lease customers.

Notwithstanding the move into wide-body operations, Nesma Egypt's appetite for growth has waned in recent years. Plans for a seven-strong fleet in Cairo were abandoned almost as soon as they were announced in 2016.

The slowdown may appear at odds with Egypt's recovering tourism figures. But lessons from the over-heated Saudi market are telling Lamoum to keep a watchful eye on capacity hikes by rivals such as Air Arabia Egypt and FlyEgypt.

He believes some competitors are offering “purely unrealistic” fares that will grow their market share in the short-term while endangering their long-term survival.

“We cannot go through the price war that others are following,” the chief executive insisted.

“Nesma has a very high standard and name regarding quality and safety. Therefore, we have minimum prices we are offering and we are not going down below those prices. If tour operators would like to sleep at night without being worried, then they are coming to us and accepting a little bit higher price than the others.”



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Increasing costs and complexity mean that it's increasingly rare for new aircraft models to appear. It's even rarer when the driving force behind a new model is a small Gulf carrier with just two aircraft in its fleet, as Alan Dron reports.

FLEX APPEAL

With Texel Air a resident cargo airline at Bahrain International Airport, visitors to the island's biennial air show at Sakhir Airbase in November would have been unsurprised to see one of the company's Boeing 737s on the static line.

The sharper-eyed, however, might have noticed, in tiny lettering below its tailfin, the inscription 'Experimental'.

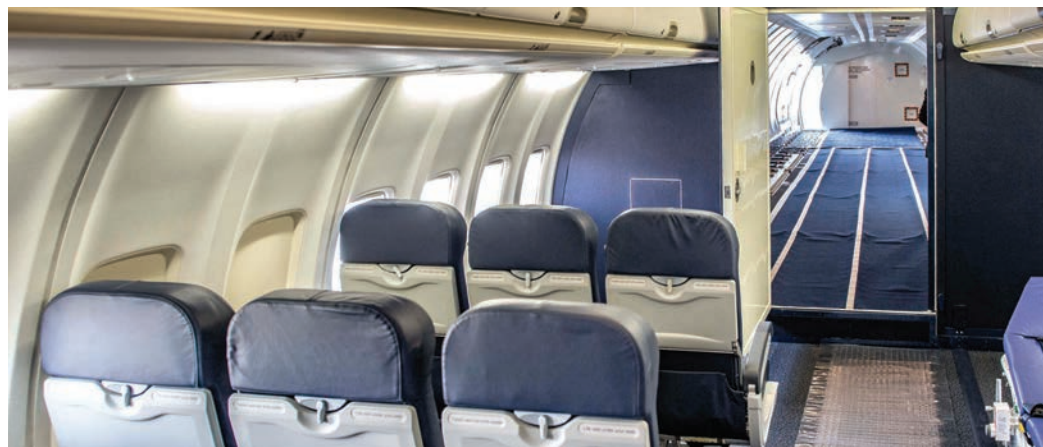
What's experimental about a Boeing 737?

Even those with some aviation knowledge, who noted the aircraft's designation painted forward of the rear fuselage door – 'Boeing 737-700FC' – might have been puzzled. Standard 737 freighters normally carry the single letter 'F' after the model number or 'QC' for 'quick change', where the aircraft's internal layout can be swapped between cargo and passenger configurations.

Freightervariant

Few would have realised that the aircraft was, in fact, the prototype of a new freighter variant, the 737-700 FlexCombi, or that Texel Air was the first operator of the type. Indeed, at the time of the show, the aircraft was still going through its certification process with the Federal Aviation Administration (FAA) in the US. Hence the 'experimental' designation.

The story behind Texel Air's acquisition of the new model began around 2015, when George Chisholm, CEO of Texel's parent company, Chisholm Enterprises, was starting to look around for a successor to the company's Boeing 737-300Fs. While the -300Fs had given sterling service, customers were starting to ask for greater capabilities – for example, when ferrying



racehorses between the Gulf and Europe.

The aircraft have a 'horse and groom' modification to carry the animals and their attendants, but "customers always want more seats, better comfort and better range", explained Chisholm.

"The -300s are still very popular aircraft as freighters, but the feedstock is coming to an end. In 2015 we saw that and started to look at what other aircraft were on the market. I travelled the globe meeting with original equipment manufacturers (OEMs), modification houses and conversion houses to see what was out there and what was coming. We found a lot of aircraft that met 50% of what we needed, but then met major flaws, either price or other factors.

"For example, Boeing has a 737-700 convertible '700C', but it's only available as a

new-build and that's a little too much for us. 'QC' convertibles, meanwhile, had to be either all-cargo or all-passenger and the overhead bins stay in, so you lose quite a bit of cargo volume."

Texel often has a requirement to carry small numbers of passengers and it even looked at the possibility of buying a small passenger aircraft to accompany the pure freighter, but the financial figures involved in operating two types of aircraft simply didn't add up for a small company.

Texel continued to scope out the design concept for a flexible combi and eventually ended up talking to three conversion houses. Two were really focused on the 737-800, but the third, PEMCO, based in Tampa, Florida, was looking for a launch customer for a -700 conversion.

The Bahraini company agreed to be the launch customer, at the same time incorporating the flexible cargo/passenger combination, but no lessor would fund an aircraft for it under those circumstances. Instead, Chisholm ended up buying an aircraft, a 2004 example of the 737-700 that had previously been operated by Airberlin and Russian carrier, Yakutia, and had been stored at the aircraft 'boneyard' at Victorville, California, for about a year.

It was a low-time example – around 24,000 hours and 16,000 cycles – and Texel bought it from owners Aviation Capital Group.

"We put it back into service, ferried it to Florida

Something for everyone

Texel and parent company, Chisholm, have operated Boeing 737-300Fs for 10 years, flying everything from racehorses to rock groups' support crews and exotic cars around the world.

As the aircraft often find themselves operating in remote locations, where support is limited or non-existent, they carry a full spares package in their belly holds.

A specially designed engine frame can also be loaded into the fuselage to hold a CFM56 powerplant.

The aircraft can carry an engineering team, enabling the company to mount a rescue mission if one of its aircraft encounters an engine problem while away from base.

For missions where passengers are being carried – for example, grooms looking after racehorses – the new aircraft will have an on-board in-flight entertainment (IFE) system. "It's more of an intranet," explained Chisholm. "Our hangar has a really good wi-fi system. We can link it into the aircraft and download material on to the on-board hard drive."



and it was in conversion from June 1 2017 to the end of September 2018,” said Chisholm.

Texel funded a proportion of the necessary research and development for the FlexCombi configuration, notably at the rear of the aircraft. That gave the Bahraini company some input into the design, notably the number of seats that it would carry.

The new aircraft will greatly expand the scope of Texel’s services, said Chisholm: “It opens up new markets. It basically doubles our range. With around 15,000lb of cargo, range is around 2,800nm. At full capacity, it’s around 2,200nm.” By comparison, at the 737-300’s maximum payload, range is between 1,100-1,300nm.

Enhanced vision system camera

To further increase the FlexCombi’s potential, Texel is working with US avionics giant, Collins Aerospace, to fit an enhanced vision system (EVS) camera in the aircraft’s nose. This is designed to cut through poor visibility such as rain or fog and is likely to be particularly valuable, given the destinations to which Texel operates.

“We usually operate from second- and third-tier airports; a lot of private airfields don’t have instrument landing systems (ILS), so the aircraft is designed to meet that challenge.”

The second-generation digital EVS that Texel has chosen is more usually found on top-of-the-range executive jets and Chisholm believes that this will be the first time such a system, with its

Magnificent seven combinations

The new Boeing 737-700FlexCombi gives its operators the option of seven different internal configurations:

- ‘Full cargo’, with pallets in eight positions;
- Combi 1, with seven cargo positions and 12 economy-class seats;
- Combi 2, six cargo positions and 24 economy-class seats;
- Combi 3, six cargo positions, 12 economy-class and four business-class seats;
- Combi 4, six cargo positions with eight business-class seats;
- Combi 5, seven cargo positions with four business-class seats;
- Medevac, with six cargo positions, two medical beds and six economy-class seats.

Other features include a removable smoke barrier, removable overhead bins, forward and aft fully equipped galleys, rear airstairs, an internal security camera system and a 180-minute extended range twin operations (ETOPS) rating.

The FlexCombi has a payload of 35,000lbs plus 12 seats in the rear of the fuselage, or 42,000lbs in a pure cargo layout.

accompanying head-up display, has been retrofitted to a Boeing 737.

The EVS came about as a result of talks Texel had with pilots, engineers and clients: “We said, ‘We have a clean sheet, what would you want?’ That’s how the EVS, head-up display and airstairs came into play.”

Another addition to the basic design was a comprehensive security camera system. As well as the standard cameras watching the cockpit door plus the L1 and R1 doors, it added several more, including two in the cargo hold and one aimed at the cargo door, which allows the crew to watch the loading procedure remotely – either from the cockpit or by crewmembers on a suitably-modified iPad.

Texel Air is planning to keep its existing 737-300Fs in service but would potentially look at acquiring more FlexCombis; the Boeing 737-700 is still in production and around 1,700 are in service. “Everyone loves them. They were supposed to be coming out of service from major airlines starting this year, but the low fuel price and delays to deliveries of the 737MAX have held them up,” explained Chisholm.

For its part, PEMCO is also interested in looking at more conversions of the 737-700 and -800 as the number of suitable -300 and -400 models dwindles. “We’re looking at getting to the -800 by at least 2021,” said Mike Andrew, the company’s director of conversion programmes. ■

A new airline aims to make its appearance in the Levant this year, with an aircraft not previously operated in the region. Alan Dron reports.

Alexcina Airways plans to be the first airline in the Middle East to operate the Sukhoi SSJ100 regional jet. The letter of intent was signed at last year's Bahrain International Air Show, where this example, operated by Russian carrier Yamal, was on the static line.



RUSSIAN EVOLUTION FOR ALEXCINA LAUNCH

If all goes according to plan, a new type of airliner is scheduled to make its appearance on airport aprons around the Middle East this year.

Alexcina Airways, based in Beirut, will start operations and build up to an ambitious network of 22 destinations in the Middle East and Europe. It is known that the first route will be to Dubai, but details beyond that remained commercially confidential at the time of writing.

The new airline is a daughter company of Alexcina Group, which began life in the US as a small excavation company in 1990 and has since expanded into several diversified sectors including investment, solar power and military support services.

The California-based group has an aviation support division that helps to plan the development or expansion of airports. It is also involved in the purchase and leasing of aircraft and plans to buy a Boeing 737 MAX and operate a 737-800 as a freighter under its own name.

It also handles maintenance of Boeing 737-800s and Airbus A320s, as well as operating a VIP and VVIP charter business. Its Middle East headquarters is currently in Dubai.

However, its Lebanese offshoot, part of the Alexcina Aviation division, is the first time it has attempted anything as ambitious as a complete airline.

Heading the new enterprise will be Captain Fadi Ibrahim.

Lebanon is the home of Middle East Airlines (MEA). However, Ibrahim believes that MEA has had things all its own way for too long and has effectively had a monopoly on air traffic in the country. The only other local operator is Wings of Lebanon, a wet-lease and charter specialist that operates a single Boeing 737-700.

"The Lebanese market is starving for a new airline," said Ibrahim, "because the market out there is limited to one national carrier that controls it... especially to the main destinations in Europe and the Middle East."

A major factor in deciding to use Lebanon as its base is that Beirut has effectively become a second airport serving Damascus in war-torn Syria. The two capitals are just 45nm (85km) apart and Syrian passengers will form an important portion of Alexcina's passenger loads, said Ibrahim. He anticipates that Alexcina will operate into the Syrian capital.

Alexcina's choice of equipment for its planned operations is intriguing. At last November's Bahrain International Air Show it signed a letter of intent (LoI) with Sukhoi for "up to 12" of its SSJ100 regional jets.

Capital and operational

Asked why it had decided to buy from the Russian manufacturer, Ibrahim said cost – both capital and operational – had been major factors.

"We have chosen the SSJ100 as a regional short-range commuter aircraft because of the low cost of operations. Compared to other types, such as the Airbus A320 or A319/318, the aircraft is very efficient in fuel consumption and maintenance costs, as well as the price of the aircraft compared to others of a similar size."

An air operator's certificate (AOC) is expected from the Lebanese authorities this year, probably at some point over the summer.

Ibrahim said that the first SSJ100 was expected to arrive as *Arabian Aerospace* was going to press and that four aircraft would be delivered every four months thereafter. The aircraft will be purchased, rather than leased.

Alexcina will operate as a full-service carrier, rather than a low-cost airline, and will have the SSJ100s configured in a two-class layout. Ibrahim declined to say whether it would compete with MEA on cost or service, or whether it would serve some of the same routes as the Lebanese flag-carrier.

In a statement after the signing of the LoI, Sukhoi said the aircraft could be delivered to Alexcina Airways, or to other customers of parent company Alexcina LLC.

The Russian regional jet has proved popular with pilots, cabin crews and passengers, but has experienced maintenance difficulties, especially surrounding its Franco-Russian SaM 146 engine.

Arabian Aerospace sources say that the problems have proved frustrating on what is an otherwise impressive aircraft. "If this aircraft had a 'Made in Kansas' sticker on it and was backed up by Boeing, it would be a runaway success," said one executive familiar with the situation.

Hopefully, the glitches will be worked out by the time Alexcina Airways begins operations. ■

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Threats of action against states discriminating against foreign airlines, news of ground-breaking aviation agreements, and criticism of airport privatisation... the 2019 Qatar Aviation Aeropolitical & Regulatory Summit was considerably more interesting than its title suggested, as Alan Dron reports.

HIGHLY CONTROVERSIAL AT THE SUMMIT

Representatives of airlines, governments and the legal profession gathered in Doha in February for the conference, organised by CAPA – Centre for Aviation, the Australia-based international aviation market intelligence organisation.

A conference theme was how liberalisation of the aviation sector had helped it expand hugely over the past 20 years and whether that tide of liberalisation was now threatened by neo-protectionism.

“Where we have seen liberalisation in markets, there has been growth,” International Air Transport Association (IATA) director-general & CEO, Alexandre de Juniac, said in a keynote address.

“In general, airlines are for liberalisation of markets. But there is no broad industry consensus on what are fair pre-conditions for broad liberalisation. We need to work towards a more inclusive globalisation. But it is a fact that globalisation has already lifted a billion people from poverty. That could not have happened without aviation.”

Globalisation benefits

However, he warned: “Some political circles are rejecting globalisation’s benefits. They favour a protectionist future that can only lead to a far less connected and less prosperous world – both economically and culturally.”

During the summit, news broke of the signing of a comprehensive air transport agreement between Qatar and the European Union (EU) that is intended to widen and deepen the commercial aviation links between the two parties.

While precise details were not revealed, the agreement “goes well beyond mere traffic rights”, said Henrik Hololei, the EU’s director-general, mobility & transport, who was prominent at the event.

“It aims for clear cooperation in all aspects of aviation: safety, air traffic management modernisation, social issues and consumers’ rights etc,” said Hololei, who revealed that similar agreements were in the works with other countries from the region.



Alexandre de Juniac: “Globalisation has already lifted a billion people from poverty. That could not have happened without aviation.”

PICTURE: IATA.



Akbar Al Baker: ICAO has been “timid” and “passive” in dealing with the dispute between Qatar and four neighbouring Arab states.



Henrik Hololei: Negotiations on wide-ranging air transport agreements, similar to that with Qatar, were under negotiation with Middle East nations.

Negotiations between Turkey and the EU are already under way, while talks with Oman were scheduled to start in March.

The EU is enthusiastic about such agreements. Transport commissioner, Violeta Bulc, said that the agreement with Qatar would “create new jobs, business opportunities and provide better prices for passengers”.

Qatar Airways’ Group CEO, Akbar Al Baker, concurred with the potential benefits: “We will have a predictable legal framework between the two parties. I see a lot of possibilities.”

One measure designed to improve the opportunities for EU airlines in Qatar is that they will no longer have to appoint a local general sales agent (GSA), who traditionally took a commission on all tickets they sold for an airline.

Al Baker added that he hoped the agreement would encourage other trading blocs to adopt liberalising regulatory regimes.

The EU raised some eyebrows during a session

entitled ‘Europe’s aviation relations with the world’ when it was revealed that the organisation plans to start getting tougher with countries deemed to be discriminating against European airlines.

Raise a complaint

Philippe Ruttley, a lawyer from legal firm Keystone Law, said that under a new EU regulation, a single European airline could raise a complaint against a country outside the bloc if it felt it was being treated less favourably than that country’s own airlines.

This discrimination could take the form of EU airlines being given less attractive airport slots or being denied access to airport ground services, for example. It could also involve subsidies to non-EU airlines that skewed competition.

The new EU regulations allowed officials to investigate countries outside the EU, “which is going to be very political”, Ruttley admitted.

Scene setter: Doha was the scene for the latest Aviation Aeropolitical & Regulatory Summit staged by CAPA - Centre for Aviation.



Even more controversially, if the EU decided that a case of discrimination was proved, it could take retaliatory measures. These could take the form of financial penalties or the suspension of concessions held by the external nation's airline at EU airports.

This threatens to re-open the type of dispute that raged some years ago when the EU attempted to impose financial levies on non-EU airlines flying into its airspace under its emission trading scheme (ETS).

Nations from the Middle East, Far East and other regions accused the European bloc of over-stepping its authority by calculating the levies on the basis of an airliner's entire journey, not merely the section of it within European airspace.

Holding the summit in Doha inevitably meant that representation from several Arab nations and airlines was absent, given the continuing political dispute between Qatar on the one hand

and Saudi Arabia, the UAE, Bahrain and Egypt on the other.

During the event, Al Baker expressed his grave disappointment at the failure of the International Civil Aviation Organization (ICAO) to take a role in solving the dispute between the two sides. ICAO had been "passive" and "timid" in the affair, he said. ICAO, he argued, should have a group of professionals who could look into such disputes and give recommendations for their resolution, with the ICAO Council then imposing that decision on the two arguing sides.

Rumours about demise

Asked about the end of production of the Airbus A380 – at the time of the conference, rumours about its demise were swirling, although Airbus had not formally announced the end of production – Al Baker said he would be sad to see it go.

Describing it as "a game-changer", he suggested that: "Perhaps it came at the wrong

time. Fuel prices sky-rocketed after its introduction and the stretch [version] didn't happen. It's been very successful in markets that have the demand and for airports where slots are constrained."

Qatar has 10 of the type in its fleet.

The privatisation of airports came in for severe criticism at the event. "We say to governments, could you consider all suggestions before going for privatisation? Use it as a last resort. Management contracts or other types of concessions while keeping airports in public hands are preferable options," said de Juniac.

Privatisation brought in quick cash for the governments selling off airports, but IATA's experience was that whichever company bought them promptly jacked up charges to airlines using them to recoup its purchase costs. That instantly increased the costs of airlines, which had either to raise ticket prices, or accept lower profits from their operations. ■

Akbar Al Baker had plenty of strong views when grilled by Arabian Aerospace editor-in-chief Alan Peaford at the Aviation Africa summit, held in Rwanda in February.



Al Baker on the front foot

With Africa being one of the fastest growing aviation markets, it is no surprise that Middle Eastern carriers have identified the continent as a target – a strategy that has not pleased the African carriers.

And at Africa's largest aviation summit – the fourth Aviation Africa Summit and Exhibition in Kigali, Rwanda, with more than 60 airlines present – it was the leader of one of the Gulf carriers that drew the most attention.

Akbar Al Baker, the fiery chief executive of the Qatar Airways group, gave a keynote address in his capacity as chairman of the governing board of the International Air Transport Association (IATA) and then took part in a no-holds-barred discussion on the main stage with *Arabian Aerospace* editor-in-chief Alan Peaford.

Many African carriers have grumbled in the past about the impact that Gulf airlines – particularly the 'Big Three' of Etihad, Emirates and Qatar – have had on the viability of their own operations.

"With the pan-African vision embraced by the single African air transport market (SAATM), the day will come when Africa starts negotiating comprehensive air transport agreements with other countries and economic blocs. In an under-served market of 1.3 billion people, the pie is big enough for everyone, so there is no reason to be concerned about competition," Al Baker said.

In the discussion he said that airlines like EgyptAir, South African and Ethiopian Airlines have been around for

decades. "They have had plenty of time to dominate," he said. "They just failed to do it."

Al Baker said that in 2018, approximately 127 million passengers were carried to, from and within Africa, generating almost \$30 billion in revenue. "Around 71% of these passengers originated or ended their journey outside of Africa and, interestingly, accounted for 85% of the total revenues," he said. "This means that intra-African air services contributes only 15% of the total industry revenue. Governments should leave behind protectionist approaches to regulating aviation and embrace liberalisation."

Al Baker said that the African airline industry needed a completely new approach towards collaboration.

"There is a need to consolidate the purchasing power for aircraft, as well as maintenance, catering and other services," he said. "For example, establishing joint maintenance, repair and overhaul (MRO) facilities is one area where consolidation would greatly benefit the African aviation industry. Joining forces to obtain better prices from suppliers will have a direct positive effect on the bottom line and long-term profitability."

Tough negotiations

He explained how tough negotiations had benefited his airline: "I squeeze until I get the last drop from the original equipment manufacturers (OEMs)," he said.

Al Baker said that the shared vision based on liberalisation would set the framework for a successful future in aviation... for Africans. But, he warned, for Africa's full aviation potential to materialise, a decisive shift in the current hubbing dynamics was needed.

"This shift will be based on the emergence of medium-sized airlines in under-served markets, which will also encourage the development of medium-sized super-connecting hubs adopting the latest airport technologies to ensure the best passenger experience and the highest levels of efficiency in operations," he said.

"Global connectivity brings opportunities and prosperity to communities and countries whose potential has been overlooked for too long," he added.

Al Baker said that currently more than 50% of traffic passed through just 10 airports in seven countries. "The aim should not be increasing the number of protected hubs or contributing to the wealth of their alliance partners. Rather, the vision should be about freedom, collaboration and long-term sustainable investments in local infrastructure, human capital, and capacity-building. We believe in Africa's aviation potential and stakeholders should be ready to offer a solid and long-term partnership."

The Qatar CEO said that Africa "is our next growth market". His airline already operates passenger services to 21 destinations in 15 African countries. Plans to increase these were hampered by the politically based dispute between Qatar and other Arab countries, including Saudi Arabia, the UAE, Bahrain and Egypt.

"Qatar Airways' vision is about freedom, collaboration and long-term sustainable investments in African infrastructure, human capital, and capacity-building.

"We strongly believe in Africa's aviation potential, and we are ready to offer a solid and long-term partnership," he said.

Governments should leave behind protectionist approaches to regulating aviation and embrace liberalisation.

AKBAR AL BAKER

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A Boeing Business Jet (BBJ) is parked discreetly at a quiet airport in Saudi Arabia. Its tail features a small UAE flag but, as Royal Jet CEO, Rob DiCastrì, explains to Alan Peaford, that is a deliberate part of the company's strategy.

THE ROYAL FAMILY...



All smiles:
Rob DiCastrì with
some of his team.

Abu Dhabi-based Royal Jet is the world's largest operator of the Boeing Business Jet with eight of the VVIP aircraft in service – and is planning to add more.

"We have just had a record year and we want to build on that momentum," DiCastrì said.

Royal Jet was spun out of the UAE's Presidential Flight 15 years ago and has been growing a reputation for a capability that maintains that pedigree, matching expectations of the some of the world's most discerning passengers.

"Leaders who don't need to have a head-of-state aircraft sitting in a hangar for most of the year are typical of our customers," DiCastrì said. "When the head-of-state does need to travel with an official entourage, say from Africa to a UN function in Europe or the USA, then the BBJ is ideal."

Different configurations

Royal Jet's eight Boeings come in different configurations, from a traditional 19-seat layout right through to 52-seats. That allows for great flexibility as the company has several 'combi' aircraft that in three hours can transform from executive layout to economy or business class seating to meet the individual customer requirements.

Royal Jet also includes two Bombardier Global 5000 standard business jets in its fleet.

Four of the BBJs also have the capability of adopting a medevac layout.

"We saw a bit of a dip in medevac activities since Abu Dhabi's hospitals are among some of the most advanced in the world. It can now be people flying IN to Abu Dhabi for treatment.

But there are people who would want to have the capability on board, and also have room for the family to travel too," said DiCastrì.

The plainness of the Royal Jet fleet is a selling point. The aircraft on the ramp near Riyadh featured a UAE flag on the tail and a graphic depicting the UAE and Saudi close relationship.

"We are discreet on the ramp and a lot of people like that. We can also quickly change the appearance so a national flag or a club or government logo can appear on the tail or the fuselage."

Service is key to the Royal Jet offering. "We have two galleys on each BBJ, and we have additional crew, so even staff entourage get that special service. We say that the 'Royal' in our name reflects that Royal service," DiCastrì said.

The aircraft at the Saudi regional airport is a 34-seater. It was one of two delivered and presented at the MEBA show in Dubai a little more than two years ago. "Since then, these aircraft have performed well with more than 1,000 hours per year."

Deepen the relationship

DiCastrì said he wants Royal Jet to deepen the relationship with the Saudi market. "Right now there is a vacuum in capacity," he said. "There is also a real buzz in the country with the government driving growth."

DiCastrì will be looking to expand his fleet and aims at basing aircraft in Saudi and also in Africa. "It is an exciting time," he said.

Royal Jet has been in talks with a Saudi Arabian air operator's certificate (AOC) holder and could see a joint venture type agreement happening before the summer. "It is a win-win situation," he said.

Africa is also high on the operator's agenda with increasing enquiries coming from African governments.

"We can handle the large entourage, we are used to working with heads of state and government leaders. That experience makes a huge difference," DiCastrì said.

As well as the jets themselves, Royal Jet is also marketing its FBO services.

The Royal Jet terminal is favourably situated right next to the runway at Abu Dhabi International Airport which, DiCastrì said, allows for swift taxiing time. "With no queue or slot restrictions, we are able to offer our clients a guaranteed 40-minute turnaround time for technical stops," he said. "Our FBO also benefits from its own security, customs and immigration department, meaning that discretion and security are always assured." ■



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We talk to ExecuJet Middle East vice president, Mike Berry, to analyse the Middle East charter market and the next big development in Dubai.

Why Dubai FBO expansion is so vital



Quality makes a difference: "Customer expectations are really high," according to Mike Berry.

One of the first companies to have a serious presence in the Middle East was ExecuJet, part of the Luxaviation Group. The company moved into the region in 1998 and was the first to receive permission to operate charter flights from the UAE.

Mike Berry, executive vice president of aviation services for Luxaviation Group and vice president of ExecuJet Middle East, followed in 2002.

Back then, he was a financial director for ExecuJet and his economic acumen has informed his business decisions in the region ever since.

"In the Middle East, wealth is around every corner," he said. "But, despite a dramatic increase in business aviation movements since the early 2000s, the market is still young – and not without its growing pains."

While the typical aircraft owner began to shift from the single, ultra-high-net-worth-individual (UHNWI) towards corporations a decade ago, this trend stalled during the 2008 financial crash and, according to Berry, never really recovered. So, how has ExecuJet adapted its offering for today's single-owner market?

"Customer expectations are really high," Berry said. "But market fluctuations from political, social and diplomatic events can make pricing that bit higher in the Middle East. Customers expect costs to be equal to those in Europe or the US, because they speak to consultants who are used to working in those more established markets, so they often get inaccurate advice about parts, services and repairs.

"Plus, the environment's more challenging for aircraft in the Middle East. Climactic conditions such as sandstorms cause erosion, which can spell a higher frequency of maintenance."

Individuals are also likely to have higher standards when

it comes to discretion, which will be enhanced when ExecuJet combines its two Dubai FBOs into a single operation at Al Maktoum International Airport.

At present, ExecuJet has five FBOs in the Middle East, at Dubai International Airport; Al Maktoum International Airport; Istanbul Atatürk Airport; Istanbul Sabiha Gokcen International Airport; and King Khalid International Airport in Riyadh.

"Apart from the dramatic slowdown over the past year as a direct result of the Saudi Arabia corruption clean out, we had been experiencing year-on-year growth in business aviation movements through ExecuJet's two FBOs in Dubai," said Berry. "This means our infrastructure needs expanding if we're going to continue to provide the level of service our customers expect. Specifically, the new FBO will be located separately from existing terminal operations, so clients will be able to enjoy a private and personalised service."

Presidential suite

The \$30 million, 25,700sqm facility at Al Maktoum will be designed as a three-storey building, featuring a presidential suite, airside hotel room suite, transit lounge smoking area and bar. There are plans for 13,800sqm of on-site hangar floor space and a dedicated parking hangar, to ensure it is equipped to manage the rising demand for business aircraft operations in the region.

"Additional parking space was non-negotiable for us when we were planning the facility at Al Maktoum," noted Berry. "These days, our customers are flying as much for leisure as for business, which means they're choosing larger aircraft capable of accommodating extended families plus au pairs, staff, even pets.

"As a result, we're seeing more of the larger Embraer and Bombardier aircraft types coming through the doors. The range capabilities of these aircraft are also important to our customers – the Global 7500, for example, can fly 7,700nm. That's the equivalent of flying direct from Dubai to Los Angeles."

It appears Dubai expansion is crucial for Luxaviation Group's business strategy, following the sale of ExecuJet's MRO facilities to Dassault.

According to Berry, the company is refocusing on its core aviation services – VIP charter and aircraft management, and its global FBO network.

"Approximately 20% of Luxaviation Group's overall business stems from the Middle East," said Berry. "It's an emerging market, but a promising one. We were the first aircraft management and charter operator to make a mark in the region and we're pushing to retain that top spot. By concentrating on innovation and investing in the sector's development, we're confident our steady growth will continue to rise." ■

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Making the link: Robert Squire, director Thales Certus Radio Communication Products, with FlytLINK at Helitech.

IRIDIUM MAKES THE

Iridium, which styles itself as ‘the world’s only truly global mobile satellite communications company’ has completed the ‘refresh’ of its low-Earth orbit (LEO) satellite constellation.

It means its new Certus satellite-based in-flight connectivity system can now go live.

Certus will offer business jets and helicopters faster and cheaper access to the internet while in flight.

While throughput speeds are nothing like that achievable with geostationary satellite-based systems, the upside is that the equipment is likely to be smaller, lighter and cheaper.

Iridium Communications announced the completion of its \$3 billion satellite constellation upgrade campaign, known as Iridium NEXT, during a press conference at the National Press Club in Washington DC in February.

It says that with a fully operational constellation, featuring 66 new Iridium satellites and no further launches planned, it has concluded its nearly decade-long capital-intensive programme to create an upgraded network both in space and on the ground.

First announced in 2010, the Iridium NEXT campaign featured eight launches with SpaceX. In total, 81 satellites were built by prime contractor, Thales Alenia Space, of which 75 were launched with nine serving as in-orbit spares.

Thales Alenia Space was responsible for design and integration of the new satellites, including launch and early operations testing in partnership with Iridium’s team at the company’s satellite network operations centre in Virginia, US.

Web of coverage

Iridium’s cross-linked satellites create a web of coverage around the entire planet. Unlike geostationary satellite systems, which normally do not work above a latitude of around plus or minus 80 degrees, Iridium says its cross-linked architecture enables real-time transit of data to and from any location on the globe, including over the oceans and polar regions.

Aviation terminals are being built by Thales, Collins Aerospace, L3, Gogo and Satcom Direct. Actual throughput speeds are not yet known, but



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are likely to be in the sub one-Megabit range. This will be boosted by the fact that the antenna for aviation use is likely to be tiny, about the same size as an ice hockey puck.

The company says terminals will be upgradable to the next speed class – Iridium Certus 700 (352/704 kbps) – with a firmware update once available.

Michael Hooper, Iridium's director and GM of aviation, said: "Iridium Certus takes us to a new level in terms of high-quality voice and streaming IP data.

"Being broadband based, we see a lot of applications in the cockpit, including safety services, electronic flight bag updates, weather, plus the transfer of data off the aircraft.

"With Certus, we are going to be able to do all those things – but that much better. Our legacy services were narrow band, but the new IP stream capability means our partners can really use our service.

"The small form factor, lower hardware cost and smaller antennas for Iridium Certus give us a lot of opportunities," Hooper concluded.

But what about comparisons with its closest competitor, Inmarsat SwiftBroadband?

"We have a number of aviation service providers signed up, but we think we have a compelling product and a competitive price point," Hooper said. "And the firmware upgrade path to faster speeds is also attractive – in-flight connectivity upgrades are normally expensive, but the ability to be able to double the speed to 700kbps with a simple firmware upgrade and no change to the antenna or terminal will be attractive."

Solution for helicopters

Thales has already developed an Iridium Certus solution for helicopters, which was on display at the Helitech 2018 exhibition in Amsterdam.

It said FlytLINK can provide reliable satellite communications for cockpit and crew operations and is said to be future-proofed for next-generation higher speed services.

Another benefit of using LEO satellites is the lower latency, or time delay, compared with geostationary satellites, thanks to their lower orbital altitude.

Thales added that, in terms of safety services, FlytLINK would support streaming flight data, future air navigation system (FANS) 1/A, controller-pilot data link communications (CPDLC), automatic dependent surveillance-contract (ADS-C), push-to-talk (PTT) voice, cockpit four-wire voice and aircraft communications addressing and reporting system (ACARS) with a short-burst data (SBD) modem. The 3.2kg line-replaceable unit (LRU) also includes an embedded 802.11n secured Wi-Fi access point.

Iridium estimates the L-band specialty broadband market size to be approximately \$700 million today. Prior to the launch of Iridium Certus, the company had an approximately \$25 million market share value in high-speed maritime services. It looks forward to that growing with this faster and more competitive service.

It had previously said it believes revenues attributed to Iridium Certus will reach an approximately \$100 million yearly run rate by year end 2021. ■

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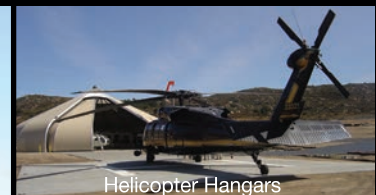
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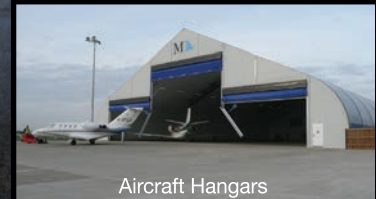
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Pascal Bachmann: “The fact that our Saudi Arabian clients are back flying again shows that there is a certain optimism for 2019.”

The Middle East is set to play a major part in aircraft buying worldwide over the next decade, according to a new market forecast.

Region is set to pep up the jet set

Jetcraft, an industry specialist in aircraft sales and acquisitions, predicts the Middle East will take 2% of total business aviation aircraft sold worldwide in its most recent 10-year market forecast.

Saudi Arabia is the most prominent market for business aviation in the region; and historically has received the largest share, closely followed by the UAE.

Yet recent political activities have slowed the Saudi market. “Flying in Saudi Arabia had been curtailed for a while following the grounding of private aircraft in 2017,” explained Pascal Bachmann, Jetcraft’s senior VP sales – EMEA. “While we saw some stability returning in the second and third quarters, 2018 was less active than usual for acquisitions.”

Last year, Jetcraft celebrated its best-ever results worldwide, achieving more than 100 transactions in one year. Despite the diminishing Saudi market, Bachmann said approximately 10% of the total value of aircraft sold by the company in 2018 came from the Middle East and Africa, as low Saudi activity was compensated for by increases in other countries, including the UAE.

“We have more than 20 offices worldwide and sales representatives on the ground in each region, so we have

the ability to read local markets and adjust our focus accordingly,” he said.

So, what does the future hold for this turbulent market?

“Speaking to our clients in Saudi Arabia, the fact that they’re back flying again shows that there is a certain optimism for 2019,” Bachmann noted. “As long as the political situation remains stable, it can only be a better year for fleet acquisition.”

Yet the type of aircraft found in Saudi Arabia can be notably different from those in other areas like the UAE. For a start, there are some very old business jets still flying, such as Gulfstream II and III jets and numerous Hawker aircraft, including 400 and 400XPs from the 1970s and ‘80s.

“These will need to be replaced soon,” said Bachmann. “While buying an older pre-owned aircraft like a Hawker 900XP can make sense in the US, where you can have coast-to-coast capabilities for as little as \$4 million, our customers in the Middle East need longer-range aircraft to achieve the same results.

“Last year, there were a lot more sellers than buyers in Saudi Arabia – as owners looked to trade up their aircraft. We anticipate this will continue in 2019.”

Emerging trend

The emerging trend for ultra-long-range jets is not unique to the Middle East. Jetcraft’s market forecast predicts that, worldwide, the large jet category – comprising super large, ultra-long-range and converted airliners segments – will constitute 32% of total units sold and 64% of total revenue over the next 10 years.

The biggest of these jets have a certain popularity in Saudi Arabia. There are about 33 Boeing Business Jets in the region, with converted airliners a favourite amongst ultra-high-net-worth individuals (UHNWI). There is also a preference for US-manufactured aircraft in Saudi Arabia, said Bachmann, thanks to the historic ties between the two nations.

“Traditionally, Saudi has been a Gulfstream market, as these aircraft were used for both government and military operations,” he explained. “There’s a bit more diversification today, with representation from all original equipment manufacturers (OEMs), but when it comes down to numbers, Gulfstream and Boeing still lead.”

The growing population of UHNWI in the Middle East, and worldwide, means that Bachmann is confident in the longevity of the region, despite recent obstacles. “These individuals will always want to own jets,” he said.

“I once had a Saudi Arabian client who only flew 100 hours a year, so we discussed fractional ownership with him.

“But, ultimately, he chose full ownership, because he liked to visit his aircraft and just look at it whenever he wanted.

“He liked knowing he could use it any time, and it was perfectly designed for him. Who wouldn’t enjoy that?” ■

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Around 13,000 aviation professionals are expected to attend the European Business Aviation Convention & Exhibition (EBACE) at Palexpo, Switzerland, from May 21-23.

Dave Calderwood looks forward to the event.

The perfect base as east meets west

EBACE is the annual meeting for European business aviation professionals – but it goes much further than that. Located at Geneva Airport, the event is ideally placed for east to meet west, with operators and businesses from Europe, the USA, Russia and eastern Europe, China, the Pacific Rim, South America, Africa and, of course, the Middle East.

EBACE brings together business leaders, government officials, original equipment manufacturers (OEMs), airport management, flight departments, avionics makers, charter/lease companies, brokers, bankers, FBOs, maintenance companies – literally, everyone involved in every aspect of business aviation.

The event is a joint venture between the European Business Aviation Association (EBAA) and the US National Business Aviation Association (NBAA), both leading trade associations representing the industry.

Sustainable jet fuels

This year's EBACE will accelerate business aviation's support for sustainable alternative jet fuels (SAJF), part of the industry's long-standing commitment to reducing its already small emissions footprint.

Initiatives will include SAJF-powered flights from multiple European airports, discussion about SAJF at the 2019 EBACE media luncheon on May 20 and a panel in the show's innovation zone focused on SAJF.

EBACE is located at a purpose-built exhibition centre – Palexpo – on one corner of the international airport. It is not only 10 minutes by car or train from the centre of Geneva and adjacent to a motorway, but also makes use of a section of the apron to host the static display.

Step out of the exhibition halls, stroll down some steps and you're in a secure area surrounded by the very best of business aviation aircraft.

Static display director, Joe Hart, said: "This year's EBACE

will host several recently and soon-to-be-certified business aircraft, including long-range intercontinental business jets such as Bombardier's Global 7500, the Gulfstream G500 and G600 and the super-midsize Cessna Citation Longitude.

"These exciting aircraft will be joined by the latest offerings from renowned European manufacturers such as Airbus, Dassault Falcon Jet and Pilatus, as well as global aircraft OEMs including Bell, Boeing Business Jets and Embraer."

This year's static display has an expanded layout, introduced at last year's event, offering easier navigation between the manufacturer displays and multiple aircraft types.

"The EBACE static display is traditionally one of the event's most popular features, and no other venue in Europe allows attendees to review and compare such a wide variety of business aircraft," said Hart.

"EBACE offers an unparalleled opportunity for aircraft sellers and manufacturers to engage directly with their customers, business aviation professionals and end-users."

Back inside the halls it's just as busy with more than 400 companies exhibiting and conducting face-to-face business meetings with new and existing clients. And, of course, they're hoping to make new business contacts – networking opportunities are one of the best aspects of events like EBACE.

Good places to start are the various functions, meetings and seminars held throughout the three days of the event. They start with a state of the industry discussion with panellists Richard Koe (WingX Advance), Rolland Vincent (JETNET iQ), Oliver King (Avinode) and Adam Twidell (PrivateFly) moderated by Robert Baltus of the EBAA. They'll be discussing current and future market conditions.

Asset protection

Other meetings include the aforementioned SAJF and its projected wider use within the business aviation sector; asset protection using flight data monitoring; electric propulsion and business aviation; social responsibility – what role does and can business aviation play; young professionals (YoPro) networking; crisis communications; global trends including blockchain; access to European airports from a business aviation perspective; electric vertical take-off and landing vehicles (eVTOLs) as urban mobility solutions; and many more.

The full list of sessions can be found on the EBACE website, where you can also register for the event.

If something more relaxing is your preferred networking event then there's the EBACE coffee social held on the EBAA and NBAA stands. ■

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Innovative design: The Yabhon United 40 medium-altitude long-endurance UAV.



Adcom adds to Algerian force

Footage shown on Algerian national TV and posted by the Algerian Ministry of Defence on its official Facebook page has revealed that two Emirati-developed unmanned air vehicles (UAVs) are now in service with the Algerian Air Force.

Jon Lake reports.

Algerian interest in the Adcom Systems Yabhon United 40 medium-altitude long-endurance (MALE) UAV was first reported during the 2013 Dubai Airshow. Adcom was urgently seeking export orders. The company had started to produce unmanned drones from 2002, initially manufacturing target drones to meet Emirati requirements after the United States restricted the sale of unmanned vehicles to the UAE.

In 2013 the company had also purchased Belarus-based Indela, a producer of small unmanned systems – the Belar Ys-Ex.

At the Dubai show, Ali Al Dhaheri, the CEO and general designer for Adcom, said Algeria was interested in acquiring the Block 5 version of the Yabhon United 40 (also known as the Smart Eye 2) for intelligence, surveillance, and reconnaissance (ISR) and light attack missions, tracking militants, insurgents and traffickers in the vast emptiness of the Sahara.

Two years later, Adcom was reporting Algerian interest in the smaller, unarmed Yabhon Flash-20 UAV.

Also back in 2013, the Russian Ministry of Defence (MoD) announced that it intended to procure the United 40 UAV, but this was only for evaluation, and the programme was delayed. The Russians finally commenced flight-tests of the United 40 at the Chkalov State Flight Test Centre in April 2016.

For a couple of years, little more was heard from Adcom Systems. The company's website and social media accounts ceased all new activity and it did not exhibit at the 2017 Dubai Airshow.

Fast forward to the end of 2018, when Algerian TV footage revealed at least two armed Yabhon United 40s (apparently named locally as the El Jazair 54 or Algeria 54) and two smaller unarmed Yabhon Flash 20s (El Jazair 55/Algeria 55) in service with the Algerian Air Force.

The aircraft were seen on the flightline of the Polygone Central de l'Air at Hassi Bahbah in the Djelfa Province, which comes under the command of the 1st Military Region. They were deployed to Hassi Bahbah to participate in a military demonstration for the deputy minister of national defence and chief of staff of the national army.

Hassi Bahbah lies about 45km south of Ain Oussera, the home of the Algerian Air Force's main reconnaissance wing, the 5e

Escadre de Reconnaissance et de Guerre Electronique, which includes at least one UAV squadron – the 545e Escadron de Reconnaissance et de Guerre Electronique, equipped with Denel Dynamics Seeker II UAVs.

A visit to the base by chief of staff, Lieutenant General Ahmed Gaid Salah, in October 2018 revealed that it also housed armed Chinese CH-3 and CH-4 UAVs. Both are members of the China Aerospace Science and Technology Corporation (CASC) Rainbow family.

A statement issued by the Algerian MoD on the Adcom UAVs noted: "These drones were built locally by engineers, technicians, and executives of the National People's Army," implying that Algeria had rights to manufacture the Yabhon United 40 and Yabhon Flash 20 as the Algeria 54 and the Algeria 55 under a licence from Adcom, or even that the entire Adcom operation has been transferred to Algeria.

Scale-model form

First revealed in scale-model form in 2007, the Adcom Yabhon United 40 was named to commemorate the 40th year of the UAE, and has been renamed as the Algeria 54 in Algerian Air Force service.

The aircraft was Adcom's largest design – a twin turboprop, 36 feet (11 metres) long with a wingspan of about 68 feet (21 metres) featuring Adcom's distinctive tandem wing configuration and curved 'S'-shaped fuselage. The aircraft is fitted with a retractable tricycle landing gear with twin wheels on each unit.

Up to 10 hardpoints can be fitted, with four on the front wings and six on the rear. These accommodate a payload of up to 1,050kg.

The aircraft was also fitted with a six-unit rotating dispenser mounted in the fuselage. The Algerian aircraft were armed with what looked like converted 120mm mortar rounds and Emirati Namrod air-to-surface missiles (ASMs).

The payload can also include a synthetic aperture radar (SAR) terrain avoidance system and a gimbaled camera.

The United 40 was claimed to offer an endurance of more than 100 hours flying at altitudes of up to 26,000 feet.

The smaller Flash 20 (Algeria 55) seems to be being used in a pure ISR role in Algeria, with no armament, and with a single gimbaled sensor under the fuselage. ■

As Kuwait gets ready to welcome new fighters to its fleet, Alan Warnes looks at the country's modernisation programme.

WHAT'S THAT BUZZ?

Like so many other Middle Eastern countries, Kuwait is modernising the combat edge of its air force.

Its elderly fighter fleet currently comprises 31 F/A-18C Hornets and eight dual-seat F/A-18D Hornets that have been in service since early 1992.

They are among the oldest legacy Hornets flying, even though they have been modernised in recent years to keep them relevant.

In recent years, the Kuwait Air Force (KAF) Hornets have been participating in the Saudi-led coalition, which has been fighting Iranian-backed Houthi militias in Yemen since 2015.

The acquisition of 56 new jets – 28 Eurofighter Typhoons and 28 Boeing F/A-18E/F Super Hornets – means the legacy Hornets' days are numbered.

In January 2017, the US Congress sanctioned Kuwait's purchase of the Raytheon AIM-120C7 advanced medium-range air-to-air missiles (AMRAAMs), while 14 Lockheed Martin Sniper ATP targeting pods were ordered in May 2017. Both will be used by the F/A-18C/Ds before being transferred to the new Super Hornets and Typhoons.

The KAF will eventually field an impressive capability to match its allies in the region, who are suspicious both of Iran and some Islamist movements. However, the force lacks any training aircraft as the old Hawk Mk 64 and Tucano Mk52s have been grounded for years and earlier plans to get them back in the air have now been dropped. It means pilots are now trained overseas, in France, Italy, Pakistan, the UK and the USA.

Undoubtedly, once finances become available and the new fighters start bedding in, the KAF will turn its attention to a new training set-up.

Leonardo is offering its T-345 turboprop trainer and T-346 transonic trainer, while Boeing is already promoting its new T-X jet trainer, which was recently selected by the US Air Force (USAF). Undoubtedly, the latter will have the political might of the US Government behind it.

On April 5, 2016, Leonardo (then Finmeccanica) signed a deal with the KAF, worth nearly \$9 billion, for 28 Eurofighters. The contract includes 22 single-seater and six twin-seater tranche 3s aircraft, that will be optimised to the latest P3EB standard. They will be the first to be equipped with the Leonardo Air and Space Systems Captor-E air radar, known as Captor-E. It comes after an agreement was penned in November 2014 to develop the new electronic radar.

The P3EB standard also includes integration of the Brimstone 2 air-to-ground weapon, Meteor beyond-visual-range air-to-air missile (BVRAAM), and Storm Shadow cruise missile – with the latter a top requirement for the Gulf regions because of the Iranian threat.

Under the missile technology control regime (MTCR) restrictions, the stand-off weapon is a capability Kuwait can't acquire from the US Government.

Advanced targeting pods

Lockheed Martin was awarded a direct commercial sale (DCS) contract on September 28, 2016 that will see it provide 18 Sniper advanced targeting pods (ATPs), as well as logistics support. Work on integration should have started in 2017.

Ken Fuhr, fixed-wing program director at Lockheed Martin missiles and fire control, said: "This contract marks the start of a successful relationship with the Eurofighter consortium to provide critical targeting capability worldwide. As a new Sniper ATP user, the Kuwait Air Force will see significant targeting benefits, including high-resolution imagery, advanced targeting modes, and intelligence, surveillance and reconnaissance (ISR) capabilities."

Sniper ATP detects, identifies, automatically tracks and laser-designates small tactical targets at long ranges. It also supports employment of all laser- and GPS-guided weapons against multiple fixed and moving targets.

Drawn from Leonardo's production line at Turin-Caselle, deliveries of the jets are expected



Super move: Kuwait has ordered 28 Block III F/A-18E/F Super Hornets. The version is the most advanced yet and will feature, among other improvements, new crew stations.

PICTURE: BOEING.

Inset: The KAF is expected to receive the first of its 28 new Eurofighters in 2020. They will be the most modern versions developed so far.

PICTURE: ALAN WARNES.

to take place between 2020 and 2023. First flight of a KAF Eurofighter should take place this year.

A Leonardo official said: "As well as the aircraft, the contract includes three years of support following delivery of the first aircraft; training for operations with the Italian Air Force; and the building up of infrastructure at Ali Al Salem Air Base, where they will be housed. A complete training package will be created for the academy training centre."

Development of the Captor-E radar and its integration is the responsibility of Leonardo. The company said it has an enormous amount of potential for future capability enhancements and that, with one of the largest radar antennas of any combat jet, it could generate the most power.

Late last year a Leonardo spokesman confirmed: "The programme remains on track, through a series of flights, with the radar both powered and unpowered, as part of the scheduled programme. The first phase of flight-tests was wrapped up in 2017 and we've seen some excellent results.

"There has been some really good long-range tracking results and we have been able to test the radar's synthetic aperture radar (SAR) mode as well.

"In 2018, we performed a series of high-



intensity flight trials with incremental software updates to enable the required capability (P3E standard) to be available for the first deliveries to the Kuwait Air Force.”

After an initial purchase announcement in November 2016, the deal for 40 Super Hornets, was delayed due to the slowness of US Congress approval.

Eventually, Boeing was awarded a \$1.5 billion contract in June 2018 to supply 22 single-seat F/A-18E and six dual-seat F/A-18F Super Hornets. They will be the first Block IIIs to be delivered.

The more modern AN/APG-79 AESA radar will provide a huge leap in technology needed for current and future missions.

In addition, the aircraft will also house an advanced targeting forward-looking infrared (ATFLIR) system, joint helmet-mounted cueing system (JHMCS), a multifunctional information distribution system (MIDS), an advanced high-capacity computer system, and a state-of-the-art cockpit.

Boeing's Alain Garcia, director international fighter and sales marketing, said the older Hornets would not immediately be withdrawn. He also revealed: “The first new aircraft is going to fly within the next couple of months and there was a roll out ceremony on April 4.

“The first four dual-seat F/A-18Fs will be delivered to the US Navy for testing, which will be split between Patuxent River and China Lake, while the second four aircraft will be used to train pilots. Deliveries to Kuwait will start in the first quarter of 2021.”

Boeing instructors are embedded with the KAF's 61 squadron, which currently carries out the initial training using the classic Hornets.

Aggressor training

Originally, the KAF was intending to sell the bulk of the single-seater F/A-18Cs and hold on to the dual-seater F/A-18Ds for aggressor training, but those plans have now been dropped. Instead, all of the aircraft will now be disposed of but, according to Garcia, that will not happen until all of the Super Hornets have been delivered.

To train pilots for the Block III F/A-18E/F Super Hornet multirole fighters, Kuwait has ordered two tactical operational flight-trainers (TOFTs).

According to a notice released on the US federal business opportunities website on June 18 2018, Boeing will supply one legacy TOFT that has been modified for the Super Hornet and one new Super Hornet TOFT, and will provide training for an initial batch of 26 pilots.

The first TOFT will be delivered to a US

location – probably NAS New Orleans – to support initial aircrew training, which is scheduled to begin in the first quarter of 2021.

Kuwaiti pilots have been flying on Italian Air Force FT-339A/Cs (MB339s) at Lecce-Galatina, the home of 61 Wing, since 2014.

They fly around 150 hours on Phases 2-3 (basic and advanced flying training).

Seven KAF pilots graduated last November, and are now flying the T-346 (M346) in phase 4, the lead-in fighter training course.

Pilots are also known to have been flying Alpha Jets in France, at Tours Air Base, and on the 260hp Super Mushshak at the Pakistan Air Force Academy for primary flying training.

Eight Kuwait Air Force instructor pilots are thought to have joined the Italian Air Force's Typhoon operational conversion unit (4 Stormo) at Grosseto to learn to fly the Typhoon before heading back to Kuwait to instruct new pilots.

Boeing instructors are currently embedded with the KAF's F/A-18C/D operational conversion unit, 61 Squadron, which is carrying out the initial flying training on the classic Hornets at Ahmed Al Jaber Air Base. It is likely a similar arrangement will continue when the new Super Hornets arrive at Ali Al Salem, and the same, too, with a Eurofighter operational conversion unit being set up. ■

*The Middle East is a key export region for British-Italian company Leonardo and, as **Beth Stevenson** reports, the company is targeting the market with ongoing developments in its airborne sensor division.*

Extra sensor perception



Countermeasure: Miysis is able to redirect the trajectory of heat-seeking missiles launched by man-portable air defence systems.

Two recent significant contracts for Leonardo's Edinburgh site in Scotland were agreements with Kuwait and Qatar to acquire the Captor-E active electronically-scanned array (AESA) radar system, for their respective Eurofighter Typhoon fleets.

These were the first two customers for the developmental radar system, while an additional commitment from Saudi Arabia in 2017 for 48 more Typhoons is also expected to see them opt for the technology.

Aside from these notable achievements in the region, the company has also sold its Miysis directional infrared countermeasures (DIRCM) system to an undisclosed Middle Eastern customer, deliveries for which are currently under way.

This system is able to redirect the trajectory of heat-seeking missiles launched by man-portable air defence systems, something that is a threat in the region, particularly from Islamic State militants.

Brendan Nolan, VP of sales for radar and advanced targeting at Leonardo, said there is a lot of further interest for Miysis in the Middle East.

He added that the company is in the final stages of discussions with six customers for its surveillance sensors.

"There is obviously a threat because of where these customers are based geographically," Nolan explained. "So, a system like Miysis is the sort of thing that will be of interest in the Middle East."

The company's sensor provision is often carried out via prime contractors that serve as the system integrator on to their respective aircraft.

Platforms, such as the King Air, are of particular interest to customers in the region who wish to operate a relatively low-cost light surveillance system.

In February 2018, a sale of four King Air 350ER aircraft, fitted with L-3 Wescam's MX-15HDi electro-optical/infrared imaging turret and Leonardo's Seaspray 7500E AESA radar for Kuwait, was approved by the US State Department. All the technology is being combined via systems integrator Sierra Nevada Corporation.

Leonardo's Seaspray radar was revealed as being an element of the UAE GlobalEye configuration when Saab rolled out the aircraft in February 2018. This offers an air-to-surface surveillance capability to the airborne early warning aircraft, three of which are being acquired by Abu Dhabi.

Nolan said there are lots of opportunities for the company's family of systems via this tier-2 supplier approach, as operators seek airborne capabilities that are able to carry out a multitude of mission types and integrate numerous sensor types on board, rather than having an aircraft that carried out a siloed surveillance mission, as was traditionally the case.

System integrators in the US are generally happy to incorporate non-US technology into these offerings, Nolan added, so Leonardo is well positioned for these foreign military sales as a tier-2 provider.

The company will, however, offer radars to end-users where appropriate and required, he noted.

Leonardo is also offering its lasers for various applications that have traction the world over. Nolan noted, for example, within systems like the Sniper targeting pod used on board aircraft such as the F-16 and F-15.

The company's Osprey distributed aperture AESA radar is one of its key offerings. It is fairly limited in the details it can disclose regarding customers outside of the US and Norway – both of which have been often reported on as being customers for Osprey – but claims that the ability to provide a 360-degree surveillance capability with a system that does not have to be belly-mounted offers a new option for customers landing on challenging runways, such as snow and sand. ■



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Egypt snaps up the 'Nile Crocodile'



Plenty of bite: The Kamov Ka-52's coaxial contra-rotating main rotors give the aircraft a notably compact 'footprint' and obviate the need for a conventional anti-torque tail rotor.

Egypt has announced that the Kamov Ka-52 helicopter has officially entered service with the Egyptian Air Force.
Jon Lake reports.

The Egyptian Ka-52 variant is an export derivative of the Kamov Ka-52 Alligator – known to NATO as the 'Hokum-B'. The Nile Crocodile name was apparently proposed by Dmitry Rogozin, the then Russian deputy prime minister in charge of the defence industry. It is not certain that the name has been officially adopted.

The Kamov Ka-52 announcement was made on December 6 during Egypt's first International Defence Expo – EDEX 2018.

At least 12 Ka-52s were visible in satellite images of the airbase at Wadi al Jandali (Al Qatamiyah/Al Khatamia) published in late 2018, suggesting that the first Ka-52 squadron was by then in place. The airfield is the home of the 550th Attack Helicopter Brigade, whose 51st Squadron is equipped with the AH-64D Longbow Apache.

The Nile Crocodile may incorporate some features from the similar Ka-52K Katran (mud shark), a navalised derivative that was originally designed to operate from the two French Mistral-class amphibious assault ships ordered by Russia in 2010.

These vessels were subsequently embargoed in 2014 in the wake of Russia's annexation of the Crimea. The ships were then sold to Egypt in 2015.

The Egyptian Ka-52 features updated avionics and a new cooling system and (like the Katran) does have a reinforced fuselage structure and some corrosion-resistant materials. However, it lacks the folding rotor-blades and folding wing seen on the Ka-52K prototypes.

In 2015, Egypt signed a deal for the purchase of 46 Ka-52 land-based helicopters for delivery between 2017 and 2020. In September 2016, Egypt and Russia signed an agreement under which an initial cadre of 30 Egyptian pilots and 70 groundcrew would be trained on the Ka-52 in Russia.

The first Ka-52 for Egypt initially flew in primer, but was first seen in desert camouflage at Progress plant in Arsenyev in the Primorsk region of Russia in June 2017. The first three aircraft were delivered from Progress in July 2017, and three more followed in August.

Russian Helicopters general manager, Andrei Boginsky, said that 15 Ka-52s would be delivered to Egypt by the end of 2017 and that the rest would follow over the next two years. Some reports suggest that 19 Ka-52s had been delivered by the end of December 2017.

But, while deliveries ran ahead of schedule, the Ka-52 experienced technical problems during its introduction to service. The engines reportedly lost power in different flight regimes, while there were also problems with the night vision and navigation systems and other avionics equipment.

It was reported that these problems lay behind the Egyptian decision to buy 10 AH-64E Apache Guardians.

Urgent hardware

Boginsky said that the company was planning urgent hardware and software upgrades to rectify deficiencies that had been found during combat testing in Syria and what was referred to as 'real action' in Egypt. These upgrades will centre on improvements to the electro-optical vision system and to the generators, which were identified as particular weaknesses.

Russian sources suggest that there is an additional requirement for further Ka-52s to fly from the Mistral-class ships. Russia's TASS news agency said that Cairo had declined the offer of European or American helicopters to equip the two helicopter carriers, and that Russia had offered modern armament, electronic warfare and communications systems for the Mistrals, as well as the Ka-52K helicopter.

It has been reported that pre-contract work is under way on an export version of the Ka-52K Katran for Egypt, including finalisation of the helicopter's "technical concept" and working on the financial aspects of the contract.

In late August 2018, Alexander Mikheyev, head of Russia's state arms seller Rosoboronexport, said that the company would "soon" start talks on supplying Ka-52K helicopters to Egypt after the completion of other equipment deliveries for the Mistral-class helicopter carriers. ■

Hello to Jordan's second 'Halo'

The Royal Jordanian Air Force (RJAF) has introduced the second of four Mil Mi-26T2 'Halo' heavy-lift helicopters into service, writes Jon Lake.

The King Abdullah Design and Development Bureau placed an order for four Mi-26T2s in April 2016 on behalf of the RJAF, though the aircraft are intended for joint military and civil use.

Jordan plans to use the aircraft for firefighting missions – the helicopter has the capability to carry 15 tonnes of water in this role. It can also be configured for heavy-lift missions, carrying up to 82 troops or loads of 20 tonnes.

The aircraft can also be used for fuel delivery and the ground-based refuelling of other helicopters and vehicles.

□□□□□

The Mi-26T2 is a modernised and upgraded derivative of the Mi-26T designed by the Mil Moscow Helicopter Plant, a division of Russian Helicopters, and built by Rostvertol, at its Rostov-on-Don factory.

It has a new digital avionics suite provided by the OJSC Ramenskoe Instrument Design Bureau and a glass cockpit with five liquid-crystal displays (LCDs). It is powered by a pair of upgraded 11,650hp Ivchenko-Progress D136-2 turboshaft engines, built by Motor Sich.

The Algerian Air Force placed a launch order for the Mi-26T2 in March 2014, signing a \$2.7 billion contract for six helicopters. The first Mi-26T2 made its maiden flight in December 2014 and serial production began in



Early bird: Jordan's first Mi-26T2 pictured at the King Abdullah I Airbase in Marka, Jordan.

May 2015. Algeria ordered a second batch of eight Mi-26T2s in August 2015.

Jordan ordered four of the type in September 2016, with two more under option. The first aircraft was delivered in January 2018, painted in the RJAF's current desert camouflage colour scheme with standard Jordanian national markings and a large eagle or hawk design on the forward fuselage, while

the second helicopter, delivered at the end of the year, had a low-visibility grey scheme and was devoid of national markings.

Deliveries are expected to continue until the end of 2019, although Russian news agency, TASS, originally reported that all four would be delivered during 2018, quoting Andrei Boginsky, the chief executive officer of the Russian Helicopters holding company. ■

UAE UNVEILS NEW ARMED BLACK HAWKS



Model move: Sheikh Mohamed bin Zayed, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, is presented with a model of the new Black Hawk variant.

The United Arab Emirates has formally unveiled a new weaponised variant of the Sikorsky UH-60M Black Hawk helicopter, writes Jon Lake.

Six helicopters have been converted to the new standard by the Advanced Military Maintenance, Repair and Overhaul Center (AMMROC), an Abu Dhabi-based joint venture established by Sikorsky, Lockheed Martin and the Emirates Defense Industries Company (EDIC).

The new type was produced by AMMROC using Battlehawk weaponisation kits originally ordered by the UAE at the IDEX trade show in 2011, along with 23 or 24 UH-60Ms.

In March 2015, Sikorsky announced that it was close to beginning an upgrade to the helicopters under a UAE-funded development programme that would give the UAE's Joint Aviation Command (JAC) the "most advanced armed Black Hawks ever produced".

The new variant was officially unveiled in January during a visit to the AMMROC facility by Sheikh Mohamed bin Zayed, the Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, and other members of the Abu Dhabi royal family.

It was announced that the JAC had achieved mission readiness with the fully integrated weapon system, and had graduated an initial cadre of pilots and gunners. Subsequently, two of the newly converted aircraft participated in the tactical demonstration at IDEX in February this year.

□□□□□

Integration of the Battlehawk kit transforms the Black Hawk into a weaponised utility helicopter – not quite the same as a dedicated attack helicopter but probably a more useful and versatile platform, and one that has been described as being a western equivalent to the Russian Mi-24/25/35 'Hind'.

The weapons system is fully integrated with the UH-60M's existing flight management system.

The UAE's new armed Black Hawk is broadly similar in configuration to other weaponised export Black Hawks, but differs from the direct action penetrator (DAP) variants in service with US Special Operation Command, which incorporate some non-exportable weapons and systems.

The new version is fitted with stub wings incorporating four hardpoints allowing the carriage of 7- or 19-shot Hydra 70 rocket pods or up to 16 Hellfire missiles. ■



Ansat at Le Bourget: the European Debut

Being a traditional participant of the international Paris Air Show at Le Bourget, Russia regularly presents its cutting-edge developments in the field of aircraft manufacturing in the French capital.

This year will be no exception: the Russian Helicopters Holding Company, which is included in the Russian delegation, will bring to Le Bourget its light multipurpose Ansat helicopter, which will take part in the flight program of the air show. The European debut of this compact, reliable and multifunctional machine will demonstrate all foreign partners that Russia is highly competent in the field of helicopter engineering.

Russian Helicopter Holding Company has emphasized that despite the sanctions, many states have purchased and continue to purchase Russian-made rotorcraft.

"The reliability, safety and high performance of Russian-made civil engineering products contributed to a notable extent to minimizing the negative impact of the sanctions. Hundreds of Russian-made machines take off every day, regardless of the political situation. People need to move quickly over long distances, to corners inaccessible to aircraft, transport cargoes there, rescue injured people, suppress fires, perform environmental control, protect the borders of their states. It is Russian-made helicopters to help them with all these tasks on a daily basis," said

Andrei Boginsky, Director General of the Russian Helicopters.

Ansat is the first helicopter to be created during the latest period of the Russian Federation's history. This project was implemented by engineers of the Kazan Helicopter Plant, a part of the Russian Helicopters holding. In the Tatar language, Ansat means "simple, uncomplicated", and this is the case, where the machine's name fully corresponds to what was envisaged by its creators.

"The batch manufacturing of the light multi-purpose Ansat helicopter for our Russian and foreign customers is one of our most promising programs in the field of civil helicopter construction. The Ansat has the largest cabin in its class of helicopters, and its high flight performance and safety level are ensured, among other factors, due to the twin-engine power plant," said Andrey Boginsky.

Ansat is certified for use with a medical module. The rotorcraft is actively used in Russia as a "flying ambulance" and has already saved many lives in different regions of this large country.

The rotorcraft can be operated in the temperature range from -45 to +50 degrees Celsius, and also performs good in the highlands. In early 2019, Ansat received a supplement to the type certificate, allowing operation at altitudes up to 3500 meters. Its significant advantage is the possibility of

storage out of the hangar and low cost of operation.

All the declared characteristics have already been tested in harsh climatic conditions. At the end of last year, Ansat together with the Mi-171A2 medium multipurpose helicopter participated in the demonstration tour of the Russian Helicopters Holding Company in Southeast Asia. The South Asian Heli Tour started in China on November 12, 2018, and ran through Vietnam, Cambodia, Thailand and Malaysia. The helicopters made their way of about 5,000 km, showed unparalleled flight performance and caused interest of many partners of Russia. As part of the demo tour, a contract was signed for the supply of 20 Ansats to the Chinese Society of Disaster Medicine, and orders were received for about 30 more rotorcraft.

In Paris, Ansat will be presented both in the flight program and at the static exhibition. All participants and delegates of the exhibition will be able to see the helicopter at the static exhibition display. It will be equipped with a new "glass cabin", and a new medical module of Austrian production, which meets all international standards of sanitary aviation.

The air show visitors will also be able to see Ansat in the sky over Le Bourget during the flight program and observe its high maneuverability, power-to-weight ratio and stability in flight.



Eagle in flight: six more lead-in fighter trainers have been delivered to Iraq

The third batch of six Korea Aerospace Industries (KAI) T-50IQ lead-in fighter trainers have been delivered to Iraq, writes Jon Lake.

They arrived by sea in late October 2017, and were then trucked to Al Basra/al Shaiba Airbase, where they were reassembled and flight-tested.

Here they briefly joined 12 earlier aircraft that had been delivered to No 204 Training Squadron. This unit was re-numbered from 4 Squadron during March 2011, and was initially expected to be based at Tikrit/Al Sahra, but the first 12 T-50IQs were concentrated at Al Basra by late 2017, reporting to the Iraqi Air Force College.

The newer deliveries were soon noted at Martyr Mohamed Alaa Airbase – the military enclave of Baghdad International Airport – where they may have formed a second T-50 squadron, possibly with a limited frontline light attack commitment.

T-50 GOLDEN EAGLES FIND NEW ROOST

Iraq originally began negotiating the acquisition of T-50 trainers in February 2009, and signed a contract for 24 T-50IQ aircraft plus additional equipment and a 20-year support and pilot training package in December 2013.

The Iraqi T-50IQ was based on the FA-50 light attack version, and was fitted with wingtip missile launch rails and an internal gun – a three-barreled version of the M61A1 20mm Vulcan cannon, as well as

undergoing hardpoints to carry a range of air-to-ground weapons. Deliveries were originally scheduled to begin in April 2016, and to be completed within 12 months. In the event, Iraq received the first of 36 Lockheed Martin F-16IQ fighters in 2014, and a batch of 10 single seat L-159As and two L-159T1 trainers from November 2015. The latter were used as interim light ground attack aircraft.

This meant that the T-50IQ was not so urgently required for operational missions, while the civil war/insurgency made it more difficult to undertake flying training within Iraq. This was, in part, due to the so-called Camp Speicher massacre at Tikrit, (during which Daesh executed 1,566 unarmed Shia Iraqi Air Force cadets as they attempted to flee to safety) and T-50 deliveries were delayed.

The first batch of T-50IQs were delivered in March 2017, and the second batch followed in May 2018. ■

TUNISIA COMPLETES BLACK HAWK PURCHASE

The US Army's Security Assistance Command (USASAC) has completed the delivery of a \$338 million foreign military sales (FMS) package of eight Sikorsky UH-60M Black Hawk helicopters and associated training and support to Tunisia, writes Jon Lake.

The USASAC's core mission is to increase the military capabilities of countries that share similar security goals with the US.

The UH-60Ms were ordered by Tunisia in 2015. Four of the helicopters were delivered in June 2017, and four more followed in June 2018.

The USASAC and the contracting authority – Army Contracting Command at Redstone Arsenal, Alabama – followed a total package approach in accordance with the USA's new security assistance enterprise mission. This is designed to ensure that partner countries are fully trained on how to use and maintain equipment purchased from the US, and to build trust and create long-term partnerships that will underpin future interoperability and cooperation.

The package for Tunisia included training an initial aircrew cadre at Fort Rucker, Alabama, for pilots, instructor pilots and standardisation pilots; while helicopter crew chiefs and maintainers underwent training at a number of US Army schools. This helped to build Tunisian capabilities, and promises to ensure



The big push: US and Tunisian personnel unload one of the eight new UH-60Ms from a USAF C-17 Globemaster III transport aircraft.

that Tunisia and the US will use the same operating and maintenance procedures, further increasing interoperability during any future combined missions.

Joint US and Tunisian teams were responsible for introducing the UH-60M into Tunisian service, even down to unloading the new helicopters from the transport aircraft which delivered them, and assembling and flight-testing the UH-60Ms.

Melissa Black, senior FMS case manager for the US Army Aviation and Missile Command Security Assistance Management Directorate's (AMCOM SAMD) Tunisia UH-60M programme, highlighted the

excellent partnership and cooperation between the various programme partners. "The Tunisian Air Force has extremely hard working and knowledgeable personnel who were able to articulate the requirements related to the varied mission profiles," she said.

The Black Hawks will improve the north African nation's ability to deter regional threats – including violent extremist organisations, piracy and smuggling, while strengthening homeland defence capabilities, as well as supporting counterterrorism and border security operations. ■

APACHEWORK...

The US State Department has approved the sale of 10 Boeing AH-64E Apache Guardian attack helicopters to Egypt. Meanwhile, Qatar's first aircraft – in two-tone desert camouflage – were delivered on March 21. **Jon Lake** reports.

The Qatar aircraft were transported to Al Udeid Airbase on board a US Air Force Boeing C-17A Globemaster transport aircraft.

The delivery came a week after a formal handover ceremony at Boeing's production facility at Mesa, Arizona.

The Government of Qatar originally signed a \$667 million contract for the supply of 24 AH-64Es with associated weapons, equipment, support and training for 70 pilots and 100 ground crew in July 2016, after initially selecting the type in 2014.

One Longbow radar crew trainer will also be provided, in addition to the aircraft. An option for an additional 24 Apaches has not yet been exercised.

The AH-64E Apache Guardian, which will be known locally as the Brimstone, has been in service with the US Army since 2013. Previously known as the AH-64D Block III, the AH-64E is powered by more powerful T700-GE-701D engines.

It has an upgraded face gear transmission to exploit the extra power, while new composite main rotor blades increase cruise speed, climb rate, and payload capability. The new model features improved digital connectivity, including the joint tactical information distribution system datalink, and can control unmanned aerial vehicles (UAVs).

Two-tone desert camouflage

The Qatari aircraft wear an unusual but attractive two-tone desert camouflage rather than the olive drab colours worn by US and other operators' Apaches.

At the ceremonial handover on March 14, which was attended by Qatar's Deputy Prime Minister and Minister of State for Defence Affairs, Khalid bin Mohamed Al Attiyah, the aircraft was fitted with its mast-mounted Longbow targeting radar, which had not previously been seen on the Qatari Apaches during flight-testing.

The US Army has contracted Boeing to support Qatar's AH-64E Apache Guardian attack helicopters, commissioning maintenance augmentation team services for the Qatari Apache fleet. Work will be performed in Mesa, Arizona, under the \$49.2 million contract, which will run until July 31 2024.

The Apache Guardian has also been procured by the Royal Saudi Land Forces and Saudi Arabian National Guard and by the UAE, which will purchase nine new-build AH-64Es and remanufacture 28 AH-64Ds to the same standard.

■ The Egypt sale announcement was made by the US Defense Security Cooperation Agency (DSCA) in November.

The Apache Guardian offers improved digital connectivity, with the joint tactical information distribution system, and the new variant is also able to control unmanned aerial vehicles (UAVs).

The aircraft is both a new-build configuration and an upgrade option for existing AH-64Ds.

The 10 aircraft for Egypt will be new-build, but it is probable that the country's existing fleet of about 45 AH-64Ds will eventually be upgraded to the same standards.



Top: The Qatari aircraft wear an unusual but attractive two-tone desert camouflage.

Above: Egypt's existing Apaches may be boosted to AH-64E standards.

The Egyptian Air Force placed an order for 36 AH-64A helicopters in 1995, and these were remanufactured to the AH-64D configuration under a contract signed in 2000, although they were supplied without Longbow radar. Egypt requested a further 12 AH-64D Block II Apaches with Longbow radars through a foreign military sale (FMS) in 2009.

The proposed sale to Egypt was valued at an estimated \$1

billion by the DSCA when it notified Congress. It revealed that the aircraft would be supplied with 24 engines (including four spares), 12 modernised target acquisition and designation sights/pilot night vision systems (M-TADS/PNVIS), as well as 135 AGM-114 Hellfire missiles, communications and electronic equipment, spares, training, and US Government and contractor services.

Congress was told that the proposed sale would contribute to US foreign policy and national security by helping to improve the security of a strategic partner, and that it would not alter the basic military balance in the region.

By expanding its fleet of multi-mission heavy attack helicopters, Egypt will be better able to counter terrorist activities emanating from the Sinai Peninsula that undermine regional stability, while also facilitating greater interoperability between Egypt, the US, and other allies. ■

A new version of Boeing's F-15 Advanced Eagle – the F-15QA – lies at the heart of Qatar's ongoing recapitalisation of its fighter force. **Jon Lake** reports.

AN EAGLE EYE ON THE QEAF'S FIGHTER REVOLUTION

Qatar is replacing a single squadron of 12 Mirage 2000s with at least 96 new fighters – including 36 Boeing F-15QA Advanced Eagles, 36 Dassault Rafales, and 24 Eurofighter Typhoons. This is an unprecedented and unrivalled expansion, but it forms just one part of a wider air force enlargement.

The Qatar Emiri Air Force (QEAF) will also see the acquisition of Boeing AH-64E Apache attack helicopters, NH 90 transport and maritime helicopters, Airbus A330 MRTT tankers and, possibly, Boeing 737 airborne early warning and control system (AEW&C) aircraft.

For many years, the QEAF has had the smallest operational fast jet fighter element of any GCC air arm, with just 12 ageing Dassault Mirage 2000-5 fighters and six Dassault Alpha Jet advanced trainer/light attack aircraft.

This small force is less than half the size of Oman's frontline fighter force of 23 F-16s, 10 Hawk 200s and 12 Typhoons. It was even dwarfed by the Bahraini fighter element, with its 12 F-5E and 21 F-16C/Ds.

Qatar first began to look at potential replacements for the Mirage 2000 in 2004,

though the programme to modernise its fighter arm began in earnest in July 2010, when it formally issued a request for proposals.

Boeing opened an office in Qatar in December 2010 to promote the Super Hornet and the F-15 as solutions to the Qatari requirement, and two US Navy Super Hornets were evaluated in Qatar at the end of August 2012. Two United States Air Forces in Europe (USAFE) F-15Es were flown to Qatar for evaluation in early September.

Split three ways

It was at this stage that *Arabian Aerospace* reported that Qatar's requirement would be for 72 new fighter aircraft, predicting the country would split its fighter buy three ways, purchasing 24 examples each of the Rafale, the Boeing F-15 Advanced Eagle and Eurofighter Typhoon.

Most air forces with a requirement for nearly 100 new fighters would evaluate a number of competing designs and would select just one, with a single maintenance and support infrastructure, and a single training system, realising significant efficiencies, and probably also gaining a lower unit cost through economies of scale.

Some air forces might 'split' such a purchase, perhaps procuring two types with complementary capabilities, or in a high:low mix to give the right blend of capability and mass. Others might want two fighter types as an insurance policy – avoiding the risk of a problem with one aircraft grounding the whole fighter force.

Suppliers from different countries could also be selected to try to guard against sanctions grounding the entire force, or to allow the use of weapons that one supplier would not export to 'country X'. Other air forces might hope to 'buy' influence with two or more states.

However, Qatar has taken things to a new level, purchasing three types of fighter from three different suppliers.

Doing so will bring Qatar the opportunity to train with three air force partners, and to exploit three different defence relationships to help establish its own doctrine and tactics and to build its own mission data sets. All of this is more valuable to Qatar than the cost savings that procuring one fighter would have provided.

Qatar began negotiations with France first, judging that Dassault was the 'hungriest' of the



Looking good: The aircraft are finished in a quasi-civil colour scheme.

**Advance and be recognised:
A Boeing F-15QA in Qatar
Emiri Air Force markings.
Qatar is procuring 36
Advanced Eagles under
Project Ababeel.**



bidder and most likely to give the best deal. It was hoped that a low Rafale price could then be used to strike a harder bargain with the next supplier. A contract for 24 Rafales was signed on May 4 2015.

In November 2016, the US Defense Security Cooperation Agency (DSCA) approved a potential \$21 billion sale of up to 72 Boeing F-15QA Advanced Eagles to Qatar, together with weapons and related support, equipment, and training.

In March 2017, HE Dr Khalid bin Mohamed Al Attiyah, Deputy Prime Minister and Minister

of State for Defence Affairs (and himself a UK Royal Air Force-trained pilot) flew in the back seat of an F-15E Strike Eagle from Seymour Johnson Air Force Base experiencing the aircraft at first hand.

Qatar signed a \$12 billion contract for 36 (not 72) F-15QAs (complete with support packages and weapons) on June 14 2017 and added 24 Eurofighter Typhoons to the mix in September 2017, subsequently adding 12 more Rafales to the order book.

The F-15QA being built for Qatar is an advanced multi-role variant of the two-seat F-

15E Strike Eagle and is broadly similar to the F-15SA supplied to Saudi Arabia.

The aircraft has the same new fly-by-wire flight control system, allowing the installation of two additional underwing hardpoints. It will also feature a new internal wing structure, retaining the aerodynamic profile of the original wing, but gaining a longer life.

The F-15QA will be fitted with an active electronically scanned array (AESA) radar, but reports differ as to whether this will be the AN/APG-63(V)3 used on some upgraded US Air Force (USAF) F-15C/Ds and selected by Singapore and Saudi Arabia, or the AN/APG-82(V)1 radar used by upgraded USAF F-15Es.

Updated glass cockpit

The aircraft will also feature a new, updated 'glass' cockpit featuring the advanced crew station with a large (10 x 19 inch) Elbit wide-area display – a digital multi-function display similar to that found in the F-35 Lightning II.

Reports also differ as to whether the aircraft will be fitted with the new BAE Systems low-profile head-up display (HUD) – a derivative of the company's LiteHUD – or Elop's low-profile HUD.

Project Ababeel will see the first F-15QA airframe being 'joined' in July 2019, and the first six aircraft will then be delivered by March 2021. A further six F-15QAs are scheduled to be delivered three months later, with further batches of four aircraft then following every three months after that.

All 36 are to be in service by the end of 2022, with 53 trained crews.

Some reports suggest that the F-15QAs will be based at Al Udeid, which is undergoing a major expansion, though this cannot be confirmed. ■

SKYDIVING OTTERS FIND A HOME IN QATAR

Qatar has taken delivery of a pair of Viking Air DHC-6 Series 400 (DHC-6-400) Twin Otter aircraft, writes Jon Lake. The aircraft will be used to support the Joint Special Forces skydiving team.

No details were released as to the number of aircraft being purchased or the value of the contract when it was signed by Major General Mubarak Mohammed Al Kamit Al Khayarin, commander of the Amiri Air Force, and Peter Walker, Viking's regional sales director for Africa, Middle East, and Asia Pacific, at Doha Airbase in June 2018. There has been speculation that four aircraft will be delivered.

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Flight Lieutenant Abdullah Al Hadfah, the vice-chairman of Qatar's skydiving committee, said that the Twin Otter purchase had been ordered by Deputy Prime Minister and Minister of State for Defence Affairs, HE Dr Khalid bin Mohammed Al Attiyah.

The aircraft are finished in a quasi-civil colour scheme, like Qatar's first C-17, but wear Qatar Air Force roundels and code letters.

Viking Air of Victoria, British Columbia, purchased

the type certificates for all out-of-production de Havilland Canada aircraft (DHC-1 through DHC-7) from Bombardier Aerospace on February 24 2006, and put the Twin Otter back into production in 2007, establishing a new final assembly plant in Calgary, Alberta. Bombardier had ceased production of the de Havilland Canada DHC-6 Twin Otter Series 300 in 1988.

Viking Air introduced a new Series 400 Twin Otter, equipped with Honeywell Primus Apex fully integrated avionics and more powerful Pratt & Whitney Canada PT6A-34 engines. The aircraft can be fitted with intermediate flotation gear (IFG) to enable it to operate on the loose sand found in the Arabian Gulf region.

Qatar is not the first military Twin Otter user in the region. Viking Air delivered nine Twin Otter Series 400 aircraft to Abu Dhabi's Global Aerospace Logistics (GAL) between 2013 and 2015, for use by the UAE Government under a multi-year service contract.

Some of these have been used for covert transport and special forces support missions by Group 18, the UAE's special operations aviation component, which is now part of the UAE Presidential Guard.

Others are used for parachute training and even civilian skydiving. ■



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www.alsalam.aero

P.O. Box 8012, Riyadh11482, Kingdom of Saudi Arabia

T: +966 11 874 2222, F: +966 11 220 3972

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The Abu Dhabi National Exhibition Centre (ADNEC) hosted the biennial International Defence Exhibition (IDEX) in February. Also taking place in the dock area alongside the halls was the Naval Defence Exhibition (NAVDEX). Alan Warnes was there.

Flare up: A UAEAF&AD C-17A shoots out flares after departing from the tactical display.

PICTURE: ALAN WARNES

BILLION DOLLAR BURST

Around 1,300 defence companies from all over the world were in town as contracts valued at a whopping \$5.5 billion (Dh20.5 billion) were announced during the five-day exhibition.

The biggest, valued at \$1.55 billion (Dh5.73bn), was awarded by the UAE to US company Raytheon for Patriot missile system launchers. This followed a \$350 million (Dh1.3bn) award the previous day for the missiles.

At the moment, the UAE is not developing its own air defence systems, although surely it is only a matter of time as they are urgently needed to thwart any Iranian threat.

While Raytheon is addressing the long-range air defence threat, Germany's Diehl Defence, US company Lockheed Martin and Sweden's Saab launched the Falcon air defence weapon system as a medium and short-range solution.

Falcon has been developed in response to a UAE requirement to replace the older Hawk systems.

The UAE and other Gulf states, like Saudi Arabia, are investing heavily in developing military industries. It's all part of wide-ranging reforms aimed at reducing the reliance on oil, creating jobs for young nationals and transferring technical know-how from western defence companies in defence contracts.



Busy: Around \$5.5 billion of contracts were announced at IDEX/NAVEX, which spanned 130,000sqm and attracted more than 1,300 defence companies.

SPECIAL MISSION FOR UAE'S NEW CHALLENGER

Four years ago, all the IDEX talk was about Saab's huge \$1.27 billion order for two Global Eyes. Two years ago that order was increased to three.

However, although there was nothing that exciting this time around, Saab did sign another agreement with Tawazun, advancing the company's UAE operations that were originally announced in 2017.

Matar Ali Al Romaihi, chief economic development officer of the Tawazun Economic Council said: "We look forward to the positive impact that Saab will have on enhancing research and development through its expected partnerships with numerous educational institutions and small and medium enterprises (SMEs) in the country."

On the subject of special mission aircraft, Tawazun-owned Aquila Aerospace, based at Al Bateen Airport, announced the sale of a new special mission Challenger 650 to the UAEAF&AD on February 19.

The aircraft will update and expand the Emirates' maritime and airborne surveillance and search-and-rescue capabilities. Additionally, Aquila has an option to supply a second Challenger.

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Aquila, with the support of Bombardier's specialized aircraft division, will conduct the modification, integration, testing and certification at the company's Al Bateen modification centre.

Danilowitsch added: "Modifications will meet the UAEAF&AD requirements, including the installation of various sensors, mission operator stations, observation windows, and air operable doors."

He would not be drawn on the variants of electro-optical/infrared (EO/IR) system, the maritime radar or the satellite communications (SATCOM), only saying that they would not be subject to the US international traffic in arms regulations (ITAR).

Aquila chairman, Homaid Al Shimmari, said the company is the first and only modification centre in the Gulf region specifically focused on specialised derivatives of business aircraft.

What affect the Challenger 650 acquisition will have on the hopes of Canada's PAL Aerospace clinching a deal with the UAEAF&AD for its new Dash 8 Force Multiplier is unclear.

PAL claims it as a 'contract ISR platform', designed for domestic and international special missions.

The aircraft would be owned, operated and maintained by the company under a power-by-the-hour contracting system.

It already runs a similar scheme with two Dash 8 Q315s, delivered to the UAEAF&AD in March and April 2012, that fly with the UAE Navy.

Following the public debut of the Dash 8 Multiplier (C-GFMX) at the Dubai Airshow in November 2017, PAL sent the aircraft back to Canada to continue its standard type certification (STC), which was completed in early November.

Keith Stoodley, CEO PAL Aerospace Services, said: "We have had a queue of interest in the aircraft. It is now a fully certified ISR platform, regulated by Transport Canada, which means it can work with anyone anywhere, without the need to get type certification in every country it operates." ■



First look: The Armed Black Hawk was making its public debut at IDEX.

AMMROC LINKS WITH

The Emirates Defense Industries Company (EDIC), hosted arguably the largest pavilion in Hall 4 and was the strategic partner for the event.

One of its main subsidiaries, the Advanced Military Maintenance, Repair and Overhaul Center (AMMROC), a joint venture with Sikorsky and Lockheed Martin, supports much of the UAE Armed Forces' aviation fleet.

AMMROC and BAE Systems announced a memorandum of understanding (MoU) that will see them work together on MRO opportunities, allowing both companies to support the United Arab Emirates Air Force and Air Defence (UAEAF&AD). Primarily the agreement will cover BAE technology on the F-16 fighter and, according to AMMROC chief commercial officer, Tim German, the plan is to develop the knowledge transfer and eventually enable manufacturing of the parts.

In February 2018, BAE Systems was selected by Lockheed Martin to modernise the F-16's head-up displays, replacing the fleet's analogue system with advanced digital technology. AMMROC CEO,

Abdul Hakeem Ahmed Saif Al Muflahi, said: "The potential projects represent an exciting opportunity for both companies to work together in the field of MRO."

AMMROC is also involved in the UAE Joint Aviation Command (JAC) UH-60M Armed Black Hawk (ABH), which was making its first public appearance at IDEX. The company is upgrading 23 of the 24 brand new UH-60Ms ordered by the JAC with weaponized kits.

Officially unveiled

Six ABH modifications have been carried out to date, with the type being officially unveiled in January when members of the Abu Dhabi royal family visited the AMMROC facility. Sikorsky's director, international military programs, Joe Palumbo, said: "The ABH kit adds four external pylons that can carry up to 16 Hellfire missiles or, alternatively, it can be fitted with M134 7.62mm machine guns, GAU-19/A 12.7mm Gatling guns and 70mm rocket pods."

NEW WEAPONS COMPANY LAUNCHED

Tawazun Economic Council (TEC) announced it was investing into a new weapons company – Halcon Systems – owned by the Abu Dhabi-based Yas Holding Group. TEC's Abdulla Al Huwar, strategic technology investments director, signed a funding agreement worth Dh193 million (\$52.5 million) with Saeed Al Mansoori, CEO of Halcon System.

The first phase of the agreement is to set up production lines and further expand Halcon's existing capabilities to cater for local and international market demands.

Al Mansoori said: "The TEC support will help us upgrade our existing production lines, especially the manufacture of the Desert Sting series."

The 100% UAE-owned Halcon will undoubtedly, in future, rival International Golden Group's Al Barij, a joint venture between the UAE Government (51%) and General Dynamics (49%).

Halcon, launched in July 2017, was making its debut at an international defence show and exhibited an array of indigenous weapons. One of the most interesting was the 227kg (500lb) P32 Thunder – long-range air-to-ground weapon.

A Halcon spokesman said: "With extendable wings, it has a range of up to 23kms, which is 5kms more than the wingless version. It is being developed for use on the likes of the AT802 Border Patrol Aircraft (BPA), which cannot provide the speed or height that a fighter can. Underneath is a rocket booster that fires after release."

Elsewhere on the stand was the company's response to Al Barij's 113kg (250lb) Al-Tariq Mk81, referred to as the P31, and the 227kg (500lb) Al-Tariq Mk82, known as the P32. They can both be fitted with a choice of two seeker heads – GPS/INS or GPS/INS and semi-active laser (SAL).



The future's orange: One of EDIC Horizon's two newly delivered Bell 429s was on display in the dock area.

BAE TO GROW MROs

The mini-guns can be mounted in the windows as crew-served weapons, but can also be fired forward by the pilots.

Sikorsky was contracted to qualify and train the JAC personnel during the six-year development programme.

One of the UH-60M's main advantages is the fully digital coupled four-axis flight director. Palumbo said: "It makes piloting much easier than earlier versions."

AMMROC's new 1.5 million square foot facility at Al Ain will be open for business later this year and German spoke enthusiastically about the new facility. "We will have a dedicated Black Hawk depot, five hangars – one alone can house up to eight C-130s."

He added: "AMMROC is out in the world market again and we are looking to stand up the centre of excellence with the backing of our shareholders, Lockheed Martin and Sikorsky, which means we have fixed and rotary-wing original equipment manufacturers (OEMs)

behind us. We are going to look at countries outside of the South Asia, Middle East, North Africa (SAMENA) grouping and also at platforms outside of Lockheed Martin and Sikorsky.

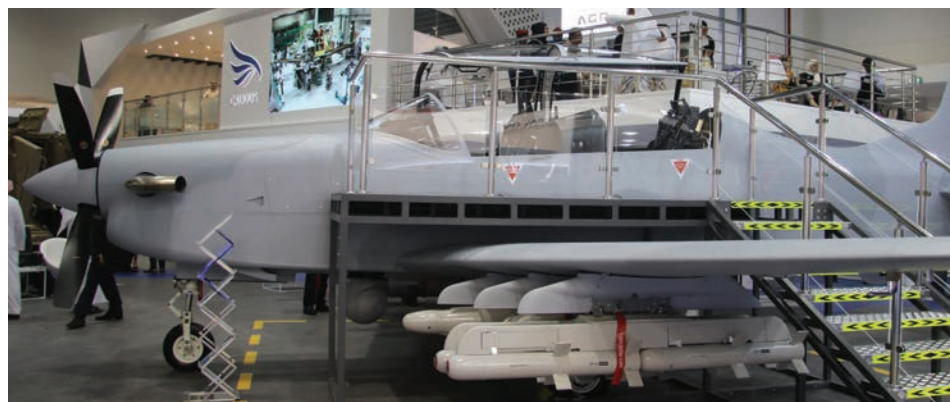
"We have recently upgraded the UAE's C-130s and L-100s with a glass cockpit."

Officially unveiled

Another of EDIC's companies, Horizon, was showing off one of its two new Bell 429s delivered last December.

The Al Ain-based International Flying Training Academy plans to improve its training capabilities by introducing twin-engine courses. Horizon has used Bell helicopters since inception and already has 12 Bell 206 helicopters in operation.

Hareb Thani Al Dhaheri, CEO of EDIC Horizon, is keen to take advantage of being the first player in the Middle East region to offer multi-engine training. ■



Well armed: Abu Dhabi's Calidus B250 showed weapons being developed by Abu Dhabi's Halcon Systems. Under each wing of the newly painted multi-mission aircraft were four Desert Sting-16s, two Desert Sting-35s and a 250lb P 31 Thunder precision-guided missile. On the centre-line station was a 500lb P 32 Thunder precision-guided missile.

CHINA NOW A BIGGER PLAYER IN MIDDLE EAST

China is now emerging as a bigger player in the region because, unlike the US and other western states, it does not stick rigidly to the international traffic in arms regulations (ITAR) that the UAE and Saudi Arabia find so frustrating.

The China National Aero-Technology Import Export Corporation (CATIC) has supplied the Middle East with armed Wing Loong I/II UAVs in recent years, as has the China Aerospace Science and Technology Corporation (CASC) with its alternative and cheaper CH-3/4 Caihan.

Clearly the UAE is keen to forge a closer relationship with the Chinese defence industry.

The Chinese were out in big numbers, showing off capabilities that included air defence systems, UAVs, munitions and aircraft.

The UAE is keen to acquire sophisticated weapons that don't come under the ITAR restrictions like the missile technology control regime (MTCR) annex.

CATIC can now see new markets emerging and was showing its new stand-alone weapon and fire control system (SWFCS) – a universal weapons launcher that allows the integration of Chinese weapons on to western or Russian fighters.

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A spokesman said: "It means that the manufacturers don't need to share the source codes or other sensitive data with us and we don't need to share the weapons information with them."

What makes the SWFCS so special is its embedded inertial navigation system/global navigation satellite system (INS/GNSS) coupled with a computer and a battery that last four hours.

The avionics helps to align the target with the launch of the weapon and a WiFi system allows the pilot to release the weapon.

A portable wireless controller (PWC) supports 24 wireless controllers in the SWFCS, with each controller simultaneously controlling 10 launcher rails.

The spokesman continued: "It is a complete standalone system but we cannot just bolt it on to an aircraft because we need to know the maximum payload of each hard point. The pylon weighs around 200lbs (100kgs) and separation flutter trials would need to be carried out too. The idea is if the customer wants a Chinese smart weapon, we can use this pylon to add them to the platform."

The spokesman added: "The Royal Saudi Air Force commander has visited the stand and said he would need to put the SFWCS through a live flying demonstration using one of their aircraft. The Egyptian Air Force and UAE Air Force commanders have also looked at the system."

Trials were successfully carried out on an AVIC test flight Su-27 during December and January.

On display with the SWFCS was the CKM400AKG stand-off weapon, which CATIC says has a range of 240kms.

It is currently used in the air-to-surface and anti-radiation role but, with integration of an active radar, could be turned into an anti-shipping weapon.

The spokesman concluded: "We have many potential customers for this and the new SWFCS would allow them to buy the weapon for the fighters." ■



Bridging the capacity gap

Thanks to increased passenger demand, air traffic volume has been rising steadily since 2008. EUROCONTROL has predicted a global capacity gap of 3.7 million flights by 2040 if things continue without change. Frequentis' Hannu Juurakko discusses ways the situation could be improved.

Forecasted growth is putting increased pressure on air navigation service providers (ANSPs) to increase capacity while meeting performance, safety and regulatory requirements. And most likely within current financial constraints. With many airports already operating close to full capacity, it's clear that it is not about building more but about working smarter. Capacity concerns can no longer be solved by adding more runways or increasing the number of controllers, ANSPs need to rethink their current workflows to allow more planes to safely fly. So, how can technology support this growth?

Capacity challenge

To solve capacity problems within airports' existing limits the density of air traffic must be increased. However, managing the increasing number of flights with the same workforce adds more pressure to achieve timely and accurate air traffic control (ATC), as well as increasing the complexity for controllers.

As the workload rises and the number of different screens grow, it becomes more challenging for controllers to manage operations efficiently and maintain a clear mental situation picture. Adding more staff to manage increasing traffic is not usually an option due to cost constraints, which includes the expenditure for refitting an entire control room to add additional controller working positions.

To manage new demands within constrained budgets, while continuously improving safety and compliance, the industry needs to introduce a tightly integrated working environment for controllers and more scalable approaches to ATC. By deploying highly integrated workflows across a united set of solutions for monitoring and managing traffic, ATC organisations can increase efficiency—handling more complex operations with their existing workforce.

Time for change

Controllers entering the workforce are accustomed to intuitive and highly flexible user interfaces. In the typical ATC tower today, users must navigate between multiple disconnected solutions, rekeying data and manually stepping through the stages of complex memorised workflows. Controllers expect to be able to switch from one mission to another rapidly and seamlessly, which is typically challenging within the rigid constraints of legacy working

positions. Instead, ATC organisations should link all functional elements via an integration layer, enabling the creation of fully or semi-automated workflows that support the controller in determining the next action. When controllers can focus on what they want to achieve rather than on executing different processes in disparate interfaces, they can fully exploit their skills and experience.

Working smarter

To help controllers focus on the right elements at the right time, the integrated controller working position of the future should provide all required systems, including voice communication, within a compact, highly visual interface that promotes a "clean desk" philosophy. The operator's precise role should determine which modules are made available to them — rather than taking a one size fits all approach. Users should be able to rearrange interface elements to fit their preferred ways of working, creating an intuitive environment across just one or two screens that promote greater situational awareness and safer, more efficient operations.

By deploying an integrated controller working position solution, ATC organisations can bring all essential information and controls into a single, operator focused interface. Choosing a modular solution will help ensure scalability from small use cases such as remote towers right up to large airports. With the availability of solutions that integrate voice communication alongside ATC specific functions, organisations can free controllers from switching between multiple systems, helping them focus fully on safety while guiding traffic efficiently.

Frequentis iCWP® can help airports to stretch capacity limits, optimise runway throughput and simultaneously improve safety. ■

Well connected: Debbie de Beer shows off Cobham's compact AVIATOR S terminal for Inmarsat SwiftBroadband-Safety (SB-S).

The two-day Connected Aircraft event, at the MOC Conference Centre in Munich, Germany, was held recently as part of the aerospace technology week. Steve Nichols was there.



FULL STREAM AHEAD

Avionics, connectivity, cyber security, air traffic management and e-enablement – you name it and the technology was on show in Munich.

The event also featured an extensive exhibition with three conference streams for delegates, plus a smaller stream for workshops.

The conference was opened by moderator Woodrow Bellamy, editor in chief, *Access Intelligence*, who said that in-flight connectivity had moved from being just about satellites and networks. “It’s a real driving force,” he explained.

“One of the exciting things we are working on with Qantas is turbulence forecasting,” he said. “Using high-speed connectivity brings quality graphics to weather reporting in the cockpit.”

“Digital pharma is also using in-flight connectivity to monitor the temperatures of products for confirmation of medicine integrity. We have equipped aircraft with internet of things (IoT) sensors from SITAONAIR to feed information to the ground via an IoT Edge gateway.”

Warren Lampitt, director, flight technical, Air Canada, said: “We’ve seen an explosion in activity in connected aircraft. We are able to use small, very powerful tablets and inexpensive satellite connectivity in the cockpit.”

Captain Jason Brown from Air Canada, added: “One of the key developments is in reducing paper and homogenising all the data in one place. Multiple legacy systems have been affected. There is still quite a lot of work to be done. We

have also worked with Gogo and the Weather Company on crowd-sourced turbulence reporting. We are also looking at predictive maintenance.”

Gogo’s US-based air-to-ground and global satellite communication network is used to send the reports for immediate action in flight operations and weather forecasting.

Traditionally, flight operations personnel, pilots and aviation meteorologists received coded verbal reports with limited information on flight conditions, also known as PIREPS. Due to multiple reasons, including a lack of cockpit data connectivity, pilots were not able to get real-time updates.

Real-time turbulence

Using the Gogo network, pilots are able to access real-time turbulence reports and forecaster-created alerts through Weather Company’s flight planning and operations applications like WSI Fusion, WSI Pilotbrief, and aircraft communication displays.

“We have a lot of work to do to manage our spares and our maintenance teams. The biggest change is the process to get people to see the true benefits of predictive maintenance. One of our staff commented ‘You want me to fix things before they break?’, so there is some education work to be completed,” Brown said.

“We are looking at hardware solutions to adopt better cyber security. We are also looking at a dedicated Wi-Fi network for the aircrew. We

continue to leverage our work with Gogo, but are also looking at SwiftBroadband Safety.”

Mehmet Emin Yildiz, system engineer, avionics and electrical systems, AeroLogic, said his company is also interested in paperless cockpits, with digital charts, maps, electronic technical log books (eTLB), and digital document distribution.

AeroLogic serves as a platform for DHL Express and Lufthansa Cargo.

“L-band [Inmarsat SwiftBroadband] is more than good enough for the amount of data we are sending,” he said. “We aim to reduce our aircraft communications addressing and reporting system (ACARS) data costs by 80%. We are still using floppy disks to update aircraft systems, which can be very problematic. We want to get rid of the physical media and are moving towards moving the data over the cellular network. This will bypass all the hassles we have today.”

“Our moving-map app will replace the paper charts, complete with a plot of where the aircraft is in real-time, by hooking up to the GPS,” he said.

“Real-time weather information will also give a clearer view of current and future weather hazards along the flight plan. This will bring enhanced situational awareness, lower fuel consumption and longer engine lifetime.”

Lisa Gladines, digital services manager, Airbus SAS, said: “Connectivity makes our lives easier, so why shouldn’t it be the same in the air? We’ve implemented

Continued
on Page 72

CONTINUED FROM PAGE 71

new secured technologies to leverage all connectivity opportunities.”

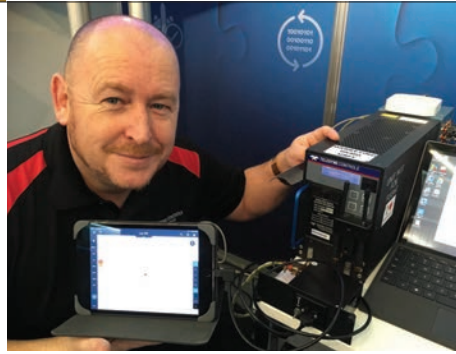
In the main exhibition area, Cobham Satcom showed its compact AVIATOR S terminal for Inmarsat SwiftBroadband-Safety (SB-S).

The small, lightweight, HELGA (HLD and Enhanced LGA) antenna reduces the required number of line-replaceable units (LRUs) on the aircraft from four to two and enables real-time, secure in-flight connectivity.

The Cobham AVIATOR S equipment can provide future air navigation system (FANS) 1/A controller-pilot data link communications (CPDLC) and automatic dependent surveillance - contract (ADS-C) capability as well as IP data to electronic flight bags (EFBs) in the cockpit.

The ACARS and IP data pipes allow network integration with a portfolio of data hosting and transmitting components on the aircraft, such as the on-board maintenance computers and devices used by the crew to service passengers. The system will also meet the requirement for FANS 1/A operation and satisfy expected requirements for NextGen and Link2000+ interoperability.

Teledyne Controls was showing its GroundLink system, which supports multiple applications across operations, providing real-time data streaming, cabin/crew connectivity,



Murray Skelton: “Real-time data streaming over satellite can happen right now.”

wireless data distribution and upload, automated flight operational quality assurance (FOQA) data and more, all through one single unit.

The system’s new GroundLink AID+ feature provides off-board communication, access to aircraft parameters, and data management capability to wired and WiFi-enabled EFBs and other crew devices.

But if you want real-time data streaming, you need a satcom solution.

“Real-time data streaming over satellite can happen right now,” Murray Skelton, senior director of aircraft solution strategy, Teledyne Controls, said. “By the end of the year we will

have 400 e-Enabled aircraft. ACARS-wise it is even more.

But real-time high bandwidth data via satellites costs thousands. Is it actually worth it? “That depends upon you,” he said.

“The trick is to look for potential problems – outliers or measurements that are out of the normal range. Predictive maintenance is a very important tool, but if you can get machine learning or artificial intelligence (AI) on board an aircraft, you can get smarter data off the aircraft.

“This data can be triggered automatically. This is the real growth area for connected aircraft. Not more data, but better data,” he said. “We are looking at AI systems that can process that data while you are in flight.”

But if you have connectivity on the aircraft, what more as an industry should we be using it for?

“Real-time fuel burn optimisation while in flight is a boon. We’ve seen hundreds of thousands of dollars made in fuel savings,” Skelton said.

He said significant cost savings could also be made with ACARS messages that are transferred via cellular and satellite IP-based broadband in all flight phases. This relieves congestion on VHF ACARS networks.

Next year’s aerospace technology week will take place in Toulouse on March 18-19. ■



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PARIS UNMATCHED

It is the world's largest aerospace event and, as industry flocks to the French capital, Alan Peaford explains why the Paris Airshow is so important to Middle East audiences.

It is not just the allure of the world-class cheese and other delights to tease the palate that will draw just about anyone who is anybody in the aviation and defence business to Le Bourget in the northern suburbs of Paris in June.

The 53rd International Paris Air Show will take place from June 17-23, with the first four days being exclusively for the trade.

While the event is organised by the SIAE, a subsidiary of GIFAS, the French Aerospace Industries Association, it is not just about France, or even Europe.

The huge show fetches delegates and exhibitors from all over the world, from long-established manufacturers to start-ups desperate to find funders for their latest disruptive technologies.

North African corner

Growing numbers of exhibitors from the north African corner of the MENA region reflect the increase in manufacturing in Morocco and Tunisia; airlines from the Gulf states have traditionally supported the major manufacturers with orders for the latest models; and the Middle East defence industry joins others from around the world to turn their eyes to the skies to watch fast jets and transporters be put through their paces – an increasingly rarer sight at the major global shows.

There were some 142,000 trade visitors at the show in 2017 with 140 aircraft on display. The 2,381 exhibiting companies came from 48 countries, with 290 official delegations from 98 countries touring the 223,000sqm of exhibition stands and static display ground. It was huge.

Qatar Airways, although in the midst of receiving deliveries of the latest aircraft from both Airbus and Boeing, could be ready for more.

Speaking at the Aviation Africa Summit in Rwanda in February, Akbar Al Baker, the airline's CEO, said he has plans to place an order for new aircraft at Paris.

"We don't have any gaps in our fleet at the moment. What we are trying to do is to order more aircraft to enhance the fleet that we already have. The strategy of



Qatar Airways is to keep our average fleet age young, hence we need to keep ordering aircraft as our aircraft exit our fleet," said Al Baker.

With Boeing anxious to capture the headlines for the right reasons, the show could see the formal launch of the company's planned New Midsize Airplane (NMA), known as the 797 by the aviation industry (and a possible contender for Al Baker's cheque book). It is widely expected to be confirmed at the Paris show, although many thought it would happen a year ago at Farnborough.

Increased interest from China could see the aircraft rolling off an assembly line some time next year.

The NMA will be available in two versions – a 225-seater with a range of 9,300km and a 275-seater with a range of 8,300km, making it ideal for Asia-Europe or Middle East to Africa flights on those routes that demand more than a narrow-body can manage – but without the cost or capacity of the current wide-bodies.

Electrifying: From space rockets to electric cars, the Paris static display has something for everyone.

The Russians could again be stars of the show. Although the MC-21 airliner may not make its international debut this year (three aircraft are now in the test programme) the latest fifth-generation multirole combat aircraft, the Sukhoi Su-57 fighter jet, could make its international debut at the Le Bourget extravaganza.

All-electric prototype

Somewhat quieter, Eviation is reportedly assembling its first all-electric prototype aircraft in northwest France, thanks to an estimated \$200 million in investment. The business and commuter plane, known as Alice, will be on display at the Paris show before heading to Arizona for flight tests.

Expect to see a lot more innovative products – especially in aerostructures. ■ *Arabian Aerospace* will be reporting from the show – if you cannot make it to the event watch out for news on www.arabianaerospace.aero



Saudi Arabia has at last developed the right formula for a major aviation event with the successful launch of the Saudi International Airshow. **Dave Calderwood, Alan Dron, Steve Knight, Alan Peaford and Alan Warnes** report from Thumamah with pictures from **Ian Billingham**

SHOW PASSES SAUDITION WITH FLYING COLOURS



Royal backing: HRH Prince Sultan bin Salman joined HRH Prince Faisal Bin Bandar Al Saud at the show.

Thumamah, just 40km to the north of the Saudi capital, is known for being a peaceful winter camping site for Saudi nationals.

But its airport, with a 4km runway making it one of the top 100 longest in the world, broke the silence with the roar of fast jets, airliners and business aircraft as the first Saudi International Airshow got under way.

Held under the royal patronage of HRH Prince Faisal Bin Bandar Al Saud, alongside HRH Prince Sultan Bin Salman Al Saud, the Arab world's first astronaut and chairman of the aviation club, the event was organised with Adone and 4M Events, who had previously delivered the popular Abu Dhabi Air Expo.

All doubts about the wisdom of building the show in the Saudi desert were swept aside on the first morning with an impressive flypast by the country's air force, showing off the wide collection of aircraft it has available.

A total of 75 aircraft populated the static display, ranging from gyrocopters to massive freighters; fighter jets to business jets – and the latest in commercial airliners.

With some 267 exhibitors and 14,750 delegates representing 57 countries, it was unquestionably a great success, resulting in a promise that it will now hold a regular position on the annual aviation event calendar.

"At Saudi Airshow, manufacturers and suppliers from around the globe presented their latest innovations; political delegations learned about state-of-the-art solutions; high-ranking government officials discovered the technologies of tomorrow; and all delegates maximised the networking opportunity," said show organiser Didier Mary.

"We are extremely pleased with how the inaugural show achieved its goal of further connecting Saudi aviation to the international aerospace industry and enhancing worldwide trade."

MAXIMUS MAKES A HUGE IMPACT

The giant on the static park was the Ilyushin IL76-TD, brought to the show by Abu Dhabi's Maximus Air, which offers outside freight deliveries throughout MENA, Africa, India and beyond.

The IL76 is still unmatched for its ability to operate into airports with few handling capabilities, thanks to its self-contained crane and winch system that can lift a 45-tonne weight.

"A Bell 212 helicopter or two Mi17 helicopters are light work for this workhorse," said charter sales manager Yazen Al Hyassat.



SAUDI INTERNATIONAL AIRSHOW

The first morning included an impressive flypast by Saudi Arabia's air force, showing off the wide collection of aircraft it has available.



A STAR OF THE MEDEVAC WORLD

A bus crash with many people injured, some seriously, in the middle of nowhere? What's needed is a huge ambulance that can travel quickly and close to the scene... something like the ATR-72 600 operated by Alpha Star Aviation Services.

The high-wing twin-engine turboprop French aircraft can land on 'dirty' strips and is big enough to take 10 patients on stretchers, with up to five in intensive care units (ICUs), plus another 30 passengers in seats.

Riyadh-based Alpha Star completed the conversion just a week before the Saudi Airshow, and demonstrated it using mannequins instead of humans. When the ATR isn't on medevac duty, it can be reconfigured as a 64-passenger corporate shuttle.

For more regular medevac missions, Alpha Star also operates a Hawker 900XP business jet, configured for one or two patients with the full ICU equipment including ventilator (with oxygen for up to eight hours), heart monitor, intravenous feeds, and full medication facilities. It can deal with almost any patient from neo-natal or newborn to adults.

THE HELICOPTER COMPANY TAKES OFF

Saudi Arabia's first national commercial helicopter operator, called simply The Helicopter Company, was officially launched at the show. It is backed by \$150 million capital from the Saudi public investment fund (PIF).

Emerging demand for luxury tourism and untapped existing demand for helicopter flights in cities are the two main markets for The Helicopter Company, as well as supporting the development of the overall aviation sector.

CHECK OUT THE GYROS

They may have been the smallest aircraft on display at the Saudi show, but the two-seat gyrocopters manufactured by Germany's AutoGyro company, were attracting plenty of attention from visitors, much to the delight of the country's Royal Guard Paragliding team who fly the aircraft for fun.

Pictured are, from left, Rahdi Al Harbi, Fayed Sumiri, and Al Jarayed Eid Abdullaha.



Rivals benefit from togetherness

National carriers Saudia and the UAE's Etihad may be seen as fierce rivals, but at the Saudi Airshow the heads of both airlines said there were clear benefits from working together.

The two airlines signed an agreement to code share in November 2018 and reported a positive growth in traffic, having jointly flown more than 16,000 guests across the partnership, solidifying their commitment to growing inbound business and tourism in their respective markets.

Etihad's group CEO, Tony Douglas, and his Saudia counterpart, director general Saleh Al-Jasser, toured each other's aircraft and donned the wristbands commemorating the Special Olympics, which were taking place in Abu Dhabi at the time of the show and led to the special livery on Etihad's Dreamliner.



Friendly rivals: Saudia's director general, Saleh Al-Jasser, and Etihad CEO, Tony Douglas, show off their Special Olympics wristbands at the show.

SAUDIA SITTING PRETTY AS MARKET MOVES

Keeping abreast of passengers' changing tastes and demands is essential for any airline wishing to remain relevant in the marketplace, and Saudia is doing just that with its medium-haul aircraft.

Standing in the static park was an apparently normal Saudi Airbus A320. Inside, however, the airline is showing off its newly refitted interiors for a sub-fleet of seven of the European twinjets.

These aircraft have extra fuel tanks to enable them to serve mid-haul European destinations – Rome, Milan, Geneva, Munich and Frankfurt.

The revamped interiors have a two-class configuration of 20 business-class and 90 economy-class seats. The business-class seats are from the Collins Aerospace Diamond range that convert to lie-flat beds, while the economy-class have been renewed with modified versions of Collins' Pinnacle A model.

The aircraft also has a new Panasonic EX1 in-flight entertainment (IFE) system with a six terabyte-capacity that, at present, supports 4,000 hours of entertainment, said Saudia's manager, onboard products, cabin interiors & IFE, Ayman Abuljadayl.



Plenty of amenities: Saudia's manager, onboard products, cabin interiors & IFE, Ayman Abuljadayl, shows off the new business-class cabin on the retrofitted Airbus A320s.

However, the airline has plans to almost triple this to 11,000 hours by August.

"Our plan is to be one of the leaders in IFE, to compete with the biggest airlines in the region and worldwide," said Abuljadayl.

Passengers also have free access to social media – Facebook Messenger, iMessage and WhatsApp – while business-class passengers have a 'dine on demand' facility, where they can eat anything on the menu at any point in the flight.

Two Prime deals for Etihad

Saudi Arabia's Sky Prime, the largest private aviation operator in the Middle East, signed contracts to collaborate with Etihad Aviation Group's engineering and aviation training divisions at the show.

The agreement allows the two companies to collaborate in several areas, from heavy maintenance to cabin modification support, including Part 21J and Part 21G engineering services.

Under the new agreement, Etihad Airways Engineering (EAE) has already delivered C-checks and cabin repairs to two VIP aircraft in Sky Prime's fleet at its MRO facility in Abu Dhabi.

Additional projects are planned over the coming months that will see the engineering team deliver a wide range of engineering solutions to Sky Prime.

As part of the agreement, Riyadh-based Sky Prime will dry- and wet-lease Etihad Aviation Training's (EAT's) full-flight simulators (FFS) at Zayed Campus, Etihad's training facility in Abu Dhabi.

Training will be conducted by both Etihad and Sky Prime instructors. Cabin crew will also receive recurrent training with EAT's cabin safety trainers.

FALCON AVIATION GETS THE NOD ON MRO

The UAE's Falcon Aviation earned approval from Saudi Arabia's General Authority of Civil Aviation (GACA) just ahead of the show to provide maintenance operations on Saudi-registered business jets.

"We have been approached by a number of Saudi business jet operators and have started taking bookings for base maintenance at our MRO facilities in the UAE," said Nicolas Tejera, the company's director of maintenance.

Falcon will soon officially open its new maintenance, repair and overhaul (MRO) base for business jets at DWC Al Maktoum International Airport in Dubai South, adding to established MRO facilities and its HQ at Al Bateen Executive Airport in Abu Dhabi.

The Al Bateen facility is also being expanded to become a leading centre for third-party regional turboprop aircraft MRO, supporting Bombardier Q400 aircraft and other types.

In Saudi to spread their wings: Falcon Aviation's Nicolas Tejera, director of maintenance, left, and Captain Ramon Oberoi, chief operating officer.



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SANG SINGS 'LITTLE BIRD' PRAISES

The first public appearance of Boeing's armed AH-6i – often dubbed the 'Little Bird' – was one of the defence highlights at the show and was an illustration of how impressed the Saudi National Guard (SANG) is with this attack helicopter.

Described as "highly mobile and agile in the mountains, where we need it to operate," the Little Bird – known as the AH-6SA in the kingdom – is believed to have been operational in the war in Yemen.

The six-bladed AH-6SA can be armed with a combination of laser-guided AGM-114 Hellfire missiles, 2.75 inch rockets, GAU-19 Gatling gun and 7.62mm minigun. With one of the latter bolted to each side of the cabin, they can fire an impressive 6,000 rounds of bullets.

The advantage of the AH-6SA is the whole package can cost a fraction of the AH-64D/E Apaches the SANG operates.



On its way: One of the latest AW139s heads for the show

Rocking in the desert...

A Saudi Aramco AW139 soars over the rocky outcrops surrounding the Al Thumamah Airport to take its place on the static of the Saudi Airshow.

The sandy terrain is not an unfamiliar environment for the Leonardo helicopter.

Saudi Aramco's aviation department operates in some of the world's most remote areas. To meet the increasing complexity and sophistication of its operations, the department has initiated a fleet strategy that oversees the replacement of its helicopters and Airbus narrow-bodies with new-generation models.

As part of the fleet replacement strategy, 16 medium-sized AgustaWestland (AW) 139s have been replaced with a new, second-generation model.

With its enhanced range, endurance, hover performance, and safety features, along night vision technology, the AW139 will complement Saudi Aramco's offshore capabilities. It also allows the company to expand its capability to provide a fully functional search-and-rescue programme, enhancing Saudi Aramco's capabilities to respond to safety and rescue emergencies in the varied environments in which it operates.

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APACHES MAKE THEIR MARK

Both the Saudi Land Forces and National Guard were present at the show with the brand new AH-64E Apache.

Saudi Arabia is the biggest export customer for this variant, the most capable gunship helicopter in the world, and features the Lockheed Martin Apache arrowhead modernised target acquisition designation sight (M-TADS) and pilot night vision sensors (PNVS) systems, making life a lot easier for the two-person aircrew during the night.

The updated Longbow radar is believed to have an over-water capacity that potentially enables naval strikes, and the more capable T700-GE-701D engine makes it ideal for hot and high conditions.

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Interiors are getting warmer all the time

The aircraft interiors market is set to reach \$40.2 billion by 2025 with driving factors including increased orders, passenger traffic growth and retrofiting. With the industry seeing such growth, Aircraft Interiors Middle East (AIME) 2019, at the Dubai World Trade Centre, provided the ideal platform for companies to meet with airline representatives.

Marcelle Nethersole reports from the event.

ADHETEC'S FOILS UNFURLED...

Located at the large French pavilion was ADHETEC – designer, manufacturer, and distributor of industrial adhesive films and solutions for the aviation industry.

The company works in two distinct fields – aircraft customisation, and technical adhesive solutions.

“Aircraft customisation is the development of certificated adhesive for mandatory markings and placards, livery and cabin decoration, as well as stencils for painting,” explained Thomas Martinez, aerospace sales manager.

Its technical adhesive solutions for aerospace, also called consumables, provide parts protection and safety of operations, as well as masking solutions.

The company, which has been operating since 1980, was at AIME to particularly highlight its decorative foils for airlines, and was showcasing a seat styled for a B737 aircraft from Italian company, Aviointeriors, decorated with its ADHESKIN.

“Interior decorative elements are the best way to convey an airline’s brand image and to create a unique atmosphere on board,” said Martinez.

Unlimited design possibilities

“The foils have unlimited design possibilities and are easy to apply on cabin monuments, as well as being quick turnaround and cost-effective. We can work from one simple logo to multiple logos, from one single square metre to tens of thousands of square metres – that is the beauty of it.”

Based in Toulouse, the company has two facilities in France, one in Seattle to support its Boeing customers, and one in Montreal to support its Bombardier customers.

“We have also been working in the Middle East for 15 years,” said Martinez. “The region really likes being able to change design logos and images if and when people please.”

Customers in the Middle East include Nile Air, Fly Egypt, Emirates, Qatar, and Etihad, where the company is working on a “nice new interior design” project.

“What sets us apart is that we are a niche medium-sized company, which allows us to be flexible in projects and offer that special custom tailor-made end result,” concluded Martinez. ■



Thomas Martinez: “Interior decorative elements are the best way to convey an airline’s brand image and to create a unique atmosphere on board.”



Sofa so good: Marjan Trobis on the Seattle prototype.

SCHNELLER HAS PLENTY OF FLOOR PLANS

Schneller was at AIME displaying its flexible film laminates, decorative thermoplastics, and non-textile flooring products for commercial aircraft.

“Our innovative lightweight and soft-touch products provide a comfort level that leads the industry, as well as 50% more flexibility, which allows our designers to create the most accepted seating characteristics in the industry,” said Mathieu Lemonnier, sales account executive.

“Comfortable environments, privacy, and technology are increasingly being incorporated into new designs, especially for first-class and private suite areas of the aircraft. Schneller produces solutions that reflect those changes down to the smallest detail.



“We are always upgrading our machinery and equipment, and making necessary upgrades to our facility to increase our capabilities. As the aviation industry focuses more on passenger comfort and experience, our product catalogue includes solutions for the latest advancements, including passenger suites with showers, beds, and dining tables.”

The company is particularly popular for its decorative laminate textures.

“Texture is the element that describes surface characteristics of our product and is an integral part of any design,” said Lemonnier.

“Designers use textures along with colour and pattern to create aesthetically inviting interior spaces.”

The French company, which also has offices in the US and Singapore, works with a lot of Middle East airlines, as well as maintenance, and design centres in the region.

“We are also here with a new generation non-textile flooring especially for the Dreamliner,” he added. “It is matt flooring for the lavatories and the galleys.”

BOXMARK SETS THE BENCH MARK

Manufacturer of high-quality upholstery leather, Boxmark, brought a new design concept to AIME.

“The Seattle is a completely new VIP two-seater bench that we think can be the future of a premium business-class seat,” said Marjan Trobis, general executive manager. “This design proposal is two-seater, a little like a bench or a two-seater sofa. The idea is to reach a better quality with more space between business class and first class.”

The Austrian company has been working in the automobile industry for 25 years – but the company tradition in leather production goes back 200 years.

It only started branching out into the aviation industry four years ago but already counts Emirates and Etihad as customers.

“We work with high-end clients in the automobile industry, including Bentley, Mercedes and Ferrari. These types of customers fly business-class and expect more than just quality; they expect exclusivity and we can offer that,” said Trobis.

“Seattle is an interesting idea that has already

received positive reactions from airlines. It is just a design proposal for the future as we need to bring something new to the market, offering stitching, style and space – space is what you need to feel comfortable in business-class.”

The company was also displaying a new upgrade of economy-class seat that allows the possibility to bring individual design.

Great advertising

“An example is a corporate company can add its logo to the seat covers for a certain amount of time – this could be great advertising,” said Trobis.

The company is also proud to be one of the few suppliers of flame-retarding equipped leather.

Cabin interior has to be particularly hard-wearing and comfortable, as well as safe,” said Trobis.

“Our high-quality products conform to standards and add a particular charm, as well as have great durability and excellent hygienic properties to the interior trim and upholstery of the aircraft.”

MAKING LIGHT WORK OF CABIN COMFORT

LED lighting specialist for aircraft, Beadlight, had a selection of its four main styles of lights on display at the show – slimline, compact, ambient and flexible stems.

“We manufacture LED lights using our patented Beadlight diffusion, which creates the finest LED illumination to read by,” said Gina Amies, director.

“Aircraft seat design requires collaboration across multiple skill sets and, with lighting being a core part of this, we consult with not only the original equipment manufacturers (OEMs) but also aircraft seat designers and airline interiors teams.”

The UK-based company predominantly designs and manufactures LED reading lights for the aircraft cabin, focusing on first and business classes. However, it is now starting to work on premium economy with some airlines too.

Its ambient light for business and first class is particularly popular with customers, especially in the Middle East.

“Our ambient lights have been designed to help create a relaxing environment,” said Amies “We offer table and wall-mounted versions to suit different seat designs and layouts. All lights have a beautifully diffused light source and a variety of switching options. The stylised designs help enhance the overall look and design of the cabin. We can also offer unique ‘signatory’ designs on request.”

“In terms of weight, we produce under 100 grams, but we focus on the depth of the light for installing so that it can be accommodated in small composite panels. Our thinnest light now is 11.5 millimetres – so it can fit into spaces not previously possible.”



Gina Amies: “Aircraft seat design requires collaboration across multiple skill sets with lighting being a core part.”

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Marek Bielowicki: "30% of our work is in the Middle East providing both carpet and seat covers for many of the local airlines."

BOTANY WEAVES A PATH FROM CATWALK TO RUNWAY

It's not just the rich and famous who attend fashion shows. Botany Weaving personnel, for example, make sure they attend the glamorous catwalk shows of London, Milan and Paris to gain inspiration for the company's next aircraft seat, curtain or carpet designs.

"The fashion shows are perfect for us to see what will be new for that year," explained Marek Bielowicki, EMEA sales manager.

"This is how we learn about the latest pattern designs and colours – it is shades of brown and burgundy this year. Like fashion designers, each year we produce a new collection, so it is an important part of our work to attend the fashion shows."

The family-run Irish company began in 1934 and today supplies 230 commercial airlines all over the world.

"Aviation is 95% of our business, while the rail industry is the rest," said Bielowicki.

"We are approved by Boeing, Airbus and the Irish Aviation Authority. Boeing has awarded us its gold approval for quality and on-time delivery."

The company, which has three facilities in Ireland, one in Spain, and will shortly open one in the US, has 30% of its work in the Middle East. It provides both carpet and seat covers for many of the airlines including Qatar Airways, Flydubai, Emirates, and Kuwait Airways.

"People come to us because we are flexible; they like the way we design and provide a service," said Bielowicki. "As a small family run business, the decision process is quick, unlike that of a big

company. Customers just need to make one call and we are on it. Also, financially we are competitive."

While airlines are often very much focused on saving weight on the aircraft, this apparently is not the case for wide-body jets.

"It is not always about being just lightweight, although this is still a big factor for low-cost airlines and short-haul. For wide-body, long-haul durability is most important," explained Bielowicki.

Nylon direction

"We see more and more airlines going in the nylon direction as it is very durable, although it is difficult to clean – so there are pros and cons for all fabrics."

One of the company's latest offerings is printed carpets.

"With printed carpets, customers can have any design," said Bielowicki. "It just works like a home printer, so if you want a particular picture on your carpet you can have it. This is proving popular in the US.

"For an example, they can have a temporary design such as an NBA team to celebrate something. It can be on for a month, then change the design."

Bielowicki said the Middle East is a "very different" market when it comes to designs.

"Middle East airlines used to like more ethnic and local designs, but now that they connect to destinations all over the world, they want to be more flexible and more modern to customers – although, they do still like their golds, reds, and blues." ■

COUTURE HERITAGE COMING TO LIFE

Creation & Image Paris was representing the 'fashion corner' at AIME. The Paris-based company is skilled in the design and production of many of the crew uniforms you may see on board an aircraft, including Oman Air, Kuwait Airlines and Gulf Air.

"We have been providing uniforms or, image wear as it is known, since 1985," said Melissa Kohlbray, sales development manager.

"We offer a one-stop-shop approach for a seamless integration with each organisation, from deep analysis of the client DNA to the follow-up uniforms distribution of the staff, and we have developed a real expertise to highlight the corporate image of each client through our uniforms.

"It is all about balance and creativity. It needs to last and appeal to the client, along with being high quality."

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The company has its own design team and garment makers. "Our designers were picked due to their cultural backgrounds as well as their expertise," said Kohlbray. "For each project and client we can bring different touches and styles to the present climate. Our proto-typists and garment makers then transform a silhouette into a pattern. It really is couture heritage coming to life."

A 'fun' part of the team's job is also to sample the uniforms themselves.

"On my first day, I had to try on one of the uniforms. We are all different shapes and sizes, so we all try on the garments for the right fit. We can then offer feedback to the tailors and then we readjust on the patterns," said Kohlbray.

"The next process is the real prototype and size set, where we produce all the sizes from a size 6-18, and the team will try them on. The customer places an order once validated." ■



Melissa Kohlbray: "We have been providing uniforms since 1985."

HAMBURG IN THE COMFORT ZONE

The Passenger Experience Week took place in Hamburg in April incorporating Aircraft Interiors Expo (AIX), World Travel Catering & Onboard Services Expo and Passenger Technology Solutions. Steve Nichols and Alan Peaford report from the combined events.

Hamburg has become world central for the aircraft cabin business and all that goes with it, so it was no surprise that the airlines flocked to the north Germany city.

CEOs like Emirates Sir Tim Clark and Qatar's Akbar Al Baker were making incognito tours to see the latest innovations that will keep their respective airlines at the top of the ratings.

While in the past their focus may have been on those prestigious premium cabins, there is a clear indication that, more lately, it is the back of the cabin that may be of interest.

Economy-class overhaul

At the ITB fair in Berlin in March, Al Baker talked about an economy-class overhaul that includes additional legroom, faster broadband, and a new menu, as well as a new economy seat designed by Italian company Optimares.

The seat – which features a 19-degree recline, adjustable lightweight headrests and dual trays, as well as 13.5in seatback IFE featuring 4K widescreen with more than 4,000 entertainment options – will debut next year, initially on the carrier's Airbus A321neos, before rolling out across the entire fleet over five to eight years.

Al Baker said the lengthy introduction was because of the young age of its fleet.

“We have a lot of aircraft that are very young and we cannot really remove the already very enhanced and comfortable seats,” he said.

The use of narrow-bodies on longer routes has also identified the need to step up the premium offer.

Airbus said it is in the process of developing a simplified, lie-flat business-class seat for the A320-family that will fit into existing economy structures.

The design enables double occupancy during cruise but can switch to a sofa seat. Airbus' Amalia Martinez-Martin said at the show that the seat is lighter than a standard lie-flat business-class seat and could be available by 2021.

Another exhibitor, Butterfly seats, was showing a concept where the two business-class seats can convert to a single suite with a lie-flat bed in just 10 seconds.”

“It gives you the best of both worlds,” said Butterfly's co-founder, Lars Rinne. “It can be a regional business-class seat by day and all aisle access flatbed by night to really bring flexibility to the narrow-body operations.”

An unnamed Middle Eastern airline has selected Haeco's Eclipse hybrid seat, designed as a premium economy seat on wide-body aircraft or as premium product on single-aisle types.

Back in economy, Avointeriors was offering a new design for its Skyriders



Sitting comfortably: Airbus' Amalia Martinez-Martin shows off the "corner settee" seat for the A320 family.

concept. Working to a 25in pitch, short-haul low-cost carriers can add passengers or create greater differentiation between the economy offer. Although far more upright than existing "seats" the latest Skyriders adds coat hook (simple or push), back-rest modular configuration (extra-pocket or table installation) with the added advantage to the airline of reduced components and, therefore, fewer maintenance costs.

Multi-class configuration

“While a standard economy seat ensures the maximum capacity only in all economy-class arrangement, Skyriders allows the airline to fill the aircraft cabin with the maximum allowed number of passengers, per type certificate, in a multi-class configuration,” the company said.

The future for in-flight connectivity was also drawing attention. Transmission of data through light waves, instead of radio waves, will improve the speed of data transfer and reduce the risk of hacking, according to AeroLiFi.

AeroLiFi managing director Birger Timm said: “LiFi is perfect for the aircraft cabin. It requires minimal physical infrastructure and provides stable and consistent data transmission.”

He believes the system could be ready for certification within two years and that



because of its security advantages there has been interest in the system for flight critical-applications on the flight deck.

Panasonic Avionics unveiled a range of new products and services.

These included Arc, a new integrated moving map and data analytics platform, which can be integrated with the company's loyalty personalisation programme, Marketplace e-commerce solution, and its new Insights data analytics service to provide a 3D immersive map experience that is tailored to individual flights and passengers.

It will also tie in with Panasonic's Wellness solution to provide recommendations to minimise the effects of jetlag by calculating time zones crossed.

Etihad Airways is to become the first airline to trial Panasonic's Jet Lag Adviser, which was developed in collaboration with Detalytics.

Jetlag is one of the biggest challenges passengers face when travelling across multiple time zones. Jet Lag Adviser takes a range of passenger inputs including chronotype, circadian rhythms, height, weight, the nature of travel. It then taps into travel information, such as flight times, routes and zones, and uses its artificial intelligence engine to produce personalised jetlag plans with tailored advisories for passengers.

Passengers will receive a combination of generic route-based and personalised 'jetlag impact scores' which give them a summary of how severe jetlag may be on that route in general and their own travel specifically.

The personalised jetlag plan incorporates the pre-flight, flight and post-flight phases, and provides a schedule of different recommendations and tips for specific times in each phase, such as sleeping, exposure to light, exercise, hydration, and the type of food to consume.

Data analytics platform

Panasonic also announced its new cloud-based Insights data analytics platform, which combines on-board and third-party data from in-flight entertainment (IFE), connectivity, social media, location and weather monitors.

It then analyses the data in real time to provide a more personal in-flight experience and better targeted in-flight sales.

The company also announced that it is to begin its eXtreme Throughput Satellite (XTS) service with the launch of the Apstar 6D satellite later this year. This will bring connectivity speeds of up to 250 Mbps, a 20x times increase on its original Ku-band connectivity.

It said it is in talks with other satellite providers for two more XTS satellites

New approach: Aviointeriors was offering a new design for its Skyrider concept.

Right: Birger Timm has seen the light for improved cabin connectivity.

over Europe and North America and expects to make an announcement later this year.

Etihad Airways also announced it is to upgrade its Bluebox Ai iPads to include Bluebox aIFE – the company's accessible IFE platform for visually impaired passengers.

Bluebox will shortly update the current iPads, allowing visually impaired passengers to enjoy the same IFE content as is provided to other passengers via the seat-back IFE.

Gulf Air announced it is implementing the Collins Aerospace GlobalConnect managed digital service to support its new fleet of 30 Airbus A320neo aircraft.

As airlines shift toward all-digital operations, GlobalConnect keeps operators connected to their aircraft by deploying the infrastructure for secure wireless connectivity.

■ Turkish cabin interiors company, TCI, announced an agreement with Airbus to become a bar unit supplier for the A350 XWB aircraft.

TCI – a joint venture between Turkish Airlines and TAI (Turkish Aerospace Industries) – produces aircraft galleys and plans to extend the product range with other cabin interior items in the near future. ■

The leasing market offers MRO providers new opportunities as well as challenges: whether they benefit will depend on a company's flexibility, expertise and customer service. Sami Ben-Kraiem of MTU Maintenance explains all to Chuck Grieve.

Market offered a new lease of life

The future of MRO is inextricably linked to the aircraft leasing market. That's the view of Sami Ben-Kraiem of MTU Maintenance... and he should know.

As vice-president marketing and sales across the Middle East and southeast Asia for the Hanover-based engine specialist, he's been tracking the shift from owned fleets to leased fleets.

This regional market presents unique challenges to an MRO provider, Ben-Kraiem said. With a few exceptions, operators tend to be smaller than their counterparts in Europe or North America, with more variation in their fleets and lower average aircraft age, making long-term maintenance planning complicated.

"Airlines here are still in growth mode," he said. "The number of aircraft on order is greater than the existing fleet."

Engine removals

But, despite the overall fleet size, it's a strong MRO market. For one thing, he said: "We see many more engine removals here, compared with other regions, driven by the harsh environment. This makes it attractive for MRO providers."

Hot and sandy conditions lower the time on-wing of engines, but an experienced MRO, such as MTU, can maximise it. "We've accumulated a considerable level of knowhow and experience," said Ben-Kraiem. "We know how to work on engines coming from this region; how to refurbish them so they are more reliable after a shop visit."

MTU holds approvals on a range of popular medium and large commercial engines from OEMs including GE, Pratt & Whitney, IAE,

Engine Alliance and CFMI. Its shops span the globe – and it is expanding everywhere, increasing capacity by around half in the next 10 years.

The Middle East market is moving away from the traditional approach of investing in aircraft toward leasing, which can make it easier to renew a fleet as and when the market requires. "Even flag-carriers recognise they need to look beyond purchasing aircraft and keeping them for life," said Ben-Kraiem. "It's more about having the right equipment. This changes the game. It automatically brings a third partner into the equation

"So we're not only serving the airline operating the plan, but also the lessor, who owns it. In most cases, we're helping both by making sure there's a stable process across the lifecycle – a win-win-win situation that benefits everybody."

By planning for returning the aircraft from the point of taking delivery, operators can minimise the "significant cost" of an end-of-lease refurbishment. "Because we understand end-of-lease requirements, we can advise what programme they require so they can return the equipment without the need for an extra shop visit at the end of the lease. And we guarantee that."

This adds value to both operator and lessor who, when he sees an MTU tag on the engine, "feels comfortable that he can remarket the engine".

MTU is increasingly focused on this area, said Ben-Kraiem.

The harsh Middle East operating environment shortens the intervals between services for engines as well as airframes. The increased

frequency of engine removal, compared with European operations, forces airlines to carry a high ratio of spare engines.

"We see operators having 15-20 spares to serve one fleet – double what an operator might need in Europe," said Ben-Kraiem.

"This is a significant number. Most of these engines have to be purchased. It's a big cash commitment at the beginning of the fleet's operation, which is a critical time for most airlines in the region."

Joint venture

In response, MTU leveraged its own healthy financial position to join Sumitomo Corp of Japan in a joint venture to support airlines with financing of their spare engines. The company, Sumisho Aero Engine Leasing (SAEL), became a subsidiary of Sumitomo Mitsui Finance and Leasing (SMFL) in April after SMFL acquired 65% of its shares. Expansion of SAEL's activities is planned.

Ben-Kraiem said the engine sale and leaseback option that SAEL offers customers has proven popular, even with large renowned carriers. MTU has a 10% share in the venture.

"We always take the MRO perspective," he said. "If we can make a reasonable offer on the financing side to support an operator who enters into a long-term engine MRO relationship with us, then we are generating business for the company and supporting the customer as well."

Working through SAEL and MTU Maintenance Lease Services, a further 80/20 joint venture with Sumitomo specialising in spare engine support and asset management,

Even
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for life.

SAMI BEN-KRAIEM

has given MTU its own unique outlook on leasing, he said. Where a lessor will typically focus on the lease transaction, MTU looks at the bigger maintenance-related picture. "That makes us behave in support of the lease with attractive rates.

Business partners

"We think the future will go more and more in that direction. We see lessors increasingly as important business partners and customers; that's why we're looking to open new offices in Singapore and Dublin – so we can be close to the leasing community there."

At the same time, he said, the company keeps close tabs on the needs of its MRO customers and airlines. A tangible result for the Middle East will be a new MTU Maintenance office in Dubai.

"We want to be here in the region to bring customer support closer to our customers; to be responsive to this dynamic and very demanding market," said Ben-Kraiem. "Our commitment is to be where the market requires us." ■

WHY LESSORS FIND MROs 'DIFFICULT'

Dealing with MROs can be "extremely difficult" for leasing companies, the audience at the MRO Middle East summit heard.

Speaking in a panel on leasing, Peter Wenham, executive vice-president, technical, of Novus Aviation Capital, said relationships between lessors and MROs were important but could be difficult to develop if, for example, a small lessor was only taking one or two aircraft for return checks every two-to-three years.

"From our point of view, dealing with MROs is extremely difficult because we have no leverage," he said. "What I would like to see is an MRO, somewhere in this region, where a meaningful relationship is struck, perhaps between a group of lessors and the MRO, where we could spread out the different needs of the lessors."

Smaller players "don't have enough product to get good MRO response", he added.

His fellow panellist, David Lewis, senior vice-president and manager of GECAS, agreed, but suggested MROs shouldered some of the responsibility by failing to account for the difference between their normal work, such as C-checks, and return checks.

"We've had some terrible experience of this where MROs just don't deliver the products to the required quality, schedule and price," he said.

"There's probably room for me to better prepare for a return check. But [the MRO] shouldn't be surprised at the time; they should be able to better predict what's going to happen."

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The "biggest problem" with balancing the old operator's focus on cost and the new operator's desire for, in effect, a new aircraft, is the new lessee's complete lack of involvement in the preparation of the aircraft. Lewis suggested an inspection by the new lessee half-a-year before the transition to work out what needed to be done to the cabin. More realistic commercial expectations would also help to "get the aircraft out on time".

Wenham said the aircraft lessor usually has no control over which MRO performs the end-of-lease checks. "It's down to the lessee which facility it chooses," he said. "We sympathise with MROs as well. We need to find a solution." ■

*Joramco is attracting attention in civil aviation circles, thanks to a well-planned transformation programme. But can the Amman-based MRO provider deliver? Absolutely, CEO Jeff Wilkinson tells **Chuck Grieve**.*

Inside Joramco's transformation

In a bullish aviation market, Joramco chief executive, Jeff Wilkinson, has good reason for optimism. "If I had more space, I could fill it," said the head of the Amman-based independent maintenance, repair and overhaul (MRO) operation. "I've never seen anything like the last year."

Wilkinson reels off a list of customer airlines that would delight any MRO. "We've had 10 national flag-carriers in our hangar this year, seven at the same time," he said. "Seven of our 15 bays held aircraft from different major fleets, ranging from Airbus A320/340 to Boeing 787s.

"We've never been as positive as we are now."

Wilkinson and his team have overseen a dramatic transformation at Joramco that left no area of its operations untouched. And the industry has noticed. "Since the last MRO Middle East show, Joramco has become a totally different company – people are amazed," said Wilkinson.

Transformation management office

"We set up a transformation management office, headed by experienced industry professionals. They've brought in new processes, procedures, facility improvements, tooling, equipment and branding – the white and blue as opposed to the old red and gold of Royal Jordanian."

Staff have new trade-specific uniforms and new canteens; customers have a new world-class customer support centre.

"Flag-carriers trust Joramco," said Wilkinson. "Some of our airline customers have what are widely regarded as the best cabins in the world. They don't take their aircraft to somebody who can't look after them."

Joramco started life in 1963 as Royal Jordanian's engineering unit. It was privatised in 2005 and Dubai Aerospace Enterprise (DAE) acquired 80% ownership in 2016. It operates from a free zone at Queen Alia International Airport on the southern outskirts of Amman.

Its five hangars can accommodate 15 full lines of maintenance, combining wide-body and



Jeff Wilkinson: "Joramco is in a very good place."

narrow-body types from Boeing, Airbus and Embraer. It is approved by the European Aviation Safety Agency (EASA), the Federal Aviation Administration (FAA), the Jordanian Civil Aviation Authority (CAA) and 22 other international authorities.

Wilkinson came on board as chief executive in October 2017 from a similar post at Etihad Airways Engineering. He was followed by new chief operations and commercial officers who, alongside the long-serving chief financial officer, completed the C-suite. He quickly set about establishing the priorities of the transformation.

"What Joramco lacked," said Wilkinson, "was a long-term strategy for where they wanted the business to go.



"Our business is now focused on high-yielding flag-carriers and tier-1 airlines. Another area we are focusing on is low-cost carriers which, given their scale and size, are a key element of our future strategy."

Joramco benefits from a geographical location ideally suited to capturing business from a wide radius covering Europe, Africa, the Middle East and India, plus a strong, flexible and experienced local workforce.

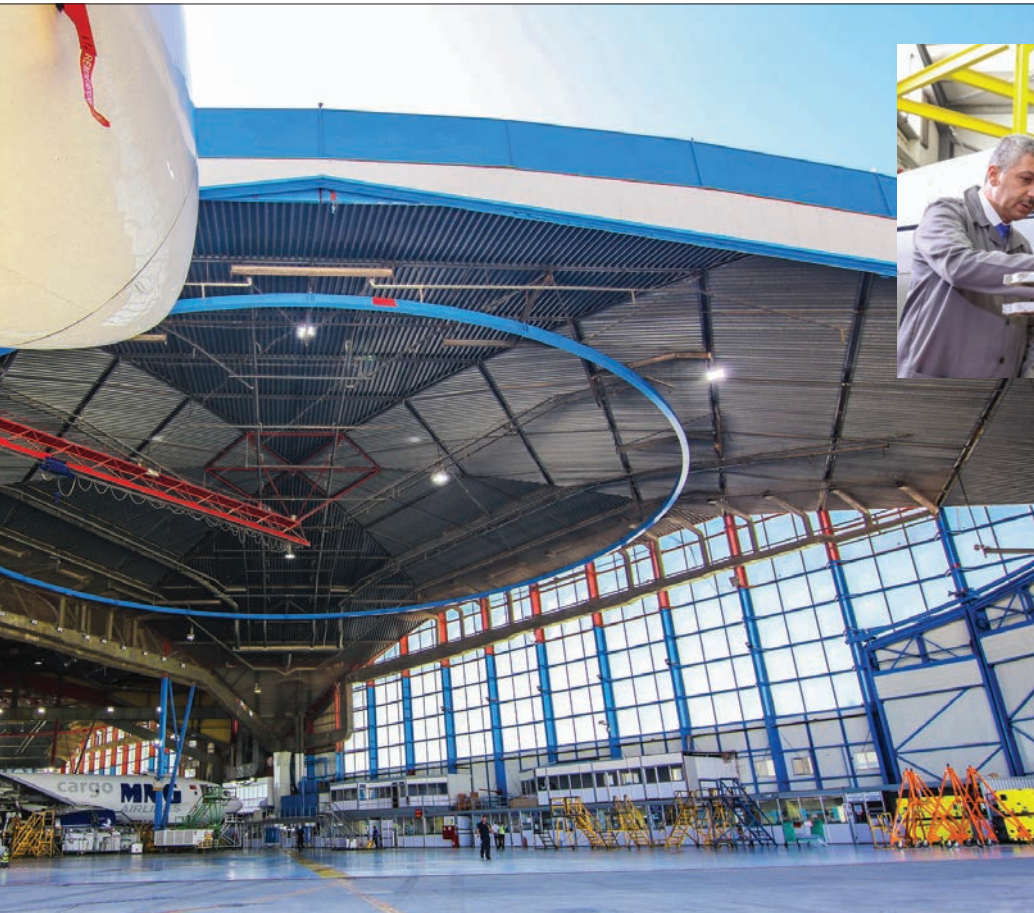
World-class processes

Wilkinson insists what he and his team have done is not rocket science: it's simply a case of installing and adhering to world-class processes and systems. The hangars are full, in part, because of the natural commercial cycle.

And it's not just Joramco. Looking around at the MRO Middle East show, he said: "Every MRO at this exhibition is full. There are more aircraft out there than slots available.

"As well as heavy maintenance based on fleet cycles, we have aircraft parked between leases and lease transfers, and we also manage entry-into-service programmes. If I had more hangars, I would fill them."

That, he said, is the biggest debate at the moment. He is in discussion with DAE about increasing capacity to capitalise on opportunities in the region. Even DAE, with its backlog of leased aircraft, is becoming a significant Joramco customer.



Something for everyone: Joramco's hangars can accommodate 15 full lines of maintenance on both wide-body and narrow-body types.



Great opportunity: Joramco's academy could "easily turn out double the number of apprentices".

TALENT POACHERS TURNED PARTNERS?

Joramco's record as an employer of its own local population is the envy of many in the Middle East. It's also an occasional problem – and potentially a huge opportunity.

"Our biggest risk is poaching by the Gulf 'big three'," said Wilkinson.

Apart from a small number of direct reports, Joramco's workforce is entirely local, which makes it one of the largest private employers in Jordan and provides extensive opportunities for the next generation of workers.

Its training school turns out 40 apprentice technicians a year, who are trained up to licenced engineer level. Air Service Training (AST) of Perth, Scotland, handles the licensing side under an affiliation agreement.

"We want to train more mechanics than we need," Wilkinson said. "We're looking at how we can double or triple the number of apprentices. You have to take the long-term view."

As a step in that direction, Joramco has signed partnerships with Royal Jordanian Air Academy and Luminus Technical College.

What Wilkinson would relish is turning the Gulf poachers into partners.

"I'd love to get in a room with the bosses of these airlines and say, rather than just coming and poaching, let's do agreements. I'd invite them to interview and select candidates; we'd train them and at the end of four years they'd get individuals with hands-on training and experience who can go straight into their business."

One problem, he said, is that aircraft maintenance is not "sexy" to a younger generation, who have grown up on a steady diet of colourful pictures on their smartphones and tablets.

"In the MRO world, you still collect your tools and manual, take them into the shop for the job. The next generation isn't going to do that. They'll expect to be using virtual or augmented reality (VR/AR) pictures. That's where we need to go – that's how we'll attract and keep people.

"Airlines and MROs are guilty of glamorising the job with photos, such as a technician sitting in the cockpit with the captain and an iPad. In the real world, how often is that technician ever going to be in the cockpit? It's about managing expectations.

"What we emphasise with our young Jordanians is hands-on skills. That's what they grow up with, and it's a huge benefit for Joramco. We could easily turn out double the number of apprentices we do today." ■

Such is the demand for slots that customers are now looking to book a year ahead. "A year ago, I was here in February taking slots for April," said Wilkinson. "I don't think there's been one person coming in today asking for a slot in April. They want to discuss October through March and beyond."

He was also seeing demand for multi-year deals, and confirmed that premium customer, Gulf Air, had just renewed its exclusive contract for C-checks and ad hoc maintenance on its fleet. The contract runs for an additional three years and secures Gulf Air valuable maintenance slots.

The challenge to MRO management is similar to that faced by airline management, said Wilkinson – to maximise the use of your assets – except they're dealing with hangars and shops, not seats and belly hold capacity.

"At what point do you say 'stop, let's wait until the space fills up and command a premium'?"

That point, he said, is coming: "We may be forced to turn away work. The difficult decision will be which customers to take on a long-term basis."

Commercial aviation is going through its full seven-year cycle and, in many areas, the cycle is extending longer, he said. It's a bullish market at the moment and prices are going up. At some stage, airlines will likely decide it's cheaper to maintain and service their fleet in-house.

But at the moment, he added, the MRO market is "crazy to the point where, if we could buy another MRO as Joramco, we'd consider it".

Wilkinson said Europe is today "more in play" because of the demise of Monarch and Air Berlin and the well-documented problems of other airlines. But it's an ill wind that blows no good, and regional MROs are reaching capacity.

Opening facilities

For Joramco, opening facilities at King Hussein Airport in Aqaba and Marka Airport in Amman – the home of Royal Wings until it ceased operations last November – are worth consideration.

Joramco could "easily" fill another three bays. The big push now is gearing up to handle heavy checks on the Boeing 777 fleets of several flag-carriers now on the horizon. The MRO is also building its back shop capabilities for components, and has plans for a dedicated paint hangar.

"Jordan is one of the region's best-kept secrets – that's what we're trying to change," said Wilkinson. "We have a low cost base, so as long as we stay competitive and keep productivity high, Joramco's in a very good place.

"We're a double-digit multi-million-dollar business. We need to take it to triple digits in the next three years. That's our mandate." ■

*The MRO industry in the Middle East faces challenges if it is to keep pace with the burgeoning growth in the region's aviation sector. The MRO Middle East summit and exhibition presented delegates with a range of solutions, as **Chuck Grieve** reports.*

Debra Santos said she “learned a lot”. Konstantyn Shyshkin said it was a “perfect platform”. Comments like these, from opposite ends of the industrial scale, help put 2019's MRO Middle East exhibition and summit in perspective.

The two-day exhibition, co-located with Airline Interiors Middle East, attracted more than 5,000 visitors to Dubai World Trade Centre in February, with about 150 attending the one-day summit – for good reason.

Figures cited by the organisers put the expected annual growth of the Middle East fleet up to 2027 at 6.2%, with the region expected to generate \$100 billion in MRO requirements over the next decade – 10% of the world's total demand. Understandably, exhibitors and speakers were keen to showcase their innovations in technology and services.

Santos, chief marketing officer, commercial services for Boeing Global Services (BGS), and herself a summit panellist, was “impressed” with the industry issues brought out. “I was engaged the whole time.”

Raise awareness

Shyshkin, chief executive of Spiral Technology and a first-time speaker and exhibitor, said the event gave start-ups like his the opportunity to gain visibility and raise awareness of breakthrough technologies among airlines and MROs in this region. “This event is a great combination of conference and exhibition; we've seen how committed the industry is to innovation and to trialling new technologies.”

Victoria Nicholls, media relations and marketing manager of MTU Maintenance, said the exhibition seemed busier than in previous years. “Long-term partnerships are very important in this market, and MRO Middle East helps us build relationships with key people,” she said.

Robbie Bourke, vice-president of Oliver Wyman, set the scene for summit delegates with his regional analysis and forecast, which identified labour shortages, fleet life, original equipment manufacturer (OEM) production issues and airline cost pressures as the key challenges facing aviation in the Middle East.

The ongoing labour shortage is “particularly acute” in the region and is pushing wages up, he said. MRO operators surveyed said attracting new

GROWING TOGETHER...



Debra Santos: Impressed with industry issues raised.

entrants into engineering was the biggest challenge they faced.

Not surprisingly, there is “a preoccupation” with the feared impact of OEMs entering the aftermarket with aggressive targets for growth and market share. Most observers think their targets are unrealistic; leveraging advantages such as intellectual property (IP) will help OEMs come close to target, but so will the growth of the aftermarket.

Speaking later to reporters, Bourke also suggested Middle East MROs are in a good position to capture work from European and north African customers. Where many European airlines now fly to southeast Asia to get maintenance, the challenge to the regional industry “is to develop a reputation for cost, quality and convenience so they

don't fly 12 hours to Asia, but four to six hours to the Middle East”.

Mansoor Janahi, acting chief executive of Abu Dhabi-based TS&S Aerospace, said OEMs entering the aftermarket was an opportunity for independent MRO providers such as his company. OEMs “can only do so much” toward building their own MRO networks in support of operators, he said. “We partner with OEMs and become their gateway into the region. That's the way forward for us.”

And it's a two-way street. By being part of an OEM's global alliance, TS&S receives engines from Asia and South America to service. An independent “needs constant dialogue” with the OEMs, he added.

Fit seamlessly

Addressing summit delegates on innovation, Arun Chhabra, chief executive of 8tree, a specialist in surface inspection tools, said any successful new technology had to fit seamlessly into the role it was designed for – “tailored so the workflow and processes don't have to be changed.”

Companies should “pressure your providers to make tools that work for you, not repurpose tools they've already developed,” he urged.

There are barriers to adopting new technology, security being one of them. “Offset the risk by relying on experts,” he suggested.

Co-panellist Shyshkin said advanced technologies, such as artificial intelligence (AI), should be treated as enablers, not standalone tools. The mixed reality (MR) software being developed by his company, building on virtual and augmented reality (VR/AR) to make the real and virtual worlds interactive in real time, could offer “incremental improvements” in performing maintenance tasks. But it's still evolving, which makes the calculation of return on investment (ROI) a case-by-case consideration. ■

Konstantyn Shyshkin: Industry is committed to innovation.



Dubai deals highlight KSA demand for MRO

A strategic partnership between Estonia-based Magnetic MRO and First Premium for Support Services (FPSS) of Jeddah is expected to provide a much-needed injection of independent MRO services in the Saudi Arabia market.

Signing the memorandum of understanding (MoU) at MRO Middle East, Sheikh Ghassan Attar, owner and chief executive of FPSS, said it would "provide us with a substantial boost in supporting the needs of our aviation clients and bring us to a leading position in the aircraft maintenance market of Saudi Arabia".

The two companies are to establish and develop wheel and tyre, brake, oxygen refill and battery shops in Jeddah. No opening date had been set.

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The partners are also planning a European Aviation Safety Agency (EASA)-compliant technical training school, a hub for engine stands operated by Magnetic MRO's subsidiary, EngineStands24, and EASA-compliant line and base maintenance facilities at the new Jeddah airport. Line maintenance services were to begin in March.

Magnetic MRO chief executive, Risto Mäeots, said the new partnership is in line with his company's vision of supporting the growth of the Middle East aviation industry by providing Saudi airlines with access to its high-quality services and innovative solutions.

Elsewhere, Saudi owners will be able to have their aircraft maintained in the UAE after Falcon Aviation and Lufthansa Technik (LHT) both gained approval from Saudi Arabia's General Authority of Civil Aviation (GACA) for out-of-



Signed on the dotted line: Sheikh Ghassan Attar, owner and chief executive of FPSS, with Magnetic MRO chief executive Risto Mäeots.

country MRO on Saudi-registered aircraft.

Falcon Aviation said it expected to book its first Saudi-registered business jet and regional aircraft into its MRO bases in Dubai and Abu Dhabi this spring. Nicolas Tejera, Falcon's director of engineering, said it was "a significant endorsement" and strengthened Falcon's market reach.

The endorsement came as Falcon completed a new MRO facility for business jets at Mohammed bin Rashid aerospace hub (formerly Dubai South aviation district) that complements its headquarters facilities at Al Bateen Executive Airport in Abu Dhabi, which are also being expanded to support more regional aircraft types. ■

ROUND-UP

JORAMCO SIGNS \$3M DEAL WITH SATAIR

The Jordanian MRO provider, Joramco, signed a supply contract with Satair, the global commercial aftermarket specialist, on the first day of MRO Middle East.

The two-year deal, worth \$3 million, covers the supply of consumables and expendables for both Boeing and Airbus aircraft. It took effect immediately.

Jeff Wilkinson, chief executive of Joramco, said: "We are pleased to be entering this engagement with Satair, who will support us in strengthening our sourcing and procurement activities and ensure world-class part number availability and reduced lead times."

□□□□

Terry Stone, Satair's managing director and head of sales and support, EMEA, said the agreement demonstrated the company's focus on its customers' needs and paved the way for "an even stronger commitment [with Joramco] in the future".

Sakhar Haddadin, Joramco's head of supply chain, said the contract was part of the ongoing effort by Joramco, a subsidiary of Dubai Aerospace Enterprise (DAE), to reorganise its supply chain. Satair won a competitive tender against more than 25 suppliers with "the right price and attitude".

Joramco also signed a long-term contract at the show with Boeing Distribution Services (BDS) for aerospace hardware and chemical products and services for its third-party maintenance business.

SRILANKAN BOOSTS SAFRAN NACELLES

Safran Nacelles has signed long-term NacelleLife agreements with SriLankan Airlines to provide asset management and unscheduled cover of nacelles on Airbus A320/321/330 types in the airline's fleet.

For its A330ceo nacelles, SriLankan Airlines will have access to the pool of thrust reversers, manufactured by Safran Nacelles, and unscheduled cover repair services of the entire Rolls-Royce Trent 700 nacelle.

For the airline's A320/A321neo fleet nacelles, also manufactured by Safran Nacelles, the operator will have access to the pool of air inlet housings and unscheduled cover repair services of the entire nacelle for the CFM LEAP-1A engine.

Work will be carried out by Aerostructures Middle East Services (AMES) from its centre of excellence for composites and structure repair in Dubai's Jebel Ali Free Zone. AMES is a joint venture of Safran Nacelles and AFI KLM E&M operating in the Middle East, east Africa and India.

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Boeing predicts continued boom

Boeing predicts the Middle East will need \$745 billion in aviation services through 2037 to keep pace with its growing commercial traffic.

In its Services Market Outlook 2018-2037 – Middle East Perspective (SMO-ME), Boeing says the high-value services market is driven largely by a projected regional demand in fleet renewal and growth for almost 3,000 new aircraft, reaching 3,900 in total.

The SMO-ME predicts the Middle East will drive more than 8% of global demand for aviation services, growing at 4.6% a year. It will need almost 218,000 new personnel, 63,000 of them technicians, over the next 20 years.

Debra Santos, chief marketing officer, commercial services for Boeing Global Services (BGS), said Middle East customers gain “tremendous value” when they combine their operational knowledge with Boeing’s OEM expertise, advanced technologies and decision-support tools.

Part of this approach, she said, involves going beyond predictive to prescriptive maintenance. “Predictive is anticipating an action,” she said, “prescriptive is ‘pre-setting’ parts solutions and engineering for maintenance when you know an event will happen.”

Boeing’s Middle East forecasts reflect a shift in emphasis to narrow-body from wide-body models, driven in part by start-ups and low-cost carriers.

BGS’ research points to an increase in airline outsourcing – particularly single-source outsourcing

– for parts, maintenance and engineering. “That’s where we see growth in this market,” she said.

“Our effectiveness in the marketplace is going to be through partnering with customers and suppliers. Touch labour isn’t an area where we’ll be specialised, so we’ll always be partnering.”

How BGS views the Middle East’s ageing wide-body fleet offers insight into its full-life support approach. BGS sees opportunities in helping the customer decide what to do with its old aircraft at the point of transition, where options include refreshing for sale, retirement, part-out and freighter conversion.

While the market for 737 freighter conversions is “booming”, Santos said Boeing also hears from the market that there’s a need for 777-300 freighters. “We’re studying that,” she said. “We don’t want to enter that market until we understand customer requirements and cost structures.”



Booming market: Boeing’s 737-800 freighter conversions are on the increase.

ROUND-UP

SATAIR TO DISTRIBUTE JETWAVE SYSTEM

Airbus subsidiary Satair used MRO Middle East to announce an agreement to distribute Honeywell’s JetWave high-speed in-flight connectivity system to a wide segment of the global business jet market.

The agreement comes as owners and operators face potential grounding of their aircraft if they miss the deadline for upgrading their avionics to comply with automatic dependent surveillance-broadcast (ADS-B) out mandates.

Honeywell described JetWave as a powerful communication system, which operates and communicates with the Inmarsat satellite network to deliver high-speed internet into the cabin to connect multiple devices.

Satair will distribute JetWave to Honeywell’s dealer network in EMEA and India, and also to non-network Part 145 MRO and repair facilities that will undertake the installation work.

Satair also signed a memorandum of understanding (MoU) with Etihad Airways Engineering to provide supply chain solutions that ensure worldwide parts availability for select aircraft components.

Abdul Khaliq Saeed, chief executive of Etihad Airways Engineering, said: “This partnership will help us explore ways to enhance our supply chain function and facilitate parts availability for customers from all over the world.”

Terry Stone, Satair’s managing director and head of sales and support EMEA, said: “We are delighted to engage even further with Etihad Airways Engineering and we look forward to putting Satair’s forecasting and planning capabilities into play and exploring the many opportunities that lie in this forthcoming partnership.”

TS&S BREAKTHROUGH INTO EUROPE

Turbine Services & Solutions (TS&S) Aerospace of Abu Dhabi has signed an agreement with TAP Air Portugal for Trent 700 engine repair – the first deal of its kind between TS&S and a European carrier.

Work on the Rolls-Royce engines, which power the Airbus A330, will be carried out at TS&S’s state-of-the-art facilities at Abu Dhabi International Airport.

TAP Air Portugal’s fleet includes 17 Airbus A330s with an average age of 13.2 years.

Mansoor Janahi, acting chief executive at TS&S, said the agreement was “a milestone... signifying an expansion of our customer base in the European market [and] testament to the quality delivered by our workforce.”

Among its accreditations, TS&S is the world’s only independent Trent 700 MRO facility.

WHEN EFFICIENCY MATTERS

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Taxiing aircraft and ground vehicles can now be tracked in poor visibility at several Saudi Arabian airports following installation of a new system. Alan Dron reports.

Sand threat: Saudi airports can be affected by sandstorms sweeping in off the desert like this one at Sather Airbase in Iraq.

PICTURE: STAFF SERGEANT WILLIAM BENNETT.

I can see clearly now...

Most airports around the world do not have to cope with sandstorms, but they are a fact of life for many in the Arabian Peninsula. And, when sand blows in off the desert – powder-fine or coarse and heavy – it can cut visibility drastically.

That poses problems for ground controllers trying to keep track of aircraft moving around taxiways and aprons at those airports, as well as the many vehicles that are essential to the smooth running of operations, such as fuel tankers, catering trucks and bird-scaring teams.

Now, a system from Spanish company, Indra, is helping controllers track ground movements at King Khalid International Airport, Riyadh, and Prince Muhammad bin Abdulaziz Airport, Madinah.

The advanced-surface movement guidance and control system (A-SMGCS) introduces vehicle and aircraft movement tracking systems on the runways and taxiways in low-visibility conditions.

This technology will increase safety and help to avoid reducing landing frequency or closing down completely due to adverse weather conditions.

Indra is providing A-SMGCS to the country's air traffic control organisation, Saudi Air Navigation Services (SANS) so that it can maintain maximum management capacity and performance at both airports, even in the event of a sandstorm.

"We could go to zero visibility. We don't stop flights, but everything slows down," said SANS director, air traffic management, Abdulrahman Alzahrani. "A-SMGCS is helping us with poor visibility, so we can 'see' the aircraft on the taxiway and any obstacles such as ground vehicles.

"In the control tower we would have a screen and the layout map of the airport in front of the controller. He will see the aircraft moving on the manoeuvring area."

Last year, Riyadh and Madinah experienced severe storms that reduced visibility to a minimum. Under these conditions,

air and land access to these cities is severely limited.

And other airports can even be blanketed by fog, noted Alzahrani. "It's a problem at certain times of the year, especially in the eastern part of Saudi Arabia, when fog can roll in off the sea, affecting airports such as Dammam."

To avoid this and reduce delays and losses, A-SMGCS's sensors will superimpose the position of aircraft and vehicles on a digital map of the airfield, allowing controllers to warn aircraft and vehicles of each other's proximity.

The system will also prevent aircraft from accidentally straying past 'hold lines' and entering live runways during periods of poor visibility.

"I don't think, so far, we need it in other airports. But, if we have a need, we will install it for sure," said Alzahrani.

A-SMGCS will incorporate control positions for the tower staff and the most advanced multilateration systems and surface radars to monitor any movement on the taxiway and flight areas.

Extend surveillance

Indra and SANS will also deploy a wide area multilateration system (WAM) that will extend surveillance for up to 50nm from each of the two airports.

Multilateration uses a number of ground stations placed around an airport, its local terminal area or a wider area that covers the larger surrounding airspace.

These units listen for 'replies', typically to interrogation signals transmitted from a local secondary surveillance radar or a multilateration station. Since an aircraft will be at a different distance from each of the ground stations, its replies will be received by each station at fractionally different times. Using advanced computer processing techniques, these time differences allow an aircraft's position to be precisely calculated.

Indra will also implement an advanced WAM system to monitor every movement that occurs in airspace surrounding Yanbu airport on the Red Sea, as well as Riyadh and Medina airports.

The system will collect information about the position of each aircraft in the terminal control areas of the three cities. Terminal control areas, in which a large number of routes converge, are separated from the rest due to their complexity, so that they can be given special attention.

Indra claims that its multilateration system is one of the most advanced in the world, due to a combination of reliability and refreshment rate.

Clear picture: Indra is providing its A-SMGCS system to help controllers at Riyadh Airport to locate aircraft in low-visibility situations, such as sandstorms.





Kevin Riordan,
*head of
airports &
checkpoint
solutions at
Smiths*

Detection, talks about the various technologies that will dominate airport security over the next decade and the impact they are likely to have on the overall customer experience.

HOW TECHNOLOGY IS MAKING AVIATION SAFER

Travellers have long-since resigned themselves to a less-than-enjoyable process of getting through airport terminals and their various security checks.

Passengers understand the necessity of strict security processes in order to get us from A to B safely, but wish it could be a quicker process.

Airports around the world understand how tedious queuing in long lines to go through security can be.

They also realise the amount of time and resources the process can take up to ensure the flight is secure. So they know they need to find ways to make the progression through the airport more streamlined.

Of course, airports cannot compromise on the levels of security.

But they can look to find ways to make the process better for travellers – while deploying increased capability at the same time. This is where they are turning to new technologies, helping them be more efficient while complying with regulations.

With that in mind, here are my predictions for technology over the next decade and how it will change the airport experience for all of us.

■ Enhanced detection – CT technology

Computed tomography (CT) technology is going to see its role become far more significant over the next decade.

First used in hold baggage security systems in the early '90s, we've already seen regulatory and technological advancements leading to CT being increasingly used in the cabin baggage screening process too.

European Civil Aviation Conference (ECAC) C3-certified scanners, which allow screening of cabin baggage containing liquids, aerosols and gels, laptops, and other large electrical items, will mean passengers (subject to approval from the appropriate local authorities) will be able to keep their liquids and electronic items in their hand luggage, rather than needing to put everything in a see-through bag when they get to the security gate.

Not only will that make the process much quicker, but it'll be a better experience for passengers who can pass through the airport with their liquids remaining stored in their hand luggage.

Longer-term integration of X-Ray diffraction technology is being explored along with other

techniques to reduce the false alarm rate and minimise delays for passengers at the checkpoint.

■ Increase in artificial intelligence

This year will see airports embracing artificial intelligence (AI) to enhance aviation security and operations – both in terms of passengers and their baggage, as well as cargo.

Currently, whether a tray passing through the security screens is a bag filled with goods or simply contains a belt, it's treated with the same level of severity and undergoes the same level of checks.

As technology in this area becomes more sophisticated with the adoption of machine learning, it will be easier to detect weapons and other prohibited items.

So, rather than spending a lot of time focusing on images of lightly-packed trays or bags that pose no threat, systems will be able to concentrate on suspect baggage, and not show operators the images of bags cleared by the X-ray system.

This will have the additional benefit of improving throughput.



■ Data and risk-based screening

With the amount of available data increasing each minute, the insights we'll be able to gather from it over the next decade are only going to be more and more beneficial.

The information we get from databases, screening processes and more refined algorithms can be used to support enhanced methods of screening – known as risk-based screening (RBS).

The concept of risk-based screening is based on the principle of differentiating passengers and applying appropriate screening protocols to them. This differentiation is based on a 'risk score' derived from an analysis of their destination or status as a passenger. The precheck scheme in the US is a form of risk-based screening.

Future developments will incorporate biometric data and dynamic risk assessment to better inform decisions on appropriate screening measures.

I believe that, within the next few years, data taken during the booking process will be combined with that from customs, border control and other sources, to help support the

passenger journey through the airport, including the security process.

Passenger data can be assessed in advance of travel and prior knowledge of the passenger, their needs and potentially their behaviour, will help inform the level of security measures they undergo when they get to the terminal.

■ Biometrics at the checkpoint

Thanks to AI and the increasing availability of data pertaining to a passenger's journey, we'll see biometric recognition more widely implemented; including for instant identity verification as the traveller moves through the airport.

Biometric identification reduces the need for physical documents and credentials at every touchpoint, promoting a paperless and seamless journey and supporting risk-based screening. Passengers around the world will soon be welcomed by biometric terminals or even biometric boarding gates at airports.

Travellers have said they'd definitely be interested in using biometrics if it makes the boarding process faster, according to the 2018 International Air Transport Association (IATA) Passenger Survey Report.

■ Cyber Security

The increasing use of data in airport operations highlights the importance of protecting this data and the networks used to store and process it.

Although the threat actors and tactics may change, cyber threats and attacks will continue in the years to come.

A joint approach between regulators, airports and suppliers is required to ensure 'cyber-compliant' equipment is available and that it is deployed and maintained securely to protect the wider aviation network.

This will continue to be a key concern for both operators and equipment suppliers in the years ahead.

All of the above have one thing in mind; getting us through the airport as swiftly as possible, but without compromising on our safety in any way.

Thankfully, airports and airlines understand the impact technology can have on the experience and are investing heavily in this area. The next decade will see a lot of changes accordingly – and it will be exciting seeing it all come to fruition. ■

The Airport Show 2019, taking place between April 29 and May 1 at the Dubai International Convention and Exhibition Centre (DICEC), is set to reflect the industry's current trends and act as a good barometer for the future for the industry. Marcelle Nethersole reports.



SOAR POINT: AIRPORTS MUST STAY GROUNDED

The aviation industry is “soaring to new heights”, according to Daniyal Qureshi, group exhibition director at Reed Exhibitions Middle East, which organises the show.

“Middle East airports are expecting an investment of \$90 billion by 2020 – more than three-quarters of which is in the Arabian Gulf states alone,” said Qureshi.

“According to the Centre for Asia Pacific Aviation (CAPA), \$255 billion is being invested in new (greenfield) airport projects around the globe. Currently, there are 415 new airport projects in the world, of which 64 are located in the Middle East. These figures speak for themselves and are a good reason why, this year, the Airport Show will be bigger with more going on than ever before.”

This year's 19th edition of the show already has a confirmed list of 375 exhibitors from 60 countries.

“We are expecting 7,500 attendees, with 75% of exhibitors returning,” said Qureshi. “The show will take place over a 15,000sqm exhibition space.”

During the last show, 190 regional hosted buyers came from 34 countries. This year organisers aim to exceed 300 buyers.

More than 40 new international exhibitors are going to tap the growth potential offered by the region and 143 international companies have already confirmed their participation.

Exhibitors include Ulma Handling Systems, ADB Safegate, Honeywell, Nokia, Smiths Detection, IDEMIA, DFS Aviation Services, Vanderlande and TLD.

The show will also feature two co-located events – the Air Traffic Control (ATC) Forum and Airport Security Middle East.

There will also be the revamped Global Airport Leaders Forum (GALF), which features a dedicated focus on smart airports (day 1), ATC (day 2) and airport security (day 3); plus the Women in Aviation (WIA) Middle East General Assembly (day 3).

CAPA's Middle East & Africa Aviation Summit, taking place on the first two days of the show, will examine the commercial and operational issues affecting airlines and airports in both developed and emerging markets.

CAPA chairman emeritus, Peter Harbison, said: “It is important and timely that CAPA brings the brand of informative and educational summits to the Middle East and Africa. Both regions are going through important change and development and, like all our events, we will seek to tap into these changes and address the key issues affecting the regions.”

Qureshi also confirmed an impressive line-up of industry key speakers at the events. These include: Arab Air Carriers Organisation (AACO) secretary general, Abdul Wahab Teffaha; Air Arabia CEO, Adel Ali; Aviation Minds managing partner, Nadine Itani; Flydubai CEO, Ghaith Al Ghaith; Gulf Air CEO, Kresimir Kucko; Kenya Airways CEO, Sebastian Mikosz; Royal Jordanian CEO, Stefan Pichler; Turkish Airlines chief marketing officer, Ahmet Olmustur; and Yemen Airways chairman, Ahmed Masood Al-Alwani.

Other speakers include: Sonja Strand, vice president, Honeywell; Bernie Dunn, vice president, Boeing International; Farid Al Bastaki, director ENOC Aviation; and Alia Al Ameri, head of corporate development at the UAE Space Agency.

Air connectivity

“Demand for air connectivity will see Middle East aircraft movements rise 5.2% by 2030, according to International Civil Aviation Organization (ICAO),” said Qureshi. “By next year, Gulf airports are expected to handle 450 million passengers.

“Investments in smart airport solutions are critical for driving efficiency, increasing security and improving the passenger experience. In the Middle East, the smart airports market will be worth \$850 million this year. The growth in the region will be spearheaded by the Gulf countries, ably supported by Egypt, Iran, Iraq, Jordan, Cyprus, Lebanon, Palestine and Turkey.”

The Middle East is an emerging market for smart airports, mainly driven by a spurt in investments from the UAE Government. “The smart airports market is expected to grow to \$25.9 billion globally by 2025,” added Qureshi.

“The growth could be attributed to increased penetration of automated and connected airport processes, such as self-service check-ins, smart baggage drop, and smart luggage tracking. Emerging technologies and devices, such as smart access control systems, fingerprint readers, and smart card technology are being increasingly implemented by airports for enhancing the overall passenger experience. These are some of the things visitors can expect to see at the Airport Show.”



Daniyal Qureshi: “Investments in smart airport solutions are critical for driving efficiency, increasing security and improving the passenger experience.”

Big welcome:
The opening
ceremony of
61st ACI Africa
conference
hosted by
EHCAAN.



Finding the key to unlock airport potential

For the first time in its 61-year history, Airports Council International (ACI) Africa themed an event around non-aeronautical revenues. It was during its regional conference & exhibition held from March 4-10 in Egypt.
Anuradha Deenanaray reports.

The commercial viability of airports in Africa, and ways to boost travel retail in the region, came under the spotlight when the Egyptian Holding Company for Airports & Air Navigation (EHCAAN) hosted the conference in Luxor.

According to ACI, the conference “was a great success from a content, participation and organisation point of view”. It brought together speakers from airports, retailers and brands.

ACI Africa secretary general, Ali Tounsi, said the existing potential of Africa has yet to be realised. “There’s a need for a new vision as airports can no longer just depend on aeronautical revenues. They must invest in innovative projects and develop high-skilled human resources to face new challenges,” he told the conference.

But, there’s a growing awareness around this issue and efforts are being made towards a paradigm shift. At a time when airports are facing major challenges to realise sustained growth, non-aeronautical revenues can be a stable source to help recover operating costs and reduce the use of aviation taxes for future airport development.

“Today, airports are faced with limited possibilities to increase their aeronautical revenues. They really need to focus on non-aeronautical sources and work on appropriate and efficient strategies to come up with innovative products and diversify their portfolio to generate new income,” said Tounsi.

Accounting for only a little more than 1% of global duty free and travel retail sales, the African market is often described as the “sleeping giant” of the travel retail industry. The continent’s potential has attracted investment from a number of global airport retailers.

Duty free and travel retail revenue is crucial to the profitability of airports around the world. Yet the market is under constant threat from excessive regulation that can damage the ability to trade.

The push for the ban of tobacco at duty free, for example, will continue to pose a challenge for many airports, the conference heard. Airports will have to strive to increase revenue through other creative sources as local regulations make the sale of tobacco products more difficult.

ACI underlined that African airports do not benefit from

the commercial revenue that travel retail stores could offer airports. “Travel retail in Africa is facing an increasing number of challenges and ACI Africa, alongside the Middle East and Africa trade body MEADFA, is fully committed to finding solutions for the industry,” said Tounsi.

Even though Africa has been lagging behind in real estate development around airports, airport cities and aerotropolises are concepts that are gaining momentum. During the last decade, there has been a shift towards leveraging the strategic and economic opportunities of this new business model, the conference heard.

Tounsi pointed out that “airports must take bold decisions to gear their management towards business, diversified products and client satisfaction”.

“Furthermore, investment in innovative projects and new technology should be based on public/private partnership. The aeropolis concept can also trigger growth by attracting new commercial revenues,” he added.

Durban and Marrakesh airports showed how these models of economic and spatial development depend on strategy, capacity, urban planning, market demand, business and commercial attractiveness, connectivity, digitalisation and a balanced approach for economic, environmental and social benefits.

The latest ACI world airport traffic forecasts (WATF) show that, by 2040, emerging and developing economies will account for more than 60% of all passenger traffic.

Africa has 12% of the world’s population but represents only 2.4% of the global air service market.

Traffic in the region will grow by 16% in the coming 12 months, according to the report. Northern Africa recovery will continue to fuel growth, which will increase by more than 26% during the same period.

The highest rate will be at Marrakesh Airport with 52%. Traffic at Cairo Airport is expected to grow by 16%, Casablanca 19% and Tunis by 9%. Traffic at Algiers Airport will decrease by 15%, especially with growing political uncertainties.

Saudi Arabia and the United Arab Emirates are projected to be among the fastest-growing markets till 2040. ■

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As airlines continue to receive deliveries of next-generation aircraft, Spatial is delivering training devices to match. **Marcelle Nethersole reports.**

Spatial delivery...

Spatial has seen business increase so much in the last two years – 10 major contracts in the last few months alone – that it has upped its staff numbers by 50%.

The company manufactures all aspects of cabin crew training devices, as well as contract manufacturing on behalf of selected third-parties.

Its core product line consists of cabin emergency evacuation trainers, door trainers and cabin service trainers, but it also provides virtual reality (VR) and augmented reality (AR) training products.

“On the contract manufacturing side, our most relevant work is producing sub-assemblies to L3 Commercial Aviation for its RealitySeven full-flight simulators,” said Marc Van den Broucq, managing director.

Over-wing exit

Over the last year the company, based in Ras Al Khaimah (RAK), has been “very busy” providing around a dozen devices incorporating the new A321 semi-automatic over-wing exit, as well as A350 and B787 training devices.

“We are just embarking on the manufacture of the world’s first B777X cabin emergency evacuation trainer, which will incorporate a number of innovations and be a truly flagship device for both ourselves and our customer,” said Van den Broucq.

“Aside from that, we are working on a significant virtual reality project with another of our customers, which will be truly transformational for them. We hope will represent a blueprint for other airlines to optimise their future training strategies.”

Eye for detail: The availability and quality of excellent human resources are the foundations of both development and competitiveness in Morocco.



MOROCCO PRESSES THE ACCELERATOR

Morocco’s industrial acceleration plan (PAI) has been supporting the development of training in the kingdom’s aeronautics industry for some years and this initiative appears now to be bearing fruit as the sector recorded 20% organic growth in 2017. Exports in 2018 were also up by 13.8%. The plan aims to double export turnover in the aeronautics sector to reach \$2 billion within five years.

Four eco-parks were launched under PAI – covering assembly, electrical wiring harness systems (EWIS), MRO and engineering – and this has attracted new operators (Hexcel, Daher and Thyssenkrupp Materials Services) and introduced new technologies like composites and 3D printing.

According to Karim Cheikh, president of the Moroccan Aerospace Industries Association (GIMAS), the challenges are ongoing in a sector that demands continuous improvement. He believes that training is the key enabler helping Morocco to keep pace with the global aerospace industry.



Marc Van den Broucq: “Every element of each device we make is precisely tailored to individual customer needs.”

All of Spatial’s products are custom-built for its clients and turn-around times depend on the complexities of the product.

“Every element of each device we make is precisely tailored to individual customer needs and we pride ourselves on ensuring that each product has the same look and feel as an actual aircraft straight off the production line,” said Van den Broucq.

“All needs and products vary and, due to this, it can be up to a year for the most complex devices to be complete. We are, however, absolutely committed to using our best efforts to meet our clients’ deadlines. An example of this would be our delivering the first A321 semi-automatic over-wing exit trainers globally to EasyJet, which we achieved within less than 10 weeks of receiving the relevant data from Airbus.”

Staff count

With all the work going on, the company has also increased its staff count to more than 130 people.

“All of our design work is carried out by our in-house team using the latest graphics packages and original equipment manufacturer (OEM) aircraft data. Undoubtedly, it is our staff that make the real difference to our business,” said Van den Broucq.

Being located in RAK also suits the company as it is “geographically perfect” for business.

“Our facility is more than 50,000sqft and is equipped with the latest computer numerical control (CNC) machinery, 3D printing and lamination technologies, as well as assembly and painting facilities. We also have a dedicated electronics and automation workshop on site, too. Having such a large space works well here in RAK,” said Van den Broucq.

“Its central location between east and west allows us to serve both geographic markets very well.

The company has also launched an office in Los Angeles, USA, this year to offer 24/7 customer support. ■

A new training course in Kuwait aims to help provide local air traffic controllers with the skills to take up positions in the nation's control towers. Alan Dron reports.



The big picture: The tower simulator employed in Kuwait gives trainee controllers a view of an airport's apron, taxiways and runways.

Towering problem cut down to size

The rapidly rising number of airline flights in the skies over the Gulf mean increasing numbers of air traffic control officers (ATCOs) will be required to guide them. So, any initiative to increase the number of ATCOs under training is very welcome.

A new training course at the Australian College of Kuwait (ACK) is doing just that.

ACK's School of Aviation is a Part 147 maintenance training organisation approved by Kuwait's Directorate General of Civil Aviation, the UAE's General Civil Aviation Authority and the European Aviation Safety Agency. As well as maintenance engineering diplomas, it now offers an air traffic control programme.

"Currently, we have 20 people enrolled in the ATC programme out of 368 students in the School of Aviation and it's open for all nationalities," said Miral Reyadh Nassar, the school's senior officer, academic administration.

The ATC programme began in September 2018 and is run by Airways International, the overseas arm of New Zealand's air traffic control organisation Airways NZ. It aims to train candidates to a point at which they can start working in an air traffic control tower.

Becoming an ATCO is not easy. Only 3% of the population has the necessary spatial awareness ability required to hold a 'picture' of an air traffic control situation in their head, said Airways International CEO Sharon Cooke.

Her organisation has been involved in the Gulf for around 20 years. Trainees from Saudi Arabia, the UAE, Bahrain and Oman have all undertaken training with the New Zealand organisation.



Sharon Cooke: "They can't train controllers quickly enough locally, which is why we're involved."

For example, groups of 30 Saudi students at a time regularly go to the southern hemisphere nation for two years – the first spent polishing their English language skills, the second on actual air traffic control training.

The need for ATCOs in the Middle East is urgent. The worldwide growth in passenger traffic over the next 20 years is estimated at 3.5% annually. In the Middle East, that figure is 8% to 10% "depending on what research you look at", said Cooke.

"They can't train controllers quickly enough locally, which is why we're involved."

Around 70% of Airways NZ's work is outside its home country, with China, Hong Kong and Vietnam among the nations whose next generations of ATCOs are being trained by the Antipodean organisation.

Military requirements

Airways International's connection with the Kuwaiti project began after the Arab nation revealed a requirement for ACK to meet military ATCO requirements. "Basically, they were looking for an ATC training programme on their campus to meet a demand from the Kuwait Air Force. We told them we had this very successful training programme with the [Saudi Arabian] General Authority of Civil Aviation, and the programme we put together with [ACK] is based on that," said Cooke.

ACK already teaches English classes, so Airways International steps in for what is essentially the second year of the course. "We provide a turnkey ATC programme. We start off with some aviation English, along with some theory, then we move on to more practical simulator-based training."

Those qualifying from the two-year course are sufficiently competent that they can conduct radio transmissions between a control tower and aircraft. They then begin on-the-job training, for which, in this case, the Kuwait Air Force is responsible.

"We bring in our own simulators and some pilots and instructors," explained Cooke. The instructors use a tower simulator plus two radar simulators that give trainees both a radar screen and a 'visual' view over an airfield.

Airways uses TotalControl simulators that employ photo quality, four-dimensional, 360° graphics that mimic the view from the tower window. This simulation technology is used from the ab-initio stage of training through to senior operational levels.

The course has proved its worth elsewhere in the Gulf, said Cooke: "With GACA, all the people who've been successful with us have gone on to become a rated controller with them."

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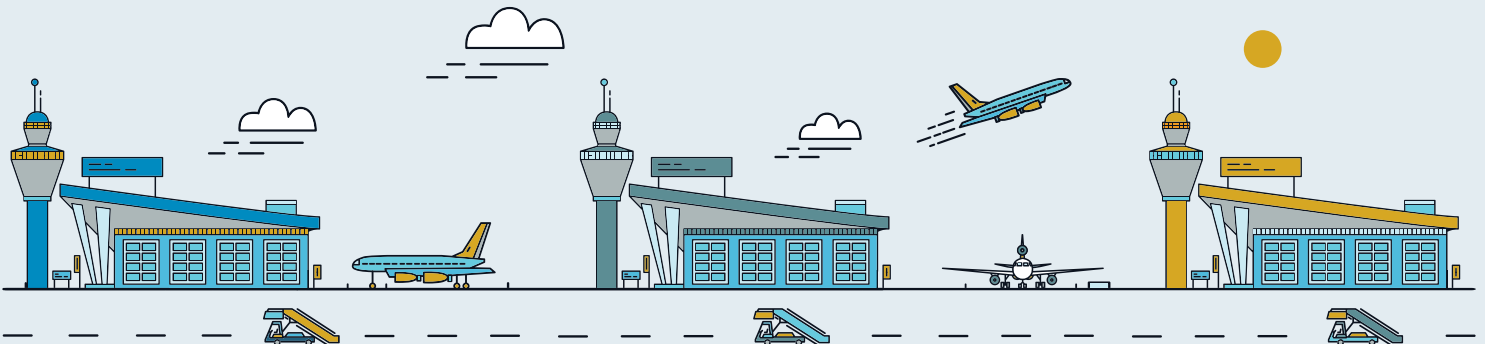


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After the defeat of Islamic State (IS), Iraq is once again looking to its aviation potential. Tom Westcott reports from Baghdad.

Iraqi aviation rising from the rubble

Iraq is now refocusing on civil aviation after the defeat of IS and a decade-and-a-half of political turmoil and instability. It is developing existing infrastructure, working on lifting a European Union (EU) flight ban and planning to rebuild an airport left flattened by IS.

“After 2014, when IS appeared in Iraq, the country faced a major security challenge, and aviation development was paused because all resources were being directed into the war,” said Ali Khalil Ibrahim, director of the Iraqi Civil Aviation Authority (ICAA).

“In 2017, after all the cities were liberated from IS and security improved, the prime minister’s office decided to refocus on civil aviation and, since then, we have been making major efforts.”

The ICAA had long been part of Iraq’s Ministry of Transport and making it an independent entity, assuming full control of overseeing Iraqi aviation, was a priority. “We became fully independent in mid-2018 and this was a very positive step because we now follow International Civil Aviation Organisation (ICAO) regulations, which insist that the national CAA body should be independent from all other government departments,” said Ibrahim. “We are now independent and taking responsibility for all decisions relating to civil aviation.”

Playing catch-up

Iraq is playing catch-up after decades of aviation neglect and sanctions, which left the country beyond the reach of changing aviation regulations, and the ICAA faces a major task.

“Iraq was away from the global perspectives of aviation for a long time. There was the Iran-Iraq war in the 1980s, then the embargoes of the 1990s, so Iraqi aviation staff couldn’t improve themselves. During those decades, there were many advances in aviation and Iraq missed all these,” said Ibrahim.

The removal of former president, Saddam Hussein, from power in 2003 opened the doors for advances but brought with it a new set of challenges.

“After 2003, there were huge changes and demand for flights increased dramatically, putting



Iraqi Airways: Currently serving 48 destinations in 20 countries, the carrier hopes to double this number in the next decade.

urgent strain on the aviation sector. We had had no direct contact with the outside world and, in 2003, we found ourselves lacking everything – infrastructure, procedures, qualifications, legislation and human resources,” he explained.

Iraq has continued to experience an increase in both flight and passenger numbers. In 2017, more than 10 million passengers passed through Iraq’s five airports, travelling on 90,000 flights, compared to just over one million passengers on 6,000 flights in 2007.

Iraqi airspace was also controlled by coalition forces for the first nine years after the fall of Hussein, and Ibrahim said the country remained too unstable for aviation to develop in any meaningful way until 2007, when the ICAA started working in earnest.

While passenger and flight numbers were increasing, the ICAA worked in the background to try and update and improve the country’s lapsed civil aviation standards. “Between 2008 and 2012 we did a lot. We developed plans, we hired 150 Iraqis to be trained as air traffic controllers and worked with specialist international companies,” Ibrahim said. “Finally, in 2012, Iraqi airspace became fully Iraqi-controlled.”

Just as Iraq’s aviation sector started really taking off, the country fell back into chaos, facilitating the growth of sectarian and terrorist groups. The dramatic rise of IS which, in 2014, rapidly seized control of almost one-third of Iraq,

put the country’s civil aviation development on hold for another four years.

A further blow was dealt to the sector when, in 2015, sole state carrier, Iraqi Airways, was banned from flying in European airspace by the European Aviation Safety Agency (EASA) because of safety issues and flaws in following international aviation standards. Iraqi Airways has continued to serve some of its European destinations via an agreement with Turkish airline Atlas Global.

New regulations

“Between 2003 and 2014, Iraq was busy rehabilitating and we were far away from following the rules and regulations exactly. In parallel, the EU established EASA, making many new regulations,” said Ibrahim. The ICAA and Iraqi Airways, he said, are working hard to get the ban lifted, which they hope will be achieved by the end of this year.

Abbas N Majeed, director general of Iraqi Airways, explained that the main problem is documentation. “We are updating all our manuals and documentation now to make them suitable for international requirements,” he said. “As soon as we have fulfilled all International Air Transport Association (IATA) requirements, the ban will be lifted.”

He explained the company had entered the final phase of the four-stage process and that

Shattered: The destroyed Mosul Airport that had been occupied by Islamic State militants. Inset, below: Iraqi ERD troops advance on Islamic State-occupied Mosul Airport as part of the offensive to retake the city on February 23, 2017.

PICTURES: MARTYN AIM.



Abbas N Majeed: "As soon as we have fulfilled all IATA requirements, the ban will be lifted."

PICTURE: TOM WESTCOTT.

relatively few changes were still required, adding that the 30 Iraqi Airways pilots with EASA licences were already permitted to pilot Iraqi Airways' European flights.

Alongside this, Iraqi Airways and the ICAA are working closely with the British authorities to reinstate direct flights to London which, at present, have to disembark all passengers in another European country – currently Bulgaria's capital Sofia – for additional security checks, adding several hours to journey times.

Majeed said he expected London-bound flights would again be direct within a matter of months.

In keeping with general upgrades, the ICAA is developing its relations with the ICAO, as part of the agency's 'no country left behind' (NCLB) initiative to support countries not yet complying with international aviation requirements.

Late last year, Iraqi aviation staff received security training from the agency and, in December, an ICAO delegation made its first official visit to Iraq in 10 years. Dependent on its universal safety oversight audit progression, Ibrahim said the ICAA is planning to be ICAO certified by 2020.

The most ambitious project the ICAA is currently working on is a new airport on the outskirts of Mosul, the IS former 'capital' in northern Iraq.

IS destroyed key infrastructure in the former airport and lined the runway with improvised

explosive devices (IEDs). This, along with subsequent fighting between IS and Iraqi forces supported by US-led coalition airstrikes, left Mosul airport a rubble-strewn wasteland.

But an Iraqi Government project to rebuild aims to put Mosul back on the Iraqi aviation map. The proposed new airport will feature a passenger terminal with a cargo facility, which will be key to supporting ongoing post-war reconstruction efforts in Mosul.

Rebuild the former airport

"The plan is to rebuild the former airport. We have carried out a full survey of what remains of the airport and some parts can be rehabilitated and others will need to be rebuilt from scratch," said Ibrahim. "This is a very important proposal, which would have a major impact for Mosul because, once the airport is built, it will be the main gate for construction materials for rebuilding and rehabilitating the city."

Reconstruction materials are currently transported across land, a time-consuming process on Iraq's often poor-quality roads, with lorries enduring long waits at military checkpoints.

The new Mosul airport proposal is currently with Iraq's new government, awaiting approval. Once authorised, Ibrahim said completion of the proposed airport – which looks set to be a joint project between the Iraqi and French governments, most likely built by a consortium of

French companies – is expected to be swift, with the facility operational within a year.

The ICAA is also encouraging Iraqi national airlines – including smaller private ventures Fly Baghdad and Nasser – to become members of IATA.

Membership, Ibrahim said, would have extensive commercial benefits, including the opportunity for national carriers to enter into bilateral agreements with international airlines, while improving operational capacity and services, while enabling the opening of new routes.

"In the next six to 12 months, hopefully by the end of 2019, we're expecting to start seeing major changes. Initially we will see the changes internally and, after maybe three years, passengers will see visible improvements," said Ibrahim. "Now we are building our bases, because our success depends on a solid plan, with achievable targets for the future."

Iraqi Airways – the second oldest Middle Eastern airline – is awaiting delivery of the first batch of new aircraft as part of a major order for 26 new Boeing aircraft, the first of which are due for delivery in 2021. This, Majeed said, will pave the way for major future expansion.

Currently serving 48 destinations in 20 countries, he said Iraqi Airways hopes to double this number in the next decade. "Of course this sounds ambitious, but that is what we are working towards," Majeed said. "We are very optimistic about the future of Iraqi Airways." ■

The Global Space Congress, the largest gathering of space industry leaders hosted by the Middle East and North Africa region, was held at the St Regis Saadiyat Island Resort in Abu Dhabi from March 18-21. Steve Nichols reports.

Emirates gifts satellite to strengthen Arab expertise

No less than 15 space agency heads were attracted to the conference, as well as executives from leading aerospace companies, government bodies, organisations and institutions. They were there to discuss a range of important topics related to the sector, plus policies and strategies.

The conference featured more than 50 specialised sessions, including the sustainability of the space environment, the exploitation of space resources and mining, as well as the protection of national infrastructure and new space projects.

In addition, the conference highlighted the future of manned space missions, the role of governments in promoting investment in the space sector, manufacturing and technology.

The Emirates Aerospace Agency (ESA) announced the details of its 813th satellite – a gift from the UAE to the Arab States.

The multi-spectral satellite will monitor the Earth and measure the environmental and climatic elements, vegetation, soil types, minerals and water sources, as well as measuring greenhouse gases, pollution and dust in the air in a number of Arab countries.

The satellite will be funded by the Emirates Space Agency and will be developed by Arab engineers at the National Center for Space Science and Technology at the University of the United Arab Emirates in Al Ain.

The National Center for Space Science and Technology was established in cooperation with the Emirates Telecommunications Regulatory Agency (TRA) and the United Arab Emirates University (UAE). It is the first space research centre in the Middle East and a hub for research, development and innovation.

The development of the satellite will take three years and it will have a lifespan of about five years in its polar orbit of 600 kilometres. Its data will be sent to a ground station in the UAE and receiving stations in other Arab countries.

The new satellite will be designed and manufactured by a number of Arab engineers and



“The conference succeeded in attracting the world’s most important space leaders.”

MOHAMMED AL AHBABI

young people from countries that have signed the ‘Arab Group for Space Cooperation’ charter.

To date, the charter has been signed by the UAE, the Hashemite Kingdom of Jordan, the Kingdom of Bahrain, the Democratic Republic of Algeria, Saudi Arabia, Sudan, the Lebanese Republic, the State of Kuwait, the Kingdom of Morocco and the Arab Republic of Egypt.

Dr Ahmed bin Abdullah Humaid Al-Falus, minister of state for higher education and advanced skills, said: “The new satellite will be developed by the hands of the Arabs to serve Arabs and will play a major role in enhancing Arab capabilities in the field of space manufacturing.”

Inspire and encourage

The conference also included a variety of activities to inspire and encourage young people to expand their knowledge of opportunities in the sector.

The youth space leaders forum, which seeks to empower young people and develop their capacity to contribute to the global space sector, sought ways to nurture and encourage young people with potential.

The conference also hosted the next generation space forum, which offered a variety of activities and workshops designed specifically for students of science, technology, engineering and mathematics (STEM).

Mohammed Nasser Al Ahabbi, director general of the Emirates Space Agency, said: “The second edition of the conference has succeeded in attracting the world’s most important space leaders, who represent the leading space agencies working on advanced space projects for decades. This highlights the UAE’s prominent place in the global space map.

“Through various working sessions, the conference sought to cover all topics related to the global space sector, encouraging all parties to share their experiences and opinions in a manner that will lead to the development of future forms of cooperation.”

Virgin Galactic looking down at the Earth from space.

PICTURE: VIRGIN GALACTIC



UAE SPACE FLIGHTS MOVE A STEP CLOSER

The Emirates Space Agency (ESA) has signed a memorandum of understanding (MoU) with Virgin Galactic and The Space Ship Company to set up bilateral cooperation frameworks to launch space flights.

These will be for scientific, technological and educational purposes, plus future tourism trips from the UAE.

The signing of the MoU came shortly after Virgin Galactic launched its first commercial space flights in December and February – an important step in the company’s progress in the field of commercial operations.

Mohammed Nasser Al Ahbabi, director general of Emirates Space Agency, said: “This important agreement builds on our long-term relationship with Virgin Galactic and reflects the tremendous development of the UAE’s space industry.

“It enhances the ability of the sector to contribute significantly to the manufacture of spacecraft and begin the implementation of the

launch of spacecraft during the next few years.”

George Whitesides, CEO of Virgin Galactic and The Space Company, said: “We appreciate the long-term commitment of the UAE to our programme and look forward to working with the Emirates Space Agency and relevant partners in the UAE to achieve significant developments in the region.

Under the memorandum, the signatory parties will:

- Plan to build a space ship and an aircraft carrier to operate from the UAE;
- Collaborate to establish a centre of excellence for microgravity research in the UAE;
- Develop operational plans for space vehicles at Al Ain Airport in the UAE.

Spacecraft in the UAE and the region will be used as a scientific platform for high-frequency space research, as well as tourist trips for individuals and customers.

This dual nature of the project will drive innovation, industrial development, science and

technology education, engineering and mathematics, and will encourage more investment and economic growth in the UAE.

“The signing of this agreement comes within the framework of the national plan for the promotion of space investment, which we have recently announced with the aim of increasing domestic and foreign investment in the UAE space sector,” said Al Ahbabi.

“It also ensures attracting investors and start-ups to work in the field of space and enable access to this distinctive infrastructure that they need for growth and development.”

This collaboration provides an opportunity to take advantage of the advanced infrastructure built by Al Ain over the years.

This include companies such as Strata, Nebras, the state-of-the-art Military Maintenance, Repair and Umrah Center, Al Ain International Airport and the National Center for Space Science and Technology at the University of the United Arab Emirates.

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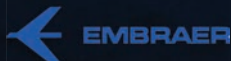
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