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ARABIAN AEROSPACE

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

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Something positive must result from this tragedy

The fatal accident of the Flydubai flight FZ981 from Dubai to Rostov-on-Don in March is a tragedy that will live with the region's carriers for years to come.

As the first fatal crash involving a UAE aircraft, and the worst since the Gulf Air GF72 disaster in 2000 when 143 people died off the coast of Muharraq, there will be plenty of analysis of the facts when the final report is issued by the Russian Interstate Aviation Committee, which is leading the probe into the crash.

Like the whole industry in the region, we extend our condolences to the families of the passengers and crew whose loved ones perished in the March 19 disaster.

A 24-hour TV news station, desperate for immediate explanations as to what could have happened, woke me in the early hours on that day. That was the first of many calls from TV and radio news desks hungry for a new 'angle'.

The "professional" aviation media pundits called that morning would not speculate and it was left to weather forecasters and others to try to guess what had happened.

An airline can be judged by its reaction to a tragedy like that of Flight FZ981, and it is a credit to Flydubai that it was quickly communicating with the general public and the media and following a well-rehearsed set of procedures to help the families and aid investigators.

Flydubai's CEO, Ghaith Al Ghaith, was also leading from the front during the difficult early days and did not shy away from tough questioning. The airline and the management stood up well to the scrutiny. I hope they will do the same once the final report is published.

But, despite all of the efforts to urge people to wait until the conclusive report, there has still been speculation and rumour, alleged 'leaks' and whistle-blower stories. All of it is noise that can get in the way of the investigation.

However, while condemning wild speculation, social media forums led to various issues being raised by the aviation community, particularly expressing concerns about crew fatigue.

Whether or not fatigue was a contributing factor to this or any other accident, it is clear that it is an emotive issue among airline crews. Rotas that don't take account of circadian rhythms may be lawful but may not be safe.

The Gulf carriers have been leading the way in many key areas of passenger experience and airline operation. There is an opportunity to take a lead in researching this concern and setting an example around the world of developing new standards.

Alan Peaford
Editor-in-chief

COVER: Flydubai's Ghaith Al Ghaith faces the media after the Russian crash. PICTURE: PA

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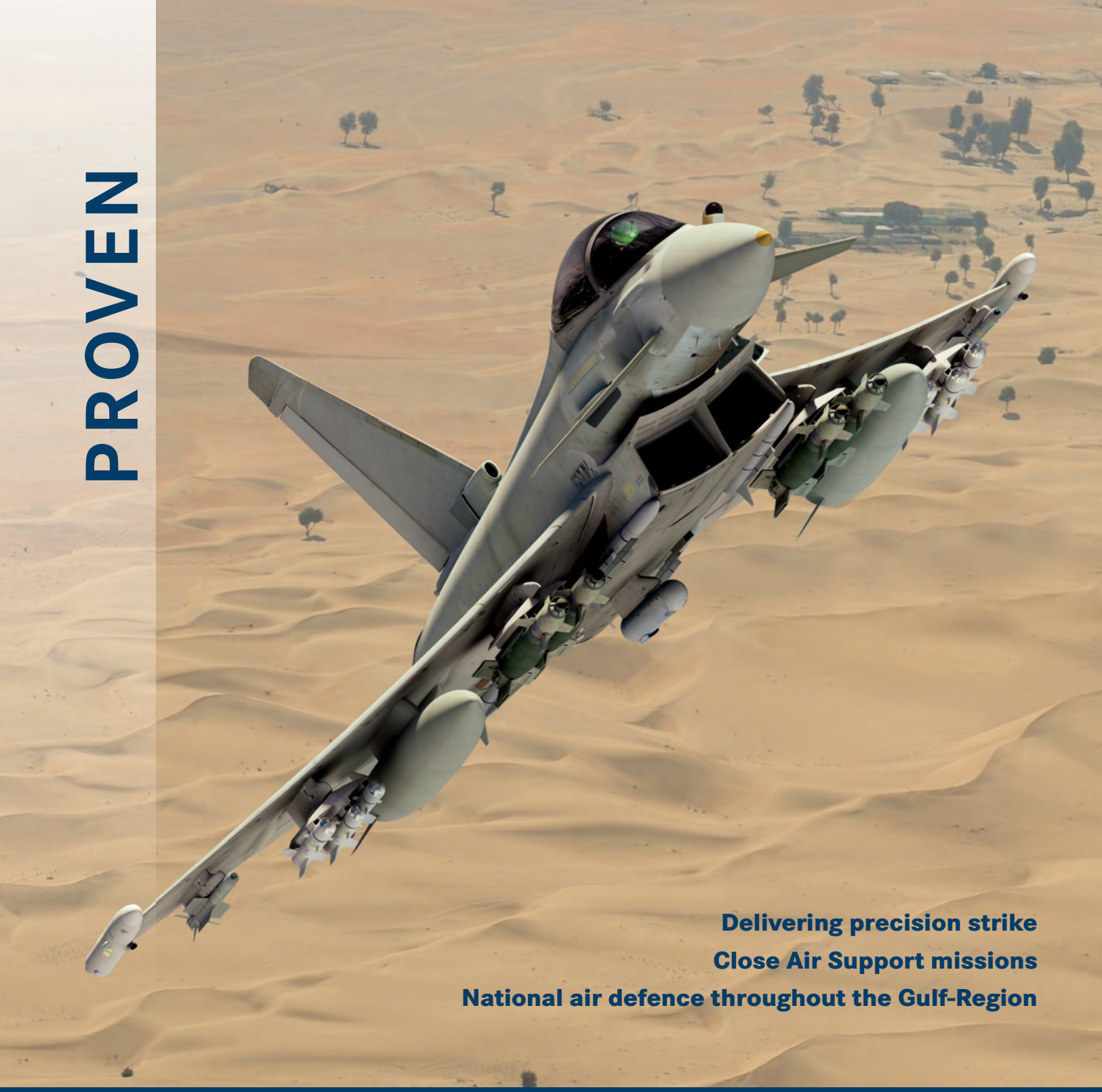

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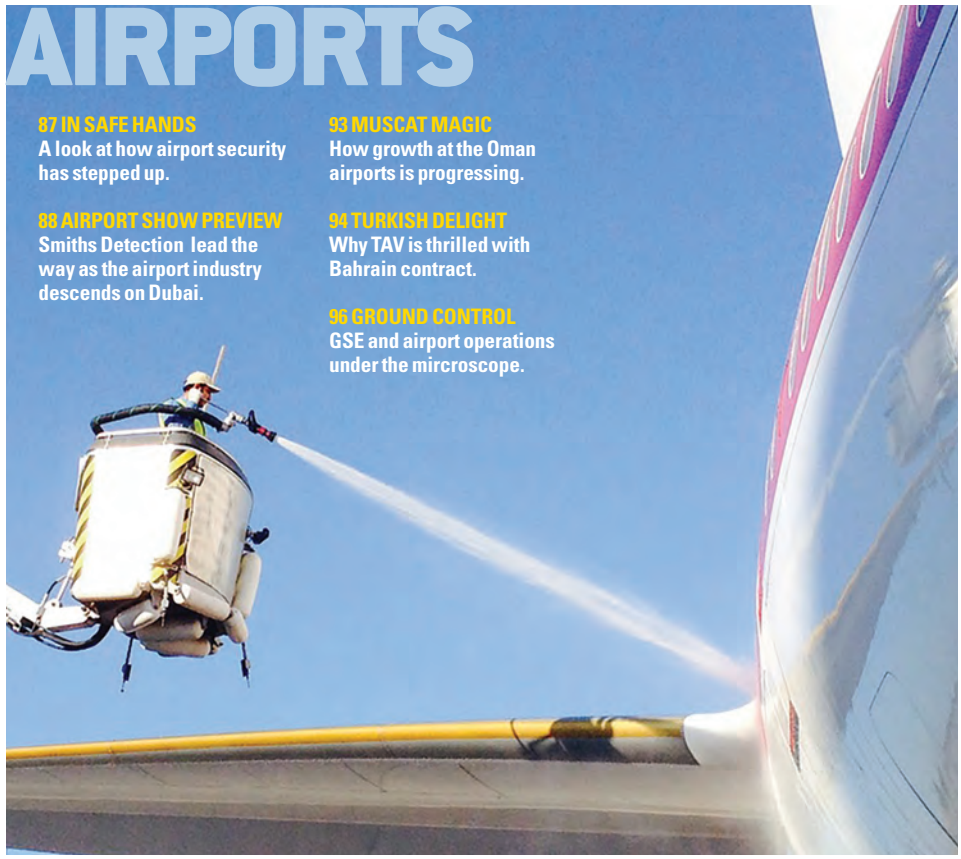

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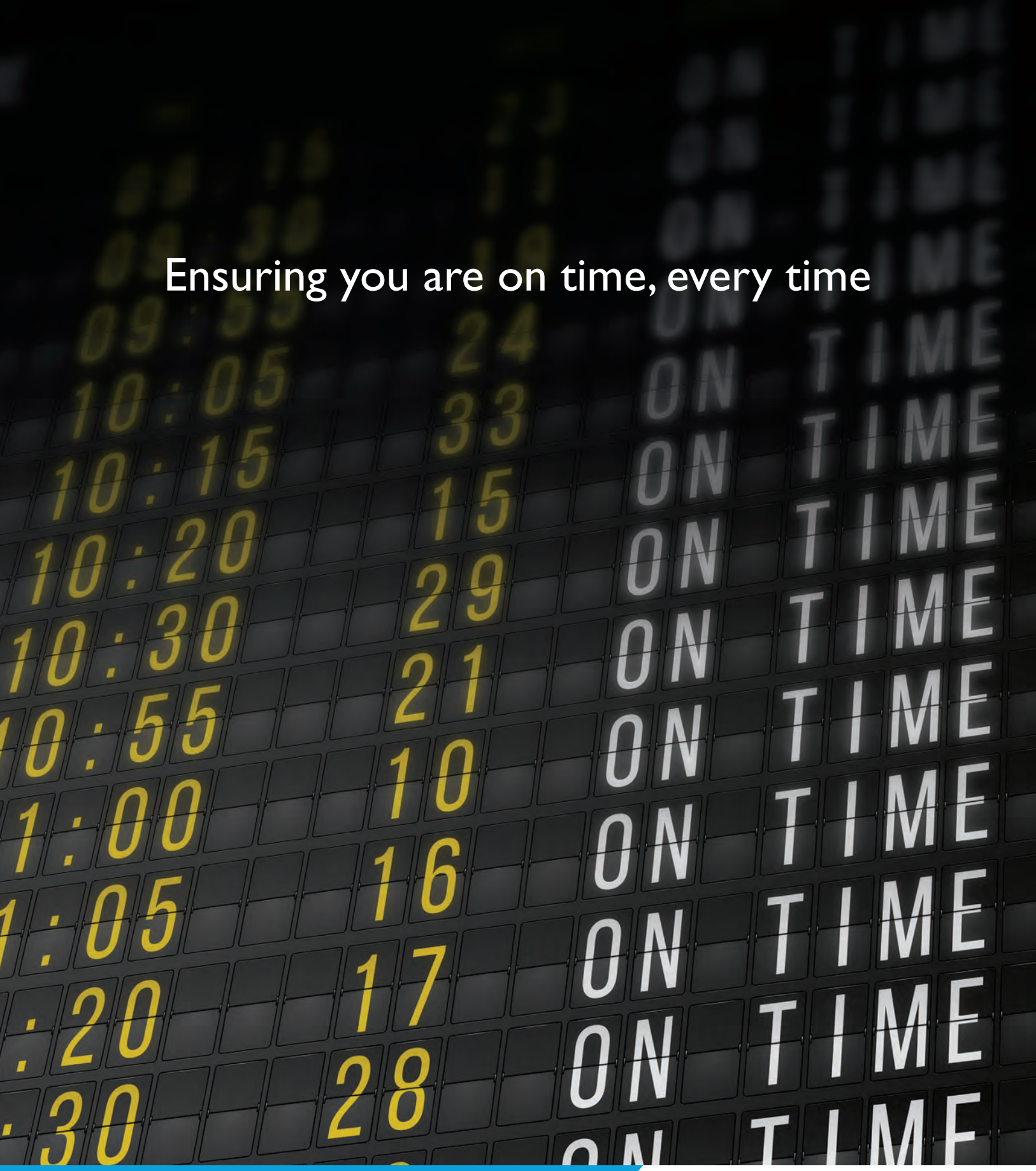

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Finmeccanica celebrates ATC contract double

Finmeccanica Security and Information Systems Division will provide the Royal Saudi Air Force (RSAF) with a total of six air traffic control (ATC) radar systems, control centres and communications, to be delivered by the end of 2017.

The Moroccan Airports Authority (ONDA) has also selected the company to improve the country's national air traffic control radar system. That contract will see the company supply six co-mounted perimeter surveillance radars (PSR) and monopulse secondary surveillance radars (MSSR) in the south of the country, with one additional PSR for the Oriental region's main hub.

Kuwait show to launch in 2017

The first Kuwait Aviation Show will take place at Kuwait International Airport from January 23-26, 2017.

The event, the first of its kind in Kuwait, will feature participation from local and international aviation companies combining both civil and military aircraft manufacturers, private jets, medical air ambulance, helicopters, and supporting equipment manufacturers, including jet engine manufacturers, navigation equipment, and products and services that serve both commercial and military aviation.

New baggage services at Sharjah

Sharjah Aviation Services will introduce new automated baggage management and communication systems at Sharjah International Airport.

The new systems, provided by global air transport technology specialist SITA, are aimed at further improving the reliability, security and speed of baggage delivery at the airport.

EgyptAir hijack on domestic flight

An EgyptAir Airbus A320 was hijacked, and diverted to Larnaca in southern Cyprus, after being taken on a domestic flight between Borj Al Arab, near Alexandria, and Cairo International Airport.

There were 55 passengers on board.

Negotiations led to most of the passengers being released but two of the cabin crew and two flight crew, as well as three passengers, were kept on board as hostages.

Eventually, seven hours after the hijacking, the remaining hostages escaped and the hijacker gave himself up and was arrested.

Cypriot officials named the hijacker as Seif Eldin Mustafa.

Reports say he wanted to talk to his estranged wife in Cyprus. During negotiations for the early release of passengers, a letter was given by the hijacker to pass to his ex-wife, who lives in Cyprus.

The suicide belt that the hijacker was allegedly wearing turned out to be a hoax.

Saudi Arabia bans Mahan Air

Saudi Arabia has issued a ban on Iran airline Mahan Air from using its airspace and airports, citing safety concerns.

Although the privately owned Iranian carrier does not fly to the Saudi kingdom, GACA – the Saudi Arabian regulator – said it decided to "stop completely permits granted to Iran's Mahan Air".

Amiri flight for auction

Kuwait's ministry of finance issued a public invitation for bids on four aircraft after an announcement that the Government is in the process of auctioning them from its Amiri fleet.

The aircraft – three Gulfstream GV large-cabin, long-range business jets and an Airbus A310-300 VIP airliner – are all used for head-of-state and government transportation and operated by state-owned carrier, Kuwait Airways.

ATR aims to sit pretty

ATR has signed a buyer-furnished equipment (BFE) agreement with Expliseat for a new ATR aircraft seat type – the Titanium.

ATR's customers will now have a wider choice when configuring their aircraft cabin layouts, as the seats will be provided as an option on new aircraft, and for types in retrofit.

The Titanium seat can save up to 300kg on cabin configuration, enabling fuel saving, enhanced payload capacity and operational flexibility.

The seats feature only 30 parts, reducing maintenance costs.

DC expands Dubai South operations

DC Aviation Al-Futtaim (DCAF) will expand its operations at its home base at Al Maktoum International Airport (AMIA) and lease an additional 10,000sqm of land from Dubai South.

The new plot will drastically increase the operational potential of DCAF – the first and only integrated private and business aviation operator at AMIA – enabling the company to expand its existing VIP lounge and hangar facility in order to keep up with growing demand for its services.

Final A350-1000 assembly begins

Airbus has started the final assembly on the A350-1000, the first of three test aircraft to be built ready for its maiden flight before the end of 2016.

A350-1000 deliveries are expected to start in mid-2017.

Jotron switches on in Turkey

Jotron AS will supply the Turkish State Airports Administration with 1,130 air traffic control radios, additional equipment and spare parts.

Nenad Jankovic, area sales manager, ATC & coastal communication division Jotron, said: "Turkey is an important market for Jotron and we are proud to be the leading supplier of ATC radios in this country.

"This new contract strengthens our position in this market."

Etihad's power play

Etihad Airways has signed a 10-year auxiliary power unit support agreement with Revima APU of France for the repair and health monitoring of the PW980 APUs on its five A380 aircraft.

Revima APU will provide power-by-hour repair and maintenance services for Etihad's PW980 APUs, and associated line replaceable units, and repair field-removed LRUs, as well as APU health monitoring services.

UAE and Japan in space link-up

The UAE Space Agency and the Mohammed bin Rashid Space Centre have signed a memorandum of understanding (MoU) and a contract with Japanese institutions to launch the Hope probe to outer space and strengthen cooperation in the field of exploration and development of human resources specialised in space science and technology.

The MoU was signed by Dr Khalifa Al Romaithi, chairman of the UAE Space Agency, and Dr Naoki Okumura, president of the Japan Aerospace Exploration Agency (JAXA).

Al Romaithi said: "The signing comes within the context of the strategic targets of the UAE Space Agency, in terms of building and developing mutually beneficial partnerships with various international institutions that carry long experience in the space sector in general, and the development of human resources in this field in particular.

Cool runnings

Abu Dhabi Airports has unveiled one of the country's biggest district cooling plants to serve Abu Dhabi International Airport's new Midfield Terminal Building.

With a total capacity of 55,000tonnes of refrigerant, the plant will provide air conditioning through 18 chillers and two thermal energy storage tanks.

It provides chilled water from a centralised cooling station, through a network of pipes, for air conditioning purposes.

Gulf Air supported by APG Network

Ahmed Janahi (left) and APG's Emillie Biggerstaff.

Gulf Air has appointed APG Network, an airline-focused representation network, as its representative to provide billing and settlement plan (BSP) support and administrative services in Australia, Austria, the Czech Republic, Finland, Indonesia, Japan, Morocco, Poland, Taiwan and Tunisia.

Ahmed Janahi, Gulf Air acting chief commercial officer said: "With an experienced business associate like APG, the airline will be better represented in our offline markets, enabling us to raise awareness of our distinctive offering and strengthen more business."

JorAMCo extension

Gulf Air has signed a three-year extension of its MRO agreement with JorAMCo, under which the Jordanian company will provide Bahrain's national carrier with heavy maintenance checks for its current fleet of 28 aircraft – A330s, A320-ERs, A320s and A321s.

All maintenance will be performed in JorAMCo's regional facility at Queen Alia International Airport, Jordan.

IATA welcomes new standard

The International Air Transport Association (IATA) has welcomed the decision by representatives at the International Civil Aviation Organization (ICAO) to agree a CO2 efficiency standard for commercial aircraft.

The standard, to come into force from 2020, will ensure that CO2 emissions from new aircraft will have to meet a minimum baseline (defined as a maximum fuel burn per flight kilometre, which must not be exceeded).

From 2023 this will also apply to existing aircraft designs still in manufacture at that date.

Engine support

AFI KLM E&M and Oman Air have signed a new, long-term contract providing flight hour support for CFM56-7 power plants equipping the carrier's Boeing 737NGs.

Franck Terner, executive vice president Air France engineering and maintenance said: "We have worked regularly with Oman Air for several years. I am very pleased that the airline has now shown us this mark of trust by opting for our engine know-how."

Gama praise

Gama Aviation has been awarded the international standard for business aircraft handling (IS-BAH) for its fixed-base operations (FBO) at Sharjah International Airport.

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First ATR 72-600s for Nesma

Saudi-based Nesma Airlines has taken delivery of its first ATR 72-600s to launch its domestic operations.

The first two aircraft aircraft will operate in Saudi Arabia, where the airline is developing regional connectivity with the support of the national government.

The aircraft are leased from Dubai Aerospace Enterprise (DAE).

Nesma Airlines and ATR also signed an eight-year global maintenance agreement (GMA), whereby ATR will provide comprehensive technical support, including a spare parts inventory on lease at the airline's premises, access to its spare part pools, offering up-front exchange and timely availability, and the single channel management of the maintenance, repair and overhaul of propellers, engines, landing gears, and line replaceable units.

Air Leisure signs for four SSJs

Egypt's Air Leisure has signed a memorandum of understanding (MoU) for four SSJ 100-95s, with options for six more.

The agreement was signed with Sukhoi Civil Aircraft. Russia's Minister of Industry and Trade, Denis Manturov, said the first aircraft would arrive by the end of the year.

The deal also includes the possibility of developing a joint venture with an undisclosed third party, which could lead to Air Leisure acquiring up to 45 SSJs over a three-year span.

Gama changer

Gama Aviation been given formal approval to expand its operations at Sharjah International Airport with the building of a new business aviation facility designed to meet the needs of the Middle East business aviation market, which is expected to grow by 7% a year between now and 2024.

Qatar ups its share

Qatar Airways has announced a new code-share agreement with Comair, a franchise of British Airways. It will add three new African destinations to the Qatar Airways route map and provide additional flight options to travellers in Cape Town and Durban.

ADA gears up

Abu Dhabi Aviation (ADA) is gearing up for expansion in Saudi Arabia following the completion of a financial feasibility study and business plan by its joint venture partner, ADA Millennium Consulting (ADAME).

ADA will now formally start an application to Saudi's General Authority of Civil Aviation (GACA) for a Part 135 licence.

ADA has successfully conducted helicopter operations in Saudi Arabia for a number of years under end user licences but says, on GACA approval of a Part 135 licence, it will expand its subsidiary in the kingdom by operating under its own licence.

90-seat turboprop

Bombardier has introduced the world's only commercial turboprop aircraft capable of carrying 90 passengers.

"As part of Bombardier's on-going commitment to the evolution of the Q400 aircraft programme, we are thrilled to offer customers increased capacity on regional routes with high passenger demand and the growth potential to increase profitability," said Fred Cromer, president, Bombardier Commercial Aircraft.

Weaving a new web

In partnership with the Tunisian Foreign Investment Promotion Agency (FIPA), the USAID-financed Business Reform & Competitiveness Project (BRCP) sponsored a pioneering webinar to bring together supplier management representatives from Boeing Defense, Space & Security and Tunisian aerospace manufacturers.

Dream start for Saudia

Saudia has received three Boeing 787-9 Dreamliners and a 777-300ER.

The airline ordered eight 787-9s in 2010.

"The delivery of our first Dreamliners marks yet another exciting chapter in Saudia's long-standing relationship with Boeing that began in the early 1960s," said Saleh bin Nasser al-Jasser, director-general, Saudi Arabian Airlines.

"With its reputation for reliability, operational efficiency and comfort, we now look forward to the 787 becoming an integral addition to Saudia's fleet as we continue our fleet modernisation and expansion as part of our transformation plans."

Iran "close to Boeing deal"

Iran news agencies are reporting that talks with Boeing over the purchase of new aircraft are continuing, and suggesting a deal with the American aviation giant is "very likely" to be sealed soon. In late January, local media also quoted a top Iranian official in a report as saying that the country plans to purchase more than100 planes from Boeing.

Iranian officials have said the country will need to buy 500 commercial jets of various models for various short-, medium- and long-distance routes.

Turkish IFE deal

A Havelsan and Turkish Technic partnership has won a Turkish Airlines in-flight entertainment (IFE) tender bid. The wireless IFE system, Skyfe, developed jointly by the two organisations, will fly on 44 of the Turkish aircraft sporting its "Made in Turkey" banner.

Data link

Satcom Direct, which has offices in Dubai, and Universal Weather and Aviation have teamed up to offer integrated datalink and trip planning.

Kish purchase

Iran airline, Kish Air, has signed an agreement with Airbus for the purchase of two A321-200s.

Tax introduced at Dubai Airport

Dubai is to introduce a 35 dirham airport-service fee on all passengers leaving the emirate, including transfers. The fee will be collected by the airlines on departures after June 30 and transferred to Dubai Airports. It is expected that some of the money will support the expansion projects in the newly opened Concourse D, as well as go to the renovation of Terminal 1.

Second Gulfstream

Qatar Executive has added a second Gulfstream G650ER to its Doha-based fleet. The first of the type joined Qatar in March.

These two ultra-long-range jets are part of a 2014 order from the Qatar Airways subsidiary for up to 30 Gulfstream business jets, including six G650ERs and 24 clean-sheet G500 and G600s, for which it is the launch customer.

Rafale deal

Qatar finally completed the deal for 24 Dassault Rafale fighter jets on the opening day of the Doha International Maritime Defence Exhibition and Conference (DIMDEX). The deal, which includes MBDA missiles as well as training for 36 pilots and more than a hundred mechanics, is worth $7.5 billion.

Etihad saddled up for thoroughbreds

Some of the most valuable thoroughbred racehorses in the world, and those who look after them, have a new means of transport for getting to classic events.

The first of two new Boeing 777 freighters, specially fitted to carry horses and grooms, has joined Etihad Cargo – the 11th freighter in the fleet.

Etihad Cargo announced it would take delivery of the two additional aircraft at the Dubai Airshow last year, forming part of the $67 billion fleet order that was made in 2013 for 199 aircraft.

The new aircraft will come equipped with nine seats, allowing Etihad Cargo to carry additional grooms as part of its sky stables programme, which supports high-value equine movement. The 777s will be the first aircraft in the Etihad Cargo fleet to be equipped in this way.

Sky stables is supervised by dedicated managers, supported by handling teams both in the air and on the ground, with horses currently being moved to destinations in Europe, Asia, Africa, Australia and the Americas.

ALAFCO finances Indian expansion

Air India has signed an agreement with Kuwait's Aviation Lease and Finance Company (ALAFCO) for the lease of 14 A320neos. The deal will see six aircraft delivered next year, followed by six in 2018 and two in 2019.

Embraer makes Iran breakthrough

Atrak Air has acquired six Embraer Regional Jets and three A320ceo aircraft.

The three Airbus jets will reportedly be delivered next month, adding to the carrier's existing fleet of three A320-200s, of which only one is currently operational according to the ch-aviation database. The Embraer additions are a new move for the Iran airline.

Royal Jordanian's profitable swing

Royal Jordanian has released its financial results showing that the airline registered a net profit before tax of $29.6 million (JD21 million) in 2015; while in 2014 it had registered $69.8million (JD49.5 million) net losses before tax.

Paris-Le Bourget link for Al Bateen

Abu Dhabi Airports has signed a memorandum of understanding (MoU) with Aéroports de Paris, linking Al Bateen Executive Airport with Le Bourget Airport.

Abdul Majeed Al Khoori, chief financial officer of Abu Dhabi Airports, and Isabelle Dreysse, deputy-managing director of Paris-Le Bourget, signed the agreement during Abu Dhabi Air Expo 2016. It will pave the way for extensive collaboration between the airports on a variety of aviation industry issues.

Regular meetings will be held between the airport teams focusing, in particular, on customer service, technology and sustainability.

Qatar Airways brand growing

Qatar Airways has been ranked as one of the world's most valuable brands for the first time, becoming the only Qatari company to be represented in the 2016 top 500 global brand ranking.

Brand Finance, an independent brand valuation consultancy, listed Qatar Airways as one of the most powerful global brands in the annual ranking.

Qatar Airways Group chief executive, Akbar Al Baker, said: "Our position as one of the world's most valuable airline brands is testament to our renowned hospitality and dedication to providing our passengers with outstanding service."

Kuwait's Crew cut

Kuwait Airways has selected aeroLINE CREW, from Information System Associates FZE (ISA), as its new crew management system. Kuwait Airways chairperson, Rasha Alroumi, said: "I expect the implementation of the system will enhance our current operational performance and reduce the cost significantly, which is in line with our recently, developed business plan. We look forward to seeing the added value the new system will bring to our operations."

Saudi joins big guns

Saudi Arabia has overtaken Russia to become the third largest spender on military equipment. According to the Stockholm International Peace Research Institute (SIPRI), which tracks arms expenditure around the world, global military spending reached almost $1.68 trillion in 2015, marking a year-on-year increase for the first time since 2011.

The USA and China hold the top two big guns followed by Saudi.

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Qatar Airways launches first app

Qatar Airways Cargo has launched its first mobile app – QR Cargo – available for both Android and iOS devices via Google Play Store and Apple App Store.

"The all new Qatar Airways Cargo app is linked to our in-house cargo reservations, operations, accounting and management information system (CROAMIS), which provides real-time data and updates for each logistic milestone achieved, direct to our customers," said Ulrich Ogiermann, Qatar Airways chief officer, cargo.

Ataturk moves close to top 10

The latest figures from Airports Council International (ACI), the global platform of international airport operators, show Istanbul's Ataturk Airport is knocking on the door of the world's top ten busiest.

It was the 11th busiest airport worldwide, providing a service to 61.8 million passengers in 2015, according to the ACI report. It surpassed Jakarta and Frankfurt airports and increased its passenger numbers by 9.2%.

According to ACI data covering 1,144 airports worldwide, Atlanta and Beijing airports maintained their positions in the top two in 2015. Dubai increased its number of passengers by 10.7% and improved its position to the rank third.

Saudi A330 Regional taking shape

Assembly of Saudi Arabian Airlines' first A330 Regional jet is well under way at the Airbus Final Assembly Line in Toulouse, France.

The aircraft is the first of 20 A330-300 Regionals that will join the airline's fleet, making Saudi Arabian Airlines the first carrier in the world to operate the new aircraft.

It is now in the initial fuselage section joining phase and will move to the next assembly station for wing junction, start of cabin installation and first power-on.

Jazeera share sale?

Jazeera Airways shareholder, Boodai Corporation, has enlisted HSBC Bank to advise it on the possible sale of some or all of its stake in the Kuwaiti low-cost carrier, according to ch-aviation.

Among the options Boodai is reportedly considering are a merger or acquisition, a re-initial public offering, or listing global depositary receipts in an overseas foreign market.

Last month, airline chairman, Marwan Boodai, said Jazeera Airways' plans to start long-haul operations would hinge on it partnering with an "international player".

Mahindra eyes UAE

India's multinational conglomerate, the Mahindra Group, is eagerly eyeing aerospace and defence partnership projects in the UAE, with a particular focus on Abu Dhabi.

Company president, S.P. Shulka, said areas of particular interest were components, sub-assembly and assembly of aerospace and aviation equipment for fixed-wing and rotary platforms adding: "Since we already do them in Bangalore and Australia we have the technology skills and management manpower to allow us to do it here."

Panasonic wins A320 IFE deal

Saudi Arabian Airlines has selected Panasonic Avionics Corporation's innovative eXO system for its fleet of 30 Airbus A320 aircraft on order. The product is available with Panasonic's new 12-inch 1080p retractable overhead monitors, near audio-on-demand and wireless support for passenger device streaming, and interaction with the in-flight entertainment (IFE) system.

It is designed for maximum flexibility and supports a wide variety of audio/video-on-demand (AVOD) configurations, including overhead video, wireless IFE, full AVOD and hybrid, cabin class-specific systems.

Closer R&D links

Mubadala and Boeing have signed a new strategic agreement to collaborate on research and development to expand aerospace manufacturing capabilities in the UAE.

The five-year agreement sees Boeing join Mubadala's existing R&D ecosystem in Abu Dhabi, including the Aerospace Research and Innovation Center (ARIC) at Khalifa University and the Masdar Institute of Science and Technology. Initial projects include research in the areas of robotics and aircraft assembly.

Extra EA 330 LTs add to Etihad Flight College fleet

Etihad Flight College has expanded its fleet of trainer aircraft with the delivery of two Extra EA 330 LT aircraft. The Extra aircraft will be used for prevention and recovery training, which equips pilots with the skills to recognise, prevent and, if necessary, recover from a developing or developed aircraft loss of control.

Christopher Ranganathan, Etihad Airways' vice president operations training, said: "Our main aim is to train pilots who are able to demonstrate safe, effective and efficient operations, and the addition of these new trainer aircraft greatly supports this goal."

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The tragic scene at Rostov-on-Don as daylight breaks on the day of the crash.
PICTURE © PRESS ASSOCIATION

Training into focus again following Flydubai crash

March 19th was a black day for Middle East aviation and for the UAE in particular with the tragic loss of a Flydubai Boeing 737. **Alan Peaford** *reports.*

As we go to press, Russian air crash investigators - with the assistance of the UAE's regulator, GCAA and experts from Flydubai, Boeing and engine maker CFM - are pulling together the final report on the crash of Flydubai's flight FZ981 which crashed at Russia's Rostov-on-Don Airport in the early hours of March 19 with the loss of all those on board.

While there has been a significant amount of speculation as to the cause of the crash, which led to the deaths of the 62 passengers and crew on board, Flydubai's CEO Ghaith al Ghaith has maintained a consistent approach saying the airline would not be commenting on the findings of Russia's Interstate Aviation Committee until the final report is issued.

Al Ghaith led the Flydubai team from the front, facing the media within hours of the crash, expressing the shock and horror felt across the industry and immediately offering assistance and support to the families of the bereaved.

This is the first fatal accident involving a UAE carrier and came just weeks after the hybrid airline had become a full member of IATA having successfully completed the gruelling IASA safety audit and passing with flying colours.

"Flydubai followed the best practice in terms of how they responded immediately after the accident," said safety consultant David Dawlish. "They had emergency

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numbers out there, they were in contact with passengers families and had set up a response centre in Rostock, they had social media messages to get fast updates to the press and quench the thirst for information from the general public. They were also reinstalling confidence in their passengers."

Safety investigators – and the worldwide 24-hour news services – had almost immediate access to closed circuit television (CCTV) images from the immediate area around Rostock-on-Don Airport showing the aircraft plunging to the ground at high speed with a steep nose-down attitude.

Those images were eerily similar to the final seconds of another recent accident following an attempted go-around. In November 2013, in similar weather conditions to the night of the Flydubai crash, Tatarstan Airlines Flight 363 - a Boeing 737-500 with 50 passengers and crew onboard - crashed as it attempted to land in Kazan, Russia, after the second attempt at an instrument approach, leaving only small pieces of debris at the airport crash zone.

The Russian investigators have made an interim report where they disclosed that the horizontal stabiliser of the crashed Flydubai Boeing 737-800 transitioned to nose-down pitch at a height of 900m (2,950ft) as the crew attempted a second go-around.

Russia's federal air transport regulator, Rosaviatsia, outlined the sequence of the fatal accident in a April 4 safety bulletin.

While it didn't disclose conclusions about the crash, it said the commission of inquiry has recommended that 737 operators be urged to study go-around procedures and handling of aircraft, particularly in regard to longitudinal flight control.

Rosaviatsia also recommended carriers include simulator training for go-around and recovery in conditions of wind shear and with failures relating to a jammed elevator.

Rosaviatsia reported that the Flydubai crew had informed air traffic control about the presence of wind shear while conducting its initial approach to runway 22. The preliminary report confirmed the crew attempted a first landing in adverse weather conditions with the autopilot turned off but called a go-around because of wind shear.

Weather reports at the time of the crash showed that although the cloud base was relatively high—2,067 ft—there was "severe" turbulence and "moderate" wind shear with sustained winds of 25 kt. and gusts to 35 kt.

Conditions on the ground included light rain showers and mist, with a temperature of 0 degrees Celsius (32 degrees Fahrenheit).

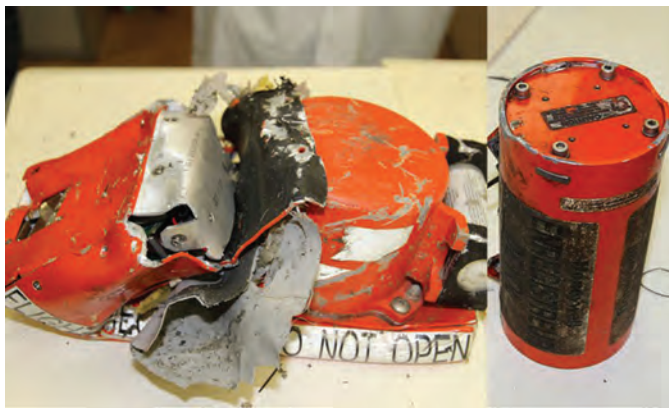
According to Russian authority, the crew then circled the airport waiting for weather conditions to improve before attempting another landing.

Air traffic control recordings, circulating on the Internet, revealed that the crew had called the Rostov tower multiple times during the holding pattern to discuss whether the visibility and wind conditions were improving.

According to Flightradar24, an Aeroflot Sukhoi Superjet 100 had tried three times to land at Rostov while FZ981 was holding, ultimately deciding to fly to an alternate airport.

The second approach was also flown with the autopilot turned off. When the plane reached around 220 meters (722 feet) in altitude, the crew again called off the attempted landing, initiated a climb and applied takeoff power to the engines.

Russian investigators said that when the aircraft had climbed to 900 meters in altitude, the plane's nose went down sharply, causing the aircraft to descend rapidly. The crew were unable to recover and the plane hit the ground at a speed exceeding 600 kilometres per hour (372 miles an hour).



Investigators said the flight data recorder did not show evidence of any failures of aircraft systems, components or engines.

Flightradar24–again widely available on the Web – showed a steeper climb out on the second go-around, with an average climb rate of 3,200 ft./min. but peaking as high as almost 5,000 ft./min. Ground speed (airspeed plus or minus a wind component) data was roughly the same during both go-arounds. Approximately 40 seconds after the pilots initiated the go-around, at an altitude of 4,000 ft, the aircraft began the fatal dive.

The investigators said the flight data recorder did not show evidence of any failures of aircraft systems, components or engines, but were continuing to study the cockpit voice recorder and flight data recorders to reconstruct the full sequence of events prior to issuing the final report.

Regardless of the ultimate outcome of the investigation, the timing of the crash–during an attempted go-around–is sure to reignite pressure from safety advocates for better pilot training on the complex but rarely performed procedures.

According to *Aviation Week* specialists, a likely contributor to the Tatarstan crash was spatial disorientation linked to somatogravic illusions during the go-around. "Under positive acceleration–a lightly loaded 737 under a high-power go-around for example–somatogravic illusions, if not overridden by the aircraft's attitude instruments, can cause a pilot to believe the aircraft is climbing," the report said.

"During go-around or takeoff phases in low-visibility conditions, while the aircraft is accelerating, pilots may try to counteract this perception of climb by pitching down the aircraft's nose until the dive counterbalances the apparent backward tilt caused by the acceleration, which may end in impact with the ground." said the French aviation safety agency, BEA, in a report published four months before the crash.

The Study on Aeroplane State Awareness during Go-Around (Asaga) labels somatogravic illusions as a possible factor in a number of accidents, including a Gulf Air Airbus A320 in 2000, an Armavia A320 in 2006, and a Kenya Airways Airbus A330 in 2007. BEA found that the difference between the actual pitch attitude and perceived pitch attitude during a go-around can be as much as 25 degrees.

According to *Aviation Week*, BEA concluded that pilots are ill-prepared for go-arounds, relatively rare events where many actions must be completed in a short time, leaving little margin for error in handling automation and control of the aircraft. Failure to handle either can lead to a loss of control.

Along with calling for somatogravic illusions to be incorporated into simulators, the BEA also recommended more training for go-arounds, particularly with both engines operating, and installation of devices to limit thrust during go-arounds.

And so Flydubai awaits anxiously for the final report. During this period of waiting the airline is seeing disgruntled former employees and those from other airlines making points about pilot training and pilot fatigue.

The Dubai airline has kept a respectful silence, mourning the pilots and crew: Captain Aristos Sokratous from Cyprus, first officer Alejandro Alava Cruz and senior cabin crew Javier Curbelo Caro, both from Spain.

Cabin crew Maxim Aydrus from Russia, Alex Confait from the Seychelles, Laura De La Cruz Roca from Columbia and Zhyldyz Nasirdinova from Kyrgyzstan.

"FlyDubai would like to express once again its deepest sympathies to all those who have lost loved ones in this terrible tragedy," Al Ghaith said.

"The families of all those who have been affected by flight FZ981 remain our top priority. We would also like to express our gratitude for the work of the Russian officials, local authorities, emergency services and volunteers in difficult conditions in the aftermath of the accident and we continue to offer our support to them."

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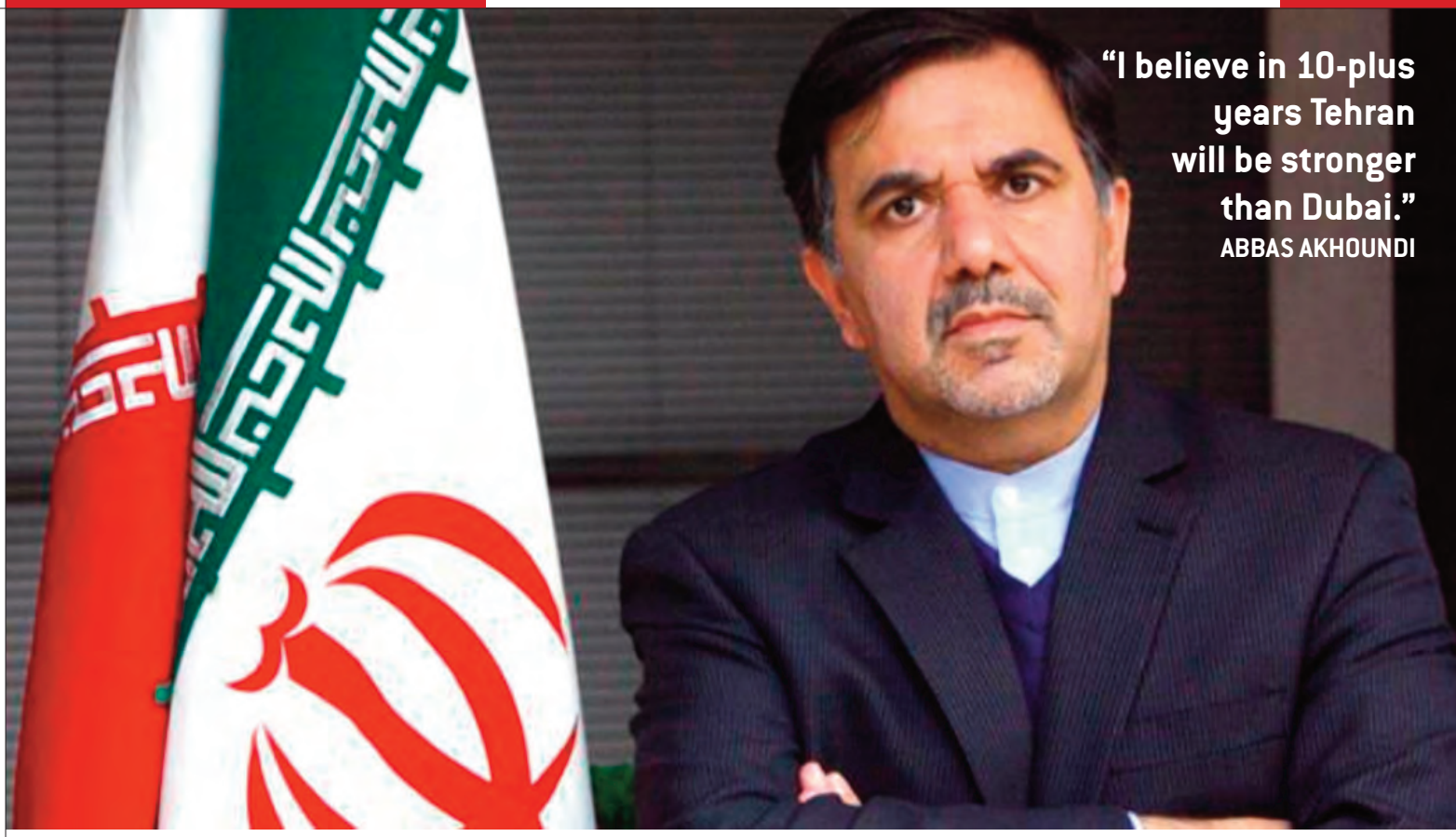

"I believe in 10-plus years Tehran will be stronger than Dubai."
ABBAS AKHOUNDI

The giant who came in from the cold...

Iran's long-suffering airlines were in bullish mood after the lifting of nuclear sanctions in January, igniting a frenzy of aircraft orders and talking up Tehran's prospects as a Gulf mega-hub.

Martin Rivers *reports on the opportunities and challenges that lie ahead.*

One of the world's biggest pariah states came in from the cold on January 16 2016, when the lifting of nuclear sanctions against Iran ushered in a new era of cooperation with the international community.

For the Islamic Republic's long-suffering civil aviation sector, reintegration will be nothing short of transformative.

More than three decades of sanctions have left Iran's airlines in a sorry state. Rigid enforcement action by the Office of Foreign Assets Control (OFAC), a wing of the US Treasury, pushed flag-carrier Iran Air and its 15 domestic rivals into the black market when buying and repairing aircraft.

The sector's ingenuity and perseverance outwitted the best efforts of a US Government that viewed every Iranian aircraft as a military threat, but success came at a price.

Hundreds have perished in air accidents since the turn of the century, giving Iran one of the worst air safety records in the world. The inflated cost of procuring second-hand equipment away from Washington's gaze also heaped financial pressure on Iranian carriers, with brokers charging a hefty risk-premium for their illicit transactions.

This, in turn, strangled the sector's growth prospects.

Despite being larger and more populous than Turkey, Iran's flag-carrier deploys one-tenth as many aircraft as Turkish Airlines. About half of the country's 250-plus commercial aircraft, which have an average age of 23 years, are grounded for safety or financial reasons. Once considered a market leader in Gulf aviation, Iran Air has become a footnote against a new breed of carriers in Qatar and the UAE.

In the words of Farhad Parvaresh, the flag-carrier's chairman, its employees have spent most of their careers trying to "keep the company alive through endless problems, issues and sufferings".

Now, finally, there is reason to believe that brighter days lie ahead.

"The joint comprehensive plan of action (JCPOA) has removed the obstacles," affirmed Abbas Araghchi, Iran's Deputy Foreign Minister and

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CONTINUED FROM PAGE 23

chief negotiator in the P5+1 talks that brokered the nuclear accord. "How business is again started depends on commercial decisions.

"Things are gradually moving towards normalisation of business between Iranian entities and foreign entities."

Early signs of that normalisation emerged quickly in the aviation sector. Just 12 days after the lifting of sanctions, European manufacturer Airbus unveiled a tentative mega-order for 118 aircraft by Iran Air: 45 A320-family jets (including 24 neos), 45 A330s (including 18 neos), 16 A350-1000s and 12 double-decker A380s.

Parvaresh subsequently signed an agreement for up to 40 ATR 72-600s – 20 firm orders and 20 options – which Iran Air is expected to deploy in a new domestic 'air taxi' subsidiary.

Brazil's Embraer has also confirmed negotiations over the sale of 50 regional jets – 20 reportedly destined for Abadan-based Zagros Airlines – although no contracts have been signed.

Having initially kept a low profile in the post-sanctions bonanza, Boeing secured a licence from the US Treasury in February that allows it to hold formal talks with Iranian carriers. The company re-established a presence in Iran two years ago during an earlier wave of sanctions relief under the joint plan of action, a precursor to the JCPOA, which allowed US firms to assist with maintenance repairs.

There is little doubt that overseas aircraft manufacturers will find a fertile ground for sales pitches in Iran.

Decades of under-development

Abbas Akhoundi, Iran's Transport Minister, has repeatedly stated that the country needs to acquire 500 commercial aircraft to reverse its decades of under-development. Government officials are eager to recover lost ground as quickly as possible, pledging to fulfil the Airbus order in its entirety by 2022.

The decision to purchase A380s underscores Tehran's commitment to developing a full-blown sixth-freedom gateway that can rival the mega-hubs of Dubai, Abu Dhabi and Doha.

As remarkable as that goal seems, Temel Kotil, chief executive of Turkish Airlines, believes it could become reality within a decade.

"Frankly speaking, with the removal of sanctions, and their capabilities, they could have a stronger hub than [other carriers in] the Gulf region," he said. "This country is well educated, it has a big population… and the airline [Iran Air] used to be at the cutting edge years back.

"With the sanctions, they have suffered very badly. It was very painful… but I believe in 10-plus years Tehran will be stronger than Dubai."

Kotil is not concerned about losing market share to Iran Air, as he sees Europe-to-Asia Pacific as the only major corridor in which the two carriers compete. "And, on Asia Pacific, we are already constrained with the bilaterals. Our load factor is 90%-plus, so no harm."

Far from posing a threat, he said a resurgent Iranian market could double demand for Turkish-operated flights to the country within one year.

Sceptics, however, are quick to pick flaws in the rosy projections.

Infrastructure is one critical hurdle that needs to be overcome. Imam Khomeini International Airport, Tehran's main international hub, handled just 7.2 million passengers last year – less than one-tenth the traffic of Dubai's mega-hub.

Minister Akhoundi has unveiled plans to lift the gateway's capacity to 34 million passengers by 2020, but even that falls well short of footfall in Dubai.

Facilitating transfers between domestic and international flights will also be a challenge: most domestic travellers currently use Mehrabad International Airport, Tehran's older and busier city-centre gateway.

Training is another consideration. While Iran has no shortage of highly qualified pilots and engineers, most ply their trade on obsolete or ageing jets. Mahdi Hashemi, chairman of Parliament's development commission, is now urging foreign maintenance firms to establish joint ventures in the country – an invitation that will be music to the ears of market leaders like Lufthansa Technik.

Pledging assistance

Airbus is among the companies that have already responded to the call. Alongside its 118-aircraft order, the European manufacturer signed a "comprehensive civil aviation cooperation package" with Tehran, pledging assistance with everything from air navigation to maintenance to regulatory harmonisation.

Yet the list of obstacles goes on, especially when it comes to financing.

Although Iran has struck deals with two export-credit agencies – France's Coface and Italy's SACE – it will take time for western banks to gain confidence in the country.

A ban on Iranian entities using the US financial system will complicate dollar-denominated deals. More fundamentally, Iran's ability to pay for aircraft has been hit by the on-going slump in oil prices.

Even the Islamic Republic's values could be problematic. Emirates, Etihad and Qatar Airways all serve alcohol on their flights – an unlikely prospect for Iran Air.

While these hurdles can be overcome with time and effort, more ominous clouds linger overhead. Each of the US presidential hopefuls campaigning for the Republican Party nomination has spoken out against the nuclear accord. If one of them is elected, or if Tehran reneges on its commitments under the JCPOA, the embargo could return.

Indeed, for some Iranian airlines, it was never lifted in the first place. The country's largest carrier, Mahan Air, is still subject to terrorism-related sanctions for alleged involvement in military activities.

Legal actions

"Those sanctions have nothing to do with JCPOA," Araghchi explained. "They have been sanctioned because of other reasons… We are now trying to see what legal actions can be taken by Mahan itself, or by the government, to consider possibilities for taking Mahan out of the list [of OFAC's specially designated nationals]."

In lieu of a breakthrough, he said Tehran would "make sure that… only those who are out of the designated list would benefit from the advantages of JCPOA".

With so much work still to be done, Iran Air's management are understandably tempering growth projections.

Parvaresh has said between five and eight Airbus jets will arrive this year, undercutting the government's estimate of 17. Rather than ballooning the flag-carrier's scale overnight, he is plotting a 10-year roadmap to incrementally lift operations in step with the company's – and the country's – capabilities.

Iran Air's A380s will not appear until the second half of the business plan.

Mohammad Khoshnevisan, the airline's commercial chief, echoed this cautious tone by promising to "maintain our current schedules" for at least three years. His focus is on lifting aircraft utilisation rates to 12 hours a day, thereby ensuring that revenue growth keeps pace with rising costs.

Fleet development, after all, is just one of several priorities. Efforts to open up the country's skies are also critical.

TOP LEFT: Iran Air could extend its Boeing fleet as sanctions lift.

ABOVE: Tehran's airport busy with local carriers but now expecting a rush from international airlines.

PICTURES: MOHAMMAD RAZZAZAN

Iran has created five new airspace corridors in recent months, according to Akhoundi, with more expected in the near future.

The benefits are being shared across the industry: seat capacity on flights between Europe and Iran increased 25% year-on-year in February, reflecting an early push by several German and Turkish carriers. Air France and British Airways are among the latecomers hastily restoring Tehran to their networks.

With Iran Air also now able to refuel at western airports – ending its costly technical stops in eastern Europe – the flag-carrier is inching towards the last, all-important symbol of rapprochement: US flights.

"From Iran's side, there is no barrier to establishing flights between Iran and United States, or Canada," said Mohammad Khodakarami, deputy director of Iran's Civil Aviation Organisation.

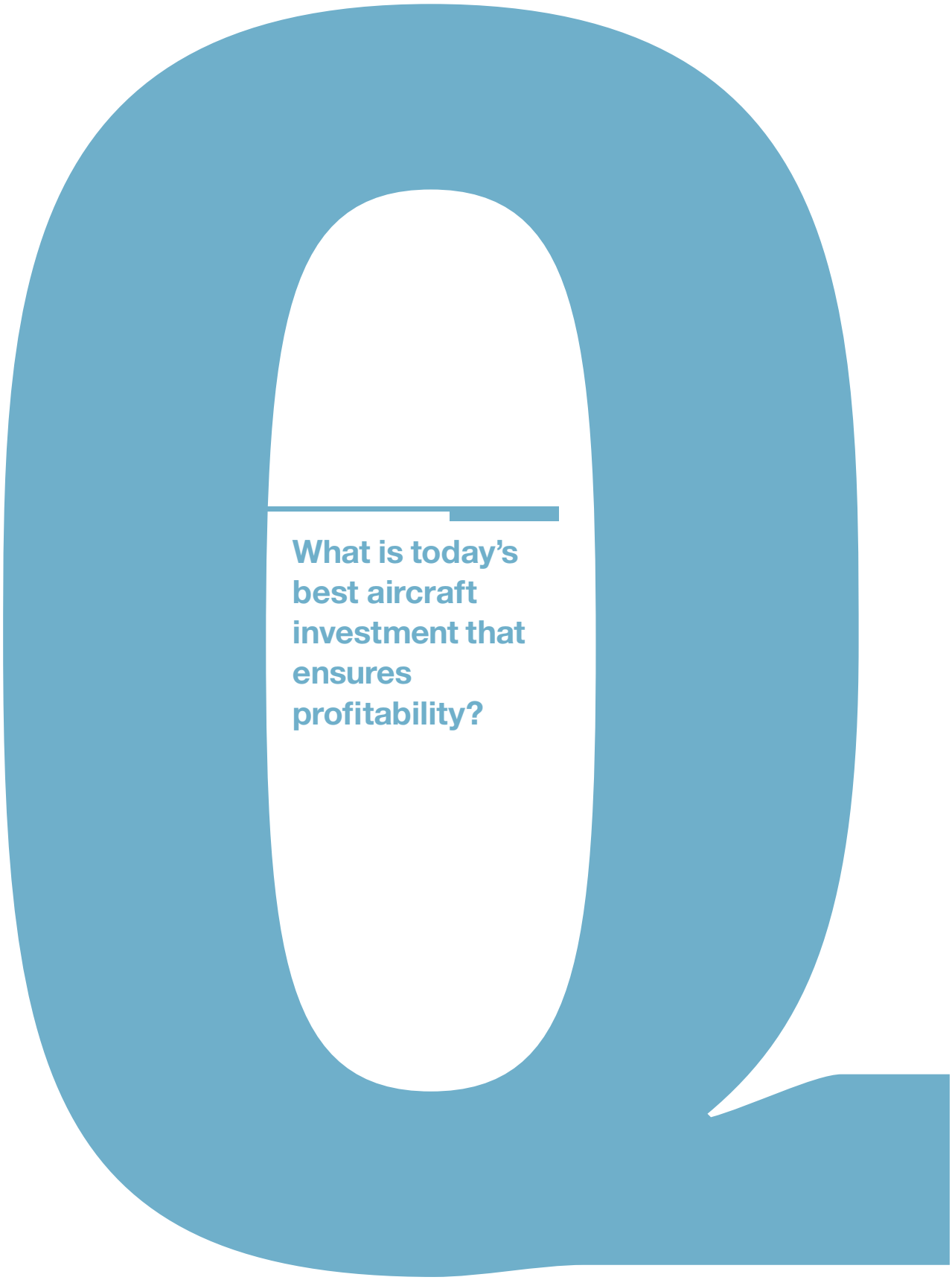
Load factor

"Before the revolution, Iran Air had daily direct flights to the United States. We know that there is demand… We are sure that the load factor will be very great. So, purely from the aviation side, we welcome re-establishing these flights.

"But I think we need some negotiations at the diplomatic level about this issue."

Just as it was politics that clipped Iran's wings nearly four decades ago, it will be politics that determines its fate today.

That translates to a degree of uncertainty for all parties – foreign and local – involved in the rebuilding process. Success is not guaranteed. But, whatever happens, 2016 has become an historic opportunity for aviation companies around the globe to gain a foothold in the Middle East's second largest economy.



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Airbus is the answer.

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As the country's largest domestic operator, Iran Aseman Airlines is leading the charge to find and induct western-built aircraft. But buying from manufacturers is just one option on the table and, as **Martin Rivers** *reports, it isn't always the best.*

Aseman follows the straight and narrow

Though hardly known outside of the Islamic Republic, Iran Aseman Airlines is the largest domestic operator in Iran and potentially one of the prime beneficiaries of the lifting of nuclear-related sanctions.

The airline was established in 1980 and is headed by Hossein Alaei, the former navy chief of the Iranian Revolutionary Guard Corps.

Despite this apparent military link, Aseman has escaped terrorism-related sanctions imposed by the US, which leaves it free to engage with western suppliers now that the broader nuclear embargo is over.

"Aseman has never been on any [terrorism] blacklist since the [Iranian] Revolution of 1979," stressed Mohammad Gorji, the airline's vice-president of executive affairs and fleet development. "We have always been following the rules and regulations.

"But it didn't make any difference. All Iranian airlines have been affected by the same constraints and difficulties during the past years."

Like many of its local rivals, Aseman is now positioning itself for ambitious growth in the post-sanctions era. The airline's existing fleet of 35 aircraft will rise to 100 units over the next five years, Gorji predicted, cementing its market-leading position in the domestic space. Aseman currently provides 34% of internal flights in the country, according to Flightglobal Innovata, compared with Iran Air's 24% market share.

Yet, despite laying out a bold growth trajectory, Aseman will not follow in the flag-carrier's footsteps by placing mega-orders with western manufacturers.

Instead, Gorji is preparing for a steady influx of second-hand narrow-bodies – primarily Boeing 737s and Airbus A320s – that will gradually allow the airline to modernise its fleet without leapfrogging the technical capabilities of its pilots and engineers.

Mohammad Gorji: "All Iranian airlines have been affected by the same constraints and difficulties during the past years."

He is also keeping all options on the table when it comes to procurement channels. Although Aseman has no need to continue using third-party brokers – shadowy figures that for decades helped Iran bypass aviation sanctions – Gorji will not turn his back on these long-standing allies. "We trusted them for many years," he said of the embargo-busting middlemen. "We don't forget our friends."

The airline's fleet today compromises 18 Fokker 100s, six ATR 72s, three A320s, one A340, five 727s (two of which are freighters) and two 737 Classics. More than half of its aircraft are currently held in storage, including 14 of the Fokker 100s.

Separately, Aseman also operates Dornier 228s and Dassault Falcon 20s on behalf of the National Cartographic Centre of Iran.

Scheduled passenger operations are firmly focused on the domestic market, with primary bases at both of Tehran's main gateways (Imam Khomeini Airport and Mehrabad Airport) plus Shiraz in the south and Mashhad in the north-east. Alongside the 36 domestic airports in the route network, Aseman currently serves nine overseas points – Istanbul in Turkey; Yerevan in Armenia; Dushanbe in Tajikistan; Kabul, Kandahar and Mazar-i-Sharif in Afghanistan; Dubai in the UAE; Kuwait; and Muscat in Oman.

Gorji said the airline would continue to prioritise domestic operations, voicing a desire to "assist the government" with developing regional hubs across the country. "It could be a very nice privilege for us if we can monopolise the domestic market as we did before," he added, although local rivals Iran Air, Caspian Airlines, Qeshm Air and ATA Airlines are unlikely to relinquish their domestic footprints willingly.

With major fleet growth on the horizon, Aseman is also exploring opportunities beyond Iran's borders. Turkey, the UAE, Afghanistan, Pakistan and countries within the Commonwealth of Independent States (CIS) are all considered growth markets.

"I am sure that if the sanctions are completely removed the [foreign] experts who will come to Iran will make [demand for] new flights," Gorji said, hinting at further expansion in some "not very far" corners of Asia.

Asked about the airline's former route to Stockholm in Sweden, he speculated that Iran Air and Mahan Air were better placed to capture European traffic. "For the time being, I don't think the [European] market is very attractive for us," he admitted, while stopping short of ruling out an eventual resumption of services.

It does not help that, in 2013, Aseman lost its Part 145 approval from the European Aviation Safety Agency (EASA) – a voluntary suspension blamed by Gorji on a "lack of inspectors coming to Iran".

With his gaze firmly set on short-haul connectivity, nearly all of the aircraft procured under the five-year plan will be single-aisle variants. "A320s and 737NGs – 800 or 900 – are the best for us because our target is regional," Gorji affirmed. "Single-aisle aircraft could also include Embraer, Bombardier, Sukhoi, everything. I cannot say which."

Only "three or four" units within the 100-strong fleet will be wide-bodies – most likely A300s or A330s – thereby leaving the door open for selective long-haul expansion.

Estimating that Aseman can induct between three and five aircraft per quarter, Gorji is hopeful of receiving six A320s and six 737s this year alone.

"We found all of them. We had some negotiation and it's under finance process now," he said. "We prefer to have both fleets growing in parallel in order to ensure that all our eggs are not in one basket. We have been working with Airbus for years with no problem – not 100% support, but support – but we have never worked with Boeing before.

"For next year we decided to do eight A320s – plus Boeing as well – then in the third year we will double the deliveries. We need 20 aircraft a year, but each year will not be equal."

Although its growth trajectory is similar to that of Iran Air – the flag-carrier has provisionally ordered up to 158 aircraft from Airbus and ATR

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"I want to bring the average age of my fleet [down from 26] to 10 years."

MOHAMMAD GORJI

CONTINUED FROM PAGE 29

– Aseman is taking a different approach to sourcing its planes.

The airline does not expect to place direct orders with manufacturers in the next five years, Gorji said, insisting that leasing companies and brokers could provide second-hand units at more attractive prices. "We have already had many proposals," he beamed.

"After five years, if possible, then we can go and do the same that other airlines are doing [by ordering brand new aircraft]. But, first, I want to bring the average age of my fleet [down from 26] to 10 years."

As well as offering a cheaper path to fleet renewal, mid-life aircraft will give leeway for Aseman's workforce to improve their capabilities step by step.

"We have to adjust ourselves," Gorji continued, acknowledging that Iranian pilots and engineers lack experience on the latest generations of aircraft.

"To change our education from the existing situation takes time. I would prefer to move from analogue cockpits to semi-glass cockpits [with some digital features], and from semi-glass cockpits to [all-digital] new generations. We need training for the pilots, engineers, tools, and equipment. Then, in five years, I can manage 100 aircraft, because the speed of the education and the management will be increased."

The first step in this process will be withdrawing the Fokker 100s, which Gorji admits have now outlived their usefulness. With the 727s also due to be retired in the near future, a significant number of pilots will need to take transit courses as they move to the expanding Airbus fleet.

Beyond practical considerations about training, Aseman has another reason for balking at direct orders.

In the future, historians may depict the lifting of nuclear sanctions as a watershed moment that precipitated Iran's full reintegration into the global community.

But that is not yet certain. On top of the threat of snapback sanctions should Iran contravene the terms of its nuclear accord, the political landscape in America looks ominous – particularly given the jingoistic tone set by Republican candidates in this year's presidential election.

Emphasising that life under sanctions forced Iran's airlines to develop in-house expertise, Gorji said Aseman would never turn its back on the capabilities and autonomy that it painstakingly nurtured over the decades.

"We educated ourselves during these past years," he stressed. "We have never received even one paper document for the Fokkers. So we learned how to manage ourselves, and we don't want to forget that. We don't want to disturb what we established during the years.

"Personally, I think we have something that we should keep, in order to ensure that the next deal with Iran should be fair."

Hedging its bets

Does this mean Aseman is hedging its bets against a resumption of the embargo? "The sanctions will never be back. I am sure," Gorji retorted with a smile. "But if we are asked to forget everything, we won't. Our infrastructure is well established."

That self-reliance will be in evidence across the country this year, as Tehran prioritises restoring grounded aircraft before new metal arrives.

Transport Minister Abbas Akhoundi estimates that about 150 of the 250 aircraft in the national fleet are held in storage – either because they are no longer economical to fly or, more commonly, because they could not be properly maintained during sanctions. Iranian airlines were banned from acquiring spare parts until 2014, when temporary sanctions relief allowed selected western companies to provide technical support.

Giving a higher figure of 120 aircraft in storage nationally, Gorji said these grounded units should be considered low-hanging fruit by the sector as it moves to scale up capacity.

"My suggestion for all Iranian airlines is that [they should] first evaluate which aircraft can be returned to service. Out of 120 on the ground, maybe 60 can come back," he said. "It could be a good solution for us. Thinking about what we have [and] what we can gain during the years: knowledge, training, tools, equipment, maintenance, everything.

"If tomorrow Lufthansa [Technik] told me, 'We will maintain all your aircraft', do I have to accept? No. I have already established good MRO at Aseman. We have to use it."

Despite talking up the country's independence, however, Gorji will not be spurning foreign overtures. Aseman is already engaged with international suppliers and it may consider formal partnerships with specialist training or technical companies.

Underscoring Iran's broader appetite for deep-rooted cooperation, Iran Air and Lufthansa Group signed a memorandum in March that pledged to explore "further business and partnership opportunities" between the two sides. Because the deal was struck at group level, it could potentially cover any facet of Lufthansa's sweeping corporate structure – operations, IT, consultancy, training, maintenance, catering and cargo.

Time will tell if Aseman goes down the same path. But, if it does, the airline's attention will never stray from building domestic expertise and defending autonomy.

"We don't want just to purchase aircraft," Gorji concluded. "We want to ask them [overseas suppliers] to educate us, to empower us. Everybody who wants to serve us with such support, we will welcome them."


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THE MAN IN THE MIDDLE...

Middle East Airlines (MEA) has fought off regional instability, domestic strife and rampant competition to become a highly profitable, niche flag-carrier. Chairman Mohamad El-Hout shows **Martin Rivers** *why biggest isn't always best.*

In the decade following Lebanon's civil war, flag-carrier Middle East Airlines (MEA) failed to post one single annual profit.

When net losses peaked at $87 million in 1997, the country's exasperated Central Bank gave Mohamad El-Hout, its chief of financial asset development, the unenviable task of finding a manager to rehabilitate the airline.

Apparently unimpressed with the candidates he proposed, it then handed El-Hout the still-less enviable task of fixing MEA himself.

By anyone's standards, the unwitting chairman has performed phenomenally well. MEA has been profitable in each of the 13 years following his 2001 restructuring programme – a slash-and-burn overhaul that grounded loss-making routes and shrank the workforce by about 40%, despite strong union opposition. Financial results for 2015 have yet to be announced.

"Restructuring never is completed! You have to do things all the time," said El-Hout, when asked if the tough days of cutbacks are now behind MEA.

"But the major part of the restructuring was implemented in 2001, and it stayed in 2002 and onwards. In 2015 we agreed the productivity of our pilots and our cabin crew. We have reached agreement with the unions for five years, in which we have made some improvement in the [cost per] ASK (available seat kilometre, a measure of capacity)."

Continual cost-refinement is the mantra at MEA – a small player in the Gulf aviation market with just 18 aircraft to its name.

The 71-year-old flag-carrier not only has to contend with fierce competition from younger, larger rivals in the United Arab Emirates and Qatar. Its home base of Beirut is also on the doorstep of the region's ugliest and deadliest humanitarian crisis – the five-year-old civil war in Syria, which has, to date, extinguished more than 250,000 lives.

Natural springboard

After hostilities broke out in 2011, the Syrian exodus provided an uncomfortable boon for Lebanon's flag-carrier. Beirut is a mere 85-mile drive from Damascus, making it a natural springboard for international flights, given the near-total closure of Syrian airspace.

This influx of refugees helped to offset a sharp drop in European tourists visiting Lebanon, contributing to average annual passenger growth of 6-7% at the airline.

However, as Syrian footfall began waning last year, MEA continued expanding its footprint. "The growth in passengers is not due to the Syrians," El-Hout emphasised. "We also don't have a lot of tourists coming to the country. But we do have the Lebanese diaspora and we have the Lebanese [citizens] that are travelling more."

An estimated 8-14 million Lebanese currently live outside their ethnic homeland, at least double the domestic population, which creates huge demand for visiting friends and relatives (VFR) traffic.

This natural advantage has, at times, carried a sting in the tail, motivating the launch of ill-advised long-haul routes such as São Paulo, Brazil and Sydney, Australia.

But El-Hout insisted the flag-carrier has learned from past mistakes. "We don't follow Lebanese [people] around the world. We follow

"We don't follow Lebanese people around the world. We follow economic routes."
MOHAMAD EL-HOUT

economic routes," he said of its refined approach. "Although we like the Lebanese, any route should be [financially] beneficial. Long-haul is not what we are looking for. It's a very sensitive market. It's not easy. The competition is so huge and we are living in an unstable environment."

Of more interest is what the chairman calls "genuine traffic" – a sideswipe at MEA's larger Gulf rivals, which are dependent on sixth-freedom connecting flows that originate and end in foreign markets.

"We have built our network in a way where there is real economic activity between Lebanon and that country," he continued.

"We don't operate aircraft to bring passengers from London to Bangkok or London to India. Why should I go to India when [Air] Arabia are flying there, Etihad, Qatar, everybody? What should I do there if I don't have real traffic? We need to have genuine traffic between Lebanon and any other country – at least 60% or 70% genuine traffic."

This focus on economically self-sufficient routes has delivered impressive returns. In 2007 and 2008, during the global financial crisis, MEA posted the strongest net profits of its post-restructuring era: $62 million and $92 million respectively.

In 2009 – described by the – International Air Transport Association (IATA) as the "worst year the industry has ever seen" – it followed up with a record-breaking $107 million net profit. The airline's takings have not dipped below $61 million since.

Network rationalisation was a key ingredient for this sustained financial outperformance.

When El-Hout took on the top job nearly two decades ago, the flag-carrier served about 30 international destinations. That figure was slashed to 20 during the early years of his tenure – and not simply by abandoning long-haul routes. Brussels, Zurich, Doha and even Damascus were among the stations axed.

Having stripped operations to the bare bones, El-Hout then began re-evaluating short-haul markets with a clean-slate approach. The cautious expansion that followed has since restored the number of destinations to 29.

"We have built our network in a way [that allows us] to absorb the security situation," he said of the airline's risk-off strategy. "We expand slowly in order to enter markets in an efficient way without excess capacity or [being] obliged to dump [ticket] prices."

Two countries in Lebanon's backyard – Iraq and Saudi Arabia – stood out as offering the best growth potential for MEA.

Iraq has almost tripled its share of Arab-origin tourism to Lebanon since 2009, sending more visitors than any other regional neighbour. In 2014, the arrival of 189,000 Iraqis helped Lebanon record its first annual growth in tourist numbers since the Arab Spring. It is unclear if the rise of Daesh reversed this progress, as Lebanon's Tourism Ministry has not released statistics for 2015.

Either way, MEA capitalised on the trend by rapidly rolling out four

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Iraqi routes: Baghdad in 2009; Erbil in 2010; Najaf in 2013; and Basra in 2014. The airline now operates an average of three daily flights to Iraq, with El-Hout promising additional frequencies to Baghdad in the near future.

Steady growth has also been achieved in Saudi Arabia in recent times. ASK capacity to the kingdom nearly doubled in the six years to March 2015, according to *Flightglobal Innovata*, with Madinah becoming the airline's fourth destination and frequencies rising for each of the pre-existing points (Jeddah, Riyadh and Dammam). Capacity grew another 22% year-on-year in March 2015.

"This is where the market exists," El-Hout said plainly. "If we have peace in Lebanon, we will increase frequencies to Saudi even more. Today we have two flights per day [for Jeddah and two for Riyadh]. If we have peace, we need four or five flights per day."

Expansion elsewhere has been equally measured. In 2013, for example, flights to Armenia's capital, Yerevan, were launched and Amman, Jordan became a thrice-daily service. The following year, London became twice daily.

MEA's network for summer 2016 features 12 destinations in Europe (including seasonal services to Copenhagen, Denmark and Nice, France); 14 in the Middle East, North Africa and the Caucasus; and three in west Africa (Lagos, Nigeria; Accra, Ghana; and Abidjan, Ivory Coast). Flights to Kano in northern Nigeria were suspended this year.

"We would like to increase frequencies to Lagos but we don't have the rights, because it's limited to three flights per week," El-Hout said, when asked about the next wave of growth planned by MEA.

"We are considering Abuja instead of Kano. And we decided to operate to Khartoum, Sudan. But, unfortunately, this has been stopped because of the currency [exchange] problems. We are not going to go anywhere that we cannot transfer our money."

Conservative route development at the flag-carrier is matched in kind by its fleet plan.

MEA presently deploys 18 aircraft for mainline operations: 12 A320s, two A321s and four A330s. Following an amendment to its order book in January, the airline now has commitments for nine A321neos, one A320neo, one A320ceo and one A330.

The latter two units will both arrive this year – joining a newly inducted A320 – before the neos come on-stream between 2018 and 2022.

Despite the influx of new metal, however, net growth will be capped at just one unit per year as MEA retires older models and preserves its average fleet age of six years.

"If the [geopolitical] situation is like this we would like to see one additional plane every year," El-Hout said, confirming that two of the three deliveries scheduled for 2016 will be replacement units. "If we have stability in the [Levant] area and in Lebanon, then we will change direction and we need to expand much more quickly."

A decision over wide-body renewal will also be made at some point in the next two years. Either the A330neo or the Boeing Dreamliner 787-9 is "probably what we are looking for", El-Hout said, though the A350 will also be evaluated. The 777 is not considered suitable.

Looking beyond organic growth, MEA's ascension to the SkyTeam alliance in 2012 has also sharpened its focus on codesharing – both within and outside the alliance.

"Our partners are SkyTeam but we cooperate with anybody who can create market value or make benefits to both companies," the chairman affirmed. "We signed codeshare agreement with [Oneworld member] Royal Jordanian in 2014. Now we have had some talks with [Star Alliance member] Turkish Airlines. We already signed a special prorate agreement with Turkish and we are talking about more cooperation."

Moreover, three recent investments by 99% shareholder the Central Bank have allowed the flag-carrier to broaden its gaze beyond mainline passenger operations.

In January, newly established business-jet subsidiary, Cedar Executive, took delivery of its first aircraft – a nine-seat Embraer Legacy 500. The company has a second unit on option and, according to El-Hout, it will consider managing aircraft for independent business-jet owners.

Last summer, meanwhile, saw the opening of two new facilities. MEA's $25 million cargo centre has nearly tripled its freight capacity at Beirut Rafic Hariri International Airport – now capable of handling 165,000 tonnes per year – as well as addressing concerns raised by both the International Civil Aviation Organization and the European Union about security at the old hub.

"The new cargo centre meets all international standards," El-Hout stressed. "We have passed many audits that are not required for MEA, but we have asked to do them to make sure that we meet those standards."

Lebanon's first full-flight simulator training centre also opened its doors in 2015, featuring a next-generation CAE 7000XR. The A320 simulator will reduce the cost of sending MEA pilots abroad for training, as well as allowing the flag-carrier to branch into third-party services.

El-Hout is candid about the challenges of operating in the Lebanese market, even when discounting the impact of the Syrian war.

Beirut's fractured political climate has hindered efforts to create an independent civil aviation authority, slowing regulatory reform and prompting international concerns about oversight. Political disagreements have also derailed proposals for a new terminal at Rafic Hariri Airport under a build, operate and transfer (BOT) contract, dampening the hub's long-term growth prospects.

Regional rivals

The unilateral declaration of 'open skies' in Lebanon in 2000 has been another thorn in El-Hout's side. Although the chairman supports liberalisation, he believes that regional rivals are exploiting open access to Beirut without reciprocating at their own hubs.

"Other countries say they have open skies but really they don't apply it," he complained, singling out the United Arab Emirates – long considered a champion of liberalisation – as one of the worst offenders.

"Now we have six flights per day from Dubai: three for FlyDubai and three for Emirates Airline. When we asked for a third [daily Beirut-Dubai] flight for MEA, they said, 'You are welcome our brother, but we don't have the [landing] slot'. And then Emirates operated their additional frequency at exactly the same time slot that we asked for!"

As a small fish in the gigantic Gulf aviation pond, MEA seems destined to be brushed aside in this way by its bulkier competitors.

But El-Hout has little interest in beefing up operations for pride alone.

Having kept MEA in the black for more than a decade, his winning formula is securing Beirut's future as a specialised hub with a cost-efficient, nimble and risk-averse flag-carrier – just what a shock-prone country like Lebanon needs.

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The mouse that roared ...using sea lions

A small Bahrain-based cargo operator aims to earn its living from the jobs bigger competitors can't handle. **Alan Dron** *reports.*

Running a small cargo airline in the Arabian Gulf is no easy task these days. The huge amount of spare capacity in the under-floor holds of the 'big three' carriers has driven some dedicated freighter operators out of business and forced others to move out of certain sections of the market.

Finding a niche in the marketplace is essential. And transporting a consignment of sea lions to Russia, moving US rock star Jon Bon Jovi's sound equipment between concerts in the Gulf, and flying prototype Volkswagen cars back to Europe after desert-testing certainly count as niche.

Bahrain-based Texel Air has been operating since 2013 and aims to handle the type of jobs that fall outside the scope of larger operators. The sea lions – they were being ferried from Qatar to a circus in Omsk – certainly fall into that category.

"There's so much weird, niche cargo that the big boys can't handle," said Texel director George Chisholm.

His father, John, set up the company, whose title may have been influenced by John's wife, who came from the Netherlands (Texel is a small island off the Dutch coast). It has the virtue of being "a short, snappy, western-sounding name".

The company operates two Boeing 737-300F dedicated freighters, converted by Pemco in the US and fitted with a 3.48 metre x 2.13 metre cargo door.

Texel has had some success in winning oil and gas industry work: "We've developed some good loading techniques with our loadmasters and can put 12-metre drill pipes into the aircraft, although it's a side-loading door." The aircraft also have an equestrian modification that allows them to carry 12 horses and the same number of grooms.

One capability that Chisholm believes is unique in the region is the ability to carry two Canadian-developed bulk aviation transport tanks (BATTs). These collapsible, double-walled, internally baffled tanks can carry up to 5000 US gallons of fuel. If emergency responders need fuel in the aftermath of a natural disaster, the BATTs are an effective means of getting it to them.

Texel Air's operations are centred on the Gulf but the company has gone as far afield as Germany and Thailand and clocked up no fewer than 599 flights over two years to Afghanistan, delivering fruit and vegetables to Australian servicemen stationed there.

"We're not competing with the big boys like DHL or FedEx," commented Chisholm. "We're usually flying to secondary airports and undertaking last-minute, urgent cargoes."

The company operates out of a purpose-built hangar at Bahrain International Airport and Chisholm appreciates the assistance the airline has received from the local authorities: "Being a smaller airfield, it's easier to get things done. We find Bahrain is very flexible and accommodating to our needs."

Next fleet development

The hangar was built to be able to accommodate a Boeing 757-300, in case Texel Air decided to move up in size from its current 737s. However, its next fleet development is likely to be replacement of its -300Fs with -700s, which are a direct replacement for the earlier model in terms of payload, explained Chisholm.

Texel Air is also developing maintenance services at its hangar. Initially built for its own MRO requirements, space in the hangar can be rented out to other companies requiring a location in which to conduct maintenance or 'A'-checks. Both civil and military operators have taken advantage of the facility.

As with its cargo operations, Texel is not trying to compete with major MRO operators in the region but can provide space for minor maintenance procedures for which a large MRO would hesitate to devote valuable hangar space.

Texel Air is, therefore, targeting customers with aircraft based in the region that want smaller maintenance checks carried out without the expense of a lengthy positioning flight to an MRO facility in Europe, for example.

It's another niche that Texel is hopeful of filling successfully.

Texel Air uses two Boeing 737-300F freighter conversions for its operations. Their interior configuration means they can handle anything from racehorses to bulk fuel supplies.

Boom time for supersonic travel?

Boom Technology plans an aircraft carrying 40 passengers at speeds of Mach 2.2 – Concorde flew 100 passengers at Mach 2.0.

The latest contender to build a next-generation supersonic airliner has caught the eye of UK entrepreneur Sir Richard Branson. Now **Alan Dron** *looks at the prospects for passengers once again flying at twice the speed of sound.*

Forty years ago, the supersonic age began with a British Airways (BA) Concorde flight from London Heathrow to Bahrain's Muharraq International Airport.

The meal served on BA300 on January 21 1976 included Dom Perignon 1969 champagne, lobster and caviar canapés, fillet steak and strawberries.

The food can be replicated today in any reputable airline's first-class cabin. What cannot be reproduced is the fact that it was served at twice the speed of sound.

In one of the rare occasions when aviation progress has visibly gone into reverse, supersonic transport ended on October 24 2003, when three BA Concordes landed within a few minutes of each other at Heathrow at the end of their final flights. Overnight, the world became larger again.

No longer would the ogee delta-winged aircraft routinely cross the North Atlantic in three hours. (The London-Bahrain service, the first stage of a proposed route that would continue on to Singapore and Melbourne, had long since been dropped – much to the annoyance of the Bahraini Government.)

No longer would travellers and workers at airports around the world instinctively turn to watch as a Concorde thundered into the sky, propelled aloft by the four blowlamp-like blue flames of its afterburning Olympus 593 engines.

And no longer would passengers be able to claim membership of the airline industry's most exclusive club.

Ever since the Anglo-French aircraft ceased flying, entrepreneurs have talked of once again carrying passengers to new supersonic heights. Several plans have come and gone. Some have lingered for years, seemingly without getting close to the ultimate goal of again flying a viable number of passengers at the speed of a bullet.

So, four decades on from that day when the supersonic airliner taxied into Muharraq's terminal, what are the prospects for recreating supersonic flight?

Several companies, notably Gulfstream, Sukhoi and Aerion, have aired plans for such aircraft, but all have been in the form of large business jets. Aerion says it hopes to begin development of its M1.5 aircraft around mid-2016.

Meanwhile, Boston, Massachusetts-based Spike Aerospace announced in January it was joining with Spanish aerostructures company, Aernnova, to develop its S-512 M1.5 executive jet. First flight is planned for 2019.

The only proposed supersonic design approaching airliner size comes from a Denver, US-based start-up, Boom Technology, which is proposing an aircraft carrying 40 passengers at speeds of Mach 2.2; Concorde flew 100 passengers at Mach 2.0.

Concorde opened the supersonic age with a flight to Bahrain and was used for VIP visits - including the British Queen - until the service ended.

High-profile interest

The Boom design has generated high-profile interest in the shape of Virgin Atlantic chairman Sir Richard Branson, who has taken options on the first 10 aircraft off the production line, assuming the design gets that far.

Sir Richard is known as a man with an eye for publicity. He offered to buy British Airways' Concordes when the national flag-carrier announced it was retiring its fleet. One of his companies, Virgin Galactic, is to assist Boom with manufacturing and testing.

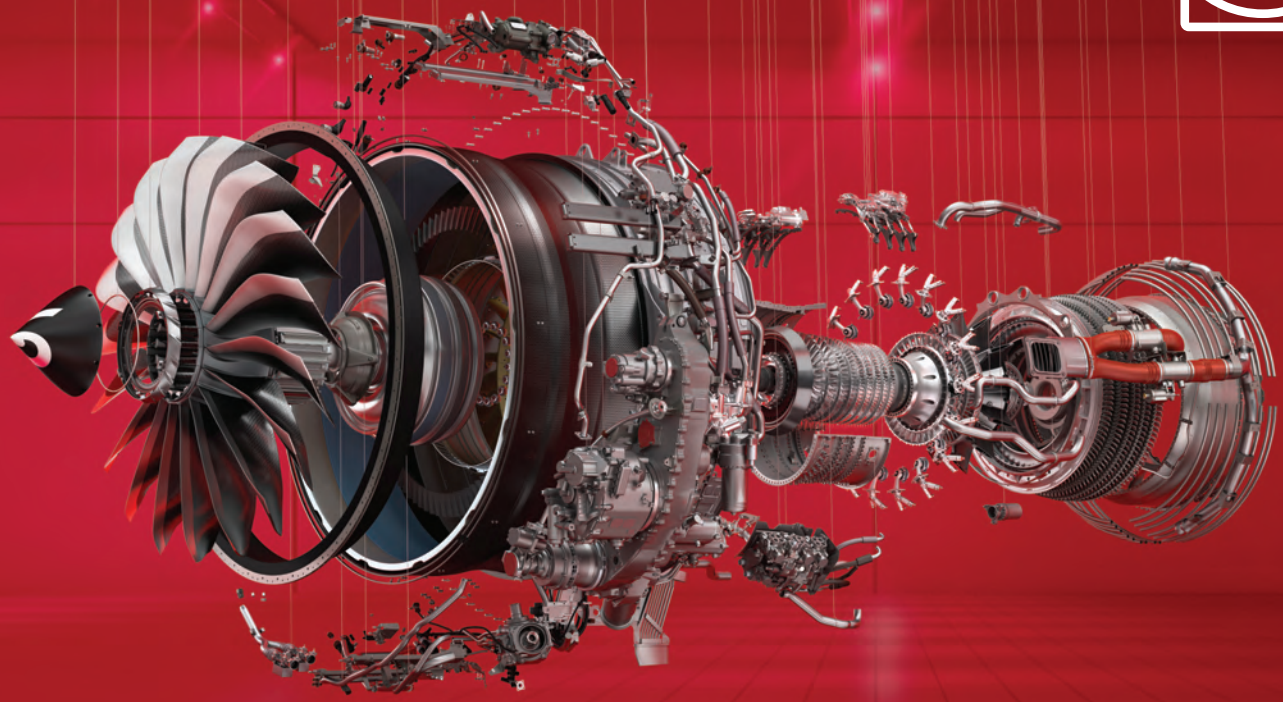
The Denver company says it also has a letter of intent for 15 aircraft from an unnamed European airline.

Boom is targeting a late-2017 first flight for a one-third scale prototype, a twin-engined design.

The team behind the new design says that it aims to achieve economics that will make it possible to offer transatlantic round-trip tickets for $5,000, or around the cost of a business-class ticket on an existing airliner. It says that this will be possible due to a combination of modern aerodynamics, composite materials and new engine technology.

To cut development costs, it plans to use off-the-shelf components. The engines will use an unnamed existing commercial engine's core.

Any supersonic design will face not only significant developmental and financial challenges, but also regulatory ones. Many nations still ban supersonic flight over their territory to avoid sonic booms. This was a major problem that crimped Concorde's operations. It shows no sign of being resolved any time soon.



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Kuwait's Typhoons will be equipped for maritime roles.

RELIEF ALL ROUND AS KUWAIT SIGNS UP FOR EUROFIGHTER

The question mark over Kuwait's fighter aircraft intentions was resolved on April 5 when the Gulf state confirmed a Eurofighter Typhoon contract. **Alan Peaford** *reports.*

You could almost hear the sighs of relief spreading from Rome to Toulouse and Manchester as the Kuwait Ministry of Defence finally put the rumours to bed and signed on the dotted line for 28 Eurofighter Typhoon aircraft.

The contract, part of an intergovernmental agreement between Kuwait and Italy, was signed in the presence of the Italian Defence Minister, Roberta Pinotti, and her Kuwaiti counterpart, HE Sheikh General Khaled Al Jarrah Al Sabah.

Finmeccanica, the Italian defence manufacturer and one of the major partners in the Eurofighter consortium, has been leading the commercial relationships with Kuwait on behalf of the consortium, and the aircraft will be built in Italy.

The deal is believed to be worth around $9 billion. Finmeccanica is the main beneficiary, with about 50% of the value of the contract, and the remaining half goes to partners BAE Systems and Airbus.

The contract signed by Finmeccanica includes logistics, operational support and the training of flight crews and ground personnel, which will be carried out in cooperation with the Italian Air Force. It also provides for the upgrade of ground-based infrastructure in Kuwait, which will be used for Typhoon operations.

Kuwait's defence minister Sheikh General Khaled Al Jarrah Al Sabah and Mauro Moretti, Finmeccanica CEO, at the signing ceremony.

The deal, though formally signed now, is not new. The broad terms of the contract were, in fact, agreed upon by both countries in September 2015, when Boeing, with its F-18, and Dassault, with the Rafale, were dropped from the race.

Since then Dassault famously won the Qatar bid, as well as the fighter contracts for Egypt and India.

Everything was set for a January 31 signing but it was suddenly put off for "procedural reasons".

Sources at BAE Systems had told *Arabian Aerospace* that the UK company was confident the deal would be done, but others were not so sure.

But last month's sudden flurry of activity that saw Pinotti heading for Kuwait City put an end to the speculation – and to the sales drought for the consortium.

Along with the air forces of Eurofighter partners Britain, Italy, Spain and Germany, the Typhoon is flown by Saudi Arabia and Austria. Oman placed the last previous order, for 12 aircraft in 2012.

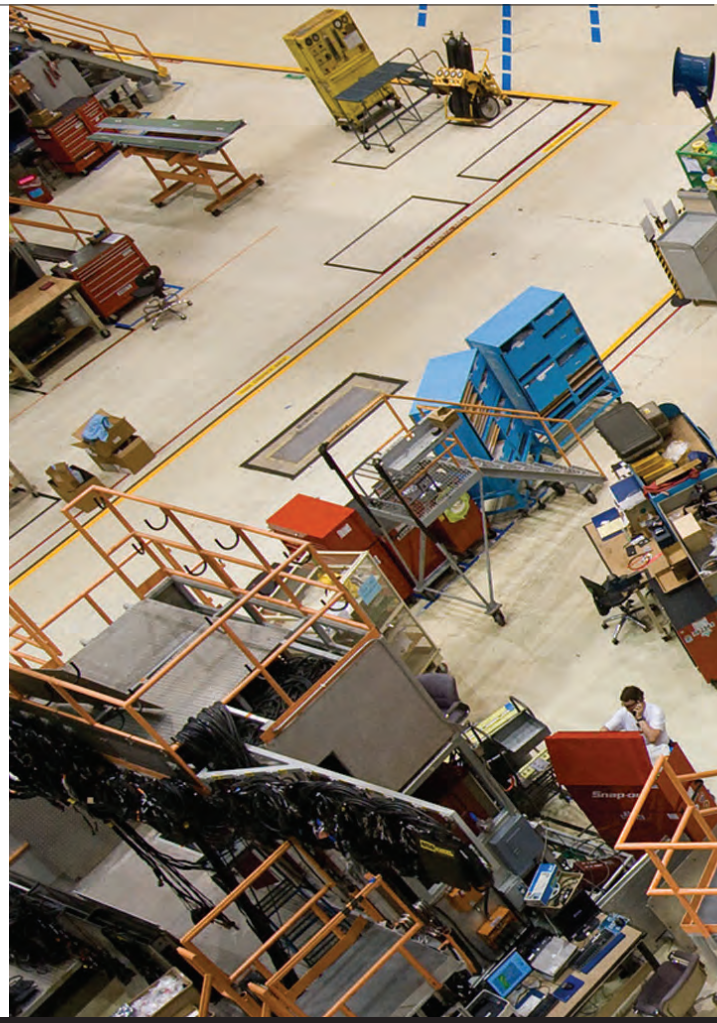
There is widespread speculation that Bahrain could also become a Typhoon operator, possibly through a defence pact with neighbouring Saudi Arabia.

The Kuwaitis will be receiving the most advanced configured variant of the Typhoon, equipped with the cutting-edge new electronically-scanned array radar (E-Scan) developed by the Euroradar consortium.

"This is Finmeccanica's largest ever commercial achievement," said Mauro Moretti, Finmeccanica CEO and general manager. "It is an outstanding industrial success with significant benefits, not only for our company and the other Eurofighter consortium partners, but also for the entire Italian aerospace industry. The contract will support expertise and skilled jobs at Italian small and medium-sized security and defence companies."

A contract for missiles will be signed separately.

Kuwait has a specific requirement for missiles for use against fast offshore boats, according to industry sources, and will be utilising the aircraft in a maritime role not generally associated with the Typhoon.



Eagle eyes a

Time could be running out for Boeing's F-15 Eagle production line in St Louis, Missouri, but, as **Jon Lake** *reports, its closure is by no means inevitable.*

Without further orders, Boeing's F-15 Eagle production line in St Louis will close after the delivery of the 70th F-15SA for Saudi Arabia, probably in early 2019.

However, a number of nations – including at least three GCC nations – are still showing interest in acquiring new F-15s.

There are also other potential opportunities for the F-15, with one particular Eagle customer having a requirement for two additional squadrons, subject to the eventual size of a new US aid package. This influential customer (which is already buying F-35s from the USA) has reportedly applied significant pressure on the USA to try to prevent exports of both the F-15 and the F/A-18E/F Super Hornet to Arab nations, with some success, though the types have at least been offered to meet a number of potential GCC requirements.

In some respects, the F-15 offers things that its competitors cannot, with impressive absolute speed performance, an excellent rate of climb, and good payload/range capability.

Though the F-15 first flew in July 1972, the Eagle remains an impressive and highly capable fighter, and still forms the backbone of the US Air Force's (USAF) air defence fighter and interdictor/strike fighter forces.

In its latest forms (the F-15K Slam Eagle for Korea, the F-15SG for Singapore and the F-15SA for Saudi Arabia) the Eagle's combination of performance, powerful AN/APG-63(V)3 active electronically scanned array (AESA) radar (in the F-15SG and SA), advanced targeting pods and electronic warfare (EW) systems make it a compelling proposition, and arguably the closest US-supplied alternative to aircraft like the Dassault Rafale and Eurofighter Typhoon.

The F-15SA introduced a new digital fly-by-wire flight control system, which allows the aircraft to use the long-dormant outboard under-wing hardpoints, known as Stations 1 and 9. This feature has formed an important element in recent Boeing offerings of the so-called 'Advanced F-15' – a description that covers a number of potential export configurations.

Boeing's F-15SE Silent Eagle added 'stealth' or 'low observability' to the mix, by providing a number of radar cross section (RCS) reduction measures – including canted tailfins and some use of new materials – and the ability to carry a limited internal warload in newly developed conformal weapons bays (CWB) that replace the normal conformal fuel tanks (CFT).

Developed to meet a South Korean requirement, the F-15SE (or some elements from it) was subsequently offered more widely.

USAF F-15E Strike Eagles are being upgraded with an AN/APG-82 AESA radar and a new wideband radome, while F-15C/D fighters are being equipped with the AN/APG-63(V)3 AESA radar.

Boeing unveiled its 2040C Eagle upgrade for the F-15C/D in September 2015. The proposed upgrade is intended to keep the F-15 viable through to 2040, and incorporates features from the F-15SE and F-15SA, with some low-observable features and conformal fuel tanks.

The aircraft would also gain quad-pack munitions racks, doubling missile load to 16, the Northrop Grumman Eagle passive/active warning survivability system (EPAWSS) and a 'Talon HATE' pod. Talon HATE is broadly similar to the battlefield airborne communications node (BACN) system, communicating with various data-links (including those used by stealthy fifth generation platforms) and fusing their information into a single common picture, rebroadcasting that common picture using multiple waveforms and 'languages', so that the F-15 can augment and operate seamlessly alongside fifth generation fighters. Talon HATE also incorporates a long-range infrared search and track (IRST) sensor.

In the longer term, an equivalent to Talon HATE could be of interest to export customers who might want to integrate F-15s, and other fourth generation fighters, with F-35 Joint Strike Fighters.

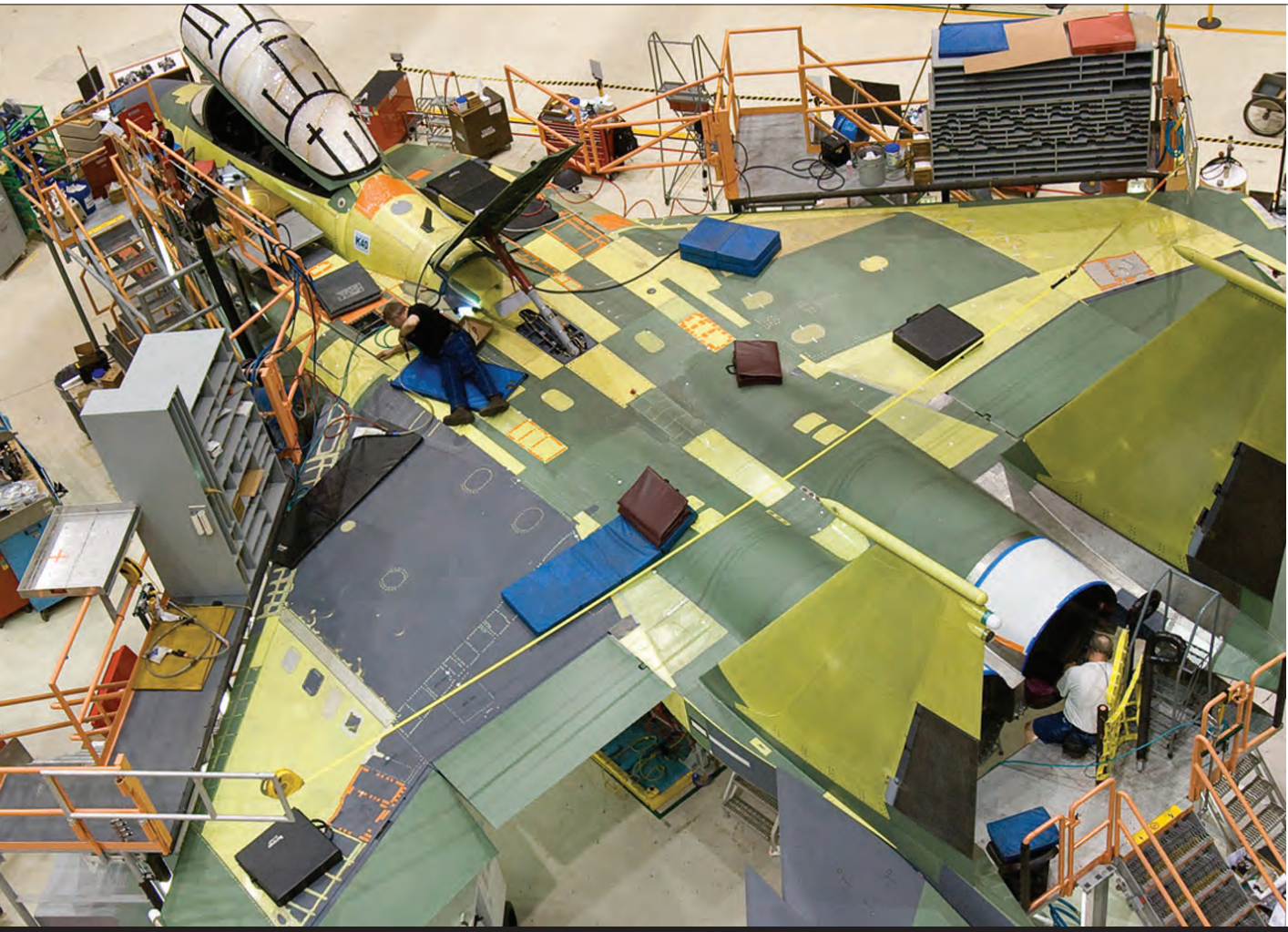
Outside Saudi Arabia and Israel, the first nation in the Middle East to express an interest in acquiring advanced Eagles was Kuwait. After a proposed Rafale buy was derailed in the Kuwaiti parliament in March 2010, interest turned to other aircraft types.

In March 2011, the Kuwait Air Force was said to have told the Pentagon that it intended to order the Block II F/A-18E/F Super Hornet. But, by December 2011, it was being reported that Boeing was also offering the F-15SE Silent Eagle to Kuwait.

The ministry technical team that had recommended against buying the Rafale, labelling it as being technically inferior to other aircraft on offer and more expensive, is believed to have favoured an advanced Strike Eagle.

It was reported that Kuwait had "surprised Boeing" by asking for information on the F-15 Silent Eagle, becoming the first country outside the existing F-15 user community to express an interest in the latest version of the fighter. Paul Oliver, Boeing's vice-president for the Middle East and Africa, confirmed that a Middle Eastern country that was looking to "recapitalise" its air force had expressed an interest in the aircraft, though he declined to identify that country as Kuwait.

In February 2012 there were reports that the Kuwaiti Defence Ministry had reactivated talks on the Rafale, scheduling a flight evaluation of the



GCC interest in the F-15 could prove a lifeline for the St Louis plant.

Middle East lifeline

French jet in June 2012. The Kuwaiti Air Force then evaluated a pair of Italian Air Force Eurofighter Typhoons that were deployed to Kuwait during July 2012.

Despite very high ambient temperatures (reportedly 53°C) and high winds (40mph), the Typhoon reportedly impressed, and, indeed, it has now been confirmed that Typhoon will be acquired. However, Kuwaiti interest in the F-15 and Super Hornet was still being reported in March 2014, with the F-15 offering a longer-range strike capability and the potential to carry a bigger weapons payload than the F/A-18E/F.

The final potential Eagle customer in the region is Qatar, which has an eventual requirement for up to 72 fighters. Boeing established an office in Qatar in 2010 to support the company's offerings to meet this requirement, and in August 2013 a Qatari team evaluated two USAF F-15E Strike Eagles and two US Navy F/A-18E/F Super Hornets.

When a Qatari order for 24 Rafales was announced in April 2015, it was suggested that a two-year delay in F-15 negotiations had driven Doha to embrace the French Rafale as an alternative to the Eagle for at least the initial batch of fighters.

In January 2016, two US senators (Senate Armed Services chairman John McCain and Senate Foreign Relations chairman Bob Corker) began raising questions as to why planned US fighter deals with Qatar and Kuwait had been delayed by the White House, despite both deals having gained the support of the Defense Department and the State Department.

After Rafale and Typhoon purchase decisions in Qatar and Kuwait, the US is eager not to lose further opportunities, and has been keen to assure its Gulf allies of the advantages to be gained by 'buying American' in terms of interoperability.

The most recent 'Eagle campaign' in the region came in the United Arab Emirates, where the UAE Air Force and Air Defence received classified briefings about the capabilities of the F/A-18E/F Super Hornet and the F-15E Strike Eagle in late 2011. At the same time, it asked Eurofighter to submit a bid to meet the nation's next generation fighter requirement, for which the Dassault Rafale had previously seemed like the favourite in what had been a one horse race.

In November 2011, the UAE Air Force announced plans to acquire a "next generation fighter" in the 2018-2025 timeframe. This was understood to be an additional requirement for a second aircraft type and was believed to have been aimed principally at the stealthy Lockheed Martin F-35 Joint Strike Fighter (JSF), though the F-15 Silent Eagle may also have been in the UAE's sights.

In February 2016 it was reported that the Crown Prince of Abu Dhabi, Sheikh Mohammad Bin Zayed Al Nahyan, who also acts as Deputy Supreme Commander of the UAE Armed Forces, had reiterated his interest in buying fifth generation fighter jets and that the US had again offered the F-15 Silent Eagle.

Alan Warnes *turns the spotlight on Bahrain and assesses the operational capabilities of the Royal Bahraini Air Force.*

RBAF fights back

Bahrain plays a key role in the Middle East's security, mainly because of its geographical location in the Gulf and its openness to international partners and coalition operations.

Situated between Saudi Arabia and Iran, it is of great strategic importance in protecting busy Gulf shipping lanes and global energy supplies.

As a key ally of the west, it hosts the US Navy's Fifth Fleet, as well as the Combined Maritime Forces base in the Gulf. A new UK Royal Navy facility is also being built.

Its relationship with the US, UK and neighbouring Saudi Arabia means it is unlikely to have to fight a war on its own. This is reflected in the small inventory, obsolete in some areas, of the Royal Bahrain Air Force (RBAF).

Unlike most Middle East countries, Bahrain has not embarked upon a major defence modernisation programme. Oil remains its main revenue earner but, unlike its big brothers Saudi Arabia and UAE, it hasn't invested heavily into large fighter or helicopter programmes.

In 2013 – the latest set of figures available – the Bahraini Government spent $1.2 billion on defence, the highest of any sector. That is around 10% of the state's total expenditure.

The RBAF chief, Major General Sheikh Hamad bin Abdullah Al Khalifa.

The drop in the price of oil is having a devastating effect on Bahrain's economy, coming on the back of the civil unrest in 2011. The latter saw the Saudi military, particularly its National Guard, help halt the majority Shia uprising, which threatened to overthrow the government.

At the same time, many of the bigger business houses in the capital, Manama, withdrew their offices.

As Bahrain's increasing fiscal deficit continues to swell, so its investment in defence procurement is being pegged back.

A lack of huge financial reserves saw a cut in fuel subsidies during mid January 2016, the first in many years, which led to a 60% rise in gasoline prices at the pumps. This threatened to destabilise the country once again.

However, the desert kingdom is continuing to diversify its economy and its gross domestic product (GDP) is now 80% non-oil.

The main concern for Bahrain and its five Gulf Co-operation Council (GCC) partners – Kuwait, Oman, Qatar, Saudi Arabia and the UAE – is the proliferation of Islamic fighters trying to spread their barbaric version of Islam to their nations. Fighting conflicts on two fronts against Daesh in

Far left: The RBAF is keen to upgrade its existing F-16C/D Block 40s to a Block 50 configuration. Meanwhile, the jets are currently involved in the Yemen operations, supporting the Saudi Government.

Above: Hawks have been serving for nearly 10 years and employ a mix of UK and Pakistani pilots as instructor pilots.

Left: Nine UH-60Ms have been delivered. This example is seen fitted with the ESSS, which will allow fuel tanks to be fitted to extend its range.

against oil slump

Syria, as well as rebels in Yemen, has illustrated to these states, that there needs to be much greater military integration.

In the past, talking has taken precedence over action. But, according to one Bahraini source, this now needs to be taken more seriously: "We need to train together more. Working with our allies in Saudi Arabia and over Syria has highlighted this."

The GCC Council is now shaping a strategy for the future. Each air force will be given specialist duties and their commanders, including the RBAF's Major General Sheikh Hamad bin Abdullah Al Khalifa, are now considering proposals for a single strategy that should be announced soon.

All of the RBAF's fixed-wing aircraft operate from the large Isa Airbase, which was built with US assistance in the late 80s.

There are 20 aircraft – 16 F-16Cs and four F-16D Block 40s. These were among 22 jets delivered from May 1990.

Two F-16C losses occurred on September 27 2003 and December 30 2015. The latter was lost during Yemen operations, although the pilot ejected safely. Video footage would indicate a catastrophic engine failure as the jet is seen spiralling down.

Four F-16s have been flying out of the Royal Saudi Air Force base, at Taif in Saudi Arabia, since March 2015 as part of the Saudi-led coalition, bombing rebel positions in Yemen.

According to the RBAF commander: "The jets initially fulfilled two roles but, with no air threats, our concentration has been on the ground effort. When we started flying sorties over Yemen, we stopped the missions over Syria."

The RBAF has already upgraded the 20 Block 40 F-16C/Ds' Northrop Grumman APG-68 radars to the version 9 within the past few years. This has given the F-16s a much better air-to-air and air-to-ground capability, but the RBAF wants to improve them further.

A senior officer said: "The RBAF is looking to step up its combat capabilities by strengthening its fighter force to confront the deteriorating security situation in the region, as well as keeping Iran in check. We want to upgrade our existing fleet of 20 F-16C/D Block 40s to Block 50 configuration, which will see integration of the Northrop Grumman APG-83 scalable agile beam radar (SABR)."

The SABR is dubbed by Northrop Grumman as a 'multifunction AESA fire control radar, which brings fifth-generation air-to-air and air-to-ground radar capability to the F-16'.

According to Lockheed Martin: "It will give the F-16 pilots unprecedented situational awareness, targeting and intelligence, surveillance and reconnaissance capabilities."

The RBAF has also requested the

Continued on Page 46

New base for the Brits

In early November 2015, construction begun on a Royal Navy base in Bahrain, which led the UK Foreign Secretary, Philip Hammond, travelling to the Gulf kingdom to break ground on HMS Juffair, the first major naval base opened by Britain to the east of the Suez canal since 1971.

The facility at Mina Salman port will provide support and accommodation for around 80 UK military personnel based in Bahrain, and end a British reliance on the facilities of the US Navy Fifth Fleet, which is also based at the port.

It is expected to be complete by autumn this year and will eventually provide port facilities for the Royal Navy's new generation of aircraft carriers.

CONTINUED FROM PAGE 45

purchase of 18 Block 50s, with Lockheed Martin offering the brand new F-16V version, which made its first flight on October 15 last year.

According to one insider: "The F-16V and upgraded Block 40s would almost be identical, although the latter would not have the capability to be fitted with conformal fuel tanks. When the US Government gives the go ahead, Lockheed Martin will upgrade a single F-16C and F-16D at Isa Airbase, where the fleet is housed. It will then provide technical support to the RBAF to upgrade the remaining 18 jets."

Meanwhile, the F-5s are now being considered for a new lease of life. As one senior RBAF officer revealed at the recent Bahrain International Airshow: "We are establishing a team to look at upgrading the F-5. We would like a new radar, precision-guided munitions like JDAMs, and laser-guided weapons plus air-to-air weapons like AMRAAM."

RBAF aspirations also stretch to a new and better engine, but surely that would be far too costly at this stage in the jet's life.

Training pilots

As well as fulfilling air-to-air and air-to-ground roles, the eight F-5Es and four F-5Fs play a part in training pilots for F-16s. "Pilots transitioning to F-16 will usually step into the F-5 to ensure they get the experience of flying with an afterburner. Some will also go straight to the F-16," explained the officer.

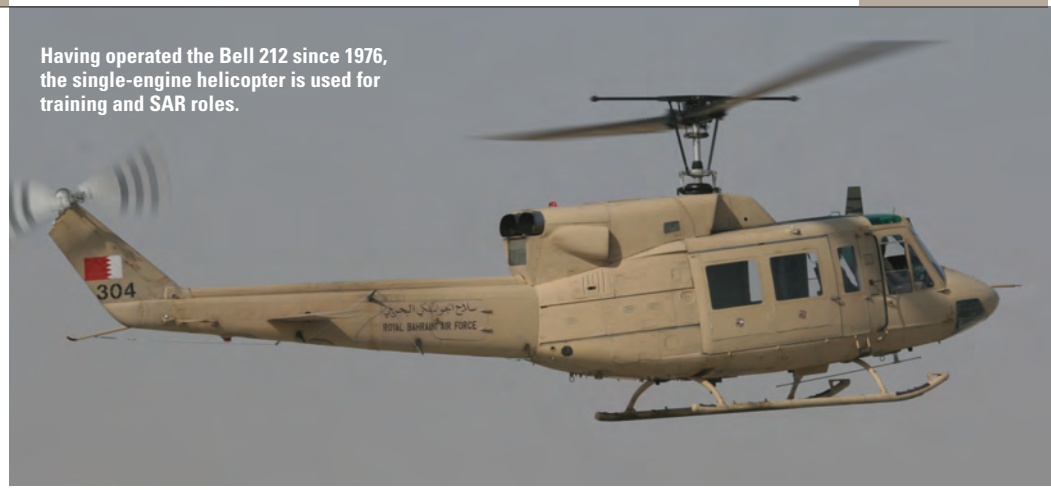
The Eurofighter Typhoon is also tipped to be a future fighter for the RBAF to work alongside the F-16, just as it will in Oman.

The fourth generation fighter has a proven track record of working with F-16s, so should not hinder any integration efforts by the GCC. A highly placed source in the RBAF maintains it will receive 12 of 48 Tranche 3s ordered by the Royal Saudi Air Force.

A leading BAE Systems source would only confirm that the RBAF leadership has regularly declined offers of briefings because they already know a lot. "We can only assume that's because the RSAF is briefing them instead."

Six BAE Hawks have been flying with the RBAF since late 2006 and students are trained by a handful of instructor pilots at Isa-based 5 Squadron, where there is a full-motion mission simulator.

"We are disappointed with the delivery of spare parts from BAE Systems, which has led to half the fleet being grounded at times. We are also having issues training instructor pilots on the Hawk jet trainer," said the same RBAF source, although he would not elaborate.



Having operated the Bell 212 since 1976, the single-engine helicopter is used for training and SAR roles.

New pilots progress to the Hawks from either training schools in the UAE, Saudi Arabia or the RBAF's own T-67M Fireflys, when they are not grounded. The latter has suffered from a shortage of spares and groundings since being delivered to 4 Squadron in January 2003. The RBAF is now considering a new elementary trainer, with the Cirrus SR22 being the most likely as the US-built composite trainer is already flown in the same role by the RSAF.

Elsewhere at Isa, the RBAF flies two RJ 85s, while a third is operated by the Royal Squadron at the main Bahrain International Airport. The latter is believed to be favoured by the royal family for its short take off and landing (STOL) capabilities required for desert strips often used for hunting expeditions.

The RBAF has a large helicopter fleet. While most, like the AH-1 Cobras and Bell 212s, are getting on a bit, it doesn't detract from the work they do.

There is a sizeable number of AH-1 Cobra attack helicopters. Their acquisition came in the wake of the so-called 1986 Hawar operation, when Qatari forces, supported by Alpha Jets, captured the workforce on the disputed Hawar islands.

The Bell 212s flew around 25 missions with troops, munitions and medical supplies and the Bahrain Government was concerned Bahrain could be the next target. The lessons learnt led to the acquisition of the Cobras.

An initial batch of 14 ex-US Army AH-1Es and six TAH-1Ps were delivered in 1994. The latter, known locally as 'TIFs' are solely for flying training and, therefore, not armed.

They were followed, in 2002, by 12 surplus AH-1Fs taken from US stocks, which have the full infrared day and night vision sensor systems (C-NITE) fitted on the noses. All the Cobras are flown by 8 and 9 Squadrons, based at Riffa.

The AH-1s have also been deployed to Saudi for the operations in Yemen, but they were never used in action and are back now.

A new attack helicopter is being considered, with the Turkish Aerospace Industries T129 ATAK being a leading contender. The RBAF nearly signed a deal for the attack and reconnaissance helicopter in 2015 but, according to one source, "political issues with Turkey over Syria and Yemen saw the deal cancelled".

Bell Helicopters is monitoring the situation and is already marketing its new AH-1Z Viper and UH-1Y Venom duo.

Training pilots

The RBAF leadership is aware that, with the deteriorating security situation in the region, modernisation is a must and attack helicopters are a real need. UAE-based NorthStar Aviation is supplying 30 Bell 407MRH light attack helicopters to the United Arab Emirates Air Force and Air Defence (UAEAF&AD), and this platform could be another option.

The US company also trains personnel on the helicopter and is currently working on a Bell 429 derivative, which can carry an additional 2,000lb payload.

Also among the rotary-wing inventory are around nine Bell 212s, now operated by 10 Squadron at Riffa. They have served the RBAF since 1976 and are looked upon with affection because of their role in Operation Hawar.

As well as being used for SAR, the Bell 212s, which were replaced by the brand new UH-60Ms in 2010, took on the Bo105's training role.

The UH-60Ms can be armed with a mini-gun for self-defence and, when fitted with the external stores support system (ESSS), can carry two additional 230 US gallon (871 litre) fuel tanks that allows the helicopter to stay flying for seven hours.

It is likely the Bahrain Navy's Bo105s, which fulfil a naval SAR role, will soon be taken over by four ex Italian Navy Bell 412s, that will come with a weapons and reconnaissance system.

RBAF ORDER OF BATTLE

1 Squadron	F-16C/D	Isa
2 Squadron	F-16C/D	Isa
3 Squadron	UH-60M	Riffa
4 Squadron	T-67 Firefly	Isa
5 Squadron	Hawk Mk 129	Isa
6 Squadron	F-5E/F	Isa
8 Squadron	AH-1E/F/TAH-1P	Riffa
9 Squadron	AH-1E/F/TAH-1P	Riffa
10 Squadron	Bell 212	Riffa
Transport Wing	RJ85/BAE 146	Isa
Royal Flight	S-70, S-92, RJ-85, Bell 430	Muharraq

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The first flight of Piaggio Aerospace's new multirole patrol aircraft (MPA) is expected imminently after the aerodynamic prototype was rolled out late last year. **Jon Lake** *reports.*

Piaggio EEZes multirole MPA into the market

The new MPA has been developed by Piaggio Aerospace in partnership with Abu Dhabi Autonomous System Investments (ADASI) to meet a UAE requirement for between 12 and 20 aircraft for surveillance duties.

ADASI is a subsidiary of Tawazun – a state-owned company that manages many complex programmes for the UAE armed forces.

Piaggio Aerospace rolled out the aerodynamic prototype on November 9 2015. A second aircraft will be built to the full planned production specification, with a fully functional mission system installed.

Piaggio already had a strong link with the UAE, since the Mubadala Development Company (a wholly owned investment vehicle of the Abu Dhabi Government) acquired a 35% stake in the company in 2006.

Piaggio's MPA is a multi-role and affordable patrol platform based on the company's innovative P.180 Avanti twin turboprop executive transport aircraft. The new aircraft shares the same three-lifting-surface configuration (3LSC) with canard foreplanes, an aft-mounted high aspect ratio laminar flow wing and a T-tail, and uses the same 'pusher' engines.

The existing Avanti combines jet-like performance with turboprop operating costs. The aircraft offers a maximum speed of 402kt (745kmh), a maximum operating ceiling of 41,000ft (12,500 metres) and a range of more than 1,300nm (2,400km), with operating costs at least 33% lower than jet-engined competitors.

Its capabilities and safety have been proven over more than 20 years of service and 800,000 flying hours, with a fleet of more than 200 aircraft serving commercial, government and military customers.

In 2009, the United Arab Emirates Air Force and Air Defence selected the Piaggio P.180 Avanti II for use as a light multi-utility aircraft, purchasing a couple. These will be delivered with a kit that will allow the aircraft to be rapidly reconfigured as an air ambulance when required. In the air ambulance configuration, the Avanti II provides outstanding accessibility for patient loading, and its spacious cabin offers a good working environment for medical staff.

The aircraft's cabin and excellent performance characteristics persuaded Piaggio and its partners to use the Avanti II as the basis of what it hoped would be the most effective special mission light turboprop aircraft on the market, in the form of its new MPA. The range and endurance of the MPA will make it uniquely suited for any surveillance, law enforcement or security mission.

The acronym MPA traditionally stands for maritime patrol aircraft but, in this case, M stands for multi-role.

Flexible platform

Piaggio's MPA is designed as a flexible platform able to perform many different roles including maritime patrol; ground surveillance; tactical intelligence, surveillance, and reconnaissance (ISR); electronic intelligence (ELINT) and communications intelligence (COMINT). It is expected that the first version will be dedicated to maritime patrol.

The new aircraft can be customised with a variety of mission-specific sensors and management features to allow it to fly a wide range of surveillance, reconnaissance, exclusive economic zone (EEZ) patrol and search and rescue missions, adding these to a reliable, proven system architecture.

Piaggio hopes that the MPA P.180 will be a game-changer in its sector when compared to its competitors, thanks to its superior performance in terms of endurance, range, ceiling, range of operating speeds, and payload. The programme leaders have identified the Middle East, Africa, Asia, and Australia as target markets.

Development of the new MPA was first announced at the IDEX exhibition in Abu Dhabi in February 2013 – the same event also seeing Piaggio Aero and Selex ES unveiling plans for the P.1HH Hammerhead, a medium-altitude long-endurance (MALE) fixed-wing unmanned air system (UAS) variant of the P-180 Avanti II. Development of the Hammerhead was, by then, well advanced, with the prototype completed and with taxi trials already under way.

The UAS version featured a reinforced and extended span wing with increased surface area and higher aspect ratio, a Seaspray 7300E search radar, communications and datalink equipment, and under-wing hardpoints for further ISR sensors.

The first MPA prototype was then set to make its first flight in mid-2014 with the pre-series production aircraft following it into the air later that year. It seems that the Hammerhead was prioritised, however, and MPA timescales were allowed to slip.

The new MPA represents a significant evolution of P.180 Avanti II aircraft, designed primarily to increase patrol endurance. It has increased capacity fuel tanks (containing approximately 50% more fuel), together with a 50% increase in wingspan, a 35% increase in the span of the horizontal tail and a 20% increase in canard span.

The original P.180 Avanti II had a wingspan of 14.03 metres, which was increased to 15.60 metres on the Hammerhead UAS, while the MPA span is further increased to 21.378 metres.

Increased fuel and mission equipment bring with them a higher take-off weight (16,500lb). This, in turn, dictated the provision of a redesigned, strengthened undercarriage.

The MPA features an external low noise pack,

The acronym MPA traditionally stands for maritime patrol aircraft but, in this case, M stands for multi-role.

including a significant power plant upgrade, and newly designed scimitar propeller blades.

The modified aerodynamic configuration underwent extensive low speed/high speed wind tunnel testing to validate the design and performance. During testing it reportedly demonstrated a 30% reduction in required power compared to its nearest competitor.

The MPA is designed to fly at altitudes of up to 41,000 feet, with an endurance of more than 10 flying hours at high altitude, or nine hours at a typical 5,000ft search altitude. In low altitude operation, the aircraft has an endurance of up to seven hours.

The aircraft is to have a maximum range of 3,300nm and a best-in-class cruise speed of 350kts, or Mach 0.65, which should make it the fastest special mission turboprop on the market. At the other end of the performance spectrum, the aircraft can loiter quietly at as little as 125kts.

In the cabin, there is no obstruction from wing spars. There are consoles for two forward-facing operators, one on each side of the aisle, with the left position slightly forward. In front of the starboard console is a single rest seat, with a small galley, and there is a toilet aft.

The MPA is fitted with a Saab Albatros open architecture mission system, which offers inherent mission flexibility, with a state-of-the-art human/machine interface, and excellent graphics capabilities and computer throughput performance. Saab reportedly based the MPA's mission system on that offered in its own maritime surveillance/patrol projects, and is undertaking the integration.

Economy and reliability

The extensive use of commercial off-the-shelf (COTS) components should ensure economy and reliability.

The primary sensors include a Telephonics RDR-1700B or 1700G2 radar with ground-moving target indicator (GMTI) and synthetic aperture radar (SAR) modes. The radar antennae and pedestal are mounted in the belly to provide an unimpeded 360° view, with an installation that does not protrude into the pressure cabin.

The provision of a GMTI gives the aircraft a formidable capability to undertake overland surveillance missions, as well as maritime search sorties.

The aircraft is fitted with an electro-optical/infrared (EO/IR) turret of unknown type under the rear fuselage, as well as an automatic identification system (AIS) and an identification friend or foe (IFF) system.

Acquired information from the sensors is processed and fused on board, using the advanced mission consoles, which can monitor and control the sensors and collect, analyse, fuse, record and distribute all available data.

The aircraft featured an advanced integrated communication system, with a wideband line of sight (LOS) datalink and a flexible Ku/Ka BLOS satellite communications system, which may be integrated with Link11/16, and an IFF interrogator.

The pilots are also well catered for, with a full glass cockpit featuring a Rockwell Collins Pro Line Fusion avionics suite. The aircraft can be fitted with an advanced self-protection system (SPS) if required.

Algeria eyes up long-range bombers

Not content with topping up its fighter fleet, Algeria is now reportedly on the verge of ordering a dozen new long-range bombers. **Jon Lake** *reports.*

An Algerian SU-30.

Algeria signed a contract, late last year, for a further 16 Sukhoi Su-30MKA tandem two-seat multi-role fighters to be delivered by the Irkut Corporation's Irkutsk Aircraft Production Organisation (IAPO).

Now the nation is also reportedly on the verge of ordering a dozen Sukhoi Su-34s from the Novosibirsk Aircraft Production Association.

This would represent the first export order for the dedicated long-range bomber version of the 'Flanker' family, which accommodates its two crew side-by-side.

The 16 new Su-30MKAs will be delivered in 2016 and 2017, and will be the fourth batch for Algeria. It will bring the total number of aircraft delivered to 60.

The 44 aircraft delivered so far currently equip three squadrons of the 12 Escadre de Chasse (12th Fighter Wing), based at Aïn Beida (121e Escadron de Defense Aerienne [Air Defence Squadron]), Ouargla (122e Escadron de Defense Aerienne), and Tamanrasset/Aguenar-Hadj Bey Akhamok (123e Escadron de Defense Aerienne). Algeria first selected the Su-30MKA in February 2006, ordering an initial batch of 18 aircraft that were delivered between 2007 and 2009. This initially equipped a squadron at Ain Beida after test and evaluation trials at Oum El-Bouaki airfield.

Two Su-30MKAs were transferred to Zhukovskii in May 2008 for the training of Algerian pilots. The type was declared fully operational in 2010.

A second batch of 10 Su-30MKAs was delivered in 2009 after the cancellation of an order for 34 MiG-29SMT fighters, which the north African nation refused to accept, complaining about manufacturing quality after only a handful had been delivered.

An order for a third batch of 16 Su-30MKAs was signed in April 2010 and these were delivered during 2011-2014.

The new fourth batch will allow the formation of a fourth frontline squadron. There has been some speculation that this could allow the retirement of Algeria's last remaining MiG-25s, which equip one fighter and one reconnaissance squadron.

An unknown number of the Algerian aircraft are locally designated as Su-30MKRs, and are optimised for reconnaissance using an unspecified reconnaissance pod. All Algerian 'Flankers' are equipped for air-to-air refuelling and routinely practise operations with the Ilyushin Il-78 tankers of the 357e Escadron de Revitaillement en Vol (air refuelling squadron) at Boufarik.

Though the Su-30MKA has a significant air-to-ground capability, the aircraft is not a dedicated long-range strike aircraft in the mould of the Su-24MK 'Fencer', which equips a wing of three squadrons at Laghouat. Algeria has a long-standing requirement to purchase a new type to augment and eventually replace its Su-24s.

Combat radius

The Su-34 fits this bill, with a combat radius of more than 700 miles on internal fuel. The aircraft is equipped with the Leninets B-004 passive electronically scanned array (PESA) radar, optimised for air-to-ground operations.

The Su-34 can carry about 17,600lbs of ordnance on 12 hardpoints, including a wide range of stand-off air-to-ground missiles, guided and unguided bombs and rockets.

The deployment of the Su-34 (newly certificated for export) for combat operations in Syria has led to new interest in the type from a number of potential operators in eastern Europe, Africa, and the Middle East.

On New Year's Day, the Moscow-based newspaper, *Vedomosti*, quoted the Novosibirsk Aircraft Production Association director general, Chkalov Sergei Smirnov, as saying that "Rosoboronexport [has] received an official application from Algeria to supply our aircraft," after eight years of talks.

It is now expected that the Algerian Ministry of National Defense (MND) and Novosibirsk will sign a contract for 12 Sukhoi Su-34 aircraft before the end of 2016, according to the Russian news service *TASS*, which quoted a Russian military-diplomatic source who had attended the Singapore Airshow.

Finalisation of the deal is waiting for the approval of export licences. Some sources suggest that the Algerian requirement could be for up to 40 aircraft.

Though the Su-34 will eventually replace Russia's Su-24 'Fencers', there are indications that Algeria will initially retain them and may even purchase upgraded versions of the type.

An order for the Su-34 would make Algeria the first official export customer for the type, although Kazakhstan already operates a squadron of Su-34s that were recently transferred from Russia.

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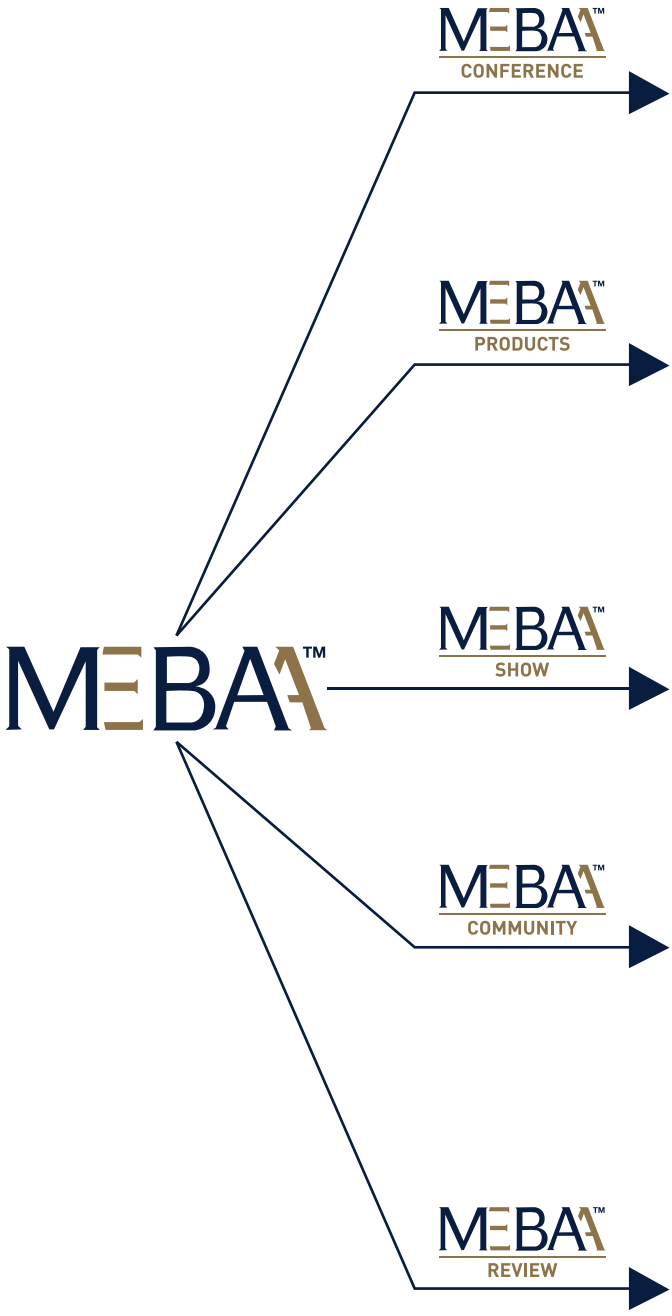

REGIONAL FOOTPRINT

MEBAA hosted conferences in several cities such as Dubai, Jeddah, Riyadh, and Amman. These conferences, with complimentary access for MEBAA members, provide a platform for discussion among members with a particular focus on the host country.

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The Middle East and North Africa's premier business aviation show will be held at DWC in Dubai, 6-8 December 2016. MEBAA Show 2014 showcased 44 aircrafts, 8,314 attendees, and 422 exhibitors. The show also had educational sessions, panel discussions and IS-BA0/IS-BAH certification workshops. MEBAA has also launched MEBAA Show Morocco, the first business aviation show in North Africa.

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GIVING BACK

With the support of its members, MEBAA has raised USD 25,000 within the first year of launching its donation program, Fly and Feed, in partnership with the United Nation's World Food Program (WFP.)

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P750 XSTOL making history in the UAE

The United Arab Emirates Air Force and Air Defence (UAEAF&AD) is operating a single example of the Pacific Aerospace Corporation P-750 XSTOL – a New Zealand-built extremely short take-off and landing (XSTOL) aircraft.

The single P-750 (formerly known as the PAC 750XL) has been seen operating from Al Bateen Air Base, Abu Dhabi, home to the UAE's Transport Wing.

It is believed to be part of the disparate fleet of fixed-wing aircraft and helicopters used by the Special Operations Command's Group 18, part of Joint Aviation Command, and mainly operating from Sas al Nakhil.

Supplied by Portland, Oregon-based US company, Vertol Systems, at the end of July 2015, the UAEAF&AD P-750 XSTOL is configured with an under-floor freight pannier, and is believed to be the first military-operated example of the type.

The P-750 XSTOL is derived from the Fletcher FU-24 agricultural aircraft, which was originally designed for the New Zealand crop-spraying/topdressing market by John Thorp of the Sargent-Fletcher Corporation.

The first FU-24 first flew in 1954, and production switched to New Zealand after four aircraft had been built.

The type was initially built by the Cable-Price Corporation, or sub-contractors James and TEAL, which became Air Parts before merging with Aero Engine Services Ltd (AESL) to form NZ Aerospace Industries (NZAI) in April 1973. This became Pacific Aerospace Corporation in July 1982, and Pacific Aerospace Ltd (PAL) in November 2006.

The basic design was progressively enlarged, strengthened and improved, with the 750XL (marketed as a purpose-designed sky-diving aircraft) flying in 2001.

Carrying nine seated passengers or up to 17 parachutists, or up to 4,000lb of payload, the latest variant of the aircraft can take off and land in less than 800ft (244m), even in hot and high conditions, and has a particularly rapid rate and angle of climb. It is claimed to offer lower operating costs than many other utility types, including the twin-engined DHC-6 Twin Otter, which is also in UAEAF&AD service.

A dedicated military version, known as the Defender II, has been offered to potential customers.

Saudi Arabia buys MH-60R

The Royal Saudi Navy (RSN) has ordered 10 Sikorsky-Lockheed Martin MH-60R Seahawk helicopters under a $145.1 million contract signed on December 17 and announced by the US Department of Defense the next day.

The MH-60R is replacing the SH-60B and SH-60F in US Navy service, and is designed for anti-submarine and anti-surface warfare, operating from frigates, destroyers, cruisers, aircraft carriers or shore bases.

The helicopter is also capable of special forces insertion, combat search and rescue, search and rescue, vertical replenishment and medical evacuation missions.

The 10 MH-60Rs will be delivered to the RSN's Eastern Fleet and will join an existing RSN helicopter fleet that includes 12 Airbus Helicopters AS 532SC Cougars, 15 Airbus Helicopters AS565SA Panthers and six Airbus Helicopters AS365 Dauphins. Initial deliveries will begin in July 2018 and the last is due to be handed over in April 2019.

The helicopters are, apparently, to be delivered to the Royal Saudi Navy in a 'green', unmodified configuration.

Further contracts will cover the provision of 10 MH-60R mission avionics systems and common cockpits by Lockheed Martin Mission Systems; a training segment in Owego, New York State (under a $117 million contract); T-700 GE 401 C engines; APS-153(V) multi-mode radars; APX-123 identification friend or foe transponders; AN/AAS-44C(V) multi-spectral targeting systems; airborne active sonars and advanced airborne fleet data links; as well as weapons, spares, and support. The total value of the package was initially calculated at $1.9 billion, when the US State Department approved the proposed sale on May 20 2015.

The MH-60R multi-mission helicopters will be armed with AGM-114R Hellfire II missiles, 70mm rockets fitted with advanced precision kill weapons systems (APKWS) laser-guidance kits, as well as 7.62mm M-240D and 12.7mm GAU-21 crew served machine guns.

Production of MH-60Rs for Saudi Arabia will dovetail with deliveries to the US Navy, with delivery of the last of 278 aircraft due in 2018.

Deliveries to the Royal Australian Navy and Royal Danish Air Force will be concluded in 2016 and April 2018 respectively. The Saudi order will, thus, sustain MH-60R production, perhaps buying time for other orders to be concluded.

A sale of eight MH-60Rs to South Korea was approved by the US in 2012, and 10 aircraft for Qatar was approved in 2013.

The A400M could be Cairo bound while the NH-90 shipboard helicopters (inset) are already confirmed.

Egyptian acquisitions continue to mount

Egypt is continuing to modernise and re-equip its air force, dividing orders for new equipment between the USA, Russia and western Europe. **Jon Lake** *reports.*

The Egyptian Air Force is now turning its attention to vital support capabilities following the selection of the Dassault Rafale and MiG-35 to bolster its fighter force, and of Kamov Ka-52 and NHI NH90 shipboard helicopters,

Though Airbus has refused to confirm the sale, in November 2015, Spanish media reported a senior executive from Airbus Defence and Space as having said that Egypt had requested delivery of the A400M "as soon as possible".

It was reported that the order would be for 12 A400Ms, at a unit price of $150 million. Egypt has already ordered 20 smaller C295s, so a visit to Seville by Egyptian Defence Minister Sedki Sobhi does not necessarily confirm the reports.

Egypt is already negotiating for the purchase of Russian Ilyushin Il-76MD-90A strategic airlifters, or possibly for the tanker-capable Il-78MD-90. A contract had been expected to be signed during January-February 2016.

The A400M and Il-76MD will give Egypt a large, strategic transport capability beyond that provided by the air force's existing fleet of about 26 Lockheed C-130s and the growing force of C295s.

A smaller but equally significant acquisition for Egypt is the procurement of a single surplus US navy Grumman E-2C Hawkeye early warning aircraft.

Between 1987 and 2008, Egypt acquired a total of eight E-2C Hawkeyes, all upgraded to E-2C Hawkeye 2000 standards, with an AN/APS-145 radar, a new mission computer, cooperative engagement capability (CEC) datalink, combat information centre (CIC) workstations with solid state glass displays, and an additional satellite communications aerial.

Under a contract with the US Naval Air Systems Command, a single surplus E-2C will be withdrawn from storage at the Aerospace Maintenance and Regeneration Group (AMARG) at Davis Monthan (the famous 'Desert Boneyard') and delivered to Cairo, together with some 3,200 parts. It is not clear as to whether the aircraft (which has been in storage since 2005) will be refurbished and upgraded in the USA, or after delivery.

The E-2C is Egypt's only airborne early warning and battle management platform, and represents a vital force multiplier, as well as providing a degree of net enabled/net-centric capability.

In addition to Egypt's recent order for 46 Ka-52K navalised attack helicopters, Russian Helicopters has received a significant support contract for the Egyptian Air Force's fleet of 41 Mi-8T and three Mi-17-1V helicopters (which some sources put at 60 aircraft, including some Mi-17-5Vs).

An existing facility at Helwan is to be comprehensively modernised and upgraded to become an official, authorised aircraft repair plant, to allow repair and upgrade work to the helicopters, their components, gearboxes and rotor systems.

Egyptian personnel are to be trained at the Russian Helicopters Aircraft Repair Plant in Novosibirsk, Siberia, and Russian Helicopters is providing the necessary equipment and documentation, and will provide design and technical support for a two-year period.

The new maintenance facility could be of pivotal importance once the Ka-52K is in service and if Egypt does acquire Mi-35 attack helicopters, as has been reported.

But, while Ka-52K attack helicopters have been selected to equip the two Mistral-class helicopter carriers (originally built for Russia, but cancelled after France terminated the €1.2-billion deal following Russia's annexation of the Crimea), there is still a requirement for a ship-borne helicopter for the new FREMM frigates and existing Gowind class frigates, and for a transport helicopter to augment the Ka-52Ks.

The Egyptian Navy is reportedly negotiating for the purchase of what has been described as "a significant number" of NH90 helicopters, perhaps including a mix of tactical transport (TTH) and naval (NFH) variants. The NFH could provide anti-surface and anti-submarine protection for frigates or landing ships, while the TTH would provide a useful assault transport capability for the Mistral-class helicopter carriers.

Egypt may also be looking at US helicopters (probably including the MH-60R) to fulfil part of its naval helicopter requirement.

Gulf nations embrace new UAV capabilities

For many years only the US, Britain, Israel, and China operated armed, unmanned aircraft (UAVs).

The US only exported armed Reaper UAVs to three allies – the UK, Australia and Italy – and rebuffed Jordan's requests for armed US drones to combat Daesh on its border.

However, that situation is rapidly changing, largely because China has stepped in to provide capabilities that the USA will not.

Egypt, Iraq, Saudi Arabia, the UAE, Nigeria, Pakistan, and, according to some sources, Somalia, have all reportedly imported armed drones from China, where systems are available for prices estimated at roughly 25% of comparable US systems.

The Chinese armed UAVs lack the range, payload, and sensor capabilities of aircraft like the General Atomics MQ-1 Predator and MQ-9 Reaper, but can still carry a meaningful sensor payload, and effective air-to-surface weapons, over a useful radius of action.

And these Chinese UAVs have been combat proven in Nigeria in operations against Boko Haram, in Iraq against Daesh, and over the Yemen against Houthi rebels. Both the UAE and Saudi Arabia used armed Chinese drones in their air campaign over Yemen.

The US arms export process has proved to be a significant obstacle to armed UAV sales, with the missile technology control regime (MTCR) regulations providing a further obstacle to the sale of the most capable UAVs, since it requires that signatories should apply a "strong presumption of denial" to exports of any unmanned vehicles capable of carrying a 1,100lb payload more than 185 miles. China is not an MTCR signatory.

The US is making efforts to make it easier for its allies to acquire the capabilities that they need, and the Royal Air Force of Oman (RAFO) is reportedly pushing ahead with a programme to acquire armed UAVs, and has apparently talked with the British Royal Air Force (RAF) about the project.

Meanwhile, the Saudi Defense Ministry is reportedly planning to procure silent, electrically powered unmanned aerial vehicles for long endurance surveillance missions. It seems likely that such noiseless unmanned vehicles will become the next 'must have' for the main regional air forces.

Jordan trainer boost

At the beginning of 2016, photos emerged of two new Royal Jordanian Air Force (RJAF) trainer aircraft, which were actually introduced during the summer of 2015. *Arabian Aerospace* reported the transfer of 13 Emirati Hawk Mk 63Cs to the Royal Jordanian Air Force last year, but the transfer of eight Slingsby T67M Fireflies previously operated by the UK's Defence Elementary Flying Training School in August 2015 went unremarked.

The Slingsby T67 Firefly was based on the French Fournier RF-6 two-seat aerobatic training aircraft. Fournier sold the development rights of the RF-6B to the Yorkshire-based Slingsby company, which put the aircraft into service as the Slingsby T67A. Slingsby produced successive versions of the basic aircraft, developing a composite airframe and adding progressively larger engines. The Slingsby T67M, aimed at the military training market, introduced a constant-speed propeller and inverted fuel and oil systems.

A USAF order for the T67M (under the designation T-3A) proved something of a mixed blessing, as the type was very publicly withdrawn from use (and the fleet scrapped) after three fatal accidents – all of which were properly attributable to pilot error. But the retirement of the T-3A by the USAF almost certainly cost the Slingsby aircraft orders.

The Royal Jordanian Air Force already operated the survivors of 14 T67M-260s, but took delivery of eight further examples of the type, formerly used by the British company Babcock to support the elementary flying training needs of the UK armed forces under a PFI (Private Finance Initiative) arrangement. The new aircraft are immediately obvious, since they still wear a yellow and black colour scheme, whereas the original Jordanian aircraft wear a predominantly white colour scheme.

At least one of the original Fireflies has been lost, with a fatal accident claiming the lives of the RJAF instructor and his Iraqi student on 6 April 2015.

All of the surviving Jordanian Fireflies serve with the King Hussein Air College at Mafraq, the original aircraft with No.4 Squadron, while the ex-RAF aircraft serve with the co-located Flight Instructor School.

The new Hawk Mk 63Cs operate in the lead-in fighter trainer (LIFT) role with No.17 Squadron at H5/Prince Hassan Air Base, replacing Northrop F-5Es and F-5Fs.

A JF-17 touches down at Doha after its flying display.
PHOTOS: PAF.

THUNDER STRUCK IN QATAR

Alan Warnes
reports on Pakistan's indigenous JF-17 Thunder making a week-long visit to Qatar.

Qatar's Doha International Airport was an unlikely setting for the JF-17 Thunder's fifth venture outside of Pakistan or China.

It came after visits to Farnborough (2010), Izmir (2011), Dubai (2011, 2013) and Paris (2015).

In early February, Doha was added to the exclusive list when two JF-17 Thunders and a pair of Super Mushshaks visited Qatar as part of Prime Minister Nawaz Sharif's two-day visit to the desert kingdom.

Pakistan Air Force (PAF) Air Vice Marshal Arshad Malik, vice-chairman of the Pakistan Aeronautical Complex, said: "We received a special invitation from the Emir of Qatar to showcase our indigenously produced JF-17 fighter and Super Mushshak training aircraft. Two of each aircraft were sent there, one for the flying display and the others for the ground display.

"While the Super Mushshak is already under serious consideration by the Qatar Emiri Air Force (QEAF) as a basic trainer, they also wanted to have a closer look at the JF-17. We provided comprehensive briefings and expect the QEAF to carry out a detailed evaluation of the JF-17 soon."

The JF-17s completed the two-hour journey from Masroor, in southern Pakistan, on February 8. The two Super Mushshaks were air-freighted by a C-130 from PAC Kamra.

The two JF-17 pilots, Squadron Leader Jawad Gilani (in solo demo) and Wing Commander Omar Anwaar (formation) spent the first couple of days after arriving in Qatar practising their flying routines. Wing Commander Shahryar Shahi did the same after the Super Mushshaks had been finally assembled.

The PAF's week-long stay culminated in two flying displays. The first, on February 11, was in front of VIPs, including Qatar Prime Minister, Abdullah bin Nasser bin Khalifa Al Thani and Nawaz Sharif. A second display the following day was put on exclusively for the Emir of Qatar, His Highness Sheikh Tamim bin Hamad Al Thani.

As well as solo displays, a QEAF Mirage 2000 and JF-17 flew in formation to highlight the close bond between the two countries.

First flight

Initially known as the Super-7, the Sino-Pak jet made its first flight in 2004. Now, nearly 12 years on and many milestones later, the JF-17 Thunder is a mature aircraft. Export deals have reportedly been sealed with Myanmar and Nigeria, Block II production is well under way, the first two-seater aircraft is expected to fly by the end of the year and PAF test pilots will then start qualification of the jet.

There has been some real momentum behind the programme over the past year. With 66 aircraft serving four PAF squadrons, and another 16 set to join them this year, production at the Pakistan Aeronautical Complex in Kamra, Attock is in full swing. Assembling and building the aircraft, in collaboration with Aviation Industry Corporation of China (AVIC), has been under way since late 2008.

Having ordered 24 Dassault Rafales in May 2015 to replace the QEAF's 12 Mirage 2000-5s in service since 1997, there is no requirement for a multirole fighter. However the QEAF is still looking to replace six Alpha Jets, operational in the ground attack role since 1980, and the JF-17 Thunder could be an option.

The 260hp Super Mushshak is under serious consideration by the QEAF. Now upgraded with a new digital cockpit, it is already being flown by the Royal Saudi Air Force and Royal Air Force of Oman, and could fulfil an elementary flying training role at the new Air Force Academy.

Wing Commander Omar Anwaar, of the PAF, and Lieutenant Colonel Muhammad Al Dosari, of the QEAF, in front of a JF-17 and Mirage 2000 after their second flying display.

Saudi takes a look, too

A month after the Qatar visit, two JF-17s were in Saudi Arabia for the first time.

One of them participated in a massive parade on March 11 at King Khalid Military City to signal the end of the month-long Exercise North Thunder. According to the Saudis, it was the biggest drill in the world, with troops from 20 countries participating, including Bahrain, Jordan, Morocco, Pakistan, the UAE and Saudi Arabia.

Gilani put the JF-17 through its paces in front of many VIPs, including Saudi King Salman bin Abdul Aziz.

The flying display also included many Saudi helicopters, fighters and transport aircraft. As well as the JF-17, there were aerobatics from two Typhoons, the PAF's Sherdils with their K-8s, and the Saudi Hawks aerobatic team.

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MOROCCO'S GLOBAL GATEWAY

Morocco's Kairaouine Mosque was the world's first university and was once the world's foremost centre of learning. Today the kingdom holds its own among much larger nations in terms of innovation.

Liz Moscrop *studies what this means for its business aviation sector.*

Morocco universities have been the seat of learning for years.

There is a lot for the world to learn about Morocco. So much so that Transport Minister Aziz Rebbah has high hopes for his country as a vital hub for corporate aviation.

At last November's Middle East Business Aviation (MEBAA) show he declared: "Already, Morocco represents about 50% of the business jet activity in North Africa. Our geographic position linking Europe with Africa is well known, but our historic and cultural links with the Arab world have made us an attractive base for many expanding Middle Eastern businesses."

Not only that, but Morocco is topping the charts for Africa, according to a couple of recent surveys. At the World Economic Forum this January, US magazine *News & World Report* ranked it 35th out of 60 countries in America, Africa, Asia, and Europe – ahead of every other North African country in the MENA region.

Nine indicators

Scores were based on 65 attributes grouped into nine indicators: adventure, citizenship, cultural influence, entrepreneurship, heritage, movers, open for business, power, and quality of life. Morocco's high scores came from the 'movers' category for its up-and-coming economy, which ranked 12th worldwide, and in 'heritage', where it landed the 17th spot. The 60 countries belong to four reputable rankings, including scores from the United Nations and the World Bank.

Add to that the fact that the kingdom is rapidly becoming an aerospace hub. According to the country's aeronautical industry organization, GIMAS, it has attracted more than 100 international aerospace players. Boeing, Bombardier, Safran, Stelia, UTC, and Zodiac have all invested millions of dollars in factories there. Key cities are Bouskoura, Casablanca, Marrakech, Mohammedia, Nouasser, Rabat and Tangier, which account for more than 8,000 aerospace jobs.

Business aviation plays a critical role in all this development and is growing at 15-20% per year. It is no surprise, then, that the F&E Aerospace/MEBA show – MEBAA – at

Continued on Page 58

CONTINUED FROM PAGE 57

Mohammed V International Airport in Casablanca, was such a success. Nearly 60 exhibitors turned up, including several Middle East players, such as JP Jets from Jordan and Saudia Private Aviation, as well as an international line up including Africair, Boeing Business Jets, Bombardier, and GDC Technics.

Although the static display was small, it was perfectly formed, comprising a Dassault Falcon 7X, a Cessna Caravan, a Diamond DA42, a Bombardier Global 6000, a Hawker 800XP and a Gulfstream G550.

MEBAA chairman, Ali Alnaqbi, called Casablanca "the new destination for business aviation", while the biggest news came from Morocco's Office National Des Aéroports (ONDA) and Director General D'Aviation Civile (DGAC), which announced that they are planning to develop Ben Slimane Airport, near Mohammedia, into the region's first dedicated business aviation hub airport. This will include a new fixed-base operation (FBO).

Ideally located

Ben Slimane is ideally located between the country's main economic centres of Casablanca and Rabat, and is very close to the fast-growing Mohammedia port city (the centre of the Moroccan oil industry). It has a single 3,074-metre runway (14/32) and has already started to establish itself as a convenient destination for private aviation, with Stars Aviation Services operating the existing VIP lounge.

Six fixed-wing operators are already signed up: Anfajet, Alfa Air, Mt Fly, Dalia Air, Air Ocean Maroc (AOM) and ASA.

Heliconia is set to be the first helicopter operator there. It says that this will "guarantee the development of this activity".

An invitation to tender has also been issued for FBOs at six of the country's main airports: Agadir, Casablanca, Fès, Marrakech, Rabat-Salé and Tangier,

This bodes well for the flourishing charter and handling industry already in place in the north African nation.

Firms such as El Massira (Agadir)-based Moroccan Aviation Services have handlers all over the country and work across the board for both commercial airline and private flights. Alfa Air and Dalia Air have modern fleets available for charter, and offshore oil and gas companies abound.

The Heliconia Group, for example, set up shop in 2012 and operates in a number of sectors such as electrical works, health, and the oil industry. Across the region, it aims to become a major competitor in France, north and sub-Saharan Africa. It won a contract with the ministry of health for a helicopter rescue service in Tangier last October, and last year opened a base in Senegal.

US helicopter firm Weststar Aviation Services also has bases in Morocco,

The Casablanca show and, above, Ali Alnaqbi from MEBAA.

predominantly serving the oil and gas industries.

Another plus is that, unlike many countries in the region, Morocco managed to avoid a big drop in foreign direct investment in the wake of the global financial crisis and the Arab Spring uprisings of 2011. This has meant that development continues apace. Indeed, the Bloomberg Innovation Index ranked Morocco as the 48th most innovative country in the world out of 80 countries in the 2016 index.

The New York financial group revealed the results of its annual ranking in January. Morocco's best performance came from the 'high-tech density' category, where it ranked 33 worldwide, thanks to its boom in aerospace, defence and renewable energy sectors.

South Korea topped the rankings with a score of 91.31, followed by Germany, Sweden, Japan and Switzerland. In the MENA region, only Israel (11), Turkey (36), Tunisia (46) and Morocco (48) made it to the 'top 50'.

Bloomberg collates its data from the International Monetary Fund, the World Intellectual Property Organization, the World Bank, the United States Patent and Trademark Office, the Organization for Economic Co-operation and Development, and UNESCO.

In recent years, Morocco has often performed well in terms of innovation in international rankings. A recent study on world competitiveness showed that innovation is one of its top assets.

This innovation has not gone unnoticed. The French equipment manufacturer, Daher, is set to acquire a third industrial site in Tangier for an investment of more than 15 million Euros ($17.1 million), according to French news site *L'Usine Nouvelle*. The firm already has units in Tangier and Casablanca, dedicated to the manufacture of composites and engine components. The new plant will be operational in the first quarter of 2017, and will create 250 jobs.

Production facility

Stelia Aerospace, too, launched a production facility in Morocco in January. Stelia is the new name of the merged Airbus subsidiaries Aerolia and Sogerma, and makes business and first-class seats, large aircraft structures and equipment.

GDC Technics is also stepping into Africa to develop MRO and modification services across the continent and challenge existing providers in southern Europe. Formerly known as Gore Design Completions until a takeover by Saudi-based owners two years ago, GDC will establish the new facility at Manera Airport in Marrakech.

Shabbur Pirmohamed, who led the aggressive turnaround at GDC USA, will spearhead the new facility.

GDC has also opened a facility in India and agreed a joint venture in Hong Kong to develop its presence in Asia. Mohammad Alzeer, CEO, said at the time: "Africa is very important to us. We have worked closely with the Moroccan Government and we have identified the right site in Marrakech. It is great place and there is a skilled workforce there."

Yes, the world has a lot to learn still about the kingdom. Today the Kairaouine Mosque is known as the University of al-Kairaouine and, like its counterparts throughout the country, is producing a generation of talented young aeronautical engineers. This has to please MEBAA's Alnaqbi, who said: "Morocco has established itself as a hub for business aviation between Europe and Africa. Its potential for growth is huge and many studies have shown that it is the most important market in the continent of Africa."

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When two of the helicopter industry's most notable individuals got together to discuss financing, the conversation was always likely to be lively and wide-ranging. **Michael Savva**, *who chaired the 'financing rotary assets' panel session at the Corporate Jet & Helicopter Investor Dubai event, reports.*

Don't get in a spin when financing rotaries

Clark McGinn, senior vice president at Waypoint Leasing and Jaspal Jandu, chief financial officer at Lease Corporation International (LCI), are two of the biggest names in the helicopter industry.

They were brought together at the Corporate Jet & Helicopter Investor Dubai event, along with Milestone Aviation Group and Lobo Leasing.

For the first time, investors, financiers, operators, lawyers and other industry stakeholders gathered in the UAE to discuss the pertinent issues in the rotorcraft and business jet world.

Inevitably, the implications of the low oil price was a theme explored in great detail, though discussion ranged from asset-specific topics, such as financing rotary assets, helicopter values and the importance of maintenance, to industry-wide issues including the lifting of sanctions against Iran.

The panel discussion was fairly wide-ranging, taking in the state of the market, looking to focus on the rotary sector and its regional variations and then looking at different sources of finance, before analysing the medium and long-term prospects.

McGinn and Jandu stressed that "the sky isn't falling" on the rotary market. While the low oil price has caused some pressure points in certain parts of the market (notably oil and gas), the wider market was considered relatively buoyant.

State of the market

A poll of the delegates showed that 36% viewed the current state of the market as positive/extremely positive, 27% as neutral and 37% as negative/extremely negative.

This view, in general, is supported by market outlooks. Honeywell, in its most recent Turbine-Powered Civil Helicopter Purchase Outlook for 2016 noted that, while the outlook for short-term new purchases remains cautious at best (forecasting between 4,300 and 4,800 new deliveries from 2016 through to 2020 – around 400 lower than its 2015 five-year forecast), clearly there will still be a demand for financing for those assets that are delivered.

However, helicopter leasing and finance is not just about oil and gas. All of the "big four" lessors have targeted other sectors, including SAR and emergency medical services (EMS).

In the Middle East. Wallan Aviation recently purchased a Bell 419 and ordered two Bell 505s for use in traffic control, border protection, training and VIP transport services.

In addition, Falcon Aviation Group's fleet of AW189s, Airbus EC130s and Bell 412s, is intended to service private helicopter charters, as well as the oil and gas sector, and Abu Dhabi Aviation's fleet of AW139s and Bell 412s likewise services ad hoc charters (including VIP) and medevac/SAR operations in addition to oil and gas.

In the Middle East, both lessor panellists suggested that they were interested in the regional market but have yet to do any deals with local operators. Waypoint was due to open a new office in South Africa in the second quarter of 2016, which will service both the African and Middle Eastern markets.

The trend towards investors financing lessors, rather than operators, seemed likely to continue, according to the panellists. As well as giving investors additional credits to rely on and diversifying risk across a number of asset classes and underlying operators, it was felt that such a financing strategy could benefit operators themselves, whose ability to take aircraft from lessors to respond to near-term opportunities gave them additional fleet-planning flexibility.

New phenomenon

Capital markets financing is a relatively new phenomenon in the helicopter market (notwithstanding Waypoint's $200 million private placement in September 2015 and Milestone's $187 million EXIM-backed bond issuance in 2013).

While still in its infancy in this market, the panel considered this as a developing structure, which gave lessors the benefits of diversified capital access, longer-term financing and reduced cost of capital, all of which could be passed on to the operator. It was noted, however, that greater investor understanding of the structure of the sector as a whole, rotary assets themselves, and (for example) their value retention capability, would be beneficial.

Islamic finance was also discussed as an alternative. LCI utilised murabaha financing as part of its first secured helicopter pre-delivery payments (PDP) finance structure but Waypoint, while having viewed the LCI transaction with great interest, has yet to take the plunge.

Both lessor panellists remained optimistic about the market in the medium-to-long-term. As well as acknowledging that it would be a mistake to view the whole oil and gas sector as one market (since different pressures affect production and exploration aspects), they recognised that the helicopter market is cyclical and they have seen nothing that makes them deviate from their strategic viewpoint.

The trend towards investors financing lessors, rather than operators, seemed likely to continue

■ **Michael Savva is senior associate, Watson Farley & Williams (Middle East).**

Putting an aircraft on an offshore registry is straightforward and is proving popular in the Middle East. **Liz Moscrop** *examines why.*

Getting on board with the offshore register

Those of you who have a second passport will understand. Sometimes it's easier to travel under the wings of another jurisdiction, for political, financial and practical reasons. The same applies to aircraft.

Since each aeroplane has its own 'birth certificate', which is the registry it is attached to once it flies the nest of its manufacturer, it then effectively becomes a child of that register.

According to the president of the San Marino Aircraft Registry, David Colindres, switching from a Federal Aviation Administration (FAA) to an European Aviation Safety Agency (EASA) type certification can cost a minimum $500,000 on top of the resale price of a used aircraft, which is a good reason many owners choose not to take that route.

Other than saving money, there are several good reasons why owners may choose a different registry to that of the place of their principal residence.

Several owners in the Middle East have selected reputable states such as Aruba, the Bahamas, Bermuda, the Cayman Islands, the Isle of Man, Malta and San Marino as their registry of choice.

Offshore registration means owners can form a company in the registering state, and own and operate their aircraft without any requirement that it be based and primarily used there.

Cape Town Convention

Several such civil aviation authorities are signatories to the Cape Town Convention, which is intended to give parties involved in such transactions greater confidence through a uniform set of rules guiding the protection, and enforcement of certain rights in aircraft and aircraft engines.

While not the only motivating factor, money is a key part of the decision-making process for many. Depending on the owner's citizenship, and where the aircraft will be based, there can be tax advantages. With levels of Value Added Tax at around the 20% mark in Europe, buying a VIP airliner conversion will cost a great deal of cash. However, offshore registries may impose no income, profit, sales or usage taxes.

Security plays a part, too. These registries provide low-profile flags for people wishing to travel anonymously.

Any aircraft registered on an offshore ticket must meet international Civil Aviation Authority (CAA) standards. For example, US or European registered aircraft must be maintained by an FAA or EASA-approved Part 145 maintenance organisation. This also helps augment resale values. Costs to register are generally based on the aircraft's weight.

There are certain guidelines to adhere to when registering offshore. Generally, applications have to come from residents or corporations registered in the place of registration. No matter which registry owners opt for, all aircraft must meet international safety requirements. Usually, the directors of civil aviation in offshore territories will accept EASA and FAA standards.

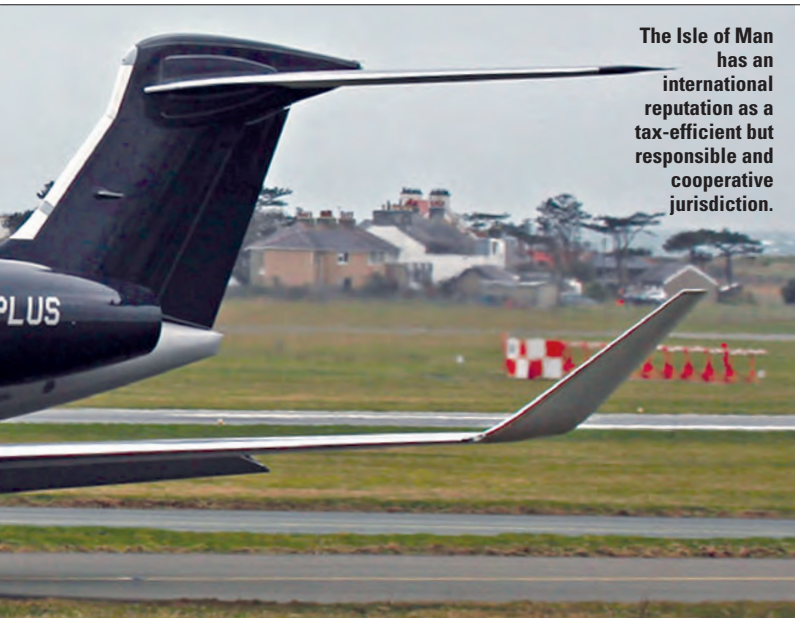
The latest registry to enter the market is San Marino, offering the T7 tail number, which has been active for three years. It has just offered a major change in eligibility requirements for registration. Foreign-owned aircraft could now register under a San Marino based trust. This, explained Colindres, provides a whole new level of privacy and protection to owners. He said: "There are now new layers of security on the aircraft title."

San Marino has close to 130 aircraft on its register and some 42% of owners and operators are based in the Middle East. This is partly because of travelling time – it is around a two-hour flight away for most countries in the region.

It is the only European state to offer both commercial and private registration and has also signed agreements with Lebanon, Nigeria and Saudi Arabia, allowing aircraft registered in San Marino to be operated for commercial purposes by these countries' air operator certificate holders. The agreement, known as an ICAO Article 83 bis agreement, provides for the sharing of aircraft regulatory oversight responsibilities between the state of registry, San Marino, and the state of the operator.

Other jurisdictions insist on registering a company in their own country. Many aircraft on the Bermuda registry, for example, are owned or leased by companies formed solely for the purpose of owning and operating an aircraft under a Bermudan ticket. These are generally referred to as "exempted companies" because they are exempted from local ownership requirements. A Bermuda-registered aircraft may be purchased and based outside of Bermuda. Registration marks are prefixed VP-B and followed by the two letters assigned to the specific aircraft.

The registration process for the Cayman Islands is similar and applies to aircraft operated in the 'private category', which is very similar to the Federal Aviation Regulations (FAR) Part 91. Applications take two to three weeks to process and the CAA performs an airworthiness inspection at the place where the aircraft is located, which does not have to take place in the Cayman Islands.



The Isle of Man has an international reputation as a tax-efficient but responsible and cooperative jurisdiction.

Registration marks for the aircraft are prefixed VP-C and followed by the two letters assigned to the specific aircraft.

The registration requirements in the Bahamas are coordinated between the Civil Aviation Authority and the Department of Civil Aviation. Registration is very similar to Bermuda and the Cayman Islands, but is much cheaper. The registration marks for the aircraft are prefixed C6 and followed by the three letters assigned to the specific aircraft.

Aruba is an overseas territory of the European Union. Although it is situated in the southwestern Caribbean, it is officially part of the Netherlands. The Department of Civil Aviation in Aruba has a similar registration policy to its offshore counterparts, and has proved such a popular flag that the Aruban Government has opened an office in Miami, Florida. Registration marks for the aircraft are prefixed P4 and followed by the three letters assigned to the specific aircraft.

The Isle of Man has an international reputation as a tax-efficient but responsible and co-operative jurisdiction and appears on the Organisation for Economic Cooperation and Development 'white list' of countries complying with the global standard for tax cooperation and exchange of information.

Regulatory standards

Like the other authorities mentioned, it offers high regulatory standards; high service levels and quality international reputation; and a neutral nationality registration prefix. Financially, the Isle of Man is a secure mortgage register, with no insurance premium tax. It also offers a professional infrastructure with experience in aviation finance, and is a Standard & Poor's and Moody's AAA-rated jurisdiction.

Malta, meanwhile, is not an offshore jurisdiction – rather it is an EU country, yet still offers tax efficiencies for those choosing to register their aircraft there. It does not impose a withholding tax on lease payments if the lessor is not a tax resident of Malta, and also boasts no insurance premium tax.

It can cost around €100,000 ($114,000) and take up to 90 days to get an aircraft on to the EASA registry and time is a major factor for owners. San Marino can transfer an aircraft to its registry within a week if necessary.

Colindres added: "We go to the aircraft's location. It doesn't make sense otherwise. We send inspectors out to check the aircraft and its records to make sure it is compliant. Such visits take around two days. Safety is always paramount."

However, in the three years since San Marino has been active, he added, there have only been "two or three" aircraft the jurisdiction has had to turn down

A multifaceted operation seems to be working well for Comlux in the Middle East, as **Liz Moscrop** *reports.*

Diversity the key to Comlux's strategy

Comlux America made waves earlier this year when it launched a new VIP service centre in the Middle East in conjunction with Texel Air at its Bahrain headquarters. The latter will provide regional customers with dedicated MRO line maintenance and cabin upgrades and refurbishments on their VIP aircraft.

While Texel Air will provide hangar, maintenance and certification services through its 3,200sqm facility at Bahrain International Airport, Comlux will take care of system upgrades and cabin modification services by hiring high-skilled local craftsmen and engineers, managed and assisted by Comlux America on-site experts.

The new service centre will provide top-of-the-range quality maintenance and refurbishment works on ACJ and BBJ narrow-body aircraft. Texel Air, which already holds Bahraini Part 145 approval, is expected to get its European Aviation Safety Agency (EASA) Part 145 by the third quarter of this year.

Offerings for customers

Comlux has plenty of other offerings for customers in the Gulf. In March, Comlux Aviation's Aruba division earned EASA third country operator (TCO) approval, which will facilitate its operations, specifically on its Bahrain-based 767-200. The European Commission now allows airlines travelling from outside the EU to obtain a single safety authorisation to travel in and out. This approval is rapidly becoming a mandatory prerequisite to obtain operating permits for commercial operations to and from EASA member states, and allows Comlux Aruba to apply for individual operating permits to perform commercial air transport operations for the 767 and the rest of the charter fleet.

In February, the group also announced it had extended its VVIP fleet with three new acquisitions and five new aircraft under management. It has taken three brand new Airbus ACJ320neo types, all equipped with CFM engines and with green deliveries starting in 2019.

Last year, Fly Comlux signed five new aircraft management contracts with undisclosed customers of heavy jets and business jets: one Gulfstream 650, two Bombardier Global 6000s, one Airbus ACJ319 and a Boeing 777BBJ.

"With two BBJ MAX8 orders a year ago and three ACJ320neos, we are providing our clients with a turnkey package, including aircraft acquisition and cabin completion in our outfitting centre in Indianapolis," said CEO Richard Gaona.

The company now has approvals as a BBJ warranty and repair centre, as well as being the first independent ACJ authorised service centre worldwide. Aircraft operation and management comes through the firm's commercial aircraft operating certificates (AOCs) in Malta and in Aruba. Today, the Comlux-managed fleet comprises 20 VVIP aircraft: one Airbus ACJ318, three ACJ319s, one ACJ330, one Boeing 767BBJ, one 777BBJ, two Bombardier CL605s, one CL850, two Global 5000s, three Global 6000s, two Embraer Legacy 650s, one Gulfstream G650, one Hawker900XP, and one Sukhoi SBJ.

The Boeing 767 is the largest on its books. Severine Cosma, head of marketing and communication, said: "The 767 is now for sale as a long-term project, but will still be available for charter for a while."

As well as its AOCs in Aruba and Malta, Comlux also has an AOC in Kazakhstan Cosma added: "The fleet we're managing there is more fit for regional operators inside Kazakhstan, which is a huge country. We can still fly, of course, to Russia and the Middle East, which is convenient for the demand we have."

Different strands

She added that Comlux is succeeding as a business because it has so many different strands to its operations.

"We have managed recently; even though there is less demand for charter and management, there is good demand for maintenance. Maybe tomorrow charter will be stronger and maintenance smaller. With our business model in different areas, maybe one company is doing well, but another not so well. It gives us stability within the group and allows us to be there when others are not."

One of the key areas where Comlux is doing well is in transporting large delegations. Cosma said: "This large delegation aircraft is something that we started with the Airbus back in 2006, and we are mastering now with the 767. Even when it is sold, our objective is to get further into the VIP wide-body business."

"With our business model in different areas, maybe one company is doing well, but another not so well. It gives us stability within the group and allows us to be there when others are not."
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Middle East charter figures continue to surge

Ian Croxton, *Avinode area sales manager, looks into private air charter in the domestic Middle East and Middle East to Europe markets, ahead of May's European Business Aviation Convention & Exhibition (EBACE) in Geneva.*

Avinode is the world's leading online market for buying and selling air charter. From January 2014 to February 2016, it has seen an increase of around 25% in the number of requests for private air charter flights departing from Middle Eastern countries – and that trend is continuing into 2016.

Around 40% of all requests generated for Middle Eastern departures are flights into Europe. Intra-Middle East flights account for 28% of requests, 12% are to Russia and Commonwealth of Independent States (CIS) countries, leaving the remainder to the rest of the world.

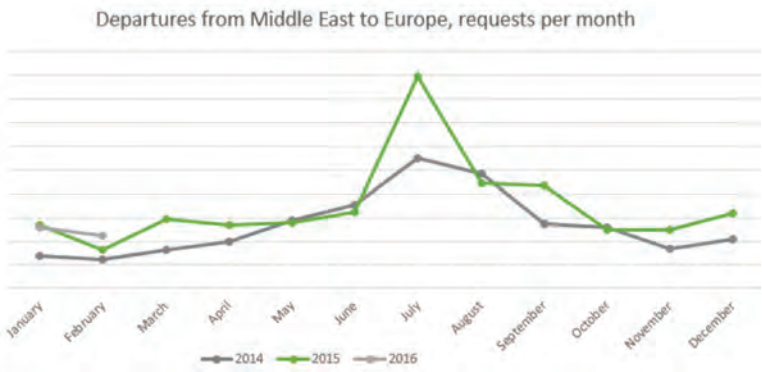
In 2014, Avinode data shows that France was the most requested arrival country from the Middle East, closely followed by the UK. However, in 2015, these two countries changed position. Turkey remains in third place, followed by Switzerland.

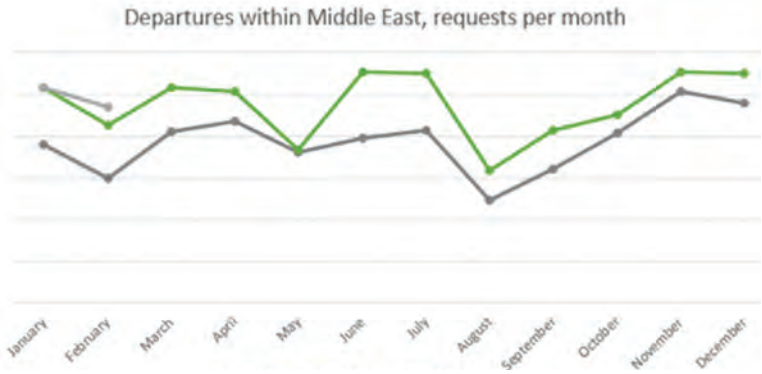
In 2014, 2015 and so far for 2016, London Luton holds the number one spot as the most requested arrival airport from the Middle East. Paris Le Bourget is second, with Geneva in third and Nice fourth.

The most requested individual routes in 2015 were from Riyadh to Le Bourget, with Riyadh to London Luton coming in close second.

Historically, Avinode has seen a dip in requests for February and then a slow increase through to the summer, until requests typically peak in July.

Avinode data shows that heavy jets take the top four spots for requests to travel from the Middle East to Europe, with Bombardier Challenger series aircraft taking both first and third slots. However, there is also a strong demand for the larger aircraft, including Airbus and Boeing business jets.





In 2015, King Khalid International Airport in Riyadh was the most requested departure airport for intra-Middle East flights, with Dubai International taking second place – this trend has been replicated so far for 2016.

Avinode reports an increased number of requests out of Dubai's newest airport, Al Maktoum International, which was the third most popular in 2015, as well as in 2016 so far.

Within the Middle East, the most requested countries to travel into are Saudi Arabia, and the UAE – almost 40% and 24% respectively. The single most requested route is Riyadh to Dubai International.

The preferred choice of aircraft for travel within the Middle East is also the heavy jet, taking the top three spots – the Bombardier Challenger Series is the most popular, followed by the Embraer Legacy series and the Gulfstream.

It is likely that the Challenger jets have been the most requested aircraft partly due to the high number of them available for charter in the region.

Highest amount of departures

The country with the highest amount of departures to other Middle Eastern countries in 2014, 2015 and so far in 2016, is the UAE. Saudi Arabia and Kuwait follow.

Since 2014, Avinode has seen around a 50% increase in the number of requests for flights out of both Qatar and Lebanon.

When it comes to international flight destinations from the Middle East, once again Saudi Arabia and the UAE dominate the market.

Flight requests out of Saudi Arabia in 2014, 2015 and so far in 2016, show that there are more than twice as many requests from Riyadh than there are from Jeddah, with these airports occupying the top two spots; Dubai international is third.

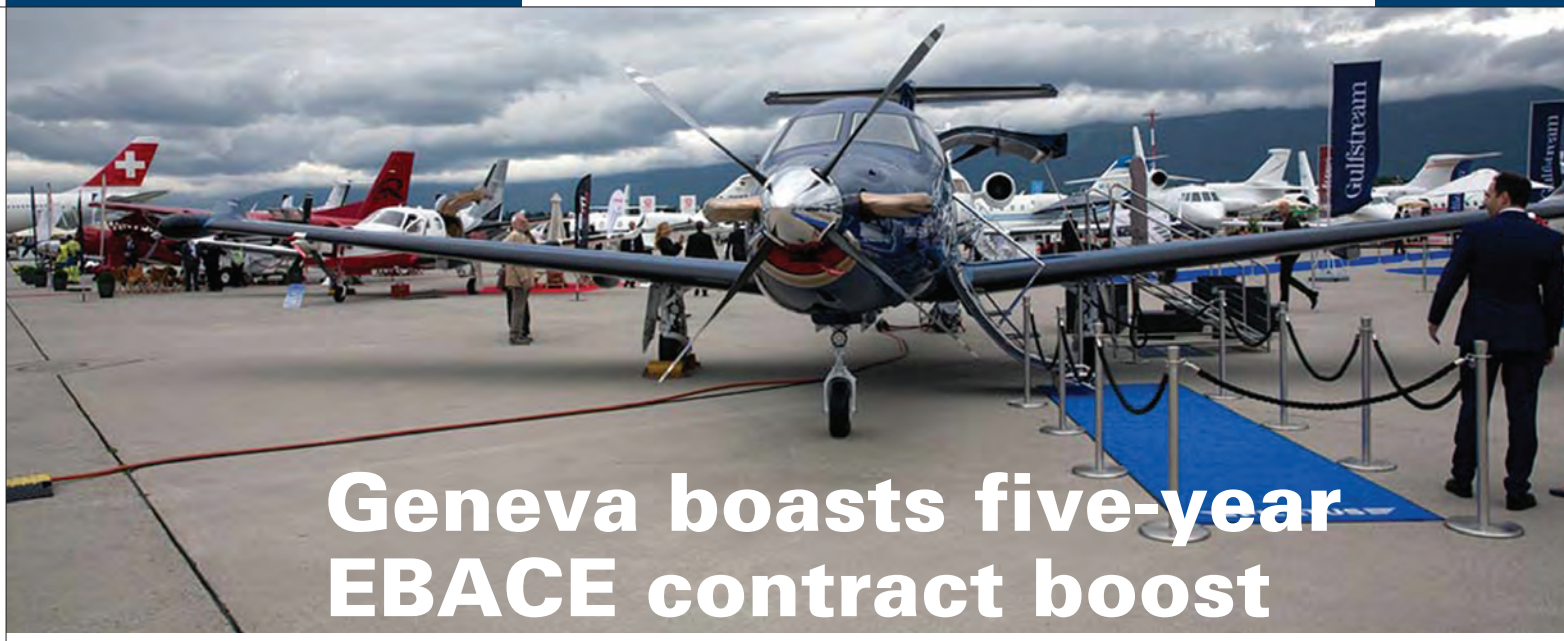
Over the last three years, the number of aircraft based in the region and available for charter within the Avinode Marketplace has increased by almost 50%. Over this same time period, the number of operators has increased by 20%.

Avinode works closely with Falcon Aviation Services. James Coak, sales and marketing manager at Falcon, said: "With oil prices slowly dropping over the last year, the general talk is that private aviation has taken a hit. A large portion of the gross domestic product (GDP) for the UAE and Saudi Arabia is taken up by oil revenue, so this drop would go hand-in-hand with the slow-down.

"Less oil money means less spending. However, at Falcon we have managed to create growth during this period. In fact, compared to the same period in 2015, our first quarter in executive jet charter revenue has seen growth of 20%. We have been proactive with our pricing models and moved away from our standard quoting rules."

Operators are being more creative when it comes to quoting for trips in order to confirm the flight; there are various ways to do this including point-to-point pricing, discounting flights, and leaving aircraft transient for longer periods to pick up overseas business.

■ EBACE runs from May 24-26.



Geneva boasts five-year EBACE contract boost

Alan Peaford *looks forward to one of business aviation's headline events.*

The MENA business aviation community can start pencilling in an annual trip to Switzerland for the next five years.

The National Business Aviation Association (NBAA), and the European association (EBAA), signed the agreement last month to ensure that the European Business Aviation Convention & Exhibition (EBACE) would remain in Geneva, at least until 2021.

The annual event, which is becoming increasingly important for the MENA region, has taken place at the Palexpo convention centre, next to Geneva International Airport, since 2001.

"We look forward to building on our partnership with Palexpo over the next five years," said Fabio Gamba, CEO of EBAA. "We are confident that Palexpo offers the kinds of facilities that will continue to make this event a success, particularly given its strategic location next to the airport, which helps to ease access to the aircraft static display."

He added: "Since its launch, EBACE has shown a steady increase in the number of exhibitors and delegates who have joined the event, and we expect that trend to continue in the coming years. We are very much looking forward to welcoming exhibitors and delegates to the 2016 event."

EBACE 2016 takes place from May 24-26 and is expected to attract 13,000 aviation professionals from around the world, with new aircraft and business aviation products and services being introduced.

Although EBACE is the only major European event focused solely on business aviation, attendees come from as far as Africa, Asia, the Middle East and North and South America.

The TBM 930 will make its EBACE debut this month.

This year, EBACE will include more than 500 exhibitors and offers a static display of almost 60 business aircraft, including types from Embraer, Dassault, Cirrus, Bombardier, Jetcraft, Gulfstream, Textron, Pilatus, and Piaggio.

With the Middle East moving towards smaller aircraft, there will be interest in some of the newly certificated or launched models.

Among those is the new TBM 930. This French-built fast turboprop – unveiled in April – incorporates further upgrades to its avionics suite, building on Daher's achievements with the TBM 900 version, which is a confirmed business aviation success. More than 110 of the type have been delivered since its launch two years ago.

"We had an enthusiastic response to the TBM 930's unveiling on April 5 at our final assembly line in Tarbes, France," said Nicolas Chabbert, Daher's senior vice president. "The TBM 930 underscores Daher's commitment to continue evolving the TBM family, while also positioning ourselves for future developments."

Drawing attention

HondaJet, certificated in December 2015, will be drawing attention from the Gulf investors, who are attracted once again to the potential for the lighter jet.

And, at the other end of the scale, Dassault's 8X – offering 500nm extra range to the already successful 7X – will be on the viewing list for many visitors, as it will be close to first delivery.

Cessna is also expected to be giving more detail on its Citation Hemisphere, the biggest of the Citation family and a development that could see the iconic brand regaining a foothold in the MENA market.

The three-day event will also cover education sessions, which will focus on issues of importance to companies operating business aircraft in Europe, including the changing European operating environment, safety management systems, security requirements, airport and transatlantic access issues.

The Palexpo complex is located within 10 minutes of the centre of Geneva and is immediately adjacent to the EBACE static display of aircraft at Geneva International Airport.

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There's something in the air...

A member of a new generation of hybrid airship that its manufacturer hopes will open up a market for both passengers and cargo is approaching several critical milestones in its development.

Alan Dron *reports.*

Behind the doors of a vast, green-painted hangar on a windswept airfield north of London, lies a new type of aerial platform that may soon become a common sight in the skies over the Gulf.

The Airlander 10 'hybrid air vehicle' – its manufacturer is similarly, if slightly confusingly, called Hybrid Air Vehicles (HAV) – should have begun ground testing by the time this issue of *Arabian Aerospace* appears.

HAV is targeting 2018 for certification of the production version of the Airlander 10.

The aircraft will take to the skies over the UK later this year from its Cardington base under a 'permit to fly'.

The Airlander had its origins in a US Army programme for a long endurance, multi-intelligence vehicle (LEMV), which was intended to provide a persistent surveillance presence, particularly over areas such as Afghanistan.

HAV teamed with US defence giant, Northrop Grumman, to develop the LEMV concept and the aircraft first flew in August 2012.

The LEMV project was terminated in early 2013 as part of the US budget sequestration cuts. The declining US presence in Afghanistan and Iraq was also a factor. The programme was scrapped after the US had spent some $150 million on it, but HAV was able to buy back the Airlander 10 vehicle for $301,000.

"We think we got the deal of the century," commented technical director Mike Durham. HAV owns the intellectual property of the design.

Returned to the UK, the Airlander 10 underwent almost a year of 'return to flight' work before starting ground testing.

Once the Airlander 10 has undertaken some 200 hours of flight-tests in coming months, HAV is keen to start demonstration flights and tests for potential customers.

Orders for between two and four vehicles would be enough to get the vehicle into production. HAV hopes to start production in January 2017. "We have a genuine pipeline of prospects with proper, credible, government-backed purchasers," said HAV CEO Stephen McGlennan. "Hopefully, we'll begin to announce those in the next few months."

As well as governments, strong interest in the Airlander 10 has come from high-net-worth technical entrepreneurs, he added.

Dubai-registered company, Airships Arabia, plans to operate two types of 'hybrid air vehicles' by the end of the decade in several roles including tourism, cargo and even commuting.

It currently plans to acquire at least one example of both the UK-developed Airlander 10 and the US-built Lockheed Martin P-791 as it seeks to bring new methods of transporting people and freight to the region.

First, though, both hybrid air vehicles (Lockheed Martin prefers the term 'hybrid airship') must gain certification from their respective airworthiness authorities.

The US craft has a planned payload of 21 tonnes and room for 19 passengers in the cabin beneath the hull. The UK Airlander 10 has a payload capacity of 10 tonnes but room for up to 48 passengers and its manufacturer has plans for a larger AL50 version, with a payload of up to six standard ISO containers, that will rapidly follow on from the initial model.

An obvious question posed by many people is what happens when the Airlander runs into high winds, especially headwinds. The answer, said Airships Arabia CEO, Gregory Gottlieb, was to adopt the sailing ship technique of tacking: "You tack to get away from the headwind. You might go several hours out of the way, then speed up on the other side of the weather system."

This means that the skills needed for a hybrid air vehicle pilot will be slightly different from those of the pilot of a conventional aircraft.

"Our understanding is that both Lockheed Martin and HAV are intending to rely quite heavily on simulators to take existing pilots and convert them. We will use a simulator, no question, but prior to that we're going to do

aptitude evaluations that will involve dinghies and hot air balloons.

"When everything goes normally [on a hybrid air vehicle flight], an air transport pilot license (ATPL) pilot would manage it standing on his head, but when things don't go according to plan, the aptitude you need is somewhat different. People will be required to have a really good feel for fluid flow.

"We're looking to bring in one or more small, conventional airships over the next 18 months that will be used primarily as training vehicles," explained Gottlieb.

Airships Arabia is in talks with UAE General Civil Aviation Authority (GCAA), together with other government bodies, such as Customs, over how to integrate its operations into the existing infrastructure. It intends not to use existing airports or runways.

"We would seek to operate from water to water, rather than use airports," said Gottlieb. That could mean using launches to ferry passengers to and from shore. Another option would be to use a floating jetty. Passengers would still require to go through airport-style security.

Gottlieb believes that commuter routes are one possible use for an airship. The road between Dubai and Abu Dhabi, for example, can theoretically be driven in an hour, but users of the road will be all too aware that it frequently takes much longer. Gottlieb believes that an airship trip between the two cities would cost not much more than a taxi.

Other potential uses for the airships would be the shipping of perishables, such as the transport of flowers from east Africa to Dubai, where there is a well-established flower distribution centre. This work is typically undertaken by Boeing 747s.

Airships Arabia's initial analysis suggests that the flight from Africa to the Gulf could be accomplished in 24 hours and at a fraction of the cost of a 747.

Airships Arabia would aim not to be a direct competitor with traditional freight or passenger services but, in the early years at least, "to do things that can't easily be done by current methodology".

The company is discussing potential partnerships with companies in the Gulf, north Africa and east Africa.

More definitely, said Gottlieb, "It's our intention to have an MRO facility for these aircraft in the UAE, not only for our aircraft but for other people's airships. We don't see Airships Arabia as the only operator of the A10 in the region. The market, we believe, is big enough for several to be in the region successfully. What we want is to capture the MRO part of that."

The Airlander – a flying wing

Unlike earlier airships or blimps, the Airlander is, effectively, a flying wing. Around 40% of its lift comes from the vehicle's aerodynamics, with another 40% coming from the lighter-than-air helium.

Two propulsors – ducted propellers mounted directly in front of vanes whose position the pilot alters to direct the propellers' thrust – are mounted on the sides of the aircraft, with two more at its rear. A small bow thruster allows manoeuvring at low speeds and when taxiing on the ground. Speed is typically 100mph (160k/ph).

The hull is made from a three-layered material. The first layer is Vectran, a woven substance that imparts strength. It is backed by Mylar to retain the helium gas within the hull, and a Tedlar finish, which protects against ultraviolet radiation and weather. The three-layer material is no thicker than three sheets of 300gsm paper.

Propulsion comes from four 350hp, four-litre engines. The engine block is a Mercedes-Benz V8 vehicle unit, but everything else is bespoke, manufactured by Austrian company Technify. This unit is already certificated as an aircraft powerplant.

The pilot sits at the front of a cabin below the hull, with the passenger cabin – or payload bay when it is being used for military purposes – behind him.

Steve Nichols *takes a look at the latest Middle East space industry stories.*

Sarah Al Amiri: new role.

Top science role for Al Amiri

Sarah Al Amiri, the Emirates Mars mission science team leader at the Mohammad Bin Rashid Space Centre (MBRSC), has been appointed chairperson of the UAE Council of Scientists.

The new council was unveiled during the structural changes in the federal government by His Highness Sheikh Mohammad Bin Rashid Al Maktoum, vice-president and prime minister of the UAE and ruler of Dubai.

The council will launch development programmes to create new generations of scientists, researchers and specialists in the Emirates.

It also aims to regularly review national policy for science, technology and innovation in the UAE, and provide decision-makers with advice based on scientific knowledge.

Amiri was also the former director for the Department of Research and Development at Emirates Institution for Advanced Science and Technology (EIAST).

NASA visits Sharjah operation

Thuraya Telecommunications recently hosted a delegation from the National Aeronautics and Space Administration (NASA) at its primary gateway office in Sharjah.

Organised in conjunction with the UAE Space Agency, the visit was an opportunity to showcase Thuraya's communication and satellite network systems, helping to demonstrate the country's satellite capabilities.

Thuraya chief technology officer, Ahmed Al Shamsi, hosted a guided tour, where the guests were shown the operations control centre and the antennae serving Thuraya's satellites. There was also a detailed presentation on the company's network and portfolio of products and services.

The visitors discussed potential collaboration and how they could explore future opportunities.

Probing for inspiration

The UAE is working hard to inspire its young people to consider a career in its fledgling space industry, using its Hope Mars probe as a hook.

The UAE Space Agency and satellite telecommunications company, Thuraya, took part in the UAE-UK Pioneers Forum in London in March, targeting Emirati students studying in the UK and Europe.

Held at the Park Plaza Westminster Bridge Hotel, and organised by the UAE Embassy in the UK, the event included speeches by several industry leaders, including Sheikha Al Maskari, chief innovation officer at the UAE Space Agency, and Amal Ezzedine, director of government management services at Thuraya.

Sheikha Al Maskari said she aimed to encourage students to learn about space and astronomy sciences and to continue their education and practical experience. She stressed the importance of the forum in highlighting promising and lucrative career opportunities in different areas of the space sector.

She added that the UAE Space Agency placed great importance on the development of specialised talent in order to pave the way for a new generation of Emirati scientists and researchers. They could lead the UAE space sector in the future, contributing to knowledge in the fields of science, technology, engineering and mathematics, which are the basis for the nation's space programme.

She also called on students to benefit from the opportunities offered by UAE space programmes, such as the Hope mission to Mars.

Hope is currently on track to enter orbit around the Red Planet some time between January and March 2021, in time to celebrate the 50th anniversary of the founding of the UAE. Once in orbit, Hope, which was named after a public campaign, will explore the Martian atmosphere using scientific instruments that include visible, infrared and ultraviolet spectrometers.

Hessa Al Matroushi, the UAE's instrument science lead on the mission, said the Hope probe will help scientists build a holistic model of the planet's daily and seasonal cycles, and help explain why it lost a lot of its atmosphere to space.

Officials from the Mohammad Bin Rashid Space Centre say the seven-month mission is not just about deep space, it's also about reaching out to UAE youth to inspire them to take on careers in science.

Omran Sharaf, head of the Emirates Mars Mission, said the team of Emirati scientists and engineers is working toward several deadlines, including having the probe ready for launch in July or August 2020.

But Hope is not the only mission aiming to inspire youngsters. It has a smaller sibling that will bring space-based data right into Emirati classrooms.

A tiny CubeSat called Nayif-1, which means "one that soars high above", is scheduled to launch this year. Engineering students from the American University of Sharjah (AUS) have built the UAE's first CubeSat as part of a senior design project.

Telemetry data

Students will be able to download telemetry data from the satellite using a simple ground station that can be set up at very low cost.

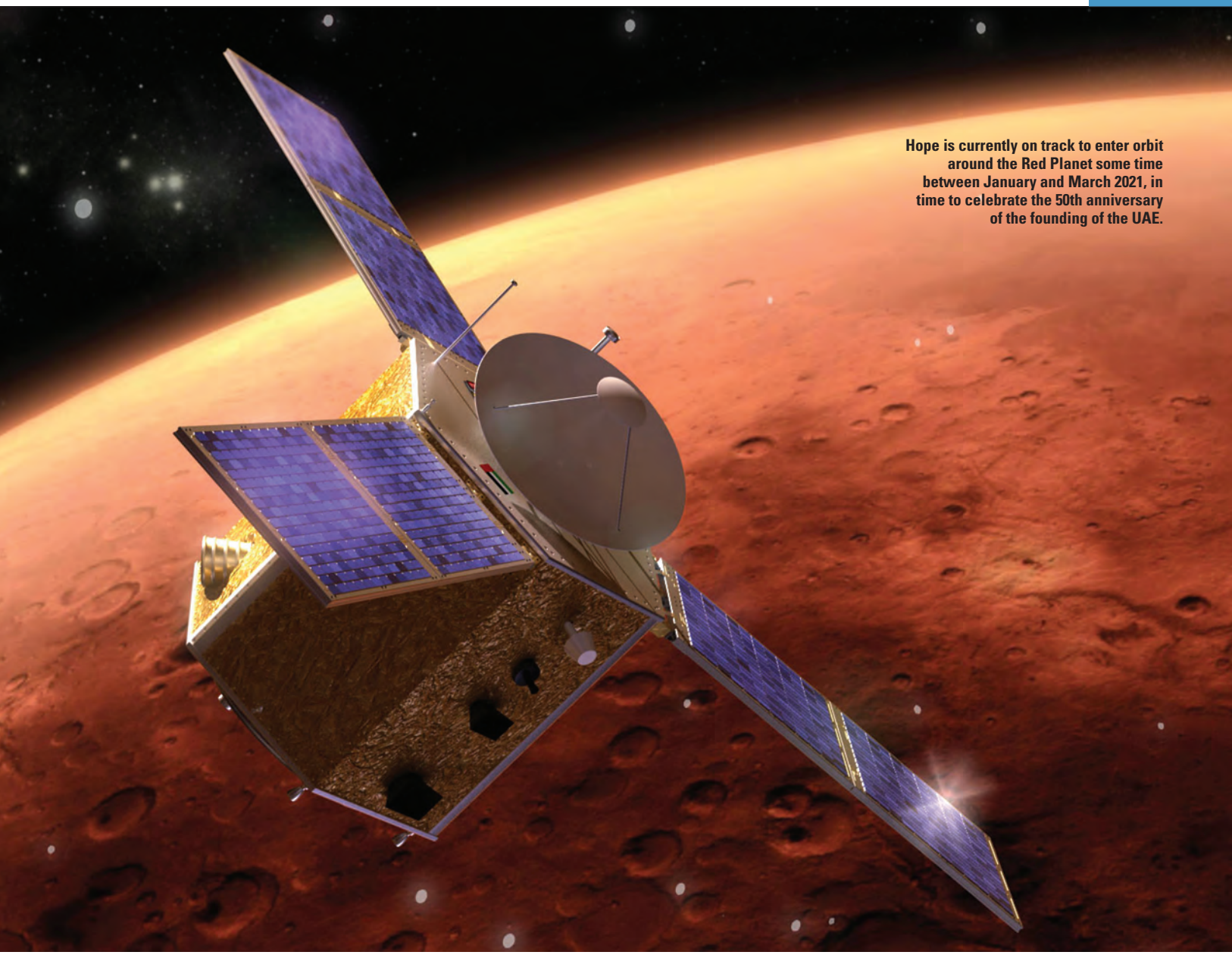
The data includes satellite temperatures, voltages and currents in each of its sub systems. These can then be used in real-life physics lessons.

Nayif-1 will also carry a transponder to allow radio amateurs to talk to each other.

The Mohammad Bin Rashid Space Centre (MBRSC) is also helping attract young talent into technology with its Entaliq scholarship programme, which aims to assist young talented Emiratis with their scientific and technological education.

Entaliq provides support to eligible high school graduates who are planning to take science and engineering courses, aiming to "substantially increase the number of engineers in the country to boost its economic productivity and knowledge creation".

Speaking at the UAE-UK Pioneers Forum, Ahmed Sharif, vice president of human resources and support operations at Thuraya, said: "Now, more than ever, the UAE is considered a fertile ground for young Emiratis to enter a new era of space science, led by the UAE Space Agency."



Hope is currently on track to enter orbit around the Red Planet some time between January and March 2021, in time to celebrate the 50th anniversary of the founding of the UAE.

Agencies create strategic partnership

The UK Space Agency and UAE Space Agency have signed a memorandum of understanding to extend cooperation between the two nations.

Signed in February by the UK Space Agency chief executive, Dr David Parker, and HE Dr Khalifa Al Romaithi, chairman of the UAE Space Agency, the agreement allows for extensive cooperative activities in the field of space, including partnerships in scientific missions and outreach efforts.

The deal covers the implementation of joint studies and projects, the exchange of scientific data and information, an exchange of personnel and training of specialists between the two agencies, as well as government activities related to space policy, public outreach and human development.

HE Dr Mohammed Al Ahbabi, director general of the UAE Space Agency, said: "The UAE Space Agency recognises the importance of space exploration in the greater context of advancing humanity's legacy. We are firm believers in working together with all competent entities in the field of space towards the common goal of fostering the well-being of humankind."

The UK Space Agency's international partnership space programme has already co-funded a project between Deimos Space UK and Mohammed Bin Rashid Space Centre (MBRSC) in the UAE to develop mapping applications that use DubaiSat-2 and Deimos-2 high-resolution satellite data.

Satellite link-up for Saudi Arabia

DigitalGlobe has entered into a joint venture with TAQNIA, a firm dedicated to accelerating technology development in the Kingdom of Saudi Arabia, and the King Abdulaziz City for Science and Technology (KACST) to develop a constellation of small imaging satellites.

The joint venture will be responsible for developing six or more satellites, which are expected to be capable of collecting imagery with an anticipated 80cm resolution. They will use DigitalGlobe's industry-leading ground infrastructure.

TAQNIA and KACST will benefit from DigitalGlobe's imagery production platform and expertise and catalogue of high-resolution satellite imagery.

They will also benefit from the company's global distribution capability and customer relationships.

KACST will construct, integrate, and launch the satellites, and will own 50% of the imaging capacity, which will include Saudi Arabia and the surrounding region.

The satellites are expected to be launched in late 2018 or early 2019.

HH Dr Turki bin Saud bin Mohammad Al Saud is chairman of the board of TAQNIA and president of KACST, an independent scientific organisation. He said: "Partnering with the premier commercial satellite imaging firm will help to propel the Kingdom of Saudi Arabia to become a leader in remote sensing and satellite technology."

HISTORY IN THE MAKING.

The hangar doors opened wide. The wheels turned. And our brand new E190-E2 rolled out to a standing ovation. For those in attendance, it was a moment both joyful and historic. Because it marked the world's first glimpse of the second generation of E-Jets — a highly evolved new family of airliners that builds on the historic success of our first generation. Now, we truly are on a roll. And ready for E-Jets to make history. Again.

EMBRAER
Commercial Aviation

Traditionally, the Middle East has not been a good market for regional jets. In the Arabian Gulf in particular, passengers do not look favourably on smaller aircraft, with the Airbus A320 and Boeing 737 families being the minimum acceptable size. Will the new crop of regional airliners change those opinions? *Alan Dron* looks at the contenders.

THUMBS UP FOR CSERIES DRIVE INTO MIDDLE EAST

With service entry of Bombardier's 100 to 150-seater CSeries airliner now imminent, the Canadian manufacturer believes that the aircraft can find further customers in the Middle East and North Africa.

Developing a new commercial aircraft is rarely simple or easy. Budgets and schedules almost invariably take on Spandex-like qualities as the development programme proceeds. After an extended gestation period, Bombardier is about to put the CSeries into commercial operation.

The first production aircraft, a CS100 variant for Swiss International Air Lines, is due to enter service shortly and the airframer is looking forward to having production examples roll off the final assembly line in Montreal as it starts to recoup its expenses on the twin-engined single-aisle airliner.

A mid-February demonstration tour began in Bahrain, immediately followed by four days at the Singapore Airshow, before the aircraft returned, stopping in Morocco and Ethiopia and then heading for Europe and home.

Kicking off the tour in Bahrain was significant, given that Gulf Air has an order for 10 CS100s – not to mention the fact that the then-acting CEO, Maher Salman Al Musallam, had expressed doubts at the island nation's biennial air show in January as to whether the Bahraini flag-carrier would proceed with its intention to operate the Canadian aircraft.

Bombardier's senior vice president sales and asset management, Colin Bole, was cagey on whether the Bahrain visit would include talks with Gulf Air or when the aircraft would be delivered. "We're in regular contact with them," was his only comment.

By the time these words appear, a decision may well have been taken on whether the Canadian aircraft will bear the airline's golden falcon on its tail fin.

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Bole was similarly reluctant to specify when the region's biggest customer for the type, SaudiGulf Airlines, would receive its aircraft, but was still confident that the CSeries would find a niche in the Middle East and North Africa.

The most important aspect of the tour, he said, was simply to say: "We're here. That's the message. It lets airlines see, feel and touch it."

The visits to Morocco and Ethiopia were technical evaluation stops, he said, with both Royal Air Maroc and Ethiopian Airlines considering the 100-seat CS100 version in their future fleet plans. "I can tell you there's significant interest from Middle East and African carriers."

Bombardier believes that one factor that will make the aircraft popular in the Middle East is its payload. In a region where passengers traditionally 'travel heavy', with an average 25-30kg of luggage, the CS100 can take 110 International Air Transport Association (IATA) standard roller bags in its overhead bins, considerably more than previous-generation aircraft such as the Avro RJ and Bombardier's own CRJ series.

The CS100 can carry up to 125 passengers in a single-class layout, which will still mean that not everybody will be able to get a roller-bag on board – assuming every passenger brings one – but in a dual-class layout, 110 on-board bags would allow virtually everyone to travel without having to wait for luggage at the arrivals carousel.

Overhead bins

In fact, so large are the CSeries' overhead bins that they can swallow a piece of wheeled luggage considerably larger than the IATA-regulated size – not that airlines are likely to encourage that particular scenario.

Staying in the cabin, Bombardier has installed economy-class seats 18.5 inches wide in its 2+3 cabin layout; better than the 17-18-inch seats more typically found in current aircraft.

Indeed, to compensate for its unpopularity in the middle of the bank of three, the centre seat is slightly wider at 19 inches, to alleviate that 'hemmed-in' sensation.

The demonstrator aircraft had a 2+2 business-class at the front of the cabin, with the economy section laid out in a variety of seat pitches from 32 to 29 inches, to give potential customers an accurate idea of the amount of room available.

Bombardier also draws attention to the fact that the cabin walls are relatively flat:

there is little curvature around the shoulder and head areas, which helps prevent window-seat passengers feeling that the fuselage is crowding in on them. Together with its unusually large windows, the overall cabin effect is airy. Bombardier believes that this attention to detail in creating vital extra inches of personal 'living space' will prove popular with passengers.

But it is airlines that Bombardier has to convince of the virtues of its new aircraft and the fact remains that new orders have proved stubbornly reluctant to materialise.

In mid-February, Air Canada broke a 16-month sales drought when it signed a letter of intent for 45 CS300s, plus options for 30 more, including conversion rights to the smaller CS100. This took the number of firm orders for the type to 288, close to the target of 300 by service-entry date Bombardier had set itself.

The day before the Air Canada order, International Airlines Group CEO, Willie Walsh, was quoted by a Northern Ireland newspaper – Bombardier has a large aerostructures factory in Belfast – as saying that British Airways would "definitely" consider the CSeries, adding that the smaller CS100 "could be an option for us at London City Airport".

The Canadian manufacturer has consistently said that it believed orders

Fighting back from a stop-start history

Bombardier launched the CSeries in 2004, before suspending the programme two years later after it had failed to garner sufficient advance orders. It was relaunched in 2008 to compete in the 100 to 150-seat segment of the marketplace.

The jet was designed to incorporate advanced technology, with composite wings, rear fuselage and empennage. Advanced aluminium-lithium alloy is also extensively used. It is powered by Pratt & Whitney PurePower PW1500G geared turbofans, designed specifically for the aircraft.

The aircraft was designed to give a 15% cash operating cost advantage and more than 20% fuel burn advantage over existing types.

The CS100 made its maiden flight in September 2013, while the larger CS300, which will carry up to 149 passengers, first flew in February 2015.

By mid-February 2016 four Middle East carriers had bought the aircraft – Gulf Air (10 CS100s plus six options), start-up SaudiGulf Airlines (16 of the larger CS300s plus 10 options), Iraqi Airways (five CS300s plus 11 options) and Abu Dhabi's Falcon Aviation Services (two CS300s).

On May 29 2014, one of the four test aircraft suffered an uncontained engine failure during ground testing, resulting in suspension of the flight-test programme for several months. The cause of the failure was traced to leaking oil seals, leading to a lack of lubrication around bearings in the low-pressure turbine.

The flight-test programme has confirmed the CS100's maximum range as 3300nm, around 350nm greater than the original design range.

As is almost inevitable with new designs, the timetable for the CSeries has slipped several times during the development process. The CS100, which should have entered service in 2013, is now due to make its debut with launch customer Swiss International Air Lines around mid-2016. The larger CS300 will follow it into commercial service around six months later with Latvian carrier AirBaltic.

would start to speed up as the aircraft neared production status and Bole said that certification of the CS100 by the Canadian aviation regulator, in December 2015, had created a spike of interest from potential purchasers: "We believe this will be a very important trigger."

He declined to name airlines, but said that the appearance of the first production version in the colours of launch customer Swiss, together with the previously announced news that the aircraft had bettered its brochure specifications in terms of payload and fuel burn, was arousing increased levels of enquiries.

"If you look at the Middle East specifically, there is a large number of narrow-bodies there, but the load factors are not at a profitable level." The CSeries would "deliver a cost-per-seat that allows you to be profitable at a much lower load factor".

Those lower costs made it possible for an airline using the CSeries to increase frequencies on a route, to protect and gain market share. "Frequency is the name of the game with this aircraft. It's a network connector in many ways."

There were obviously several major hubs in the region, but there was a need to develop 'mini hubs' on the North American pattern and the CSeries would be adept at building such secondary centres, he said.

One reason for the low number of sales won by Bombardier in the Middle East over the past year has been the low price of oil: "When fuel prices go down, the rest of the world benefits but in this part of the world, budgets go down a bit," said Bole. Turmoil in several of the region's countries has not helped. "We can't control that. What we can control is that the aircraft performs and that we're on top of the support side.

"We'll be expanding our regional support office in Dubai. We have a spare parts distribution centre there already and we're looking at a couple of other initiatives. One is a simulator; the other is a maintenance centre. Then we would have the full gamut of support in the region."

The CSeries would "deliver a cost-per-seat that allows you to be profitable at a much lower load factor".
COLIN BOLE

Tough competition

The CSeries has faced tough competition, particularly from Airbus, which is said to have pulled some deals out from under Bombardier's nose with last-minute offers of aircraft at extremely advantageous prices.

Bole is philosophical. "When we launched the aircraft in 2008, we obviously created a shift in thinking in the market. That required our competitors to react. You saw that in the re-engineering on pretty much all the platforms.

"We're not surprised by the competitors' behaviours. We hope that the industry and the airlines out there appreciate that level of contribution [from Bombardier], because when you have a duopoly, it's almost like a monopoly. When you introduce a third player, you actually introduce some competition."

As well as Boeing and Airbus, Bombardier faces competition from Embraer, which has launched the re-engined E2 version of its E-Jet regional aircraft and the Sukhoi Superjet.

Bole believes that the advantage of an all-new aircraft gives Bombardier an edge on Embraer and that Sukhoi, while "quite aggressive in the marketplace", is at the lower edge of Bombardier's target audience.

There have been persistent reports in the industry that the company has been reluctant to offer the type of discounts common among aircraft manufacturers (although *Arabian Aerospace* understands from informed sources that discounts were offered to Gulf Air).

Sales campaign

Asked if Bombardier would look more favourably on discounts as a method of boosting its sales campaign, Bole did not answer directly but seemed to indicate that it remained reluctant to follow rival manufacturers.

"The cost of our aircraft, because it's 100% new, because there has been no compromise in the airframe in terms of aerodynamics… the cost gap is still there. With the amenities that we offer in the highest technology aircraft out there, we feel confident in its ability to compete well. Our aircraft will be priced to the value it brings to the client. It will be competitively priced."

He argued that the 'sticker price' was just one part of the equation airlines took into consideration when buying an aircraft. Lifecycle costs were also important and the CSeries' longer-than-normal gaps between visits to the hangar would work in its favour.

"It will have 850 hours to an 'A-check' and 8,500 flight hours for a 'C-check'. That makes it very compelling. The composite wing and aluminium-lithium alloy [allows] for a longer interval for the corrosion prevention and control programme check, which happens at 12 years. That's a major contributor to the overall cost.

"Bombardier's Smart Parts programme also means a CSeries client has the benefit of having predictable, competitive costs for the life-cycle of their aircraft."

Passengers in the Middle East will be keen to try out the new aircraft when it eventually appears in the liveries of operators in the region.

SUKHOI TARGETS MIDDLE EAST SUCCESS AFTER EUROPEAN BREAKTHROUGH

The next two years could be critical for the Sukhoi Superjet. This spring, Ireland-based CityJet takes delivery of the first of 15 leased examples of the Russian aircraft, giving it its breakthrough sale in the European market.

The initial aircraft will be deployed on wet leases to other airlines, which will give various companies the opportunity to run the rule over the twin-jet and gauge passenger reaction.

The Superjet is the aircraft that Russia's United Aircraft Corporation (UAC) created with the aim of breaking out of the limited export market that the former USSR had achieved with its Tupolevs and Ilyushins.

The Superjet was designed with western customers in mind, with big-name western suppliers contributing to the aircraft in the hope that this would reassure potential export customers.

Thales was contracted to supply the avionics, Messier-Dowty the landing gear, Honeywell the auxiliary power unit and Liebherr the flight control system. The aircraft's SaM 146 powerplants are the result of a joint venture between Snecma of France and Saturn of Russia.

The other aspect that Sukhoi was keen to address during the development process was the poor reputation for after-sales service that lingered around Russian aircraft. Today, there is a service and spare parts centre in Florida, a sales and support centre in Venice and a worldwide spares set-up backed by Lufthansa Technik Logistik.

Sukhoi, like other contenders in the regional jet market, is hoping for orders from the Middle East, although the region has traditionally not been fertile ground for this class of aircraft. The minimum size of aircraft deemed acceptable by passengers has generally been the Boeing 737/Airbus A320. The Russian manufacturer puts the number of potential Middle East regional jet sales in the tens, rather than the hundreds, over the next 10-15 years.

It feels it has a sporting chance of gaining some Middle East sales due to the Superjet's interior space, which gives it a different 'feel' than current-generation contenders in the regional marketplace. Like other new-generation regional jets, the Superjet has overhead bins considerably larger than those of current aircraft, such as the Bombardier CRJ and Avro RJ, allowing full-size roller bags to be stowed in the cabin.

Patrick Byrne, CityJet's chairman, is enthusiastic about the passenger experience, describing the cabin as "superior to all its competitors". CityJet looked at the Bombardier CSeries and Embraer E-Jet E2 series before choosing the Sukhoi.

In February, Egyptian carrier Air Leisure signed a memorandum of understanding (MoU) for four Superjets, with six options. A Russian Government minister also claimed that a much larger order with another Egyptian airline was imminent, although *Arabian Aerospace* understands that talks are still at an early stage.

The Superjet is building a useful reputation in airline service. Around 70 are in service worldwide. Mexico's Interjet initially bought 20 and was sufficiently impressed with its early experience to add another 10. It has outfitted its aircraft with a Pininfarina-designed interior, with spacious dimensions and leather seats set at 34-inch pitch – which would be generous in a long-haul jet, never mind a regional one.

Interjet is operating the Russian aircraft both within Mexico and on services to several southern US destinations, and reported last year that it was achieving a 99% dispatch reliability rate.

The Mexicans are, by all accounts, very happy with the Superjet – so why have more not been sold to western companies?

Speaking last year Eduardo Munhos, senior vice-president, commercial, for SuperJet International, the Italo-Russian marketing arm for the aircraft in western markets, said: "I think that our issue is not directly related to the fact that it's a Russian aircraft. It's to do with our lack of past performance in the market; we don't have a track record."

Gaining that track record can only be done through operating it, which is why the CityJet deal is so important. The Superjet will replace the Avro RJ85 with the Irish company, one of whose main centres is London City Airport, where it will be tried out by a business-heavy clientele. Good reports filtering back from passengers could be the catalyst that Sukhoi needs to prise open wider markets in both Europe and the Middle East.

This Sukhoi Superjet, in the livery of major Mexican customer Interjet, gave potential customers a chance to sample its qualities at January's Bahrain International Airshow.

BRAZILIANS BUOYED BY E2 UPGRADE

Unlike all other members of the new generation of regional jets, Embraer's contender for sales in this marketplace is an upgrade of an existing aircraft, rather than a new design.

The upgrade for the E2 range is, however, substantial, with a new, high-aspect ratio wing, fourth-generation fly-by-wire controls and a new-generation powerplant in the shape of Pratt & Whitney's PurePower geared turbofan, which replaces the General Electric CF34 used on the current generation of Embraer E-Jets.

The combination of improved aerodynamics and the new engine will cut fuel-burn of the E2 line-up by around 16% over the existing models, as well as increasing their range. The baseline E2 model, the E190-E2, will have a maximum range of 2,800nm (5,180km), an improvement of 400nm (740km) over its earlier-generation counterpart.

Embraer is seeking to build on the considerable success of its existing design, which has sold close to 1,500 examples since it entered service in 2004. The Brazilian aircraft are flown by around 70 operators and Embraer claims to have more than a 50% share in the market segment of up to 130-seat aircraft.

The market seemingly approves of the new offering: since its official launch at the 2013 Paris Airshow, Embraer has gathered 267 firm orders and 373 options or purchase rights agreements for the updated version.

The manufacturer rolled out the first prototype of the E190-E2 at its São José dos Campos facility on February 25, with first flight scheduled for the second half of the year and service entry due in 2018. The larger E195-E2 will enter service in 2019 and the smaller E175-E2 in 2020. Embraer has decided not to produce a second-generation E170.

The E190-E2 will have the same passenger capacity as its direct predecessor, with 97 seats in a dual-class configuration, or 106 in an all-economy layout. The stretched E195-E2 will have three more seat-rows than the current E195, while the E175-E2 will have one more row than the current E175.

Shortly before rolling out the new aircraft, Embraer announced it was increasing the E195-E2's maximum take-off weight by 2,000kg and its wingspan by 4.6 feet (1.4m) to increase performance in the hot and high regime.

The 195-E2 will have a maximum range from a non-restricted airport of 2,450nm (4,530km). From higher, more challenging airports, such as Denver in the US or Bogotá in Colombia, the improvements will give around 250-280nm (460-520km) additional range, Embraer estimates.

As with other new-generation regional jets, the E2 series aims to provide more personal space for passengers and generally give a more spacious feel to the cabin. At last November's Dubai Airshow, an Embraer mock-up showed an innovative concept for the business-class cabin with the 2+2 rows configured in a staggered arrangement in which the aisle seats were offset from the those at the windows.

Economy-class is a standard 2+2 arrangement, but a major change can be seen in the overhead bins, which are 40% larger than the current versions and capable of taking full-size roller-bags. Anyone who has struggled to get luggage into the overheads on an Avro RJ, Bombardier CRJ or even an Embraer ERJ-145, will notice the change. It also benefits airlines, potentially reducing the amount of luggage needing to be stowed in the hold, thus cutting turnaround times.

Embraer is also proposing a combination of window treatments and LED lighting to help the feeling of airiness in the cabin.

According to the company's 20-year market forecast for the Middle East, released at the Dubai show, the region will account for 220 jets in the 70 to 130-seat category. This is a relatively modest number and indicative of the dominant role that long-haul traffic plays in the region.

However, says Embraer, the regional segment does have some significance in the Middle East, feeding the major players' hubs and enabling them to access smaller markets. In 2015, it notes, 41% of intra-Middle East flights departed with fewer than 120 passengers. These markets, it argues are not efficiently served by larger jets.

MITSUBISHI MRJ CAN FULFIL JAPAN'S EASTERN PROMISE

For a nation with such a technology-based economy, it is perhaps surprising that, for the past 50 years, there have been no airliner manufacturers in Japan.

Certainly, Japanese companies have long been tier-one suppliers to Boeing and others. Mitsubishi Heavy Industries, for example, provides the composite wing box structure for the Boeing 787, while Kawasaki Heavy Industries provides fuselage sections for the same aircraft.

The country also has a long-standing military aircraft manufacturing capability, either building US designs under licence or, increasingly, designing its own prototypes for next-generation aircraft.

However, it has not built a domestically-designed airliner since the last of a modest production run of 182 Nihon Aircraft Manufacturing Corporation (NAMC) YS-11 twin turboprops came off the final assembly line in 1974.

So, the first flight of the Mitsubishi Regional Jet (MRJ) in November last year was greeted with considerable enthusiasm in a nation that, despite its two decades of economic problems, remains proud of its technological prowess.

In what is becoming an increasingly congested market sector, Mitsubishi believes that the MRJ's advanced design will allow it to build a niche in the regional airliner market.

As the first prototype MRJ took to the sky from Nagoya Airport, Mitsubishi Aircraft's vice-president of sales and marketing, Yugo Fukuhara, told the London *Financial Times* that Japanese "reliability and quality" would boost its chances.

The desire – indeed, need – to produce a high-quality contender in the marketplace is thought to be one factor behind Mitsubishi's announcement, just a month after the first flight, that it was delaying the MRJ's service entry from the second quarter of 2017 to "approximately one year later".

In a statement, it said that the initial flight tests had confirmed the aircraft's basic characteristics as satisfactory. "However," it added, "we also have recognised several issues as we attempt to accelerate our development.

"Specifically… we have made additions to and revisions of test items in order to complete a better-integrated aircraft."

Mitsubishi Aircraft's president, Hiromichi Morimoto, told reporters that while the MRJ's airframe had passed strength tests for normal usage, there were some concerns that it would not withstand certification tests that require components to handle 150% of normal loads.

"This is Japan's first new passenger aircraft in 50 years and, on paper, everything looked fine," he was quoted as saying. "However, when we built it we found places to improve that we hadn't banked on."

The delay was the fourth to be announced in the MRJ's development programme. While delays in bringing a clean-sheet design to market are almost inevitable today, the latest delay is a blow and will allow competitors, such as the Bombardier CSeries and Embraer E-Jet E2, range a head-start in the market.

Mitsubishi plans two versions of the aircraft, the 90-seat MRJ90, which will be first off the production line, followed by the 70-seat MRJ70.

"This is Japan's first new passenger aircraft in 50 years and, on paper, everything looked fine. However, when we built it we found places to improve that we hadn't banked on."
HIROMICHI MORIMOTO

The standard version will have a range of 1,150nm/2,120km, while the MRJ90ER will have a range of 1,550nm/2,870km and the MRJ90LR will be even longer-legged at 2,040nm/3,770km.

The MRJ90 will typically have a two-class seating arrangement of nine business-class seats at 36-inch pitch plus 72 at 30-inch pitch. An all-economy version will have 88 economy-class seats at 31-inch pitch or a maximum density layout of 92 seats at 29 inches.

Mitsubishi says it has designed the cabin with class-leading passenger space, with a 6ft 8in (2.03m) tall ceiling, seats 18.5in wide and more arm, leg and shoulder room than other regional jets.

It is the launch customer for the Pratt & Whitney PurePower geared turbofan, which was optimised for the MRJ.

As of mid-February, the MRJ had 427 commitments for the aircraft, consisting of 233 firm orders plus 170 options and 24 purchase rights.

Many of the aircraft's major customers, such as Skyways and Trans States Airlines, are in the US. Currently, 'scope clauses' limit regional partners of major US airlines to aircraft that carry fewer than 76 passengers and a maximum take-off weight of less than 86,000lbs (38,300kg).

The MRJ90 breaches those limits, but Mitsubishi is hopeful that negotiations will have eased the scope clauses by the time MRJ deliveries begin.

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CHINESE ARJ WORTH WAITING FOR

November 2015 saw a major milestone in China's civil aviation industry. The first Advanced Regional Jet for the 21st Century (ARJ21) was delivered to launch customer Chengdu Airlines, marking the long-delayed debut of the aircraft.

Bearing a distinct resemblance to the McDonnell Douglas MD-82 (perhaps hardly surprisingly considering that the US manufacturer had a factory in Shanghai where the twin-jet was built under licence in the 1980s and 90s) COMAC's ARJ21 has been through a lengthy development programme.

Delays in bringing a new airliner to service entry are, of course, not unique to China – most new western designs miss their initial timetables, sometimes by several years – but China's second attempt at building a modern jet airliner took considerably longer than normal. (Its first passenger jet, an early 1980s Boeing 707-lookalike, the Shanghai Y-10, did not get beyond the prototype stage.)

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The Chinese Government approved the ARJ21 in 2002, with initial deliveries due four years later. However, the aircraft only made its first flight in November 2008. There then followed an extraordinarily long period to gain certification, largely due to the fact that China had never previously qualified a civil jet airliner for revenue service.

From 2010, the US Federal Aviation Administration conducted a shadow certification process on the ARJ21 programme, to assess the ability of CAAC, China's aviation regulator, to conduct a technical assessment of a modern aircraft.

The FAA said last year that it was never the intention that this process should result in FAA certification of the ARJ21, but noted that COMAC intended to produce an improved derivative of the aircraft to meet international regulatory standards.

The lack of FAA, or European Aviation Safety Agency (EASA), approval means that, for the moment, the ARJ21 will be limited to Chinese domestic airlines, or to those countries prepared to accept CAAC, rather than western, certification.

Given the scale of China's booming airline industry, plus the fact that Chinese carriers are being 'encouraged' to support the ARJ21, around 350 have been ordered. The vast majority are bound for Chinese carriers or lessors, although small numbers have been ordered by airlines or operators in Myanmar, Thailand and the Republic of Congo.

The only western purchaser is lessor GECAS, which has placed a firm contract for five, plus 20 options.

The ARJ21 is a rear-engined twin-jet, capable of taking 90 passengers in a single-class configuration or 78 in dual-class layout. COMAC says it will replace smaller regional aircraft, particularly in China's western regions, and will optimise capacity on thinner routes currently served uneconomically by larger aircraft.

A further role will be to extend hub-and-spoke routes from major centres to smaller regional airports.

The ARJ21 contains a substantial percentage of western equipment, notably General Electric CF34-10A engines and Rockwell Collins avionics. Despite this western input, however, observers believe it has little chance of competing with western airliners, even if it eventually receives authorisation from the FAA and EASA. They cite weight problems and outdated internal equipment.

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Since its delivery to Chengdu Airlines, the ARJ21 has been carrying out demonstration and route-proving flights and was due to enter revenue service by the end of February this year. By early March there was still no sign of this happening.

The Hong Kong-based *South China Morning Post* reported in late October 2015 that converting to the ARJ21 would be a major career gamble for pilots whose pay depended on the number of hours they flew. To make up for this, said the newspaper, Chengdu Airlines was tripling ARJ21 pilots' hourly pay, to make up for the shorter hours that flying the ARJ21 would entail.

In many ways, however, the ARJ21 can be regarded largely as a pathfinder for the next jet airliner to emerge from China, the COMAC C919, which was rolled out last November. A larger aircraft in the Airbus A319 category, it will benefit from avoiding the mistakes made in developing the ARJ21. Perhaps still not up to the latest western standards, it will be sufficiently close, especially if offered at knockdown process, to win more international orders.

The COMAC ARJ21 is unlikely to set sparks flying among western carriers. It is seen here undertaking minimum speed unstick trials in the latter stages of certification.

TURKS COULD HAVE A SURPRISE HIT ON THEIR HANDS

One of the bigger aviation surprises of 2015 was the news that Turkey was to restart production of the Dornier 328 regional aircraft as the basis of a new civil airliner industry.

Even more surprising was the announcement that Turkey will build new versions of both the turboprop and jet versions of the German-designed aircraft, with the initial aim of using the 30-seater aircraft to create a network of routes linking smaller Turkish cities.

New company TRJet aims to deliver the first examples of the modernised version of the 1990s-vintage German commuter liner – sporting new engines and avionics – in late 2018.

This, however, is just a stepping stone to Turkey's wider aviation ambitions, which revolve around the creation of a clean-sheet design, the TRJ628 – also to be produced in turbofan and turboprop versions – in the 50 to 70-seat category. First flight of the larger aircraft is scheduled for 2023.

The 30-seater airliner category was generally believed to be largely extinct, partly due to its relatively high seat-mile costs and the tendency for most regional airlines to upgrade to 50 to 100-seat aircraft.

However Dave Jackson, managing director of 328 Support Services, the type certificate holder for both the turboprop and jet versions of the original Dornier aircraft, takes the view that the only reason that more airlines do not buy 30 to 60-seaters is that few modern designs in the category exist.

Only Franco-Italian consortium ATR, with its 48-seat ATR 42, and China's AVIC MA-600 (which has a patchy safety record and limited appeal outside nations where China's generous purchase terms are a major attraction) are still in production. Jackson points out that there are roughly 5,000 aircraft still flying in this category and that many smaller airlines still operate aircraft such as the Embraer ERJ-135, earlier versions of Bombardier's Dash 8 and BAE Systems' Jetstream 41.

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Currently they have no obvious replacement and Jackson believes that Turkey's plans to build around 250 of the 32-seat design could tap into a market for airlines seeking replacements for these earlier aircraft.

So, what chance does a new 328 – either turboprop or jet – have of gaining intentional sales, particularly in the Middle East?

The basic design will embody the existing high-quality German engineering and the aircraft has shown itself capable of operating from unimproved airstrips. The cabin is also spacious and many 328s are used as executive or corporate commuter aircraft.

This is just a stepping stone to Turkey's wider aviation ambitions, which revolve around the creation of a clean-sheet design, the TRJ628

That, perhaps, is the best chance of Turkey finding sales in the region. It is unlikely that Gulf airlines will be interested in such a small aircraft, but it could find a niche as an executive product. Some of the original aircraft were sold as Envoy 3 business jet versions, typically with a 14-seat interior.

Sales of the airliner version are more likely to come in north Africa, where smaller carriers, particularly those involved in flying personnel in and out of remote airstrips for the oil and gas industries, could find the re-born 328 of interest – especially if Turkey offers the aircraft at an attractive price.

Looking into the early 2020s and the 628 requires a considerable amount of crystal ball-gazing – who knows what the airline market will look like that far down the line?

By that time, however, aircraft such as the Fokker 50 will be well into the second half of their lives and airlines might well be interested in a new-generation aircraft in the 50 to 70-seater category. The choice of either a turboprops or turbofans will also allow TRJet to cast its net wider in the search for customers.

TRJet promises that the 628 will embrace the rugged and reliable design philosophy of its 328 predecessor. Perhaps that will make it an attractive buy for carriers operating off the main airways.

WHY ATR TURBOPROPS REMAIN A RARITY IN THE GULF

Avions de Transport Regional's ATR series of turboprops have won a host of orders worldwide, but they remain a relative rarity in the Middle East.

Traditionally, civil turboprops have not fared well in the Middle East. The region has a sprinkling of the ubiquitous Lockheed Martin C-130 Hercules military transport, but civil cousins are much more thinly spread.

In the Arabian Gulf in particular, airlines almost invariably opt for jets, even for sectors where a turboprop would make perfect sense, such as those up and down the eastern coast of the Arabian peninsula.

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A route that takes one hour by jet – say, between Kuwait City and Manama, or Doha and Muscat – is likely to require only an extra 10-15 minutes longer by turboprop, given the take-off and landing phases where jets have no advantage over their propeller-powered brethren. Only in the cruise does the higher speed of jets come into its own.

Sectors between Kuwait, Bahrain, Qatar, the UAE and Oman are ideally suited for turboprops. But they have never been popular with passengers, partly because the local population dislikes smaller aircraft and partly because anything with propellers is instinctively seen as a second-class form of travel.

This helps explain why ATR has sold more than 1,600 48-seat ATR 42s and 70-plus seat ATR 72s worldwide but that it has placed only around 12% of that number into what it classes as its Africa and Middle East sales region.

The largest operator, not only in the Middle East but also on the African continent, is Air Algérie, which has 12 ATR 72-500s in its fleet, with three more ATR 72-600s on order. These fly primarily on domestic and short-haul regional routes.

But Air Algérie's fleet is the exception. The remaining ATRs in the Middle East are deployed in small numbers around another half-dozen carriers. And even among the relatively small number of the Franco-Italian company's products sold into the MENA region, some have arrived and departed again.

Regional Air Lines of Morocco, for example, ditched its examples when it became Air Arabia Maroc in 2009 and switched to the parent company's Airbus A320s. Oman Air, which has operated a pair of ATR 42-500s for domestic services and charters, is in the process of selling them (and may have done so by the time this issue of *Arabian Aerospace* appears) as it attempts to rationalise the number of types in its fleet.

National carriers in two of the strife-riven nations of the region, Libya and Syria, are believed still to operate a pair of ATRs apiece, although accurate information on their operational status is difficult to ascertain, particularly from Syria.

One oddity, given the caution with which customers in the Gulf approach turboprops, is the presence of a single ATR 42-600 and ATR 72-600 with executive operator Alpha Star Aviation Services of Saudi Arabia, which operates them in airline configuration for group travel. The company is happy with them, particularly their performance in Saudi Arabia's challenging climate, having ordered the larger aircraft around a year after it acquired the ATR 42.

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ATR's presence in the Gulf is about to increase considerably, given the signing of a contract in February this year between ATR and Iran Air, which has placed a firm order for 20 ATR 72-600s plus 20 options. These will join around six ATR 72s already in the country operated by Iran Aseman Airlines.

However, the likelihood is that Iran Air's substantial fleet will be used mainly on internal routes. So the type is likely to remain a relatively rare sight on airport aprons on the western side of the Gulf.

This Q400 operated by Starbow of Ghana is owned by Abu Dhabi's Falcon Aviation Services.

Q400 STILL A RARE BIRD IN THE MIDDLE EAST

Attention on Bombardier in recent years has focused on the CSeries airliner and its protracted development process.

Beyond the headlines surrounding the Canadian company's latest product, however, its two existing regional aircraft, the CRJ regional jet and Q400 turboprop, have quietly continued to tick up sales.

Both aircraft are the latest variants of long-serving designs, which have been steadily stretched over the course of their careers. The Q400, for example, began life as the Dash-8 Series 100 with a typical 37-seat layout, which became the uprated, faster Series 200 with the same seating arrangements.

The first major stretch came with the Series 300, which boosted capacity to 50 seats. These variants became, respectively, the Q100/200/300 (Q-Series) with further refinements including Bombardier's active noise and vibration suppression (ANVS) system. This measures the vibrations caused as the soundwaves from the propellers beat against the fuselage. The system then generates an equal frequency 180 degrees out of phase, which effectively cancels out the vibration (and thus the noise it causes), which cuts down considerably on noise in the cabin.

The Q400 version saw the largest stretch yet, with a typical 78-passenger configuration. This was further increased to 86 seats in a high-density layout (at a seat pitch of 29 inches) unveiled at the 2013 Dubai Airshow.

Bombardier showed off a 90-seat option at February's Singapore Airshow that would slot in an extra row of seats at the cost of an inch of seat pitch. The company has said that it foresees this version being used on short-haul services and argues that new-generation slimline seats mean that 28-inch pitch today is equivalent to 30-inch legroom in earlier-generation seats.

The Q400 NextGen is also the fastest of the Q series yet, with a cruising speed of 360kts or 667kph, around 100kts faster than the Series 100. On flights of 300-400km, the difference in flight time with a jet is minimal.

For all these qualities, however, the Q400, like its rival from Franco-Italian consortium ATR, remains a relatively rare bird in the Middle East, due to the preference among local passengers for jets.

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At present, the biggest Q400 operator in the region is Abu Dhabi's Falcon Aviation Services, which operates three on behalf of a local oil and gas company and has leased out three more to Senegal Airlines and Starbow of Ghana.

Also in Abu Dhabi can be found three Q400s of Abu Dhabi Aviation (which additionally operates two Q200s and three Q300s).

Palma Holdings of Dubai owns five Q400s, but these operate outside the region, with Ethiopian Airlines (four) and RwandAir (one).

Smart Aviation of Egypt's two Q400s similarly operate far from home, with Biman Bangladesh.

The only other MENA-based Q400 operator is Algeria's Tassili Airlines, with four in its fleet (which also includes four earlier -200s.) These have traditionally have been used for shuttle services or charters for oil companies servicing remote airstrips in the south of the huge country, although they now also operate scheduled services.

Tassili's operations give a clue to the type's attraction in Africa (several carriers south of the Sahara also use the aircraft). Its aerodynamics and speed give it some advantages over longer sectors than the ATR design.

That speed comes at a cost in fuel consumption – roughly 30% greater than that of the ATR. The purchase price of the Q400 is also greater than that of the ATR 72-600 (although prices for both types can vary considerably, depending on the discounts the manufacturers are prepared to negotiate).

Cost, of course, is the major defining factor for airlines, which helps explain why ATR's order backlog is considerably larger than Bombardier's. At the end of 2015, the Canadian company had just 39 Q400s to build, whereas ATR had around 280 aircraft on its list. By that date, however, Bombardier had sold 1,218 of its twin turboprops – a healthy total by anyone's standards.

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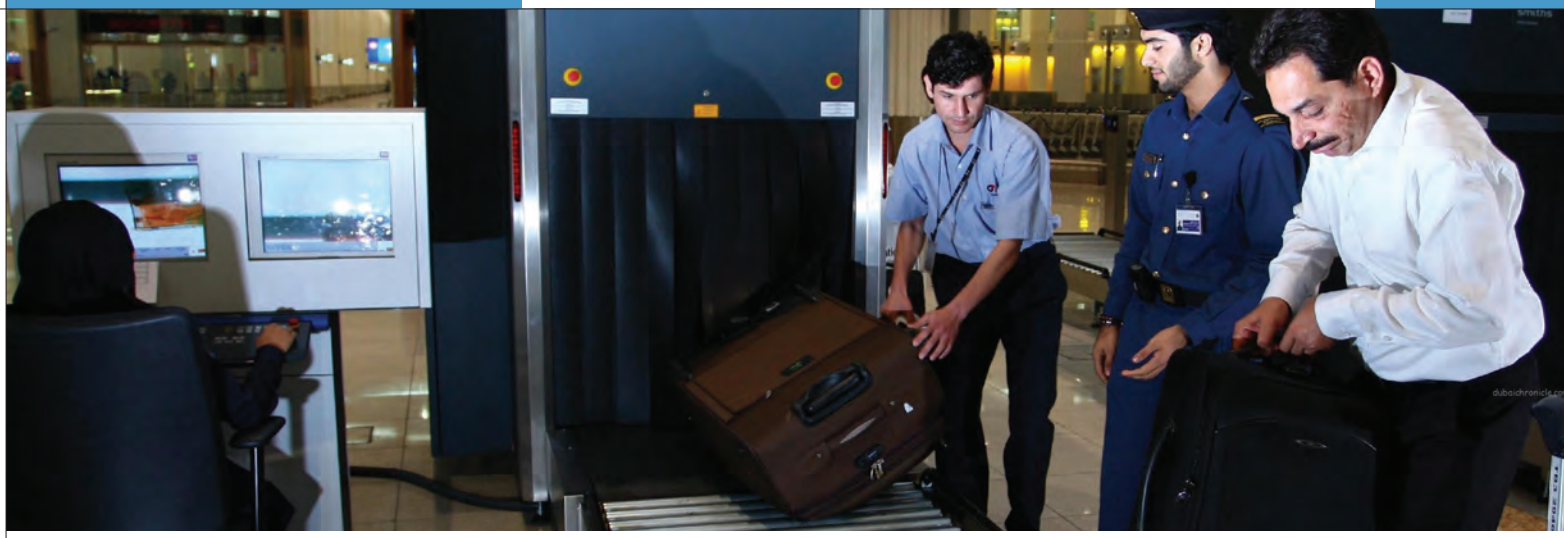

The code of conduct that can beat the bombers

Airport security is an important issue that international governments are tackling as sensitively as they can. **Liz Moscrop** *reports.*

The lethal attack in Brussels in March has put airport security into sharp focus, as military forces and businesses alike join forces to combat the deadly threat of terrorism.

Many agencies are discussing whether security should extend throughout the whole airport and not just airside.

The Brussels bombs were hidden in suitcases that had not cleared screening, and the three suicide bombers were able to move around unchecked, even though one of them was a suspected Daesh bomb-maker linked to the Paris attacks.

Belgian authorities were already aware of the other bomber – Ibrahim El Bakraoui, who had been deported from Turkey in June.

That said, many airports in the Middle East already do protect themselves with a wider security cordon. Philip Baum, author of Violence in the Skies: A History of Aircraft Hijacking and Bombing and editor of *Aviation Security International*, told the UK's *Daily Telegraph*: "We need to focus much more on behavioural analysis, on negative intent, rather than prohibited items."

He continued: "I prefer the term 'profiling' – just as long as it isn't converted into 'racial profiling'. Security is not about race. It is about behaviour that you can see – if somebody is behaving in a nervous manner, or interacting with their surroundings in an unusual way."

He believes training airport staff to notice odd conduct, using dogs to sniff out explosives and being alert for people not interacting with others in a usual way, are key elements to combating terror threats. However, he is opposed to extra security checkpoints, which he believes would add more vulnerable areas to an airport.

The world has reacted vigorously to bombings and the global airport security market is predicted to more than double its expenditure to around $45 billion by 2018. Investments in security and surveillance, access control, perimeter security, integration, cyber security and screening are top of the agenda.

In the Kenyan capital Nairobi, for example, authorities are on high alert for attacks by Somali-based al Shabaab militants, so passengers have to get out of their cars, which are then searched, at a checkpoint a kilometre from the main terminal. However, some analysts believe that adding checks such as bag X-rays at terminal entrances could, themselves, create a potential target.

Additionally, several countries have tightened or reviewed airport security in the wake of the Brussels attacks, although even areas with much tighter controls cannot prevent leaks. For example, the likely cause of an explosion, which caused a man to be sucked to his death through a hole in a Somalian plane earlier this year, was a bomb, according to US government officials. An on-board explosion killed the man, injured two others and forced the Airbus A321 flight to return to the capital city of Mogadishu and make an emergency landing.

Reacting strongly

The commercial world is reacting strongly and business aviation travellers can get some useful hints and tips from the US National Business Aviation Association website.

Thomson Hunter, head of international capacity development for the British Department of Transport, said: "It is difficult to come up with a measured and proportionate piece of guidance to give to the industry. We don't want to stop airports from performing their legitimate business safely, but the consequences could be hideous. It's not an easy task to come up with advice."

The DfT alerts carriers and lets them know if there is a risk, but he said: "It's rare to have a specific plot and method of attack."

He added that governments all over the world were now collaborating, and sharing, information via Notices to Airmen (NOTAMs).

The UK's Joint Terrorism Analysis Centre, an all-source intelligence organisation closely related to the UK security service, provides advice to the British Government and firms within the critical national infrastructure on terrorist threats. It also shares its information with the International Civil Aviation Organisation (ICAO).

Baum concluded: "We need to continue going about our daily lives. That's most important. Otherwise terrorism wins."

All eyes will be on the Airport Show in Dubai in May as more than 250 participants are confirmed.
Marcelle Nethersole *finds out why the event is of such huge importance to suppliers, and what visitors can expect.*

SHOW OF STRENGTH

As Middle East airlines are recording the strongest annual traffic growth compared to their counterparts and announcing even more network and strategic fleet expansion plans, it is no wonder that suppliers from around the world are taking such a keen interest in the region – a fact that is reflected at this year's Airport Show, taking place from May 9-11 in Dubai.

In 2015, the event gathered more than 7,120 aviation professionals who networked, sourced their product requirements and created more than $20 billion worth of regional business possibilities.

Event organiser, Reed Exhibitions Middle East, has already confirmed 250 exhibitors will be showcasing their latest product offerings to a projected 7,500 attendees. This includes 150 hosted buyers, plus some 50 regional aviation authorities attending the event, which will be co-located with the World Travel Catering and On-board Services Expo Middle East, as well as the Global Airport Leaders' Forum (GALF).

"The 16th edition of Airport Show will continue to serve as a B2B platform for companies to present their airport and aviation-related products and services," said Daniyal Qureshi, group exhibition director, Reed Exhibitions Middle East.

Seven areas

"It will cover seven areas, including airport build and installations, airfield construction and installations, airport operations, airport security, airport technology and IT, ground support equipment and services, and air traffic management.

"The event will continue to focus on more than $100 billion worth of regional airport developments across the GCC, Middle East and South Asia, with decision-makers utilising the event to explore new technologies and meet their procurement requirements, thereby offering immense business prospects for global industry suppliers."

Exhibitors will occupy a 15,000sqm exhibition space at the New Za'abeel Halls in Dubai International Convention and Exhibition Centre (DICEC), with larger participation this year

"The tremendous response to the Airport Show reflects the strength of the region's aviation industry."
DANIYAL QURESHI

expected by country pavilions from Germany, France, the UK, Italy, Switzerland, the USA and China.

"The tremendous response to the Airport Show reflects the strength of the region's aviation industry," said Qureshi. "The region, particularly the UAE and Dubai, has a deep commitment toward the aviation sector, which contributes more than 27% to Dubai's gross domestic product (GDP) and accounts for more than a 21% share in employment. The strong performance of airlines and expansion plans continue to generate an array of opportunities worldwide."

Middle East carriers had the strongest annual traffic growth at 10.5%, according to latest statistics from the International Air Transport Association (IATA). As a result, the share of international traffic carried by Middle East airlines reached 14.2%, surpassing their North American counterparts.

Going further, airlines in the region will continue to present tremendous opportunities for global suppliers as they stay strong on expansion.

According to Boeing, Middle East airlines will require 3,180 new aeroplanes over the next 20 years, valued at an estimated $730 billion. While approximately 30% of that demand – 960 aircraft – will replace today's fleets, 70% is expected to be driven by rapid fleet expansion in the region.

According to Airbus: "In order to foster continued economic development of the region, particularly non-oil related, to encourage more tourism and to transport business travellers, the Middle East region is establishing an impressive fleet of passenger aircraft. In fact, the share of passenger aircraft in the world operated by the region's carriers has doubled in 10 years."

Annual growth rate

Airbus forecasts an annual growth rate of 6% in air traffic for the Middle East region over the next 20 years – well above the projected growth in global traffic of 4.6%.

Middle East airlines also continue with strategic network and fleet expansion, which will further propel growth.

Qureshi added: "Massive investments toward airport construction activities in the Middle East would further add to the opportunities that global suppliers can tap into. According to the Centre for Asia Pacific Aviation, airport

investments worth more than $32.7 billion are under way or planned in the UAE alone.

"Airport Show 2016 presents an ideal platform for global players to tap into these opportunities."

This year's show will also focus on 'smart' airports, which are set to revolutionise passenger experience as their managements allocate higher budgets to expanding and adopting the latest technologies.

Massive investments in the region, especially the UAE, will drive the Middle East smart airports market to cross $850 million within the next three years.

A latest study by Technavio said the global market for smart airports is estimated to reach $13 billion by 2019, at a combined annual growth rate of 6%.

From smart gates, beacon technology, mobile devices to navigate the airports and face recognition systems, to air traffic management, baggage and check-in management, IP-based security monitoring, communications, ticketing, and information systems, freight operations information systems, air traffic management and airways analytics, airports worldwide are actively adopting new technologies.

"Airports are more active than ever in adopting new and smart technologies and they are reaping

Continued on Page 90

TOP: Smart airports for the Middle East will be a major topic at the show.
ABOVE: Vestergaard's jet wash system is now in operation at Dubai.

CONTINUED FROM PAGE 89

benefits in enhancing efficiencies and passenger experience, as well as in reducing costs," said Qureshi. "With global passenger numbers expected to rise to 7.3 billion by 2034, airports need to ensure they are able to cope with the rising numbers, and, at the same time, offer a seamless travel experience. Smart technologies can greatly help in delivering a hassle-free passenger experience that can put an airport ahead of its competitors."

With this boom in the region, it is understandable why a wide range of global aviation suppliers are interested in doing business.

One of those suppliers is Vestergaard Company, which designs and manufacturers high-quality ground-support equipment. In the Middle East, the company has established itself with aircraft washers, as well as water and lavatory service vehicles.

"We have been in business since 1962 and today we have equipment all over the world. We mainly deal in de-icers but our business in the Middle East is to do with aircraft washers," said managing director Lars Barsøe.

"We have just delivered a new dedicated aircraft washer to Dnata's operation at Dubai International. This will be used with a new, environmentally-friendly soap, to keep the Emirates fleet looking sharp and to help save on fuel. With residue and dirt on aircraft surfaces, the drag is increased, so keeping aircraft clean can reduce fuel consumption by up to 2%, while maintaining an image of cleanliness and professionalism.

"By using environmentally-friendly soap Dnata is, therefore, not adding to the overall environmental footprint. The larger concentration of sand in the air in the GCC area is a contributing factor to the drag."

Lars Barsøe: "Keeping aircraft clean can reduce fuel consumption."

Barsøe, whose company will be exhibiting at the Airports Show, added: "Our de-icers are sold in the Northern Hemisphere, but the Middle East has seen the value of clean aircraft, and the other line of water and lavatory service has proven its worth in the region.

"The fast-growing airports need efficient vehicles to fill and empty the aircraft to ensure faster turnarounds. The Vestergaard line of potable water trucks have guaranteed clean water, even at the highest ambient temperatures, and the very fast and efficient vacuum lavatory vehicles can empty aircraft systems in less than five minutes and eliminate problems with blockages, due to their powerful vacuum systems."

France will have a big pavilion at the show and one French company participating is Egis.

The company is a provider of consultancy, engineering and operations services to the aviation industry and it has completed more than 200 projects in the Middle East, including many in the airport domain. Its presence in the region was reinforced last year by the acquisition of Projacs, a leading regional project management company.

"The Dubai Airport Show will provide an excellent opportunity to introduce the Projacs team to our airport clients," said Jacques Khoriaty, Middle East aviation director.

Egis will be showcasing some of its current work at the show, with highlights including a major project to develop standard operating procedures for the new terminal at Jeddah King Abdulaziz International Airport; the design of new air traffic control (ATC) procedures and the integration of air traffic management (ATM) systems for the new control tower in Jeddah; the design of the airside facilities at Riyadh King Khaled International Airport; and a new contract to provide value engineering services at four regional airports, with the aim of reducing construction costs and improving the operational efficiency of terminals and airport infrastructure.

Experts from Egis and Helios - its aviation consultancy - will be on hand to discuss recent projects, as well as aviation 'hot topics', including airport resilience and cyber-security.

"Egis also operates 14 international airports and we are seeking to grow our airport portfolio within the region. We have prequalified on the Taif Airport public, private partnership (PPP) in Saudi Arabia and are looking for other airport investment opportunities," added Khoriaty.

The GALF will continue to welcome the support of the Dubai aviation authorities.

This high-level conference will help airport, policy, business and technology leaders gain exclusive strategic insights into the perspective of international airport leaders and benchmark to ensure that their organisations have a leading-edge approach in place that will convert into enhanced performance.

"The forum will also help them expand their professional knowledge base and find out what it takes to be the world's top ranking airport; at GALF they will be able to network with 30 plus international airport top-level speakers," said Qureshi.

The Travel Catering Expo is positioned as the Middle East's largest dedicated exhibition to tap into the opportunities presented by its booming aviation catering business, thus ensuring the sector mirrors the growth and success of the region's thriving aviation industry.

"As regional airports gear up to receive more than 400 million passengers by 2020, the expo will provide an essential platform to meet the catering challenges this massive increase presents," concluded Qureshi.

Based at the company's regional headquarters in Dubai, Paul Baker is responsible for the overall leadership of the Smiths Detection Middle East team.

It was just over 11 years ago when the company opened its offices in Dubai and Baker now feels it has earned its place as the number one provider of security and screening technologies – and is pushing for the top spot in several other sectors in the region.

"The security industry here in the Middle East is very forward looking," said Baker. "Customers want to have the best equipment to secure the border and to protect both the citizens and expatriates that live here."

Baker clearly observes the need to deploy the highest levels of technology at airports in the region. "There are a lot of very competent customers here in the Middle East, not just competent in business but they are actually technically aware at much higher levels of the businesses, which is unusual."

Annual growth rate

He referred to instances where it was common to see senior vice presidents of large companies appearing at training courses and getting to grips with all the technical knowhow.

"This level of education means that, not only do they know what the machine can do, but also how it does it. It's very impressive. This makes them very confident when making decisions on the equipment that they need for their airports," Baker emphasised.

The desire for technical knowhow is not surprising and is highlighted by the theme for the 2016 Airports Show this May in Dubai, which is all about showcasing the latest innovative technologies for 'smart airports'.

A recent study by Technavio says that the global market for smart airports is estimated to reach $13 billion by 2019, at a compound annual growth rate of 6%. Massive investments in the region, especially the UAE, will drive the Middle East smart airports market to reach $850 million within the next three years.

CARRY ON SMART...

Carry-on baggage screening technology has been slow to evolve but, as **Keith Mwanalushi** *finds from Paul Baker, managing director for Smiths Detection Middle East, the cost of providing more enhanced threat detection is now within reach.*

From smart gates, beacon technology, mobile devices to navigate the airports, and face recognition systems, to air traffic management, baggage and check-in management, airports worldwide are actively adopting new technologies.

Baker is keen to use the Airports Show platform to showcase Smiths Detection's latest innovation that will soon come to market.

"It's very exciting," he said. "We are looking at computed tomography (CT) screening, but for carry-on hand baggage. We are going to show people what this innovation is going to look like and how it will help to enhance both detection capability and passenger experience."

The key attribute is that CT is capable of screening liquids and laptops and large electronics left in bags, which reduces the number of trays and expedites the inspection time per passenger.

Baker stressed that, in addition to having good security and efficient detection capability, airports want passengers to move through the checkpoint as quickly as possible. "Security queues don't really help airports reduce the amount of time their passengers can spend in retail outlets once they have passed through the checkpoint," he pointed out.

Asked why the industry had been rather slow to achieve in-bag screening of liquids and large electronics, Baker defended the position. "It has not been cost-effective to have CT technology in airports for passenger baggage screening but the technology has moved on and is being widely adopted for use in more parts of the security market," he explained.

Baker added that CT technology had reached a point where it could deliver improved capabilities in detection but also with the necessary bag throughput. With a belt speed of 0.2m/s, he is convinced that the CT technology can scan effectively at a price point that's cost-effective enough for the airport to invest.

Paul Baker: "We are looking at computed tomography (CT) screening, but for carry-on hand baggage."

In addition, highly accurate dual-energy operation offers more effective detection and increases screening efficiency. The system generates high resolution 2D and 3D images. "This will help simplify the identification of a threat," he said.

Smiths Detection's checkpoint CT screening system will be available for airport use in 2018. In the meantime, the company is working on prototypes, testing, and certification.

In addition to developing the technology, Smiths Detection manufactures its equipment. "We are very much a manufacturer, with more than 60 years' experience and knowledge.

"It's very exciting when we get involved in new technologies. We know how threats evolve and we know how to adapt and develop our technology to meet those threats and put all that knowhow into new equipment," Baker stated.

Annual growth rate

The UAE, in particular, has been on the forefront when it comes to adopting the latest smart technologies. For instance, a significant investment has been made towards the smart gates initiative at the Dubai International Airport.

Smiths Detection has on-going projects locally, including the Abu Dhabi Midfield Terminal, which is the largest current airport project in the region.

Elsewhere, Baker is positive that further partnerships with Dubai Airports will help his company develop the right solutions. "They are looking at the most modern solutions for the development of their airports, especially with the Dubai 2020 initiative," he explained.

"We are currently embarking on a long partnership with all of the UAE and across the Gulf Cooperation Council countries," Baker concluded.

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Oman Airport: More than 10 million passengers used Muscat International airport in 2015.
PICTURE: OMAC

Oman's flight plan for expansion...

Oman's airport management company plans to become a major global player in the aviation sector.
Keith Mwanalushi *looks at how it aims to spread its wings.*

Muscat International Airport, the largest airport in Oman, is currently being expanded and will see a new terminal with a capacity for 12 million passengers per annum.

Figures released by Oman Airports Management Company (OAMC) indicate a promising performance at Muscat last year. The number of passengers for the first time exceeded 10 million – representing an 18% year-on-year growth.

Salalah International Airport also broke its own record by reaching one million passengers in 2015, with a surge in both domestic and international travel.

Additionally, flight movements increased by double digits. Muscat International exceeded 95,000, an increase of 15%, and Salalah International by 21%, reaching nearly 9 000.

New destinations during the year helped raise passenger throughput. Home-based carrier, Oman Air, started its operations to Singapore and Goa, India. Additionally, two new airlines launched operations from the Iranian market and there was a new carrier from Damascus, Syria.

OAMC has reported that transfer traffic at Muscat Airport increased by 32% last year, reaching nearly 3.8 million transfer passengers.

Biggest markets

The biggest markets are the Gulf Cooperation Council (GCC) countries, representing 37% of passengers. The Indian subcontinent follows with 35% and Europe with nearly 10%. Much of this increase comes from the expansion of airlines operating routes into Oman.

Oman Air is growing is fleet, with the arrival of new 787s. Meanwhile, Qatar Airways, Flydubai, Emirates, Air India and Turkish Airlines all showed double-digit growth numbers in 2015.

Sheikh Samer Al Nabhani, general manager for commercial operations at Oman Airports, said this growth was attributed to the different passenger mix that included business, leisure and tourist travellers from various destinations. "We continued to boost the inbound tourism accessibility to Oman by facilitating the operation of new airlines and expanding route availability," he said.

OAMC seems to have a clear strategy, focusing on attracting operators from new growth markets. At a route development forum in Manila in March this year, OMAC's mission was to enhance the relationships with existing airlines, and to develop relations with Asian carriers for new potential opportunities.

OMAC has indicated that the long-term goal is to connect Africa and Asia (specifically China), as well as Asia and Europe.

Talks of creating an airport city around Muscat International have been circulating in trade media for the last few months. Aimen Ahmed Al Hosni, CEO of OAMC, has been quoted by local media in Oman confirming that the initiative is a key part of the company's five-year strategic growth plan that aims to transform the company into a global airport operator.

Operate and manage

The vision not only involves the operation and management of airports in Oman, but also, within the next five years, OMAC hopes to operate and manage, and potentially even own, airports in other countries too. Reportedly, the strategy envisions a plan to operate a total of at least 10 local and international airports by 2020.

There are a number of initiatives that OAMC is implementing to achieve its goals. To support the ambitious growth plans of both Muscat and Salah, as well as the national carrier, Oman Air, OMAC has agreed to a seven-year contract with Lockheed Martin for its suite of Beontra forecasting solutions. Beontra is an integrated traffic, capacity and revenue planning software for infrastructure providers.

OAMC will use the Beontra tools, B Tactical and B Capacity, to forecast and effectively manage the impact of this steep growth curve on both strategic planning and day-to-day operations. They will help the airports generate accurate resource plans to ensure passenger experience is not compromised.

At the signing of the agreement at the Passenger Terminal Expo in Cologne recently, Al Hosni, said: "We achieved record growth last year surpassing 10 million passengers for the first time. To help us continue this trend, we wanted to work with a partner who has a global reputation for product innovation, successful delivery and first-class support. The team at Lockheed Martin absolutely fits each criteria."

TAV BRINGS BAHRAIN TERMINAL TO LIFE

The construction of Bahrain International Airport's new terminal building comes at the most significant phase for airport modernisation in Bahrain. **Keith Mwanalushi** *follows TAV Construction's response to winning the bid.*

In January this year, TAV Construction announced that it had won the tender to build Bahrain International Airport's (BIA) new terminal building and affiliated works. The $1.1 billion project is expected to be completed in just over four years' time.

If all goes to plan, airport capacity will increase from four million to 14 million passengers per annum with the opening of the new terminal building. It will be located on an area of 220,000sqm.

Since the Istanbul Ataturk Airport project in 2000, TAV has built a total of 16 airports in the MENA region. The Bahrain project, however, is momentous due to the fact that it is the biggest construction tender won by a Turkish company in Bahrain.

Ümit Kazak, TAV Construction general manager, said: "We are proud and thankful to be selected to realise this important task."

TAV Group chief executive, Sani Sener, said he was proud that TAV was announced as the preferred bidder and adding Bahrain Airport to the portfolio, which included on-going projects in the UAE, Oman and Saudi Arabia.

Also factored in is the joint venture partner Arabtec, which is responsible for certain works. Saeed Mohamed Al Mehairbi, acting CEO of Arabtec Holding, stated that it was a landmark project. "Such major projects have a strategic importance for the development of the region's capabilities and the continuing growth of the Gulf Cooperation Council (GCC)," he added.

More importantly, with this project, Kazak said TAV had become the contractor for airports at five out of six GCC capitals. "For a company that entered into the GCC market in 2003, this is a very important achievement; this is a clear endorsement for our quality, reliability and hard work," he said.

"The expansion project for Bahrain has been planned for a long-time and, despite the unfortunate setbacks, this project has come to life."

Kazak also commended the local aviation authority and the Bahrain Airport Company for their devotion to the project.

The contract covers construction of the terminal building, which will have capacity for 14 million passengers, as well as the building of a main service building, air and land side infrastructure works, and a multi-storey car park.

The terminal building will be built using green technologies and is expected to receive a leadership in energy and environmental design (LEED) gold certification. LEED is a voluntary programme, which is increasingly integrated into new airport terminal designs. It is used worldwide to ensure the design and construction of the buildings meet certain ecologic criteria.

In March 2016, Izmir Adnan Menderes Airport's domestic terminal became the first LEED-certificated terminal building in Turkey.

Kazak stressed the importance of designing the terminal with this certification in mind. "We are glad that the results of our endeavours were awarded with LEED silver certification by the US Green Buildings Council, the most respectable institution worldwide. Built by TAV Construction, the terminal building of Madinah Airport, the first airport privatisation project in Saudi Arabia, also received the LEED gold certification. As a result, we will continue to complete our projects through the implementation of the latest environmentally friendly technologies," he said.

The momentum is growing in Bahrain. "The enabling works have already started," Kazak said, adding that some of the terminal building and car park works were awarded to Arabtec in January.

It's expected that the new terminal will adopt many of the 'smart technologies' that are making their rounds at new airports. Kazak was confident that the Bahrain terminal would meet the standards of the region. "The airport systems,

The new terminal will bring capacity to 14 million passengers per annum.
Left: Ümit Kazak: "This is a clear endorsement for our quality, reliability and hard work."

including the baggage-handling and information and communications technology, are going to be adapted with the recent technologies," he said.

"Also, the design of the terminal building will reflect both the culture of the country and international standards, aimed at maximising the passenger comfort."

The massive regional airport developments and infrastructure investments will come under the spotlight at the 16th Airport Show in Dubai. The Centre for Asia Pacific Aviation (CAPA) has revealed that spending on airport construction projects globally has risen to more than $441 billion. It highlighted Middle East airport developments as key to global investments in the sector.

Around 90% of TAV Construction's activities are in the Middle East, where it has undertaken multi-billion dollar contracts in the UAE, Saudi Arabia, Egypt, Oman, Qatar, Tunisia and now in Bahrain. CAPA stated that the trend is relentlessly upwards, with more than $30 billion worth of airport investments under way or planned in the UAE alone.

This expansion also brings in a plethora of opportunities for product and service providers in the aviation industry and allied sectors.

"We see the Middle East as one of our primary targets for future expansion. While keeping our position and ambition in aviation, we also want to have a significant presence in building and infrastructure projects in the region," Kazak said.

Kazak acknowledged that BIA is an important hub and probably the oldest in the region thanks to home-based carrier, Gulf Air.

Bahrain's national carrier plans to drastically increase its global footprint over the next few years with the acquisition of new aircraft. Also in January, Gulf Air said it would reorganise its orders with both Airbus and Boeing, worth some $7.6 billion.

Replacing the previous order for 16 787-8s, the airline will, instead, take delivery of the larger 787-9, adding capacity through the airport. Gulf Air currently operates 28 Airbus aircraft – 17 A321neo and 12 A320neo jetliners are on the order book. Ten of the A320neo aircraft were confirmed in 2012.

The carrier will begin taking delivery of the new equipment in the second quarter of 2018. The expansion will primarily look into increasing the airline's presence in Europe, the Indian subcontinent and Asia.

Since March 2016, the government-backed airline has added capacity on services to Saudi Arabia [Riyadh], with an additional four afternoon flights per week bringing the number of operations from 28 to 32.

Fleet expansion at Gulf Air comes at a time when the airline is undertaking a significant overhaul. Reportedly, the airline lost BHD 62.7 million ($166.3 million) in 2014, compared to BHD 93.3 million ($ 247.4 million) in 2013.

Dnata has introduced more flexibility in the GSE fleet.

D-DAY

Following the opening of Concourse D at Dubai International Airport in February, **Keith Mwanalushi** *learns how Dnata prepared for airside operations.*

The much-anticipated opening of Concourse D at Dubai International's Terminal 1 will expand passenger capacity at the airport from 75 million to a staggering 90 million per year.

The Dubai airport authorities hope that the $1.2 billion investment will enhance service and boost capacity for the more than 70 international airlines that will use the facility.

Air services provider, Dnata, has also begun its operations at the new concourse. Some 3,000 staff have been assigned to the new facility, working in various capacities from check-in, special handling and airside operations.

The task at hand is enormous, considering the company now handles all flights and baggage at Concourse D, as well as all passengers transiting though this new part of the terminal.

Nick Moore, Dnata senior vice president, said preparations to handle the more than 70 airlines started long ago. "The operating challenge of Concourse D was recognised well before construction started and we had a project team working very early on with all stakeholders."

A Dnata project manager stayed with the programme for well over two years in a full-time role. "The task also included lounge design, and we are very proud of our flagship Marhaba Lounge, which opened on schedule on day one of operations," Moore said.

Dubai airports enjoy a talk in the Park

Northrop Grumman Park Air Systems, the UK-based air traffic communication systems subsidiary of Northrop Grumman Corporation, is expanding the capability of the ATC communication systems at Dubai International (DXB) and Dubai World Central (DWC).

Under the terms of a contract awarded to Bayanat Engineering, Dubai Air Navigation Services (DANS) has begun receiving Park Air Sapphire portfolio products including its latest Park Air T6 Radio at five radio sites at each airport. The system – which began installation in March - simultaneously supports both legacy E1 and Voice over IP (VoIP) connectivity and provides flexibility to enable radio channels to be connected to a network of Park Air S4 IP controllers while also connecting to the airports' legacy voice switch.

The Park Air T6 Radio is an integral part of the Sapphire portfolio and will deliver to DANS Simultaneous Call Transmission (SCT) detection, a method whereby the T6 Radio receiver will detect that two pilots have spoken at the same time and sends an alert to the air traffic controller to take appropriate action.

The new Park Air T6 radio is the lightest and smallest radio in its class, its power consumption has been minimised and it's free of toxic materials such as beryllia and lithium.

"As we moved towards the day of opening, our customer service and airside operations teams were trained and familiarised with the facility, and we also had to ensure the various airline departure control systems were up and running for the start of operations."

On the apron, Concourse D provides 21 contact stands – four of which will be able to accommodate up to A380-sized aircraft – and 11 remote stands, with a design capacity for 18 million passengers.

The concourse is linked to the newly renovated Terminal 1 by an airport train that can transport 300 passengers per trip.

Designed around a central atrium, Concourse D allows short walks to open gates, which will allow travellers to board directly from the waiting area.

During the first 24 hours of operation at the new concourse, with just two airlines having moved to the new facility, Dnata staff handled six flight turnarounds, 1,050 passengers, and 1,755 pieces of baggage.

To put things into perspective, for the whole of 2016 the company estimates that it will [at the new concourse] deal with some 115,400 flights, 16 million passengers, 25 million items of baggage and 408,273 tonnes of cargo.

Moore revealed that the new facility was more open and spacious, when compared to Concourse C. It features 'open gates', which is a

3,000 dnata staff have been assigned to the new Concourse D.

step change from previous operations. "We designed our standards based on industry learning. Operations are very similar to all the other concourses at Dubai International, but our main challenge is to ensure baggage delivery standards are maintained at the previous high standard," he stated.

The travel distance for a bag from Concourse D to the arrivals hall is approximately 2.5 kilometres longer than the previous distance. "We have had to deploy more ground support equipment (GSE) and drivers to overcome this particular issue," Moore continued.

Dnata has dealt with busy operations before – one day in December last year the company handled more than 296,000 pieces of luggage and serviced more than 570 flights.

To ensure that every aspect of the passenger experience was taken care of, more than 9,000 staff were mobilised at both Dubai airports, with 6,400 vehicles deployed on the airside, including baggage conveyor belts, passenger steps, pushback trucks, and baggage cars.

Moore recalled that it took an incredible amount of coordination and teamwork to successfully handle the volume of passengers and air traffic in Dubai's airports on that exceptionally busy day. "On average, a flight was taking off or landing every minute. Round-the-clock, our ground-handling crews delivered a smooth turnaround service and a strong, safe, on-time performance," Moore recollected.

Back at Concourse D, Moore said the company had introduced more flexibility in its tractor fleet. "We purchased a more powerful baggage tractor [Harlan] and this can better deal with the new tunnel route to the concourse. We have recruited more than 50 airside drivers and numerous tractors to overcome the increased travel time."

Getting smarter

Airside operations at major airports are getting smarter. For instance, using in-ground systems, and thereby limiting the use of conventional service vehicles.

Existing aircraft parking areas at terminals and hangars typically have not been designed for optimal use of ground support services. The result is a clutter of hoses, cables and carts around the parked aircraft.

However, experts, such as Cavotec, have developed full-scale tunnel systems with in-ground services, bringing GSE closer to the parked aircraft.

Especially with the introduction of the A380 and 747-8, existing supply systems are no longer sufficient, creating even more problems in terms of space, costs and efficiency.

Moore said Dnata would continue to trial new technology to suit operations. "We welcome in-ground systems as this takes vehicles off airside roads and stands and any reduction in clutter adds up to better safety. At present, we are buying and trialling electrical GSE with proximity sensors. All our GSE is tracked and maintained according to engine hours and usage," he stated.

Adding on to new capabilities, Moore expressed enthusiasm with the introduction of multiple arrival receiving stands (MARS) introduced at Concourse D. He explained that, in order to maximise on-pier service, the concept of MARS operations has been successfully introduced.

He said: "In effect, one large stand can be tactically reconfigured into two small aircraft stands, both with separate boarding and jetty services. This type of operation is in use at numerous major international airports, and it has been successfully introduced now at Dubai International Airport."

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Spatial Composite Solutions is making big news in Ras Al Khaimah as it manufactures training equipment for cabin crew. **Marcelle Nethersole** *found out more from CEO Joseph McKeever (right).*

SPATIAL DELIVERY...

"We are proud of the fact that a home-grown UAE company can compete and win overseas aviation contracts in today's competitive business environment."
JOSEPH MCKEEVER

Just as Ras Al Khaimah has rapidly developed into a thriving emirate, one of its home-grown aviation companies has also seen a surge of business over the last few years.

Spatial Composite Solutions, located at the RAK Investment Authority Free Zone (RAK FTZ), has become one of the region's most noted manufacturers of training equipment for cabin crew, creating the first A380 door training device to be built outside Europe.

The company enjoyed a particularly busy 2015 with new contracts – notably the production of a variety of full-flight pilot simulators for L-3 Link Simulation and Training.

"The L-3 Link contract is the result of many months of negotiations and site visits," said CEO Joseph McKeever. "L-3 Link engineers conducted very thorough quality audits at our manufacturing facility here in the UAE and no stone was left unturned in what turned out to be a very exhaustive assessment process."

The company has been contracted to build a variety of full-flight pilot simulator modules for L-3 Link's Reality Seven Simulator manufacturing project.

Long-term agreement

"Its a long-term agreement – initially for five years – and we would expect that it would translate into a long-lasting business relationship thereafter," said McKeever. "We have no role in L-3 Link's sales and marketing function. However, Spatial is a well-respected name in the aviation training industry here in the Middle East and we will certainly not miss an opportunity to promote the L-3 Link brand whenever the opportunity arises.

"We have recently completed a 10,000sqft extension to our factory in order to accommodate the new pilot sim activity but already we are planning additional capacity as we continue to grow our business."

In the last 18 months the company has increased its staff numbers to 75 and built its own modern accommodation on site to house its blue-collar workforce.

"Last year we concentrated on on-going projects and upgrades with the local airlines Etihad and Emirates, and we have a new contract with Oman Air on the horizon," said McKeever. "We reached another milestone just last month when we achieved ISO 9001:2008 certification."

McKeever said the company is on such a roll that even its sports team is on winning form: "We have our own basketball team at Spatial, which usually finishes bottom of the local league, but for some reason they have won all their games so far this year. There certainly seems to be something of a feelgood factor in the air over here."

Various contracts

Spatial has won various contracts in Asia and the US, including several new cabin crew training device contracts currently under way, including a B737 door trainer for shipment to Bangalore, an A320 evacuation trainer for Singapore and several door trainers for Spirit Airlines in the United States.

"We installed the first door trainer for Spirit in Fort Lauderdale and will complete two further installations in Las Vegas and Dallas, Texas, during the coming months," said McKeever. "We are currently working on an A350 cabin evacuation trainer for one of our Middle East clients, which will be, perhaps, the first of its kind in the world.

"Generally speaking, our cabin crew training business has been brisk and continues to grow apace and we are proud of the fact that a home-grown UAE company can compete and win overseas aviation contracts in today's competitive business environment."

One of the biggest challenges is that there are simply not enough hours in the day.

"We work a six-day week and our machine shop tends to run on double shifts most of the time yet still we have to work hard to ensure that our quality never suffers," said McKeever.

The CEO is proud of how far the company has come since its launch in 2007.

"In my early days in this part of the world, some 20 years ago, I used to rally the troops by telling them that we didn't come all this way to be second best. That still sounds OK to me now."

Spatial's B787 Cabin Service & Safety Trainer.

Liz Moscrop *asks: From where will Middle East airlines conjure up their new pilots?*

FLYING SORCERERS NEEDED...

Unless the region can pull off a stupendous magic trick, Marwan Atalla, CEO of Ayla Aviation Academy in Jordan, is concerned that a looming pilot (and instructor) shortage is going to hit everyone where it hurts – right in the cockpit.

He explained: "There is no shortage of fresh ab-initio graduates, but there is already a shortage of experienced pilots and captains. At the moment, there are 800-1,000 graduates in the MENA region, all looking for jobs."

The discrepancy is the result of airline recruitment criteria, which requires pilots to have a minimum of 500-1,500 hours of experience. As a result, many graduates are unable to find jobs.

There are exceptions, and some carriers do hire fresh graduates, but they tend to hire only locals (nationals). This does not solve the problem for non-nationals, who may have to look further afield to build up their hours.

While Captain Suheil Salim Abumariam, manager advanced qualification programme for Gulf Air training, agrees in part, he also provided some background. Speaking as an industry expert, rather than on behalf of his company, he explained: "The entire industry puts safety first but the trouble is no one is doing enough to get people flying. The problems started with rising fuel prices, therefore rising costs, so most airlines dropped their cadet programmes. For some it was cheaper to poach from other companies."

Knock-on effect

The knock-on effect was that smaller carriers had to go to regional airlines and to schools, and took instructors. "It then started to snowball in all sectors. The level of experience is diminishing. In the biggest airlines, relatively low time pilots are flying in an Airbus A380 rather than a A320," said Abumariam. He added that this naturally appeals to pilots.

Both Atalla and Abumariam pointed to the imminent skills gap as more experienced pilots get nearer to retirement and younger graduates get fed up with waiting for jobs, so leave the industry. Abumariam said: "There is a large pool of pilots, but not enough captains and experienced first officers to promote to captain, and you need training captains to train others."

There have been traditionally three main streams of talent to draw from: self sponsored, airline cadets and other airlines. He added: "In the US, another stream was the Air Force, which is drying up now as the USAF is not retiring as many pilots at a young age any more."

Atalla is concerned that the predominant regional policy of only hiring nationals is shoring up a problem that will explode in a few years' time. "The excess of fresh graduates, who are not flying, means that their skills deteriorate, and they will discourage others from entering the industry."

Captain Suheil Salim Abumariam: "There is a pressure all over the industry on training departments, which can't produce pilots as fast as we'd like. To compensate for lower levels of experience, more training is required. It is a big dilemma."

There also seems to be a wide disconnect between some flight training organisations (FTOs), airlines and the civil aviation authorities. While they all agree on the fundamentals of supplying pilots, safety being at the forefront of the list, there are differing opinions on where the problems lie.

Ahmad Azzam, the acting chief commissioner for the Jordanian Civil Aviation Regulatory Commission, pointed out that, in Jordan, there are many foreign commercial pilots working with commercial operators whose licences have been approved.

Both Atalla and Abumariam agree, but say that these pilots are from the experienced pool of international captains, rather than low-time graduates.

Commercial pilot graduates

There are three approved FTOs in Jordan that average between 400 to 500 commercial pilot graduates each year. Azzam said: "On average 15-20 flight instructors graduate yearly from our approved FTOs, which fulfils demand."

Atalla disagreed: "We are seeing an increasing trend towards the European Aviation Safety Agency (EASA) license, while the civil aviation authorities in the Middle East region have not done much in terms of pooling their efforts to recognise each other's' licences and create harmonious civil aviation regulations for the region."

On the plus side, in Bahrain the government

"The excess of fresh graduates, who are not flying, means that their skills deteriorate, and they will discourage others from entering the industry."
MARWAN ATALLA

has committed to a pilot training programme whereby Gulf Air trains up to 50 fresh graduate pilots and keeps them flying and active in first officer positions, which is surplus to present requirements.

Over in Sharjah, Air Arabia partnered with Alpha Aviation Academy UAE as the exclusive provider for its cadet pilots under a multi-crew pilot licence (MPL) cadet programme working towards an A320 type rating. Graduates then have the opportunity to continue with the company as a first officer.

Abumariam explained the airlines' point of view. "People in the industry are waking up. There have been huge fleet sales worldwide. American Airlines is now putting in a cadet programme, and taking pilots into one of its regional subsidiaries and subsidising the cost of training.

Pressure all over the industry

"There is a pressure all over the industry on training departments, which can't produce pilots as fast as we'd like. To compensate for lower levels of experience, more training is required. It is a big dilemma."

Like Atalla, he is concerned about flight safety using pilots with low experience. He pointed out, too, that it is a huge burden for an airline to pay tuition fees to bring a recruit to captaincy. If that person then chooses to leave and fly for another carrier, that is a great deal of time and money wasted.

The self-sponsored route, he said, is also disappearing. "Fifteen years ago self-sponsored pilots paid around $10,000 for their initial training; now it is so much more that only rich people can afford it. If you then add waiting around to get paid [at a low rate with regionals and small carriers] it becomes very unappealing for a young person."

Background checks come into play, too, especially now with so much political instability in the region.

It can take four months to bring someone new into the airline. This has helped correct the market, however, said Abumariam: "Instability in Arabian countries helped reduce the shortage as there are less people flying commercially in countries such as Syria, Iraq, Tunisia, Yemen and Libya. When stability occurs, we should brace ourselves for a much higher shortage. We've just seen almost 200 commercial jet orders from Iranian Airlines. Who will fly them?"

CAE's group president of civil aviation training, Nick Leontidis, has seen a shift in available numbers of instructors, too. He said: "There is a global need for more training and many training companies have challenges attracting instructors."

Adding that CAE is amply staffed, he continued: "When an airline orders 1,200 new aircraft there is a high probably that it will be hiring captains."

He pointed to the issues in India, where young first officers cannot get a job because of strict controls in hiring foreign nationals without a licence exemption.

CAE also offers a pilot leasing business, which, he believes, can help alleviate the problem.

This will help the mighty three regionals: Emirates, Etihad and Qatar, who look for pilots (again nationals) with 1,500 hours as a starting point, and offer attractive salaries further up the food chain. Three years ago, Arab Business reported that first officers on wide-bodies with Emirates are paid around 336,000 UAE dhs (around $91,500) per year, including per diems, plus housing and schools allowance.

Hunt for a position

This, obviously, would be a draw, especially to young people struggling to make ends meet while they hunt for a position.

Abumariam continued: "Self-sponsored students wouldn't mind paying back their training fees if they were guaranteed a job. I'd like to see MPL training and airlines working with approved FTOs to provide initial training to cadets."

So, it seems everyone is in agreement, but the disconnect is still there. It doesn't have to mean an incredible magic trick.

Atalla is for getting all the players together more regularly to hammer out a solution, for example, in more frequent regional training conferences and symposiums.

He concluded: "The Middle East region is completely different to Europe. It is almost like an upside down pyramid. We have plenty of young graduates. We need everyone to get together and work out a solution."

Pilot training academy, Airways Aviation, is going about its recruitment in a somewhat different way, as **Dave Calderwood** *found out when he talked to CEO Ian Cooper.*

COOPER'S CLASS ACT

Iraq, Kuwait and Lebanon are not places that you would traditionally think of as providing airline pilots for the future. However, Airways Aviation does things a little differently.

Over the past year it has established, what it calls foundation schools, in these three countries, adding to one it already has in Dubai.

And it's working. The first batch of Kuwaiti Airways student pilots – known as cadets – has just completed the eight-week foundation course and moved on to become the inaugural Kuwaiti Air Transport Pilot's Licence (ATPL) class. They will be training at Airways Aviation's facilities at Huesca Airport, Spain. On graduating they will be industry-ready pilots with a frozen European ATPL (fATPL).

The Kuwaiti students join others who have passed through Airways Aviation's foundation schools. One group from Dubai is already most of the way through the fATPL course, and the school in Iraq is also up and running.

It's impressive growth for a company that has only been in existence for four years. It has already outgrown its original base in the UK, at Coventry Airport, and is about to move into brand new premises at London Oxford Airport, just across the apron from one of its key rivals in the business, CAE Oxford Aviation Academy (OAA).

Airways Aviation CEO Ian Cooper and inaugural Kuwaiti Cadets.

Business and airport

It's a business and airport that Ian Cooper, who became Airways Aviation CEO last December, knows well. He used to be general manager of training and operations at OAA, before being promoted to operations director of parent company CAE's 12 training centres worldwide. This was after a successful first career at an airline pilot with Monarch and British Airways. So, Cooper is well qualified to lead Airways Aviation.

Cooper took over as CEO from Airways Aviation founder Romy Hawatt, who provided all the finance required to get things moving from the sale of his previous business, SAE, an Australian-based company that's a world leader in creative media education, with 54 campuses in 28 countries.

"Romy is a helicopter pilot with a passion for aviation. He saw the growth in the airline industry and the predicted needs for pilots and set up some schools in Australia just under four years ago, training for the Australian (CASA) ATPL," explained Cooper.

"Naturally, after that, the business looked at Europe, so Atlantic Flight Training [based at Coventry Airport] was acquired in September 2014. It was bought really for the approvals to accelerate the entry into the European business. That's happened and been consolidated, and now we're looking to grow that platform.

"We have 12 foundation schools feeding into Europe and Australia and, over the next 12 months, we'll be growing that to 20. In years to come we'll be growing more.

"The business model is all about having foundation courses that feed into the flight schools. They are an eight-week introductory course into aviation – it's really for the students and the parents to satisfy themselves that their son or daughter has the ability to be a pilot before they invest a lot of money in the full-time integrated course we offer.

"We're differentiating ourselves from the competition. We're not churning out 3,000 pilots a year. We're limiting the amount to 200 in Europe and 200 in Australia at the moment. It's all about the cadets having an excellent experience with us as they're going through the training programme, so we're investing heavily in new training facilities.

"That's why we're moving to the new group headquarters in Oxford. It's a three-storey training facility with first-class facilities. Our aircraft are, on average, four years old, and all have glass cockpits. We've also invested €750,000 ($852,000) in facilities in Spain. So then the students from Europe will have a high-end training solution, similar what we have in Australia."

Strong legacy

Cooper added: "When we acquired Atlantic Flight Training it had a strong legacy with the Middle East, which helped secure the partnership to provide training for 50 Kuwait Airways cadets. We've also just signed a contract with Kuwait-based Jazeera Airways to train six to eight of its cadets. We see the Middle East as a real growth area with our foundation schools feeding through to Australia or to Europe – 50% go to Australia and 50% to Europe. Australia has obviously got the advantage of the [Australian] dollar which makes it very attractive."

However, Airways Aviation does not intend to

"We see the Middle East as a real growth area with our foundation schools feeding through to Australia or to Europe."
IAN COOPER

compete with the training programmes being offered by major Middle East carriers such as Emirates.

"We're there to support in any additional training they need but we don't really see that's an opportunity as such," said Cooper. "With the national programmes, there are only so many nationals that can be trained to be a pilot. Air Arabia, for example, has already decided to go outside of nationals and take any nationality into its multi-crew pilot licence (MPL) programme. That's where we see we can add a lot of value with our international bases.

"We believe we will be the number one training organisation globally within the next three to five years. It is ambitious, but we have the right funding, the right ambition and we're bringing the right people on board to make it a reality. The future looks exciting for us."

The new facilities at Huesca are there to fill a particular need.

"Our European pathway is all about training pilots to get a European licence so we have a strong belief that you need to train in European airspace. Some of the competition train in Australia, America or New Zealand, but we feel very strongly that you need to be in Europe. We've chosen Spain because of the weather. In the UK you lose three or four months' production for the basic flight training because you need to see the horizon," explained Cooper.

There's another benefit to training in Spain apart from the weather: obtaining visas for Middle East students.

"The challenge we have is visas, getting the students into the UK," said Cooper. "That can add time between graduating from foundation school and getting the visa to come to the UK to study. The Spanish system is much more favourable, so we're sending more of our Middle East students straight to Spain to train."

Special attention

Huesca is where the Kuwaiti Airways students are studying, and they are receiving special attention. "It's the first time the students are away from home in a foreign country, with a different language and culture," said Cooper. "So the airline really wants us to focus on making sure the cadets' experience with us is first class. For the Kuwait students, we have a dedicated customer service person to support them."

Airways Aviation's global plans are ambitious but Cooper has mapped out the route forwards.

"The next big thing is getting those key airline partnerships," he said. "We've already done well in the Middle East with Kuwait Airways and Jazeera Airways. We're working on expanding that portfolio of partnerships.

"There are really two questions that students ask. One is, 'What financing solutions do you have in place'? That's less of an issue for the Middle East customers. The second question is, 'OK, if I train with you, what airline will I go to work for'? If you say, 'We don't have any airline partnerships', then it's quite a challenge to sell the course. So the more airline partnerships we have with credible carriers, the more students will come in the front door.

"We need to demonstrate to the airlines that students who graduate from here are high quality. We strongly believe we have to assess the candidates because unless you get high quality coming in, you can do as much as you can in training but you'll never get high quality out. That's one reason for the foundation schools – if you can't pass the foundation course, there's no way you'll ever pass the pilot's course. So we now have a really rigorous selection process to assess the cadets."

If you're wondering about the need for a foundation school in the tiny country of Lebanon, the answer is simple. Airways Aviation founder Romy Hawatt is from Lebanon and has family ties with the country. It's his way of putting something back.


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MROs all set for Middle East bonanza

The Middle East's MRO market is forecast to effectively double by 2025, rising at 7.4% per annum to reach $10.2 billion over the next decade. **Alan Peaford** *reports.*

Aviation and aerospace consultancy, ICF International, issued its 10-year forecast at the MRO Middle East conference in Dubai.

The event – co-located with Aircraft Interiors Middle East (AIME) – saw a record number of visitors.

More than 700 representatives from some 100 leading airlines attended the two-day event at Dubai World Trade Centre.

Representatives from local giants Emirates Airline, Etihad Airways and Qatar Airways, were in attendance, alongside many others who travelled from Africa, India and Europe to network and create relationships with the 278 exhibitors at the event.

Companies exhibiting included Saudi Aerospace Engineering Industries (SAEI), Thales, B/E Aerospace, and Volga-Dnepr, plus a plethora of first-time exhibitors, who took advantage of the opportunity to maximise their exposure to the region's leading airlines.

And the future looks bright – but some challenges remain, according to the conference.

Richard Brown, principal of ICF's aerospace & MRO advisory, said Middle East-based operators currently spend around $5 billion on their MRO needs, representing 8% of global demand. While global MRO demand is expected to grow by 4.1% per annum to reach $96 billion, the Middle East market will significantly outstrip the worldwide average.

Brown predicted the strongest demand drivers would be engine and component markets, while airframe maintenance would be characterised by reduced labour intensity of checks and increasing intervals.

Within the Middle East, Brown said the region's robust wide-body fleet would be the leading MRO spend driver over the coming decade. Annual regional demand growth from turboprops would be just 0.7%; while yearly demand from regional jets would be 1.6%, narrow-body jet demand would grow by 9.4% and, for wide-bodies, by 7.1%.

Brown said suppliers were now actively pursuing expressed interest in Iranian MRO opportunities. "Iran will require new MRO capacity, services and capabilities, providing significant growth opportunities for suppliers. The country is already peaking interest from leading MROs."

Meanwhile, Andrew Medland, principal at Oliver Wyman, predicted a "staggering change in fleet mix" by 2025, and spoke of the challenges and opportunities it presented for MRO providers.

Quoting research by Vintage, Medland said the significant move towards late generation aircraft, in addition to improving airline costs, would undoubtedly affect MRO dynamics.

Fleet mix

Currently, fleet mix is reported to include less than 10% of aircraft from the 2000s. However, that percentage is predicted to increase more than four times by 2025, as newer aircraft are ordered, both as a result of airline expansion and older aircraft replacement.

Medland was speaking as part of the 'MRO Middle East Market Forecast and Key Trends Panel' during MRO Middle East, following a keynote address from Abdul Wahab Teffaha, secretary general of the Arab Air Carriers Organisation (AACO).

He noted that the airlines of the region have all the necessary attributes to continue making a mark on the global scene.

"Today's speakers really drove home a lot of the drivers having an impact on the future of MRO, both in the region and worldwide," said Brian Kough, director, forecasts and analysis, for the conference organiser, Aviation Week.

"Key factors are lowered costs for airlines, new technology aircraft having an impact on MRO capabilities, and growing overall fleets."

Staffing challenges were also a focal point, with Medland pointing out that employees would require new technical skills and capabilities to maintain and repair new technology aircraft. He predicted that these will make up 42% of fleets in the MENA region within 10 years, meaning that training and knowledge development should not be delayed.

Representatives from local giants Emirates Airline, Etihad Airways and Qatar Airways, were in attendance, alongside many others who travelled from Africa, India and Europe.

Abu Dhabi is home to a new name in the MRO business that is building on more than 25 years' experience to raise the bar for service standards.
Alan Peaford *reports.*

Etihad engineers a winning formula

Abu Dhabi is a Formula 1 city. The annual grand prix event captures the imagination of the entire population, and the folk at Etihad Airways Engineering are no exception.

"You just have to love the pit stops," said the UAE flag-carrier's senior vice president technical, Jeff Wilkinson. "The speed that they change the tyres and get the car back out into the race is amazing. But it is all down to teamwork, with everyone knowing exactly what needs to be done and when."

That F1 magic has rubbed off on this new division of the Abu Dhabi airline, which worked with colleagues from GE to break the world record for the fastest ever engine change on a Boeing 777. Normal expectation in the engine shops around the world is around 18 hours – but Etihad Engineering managed it in less than seven.

"It was like an F1 pit stop," said Wilkinson. "We prepared, we managed the risks and the team knew what they had to do."

Today, an eight-hour change is the norm and reflects the Etihad Engineering target to reduce downtime for all aircraft that come into the shop.

A number of new targets have been developed since the major moves last year, which saw MRO and technical services brought in-house. This followed the acquisition of Abu Dhabi Aircraft Technologies (ADAT), the Mubadala-owned MRO provider that, itself, grew out of GAMCO when the company carried out the maintenance and repair for Gulf Air.

Wilkinson wears two hats; the first as the Etihad Airways SVP for technical, and the second as accountable manager for the engineering facility. He extols the virtue of the change.

"Being part of an aviation group such as Etihad Airways, and a resource for its equity partners all over the world, gives us the benefit of leveraging business synergies across the global network," he said.

"As we are part on an airline, we think and operate like an airline. We realise how critical an aircraft on the ground (AOG) is, as well as the importance of high dispatch reliability and fast turnaround times."

Etihad Airways has invested heavily in its new MRO business. It now features more than 200,000sqm of apron and hangar space, with state-of-the-art training facilities offering courses in most Airbus and Boeing aircraft types, including the Boeing 787 Dreamliner – Etihad will become the world's biggest operator of the type once its orders are fulfilled – and the Airbus A380.

Specialist facilities

Much of the original GAMCO facilities, which were more than 30 years old, have disappeared. In their place are new specialist facilities among 41,000sqm of new hangar space.

"Etihad, of course, has A380s and it is a big investment to get the facility up and running, but we are getting other airlines in now at a rate of one a week," Wilkinson said.

Third-party work is essential for achieving a return on the investment. Etihad Airways makes up 40% of the workload with a further 10% coming from Etihad equity partners such as Alitalia, Jet Airways, Air Berlin, Air Seychelles and Air Serbia. "That leaves 50% for tier one strategic customers," Wilkinson said.

The list of services offered by the company is formidable. It already services more than 40,000 components annually and has in excess of 100 connectivity embodiments under various supplemental type certification (STC) providers.

The 11,000sqm of dedicated component shops have test, repair and overhaul capability for more than 5,000 Airbus and Boeing part numbers.

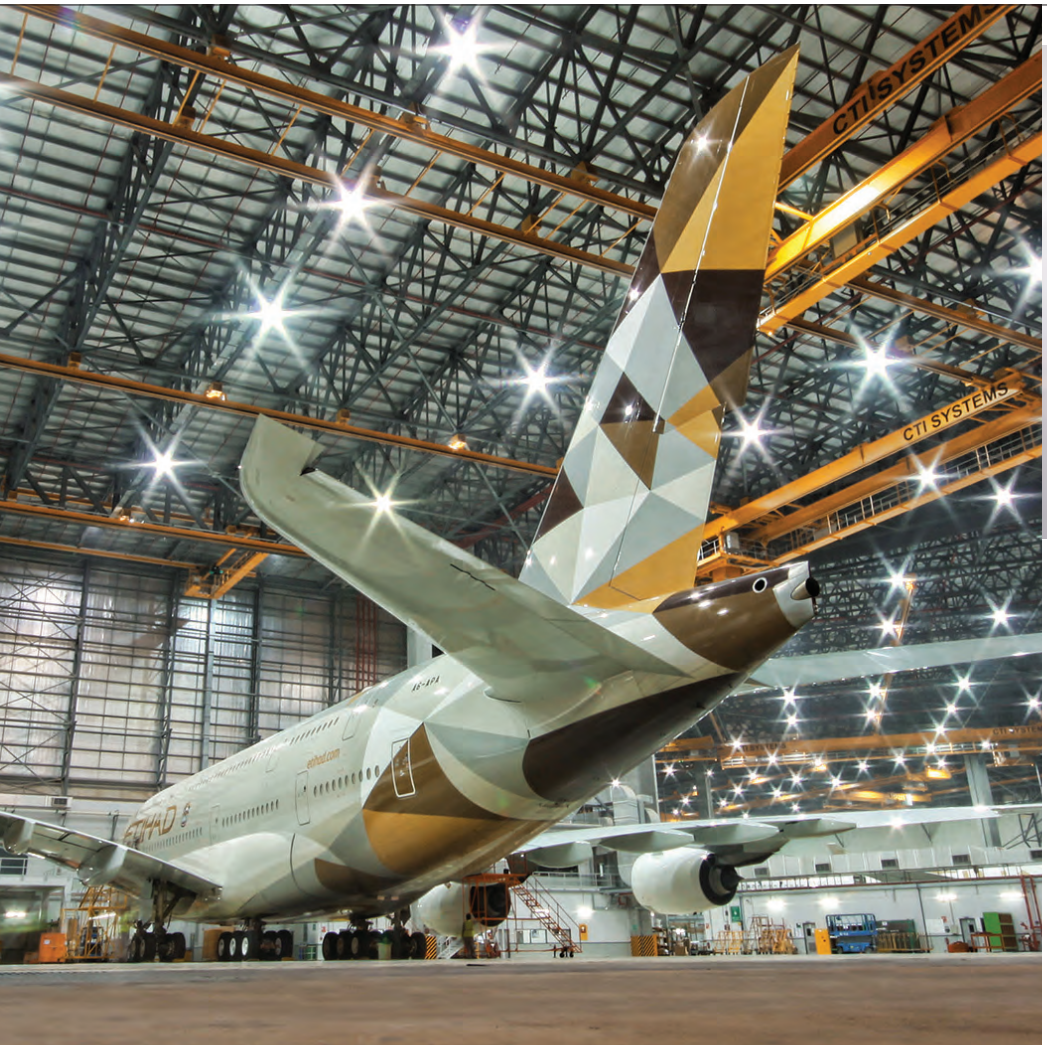
Composite repairs on nacelle and thrust reverser systems lead the complex structural repair capabilities and the company has recently added a second dedicated paint hangar.

"We have also added the quick engine change facility, as well as Boeing's state-of-the-art desk top simulator (DTS) and the A380 competency trainer, for training aviation professionals as part of Etihad Airways Engineering's commitment to continuous business improvement," said Wilkinson.

The relationship with the Etihad equity partners has also made a major difference, with the ability now to provide AOG support, as well international line maintenance, not just in Abu Dhabi but also across the world.

Again, Wilkinson sees this as being part of the benefit of the airline umbrella.

"Investment made by an aviation group in MRO capabilities is more focused on what is best in the long run for the airline, even if it may not



Jeff Wilkinson: "It was like an F1 pit stop. We prepared, we managed the risks and the team knew what they had to do."

show quick returns on the investment. This focused investment will pay rich dividends, not just for Etihad Airways, but for every customer we serve – including third parties."

Wilkinson was talking at the MRO Middle East show, where several conference speakers were critical of the lack of MRO support in the region. But the Etihad man was having none of it.

Catching up

"While the Middle East is a late entrant globally in the MRO business, we like to believe that the region has been catching up very well with the rest of the world in terms of capability in recent years. Some of the world's fastest-growing fleets are in the Middle East and the MRO capability is growing by leaps and bounds to serve that market," he said.

"Last year Etihad Engineering performed the region's first B787 C-check in Abu Dhabi and we have completed several since. We were also the first MRO of Middle East origin to be granted a major European Aviation Safety Agency (EASA) Part 21J approval for cabin changes and modifications last year.

"We have third-party customers, like the LATAM group, flying their new generation aircraft all the way from Latin America for heavy maintenance. So, while there may be a shortage of MRO capability in the Middle East generally, extensive MRO capabilities are available if you look in the right place."

Wilkinson has a passion for his two roles that has seen his career develop from an apprenticeship with British Aerospace (now BAE Systems) close to his native Manchester, in the UK.

"It was a great way to learn, from making the tea to working on the BAE146," he said.

As the airline industry hit a slump in 1994, Wilkinson and the 74 other apprentices in his cohort were made redundant.

"Looking back, it was the best thing that could have happened to me," he said. "I was 22 years old and had to move around for two years on short-term contract work, which saw me working on all sorts of aircraft types, from the Boeing 747 back to the BAE146."

The iconic 146 became a key part of his next career move, when he went to Swiss Air's regional business and rose through the business over 10 years to become head of base and line maintenance, before moving to Abu Dhabi.

Having gone from the very bottom to the top, Wilkinson has empathy with the whole issue of recruitment and retention and is fully behind the Etihad commitment to Emiratisation.

"We face the same human capital issues in the Middle East as our MRO counterparts around the world – shortage of expertise and local talent – retention and recruitment. The key to managing human capital is to be smart in recruitment and training strategies, so that people's core competencies are continually assessed and they are assigned tasks that they are very competent at rather than trying to build a labour force where 100% of your people can do 100% of the jobs on 100% of the aircraft inputs. With specialists in specific areas, efficiency and high standards of service are achieved. As technology develops and new platforms arrive, human talent must be trained and developed accordingly."

Educational institutions

Etihad Engineering is working actively with educational institutions to impart hands-on engineering training though a graduate training programme.

"These work alongside career development opportunities for aviation professionals already in the field through our technical training facility on site, which conducts hundreds of courses annually," Wilkinson explained.

Working closely with the Higher College of Technology in Abu Dhabi, Etihad Technical Training is taking on 80 new entrants a year. "We currently have 384 trainees, of which 249 are UAE nationals," Wilkinson said. "There is a two-year classroom training programme, then two years on-the-job training, then two or three years certification. It's a lot more training than you would need for a pilot."

Emirati engineers are now working overseas to support the requirement of the airline fleet and Wilkinson is confident that the demand will continue to grow.

"In the future, we see greater capability, faster and even more efficient operations and a larger customer base," Wilkinson concluded.

Chromalloy Arabia, an independent gas turbine services provider, plans to open a workshop in Jeddah, Saudi Arabia. **Barbara Saunders** *reports.*

Chromalloy's mettle boosted by Jeddah workshop

Chromalloy Arabia, a joint venture between Chromalloy of the USA and Arabian Qudra of Saudi Arabia, was launched in Jeddah last year.

The new workshop is part of its Middle East expansion strategy and follows the opening of a sales and customer support office in the Dubai Airport Free Zone.

"We are looking at beginning workshop operations and to be operating at full capacity in 2018," said CEO, Hani Shehata.

Chromalloy Arabia already has a service centre within Saudi Aerospace Engineering Industries at King Abdulaziz International Airport, following a 17-year relationship between Chromalloy and the Saudi Arabian Airlines subsidiary.

The new workshop will fulfil the needs of both the aerospace – commercial and military – and industrial sectors. Shehata said it would create a step-change towards cost-effectiveness, prompted by the prevailing, post-oil price downturn economics, and from an increasing desire by operators for the promotion of workforce localisation.

He added that the move into the Gulf, after 15 years of servicing clients in the region from overseas, was made because of changing requirements.

"Operating remotely on business trips to the region is no longer feasible," he said. "The move towards using nationals within the workforce has now become much more imperative and we are increasingly seeing preferential procedures on this coming into place for business. By moving into the region, we are providing economic benefit and jobs as well as ensuring Chromalloy's efficiency, quality and order execution on the customer's doorstep."

Hani Shehata: the workshop will be fully operational in 2018.

Shehata said the new workshop would play a role in developing Saudi nationals through training and career progression opportunities.

"We are looking to operate at double the workforce localisation quota of Saudia Aerospace Engineering Industries (SAEI), which reflects our commitment to the Saudi market," he said.

According to the CEO, the company is remaining pragmatic about its Gulf investments. "We are all bracing for a tough financial year here but we see this as an opportunity. For many years Saudi and the GCC operators have been very loyal to original equipment manufacturers regardless of the cost of maintenance, but we believe cost pressure from lower oil prices may provide us with opportunities.

"Chromalloy is globally known for the highest yield on repairs, which saves significant cost for operators, with demonstrated savings of up to $500,000 per shop visit."

Customer support base

From its new Dubai sales and customer support base, which operates with a 10-strong team, Chromalloy Arabia is looking to expand its GCC and MENA reach to "complement our support services office in Jeddah and further ease the expansion and reach across these key markets", explained Shehata, who added that business from Iran was on the company's radar.

"From the UAE perspective we see demand from the Iranian market," he affirmed.

Chromalloy, which is headquartered in Florida, has annual sales of $1 billion in gas turbine engine solutions, including component repair, engineering services, castings, machining, protective barrier coatings, manufacturing and supply chain management. It operates in 23 locations in 11 countries and has a workforce of more than 4,000 personnel. Arabian Qudra is part of Saudi Arabia's Abunayyan Holding.

Satair support deal

Airbus subsidiary, Satair, announced at the MRO Middle East show that it is to market the ground support equipment from Dedienne Aerospace across the wider Middle East and Africa regions.

Satair will promote and sell Dedienne equipment in southern Central Asia as part of the five-year deal.

Zaher Elsahili, Dedienne's Dubai-based general manager said: "Our commitment to our customers is to deliver high-quality products, as well as premium service. With a strong partner in Satair Group, we ensure that our ground support equipment tooling will benefit from excellent marketing and commercial strategies with proven solutions, such as full-service distribution and an integrated purchasing programme."

Ziad Al Hazmi with one of the hunting falcons.

Falcons sitting pretty thanks to Lufthansa Technik

Hunting falcon owners across the Middle East will find transporting their birds on VIP jets and commercial aircraft has become a little bit easier, thanks to a new product from Lufthansa Technik.

Falcon Master is a novel bird stand that provides a safe, secure and hygienic perch for the birds during transportation. It was on show at the MRO Middle East event in Dubai.

"Birds can make a bit of a mess during flight and, of course, transporting falcons can also mean having to remove seats beforehand," explained Lufthansa Technik Middle East CEO, Ziad Al Hazmi. "The new Falcon Master will change that. It protects panels, seats and carpets from possible damage."

The bird stand fits on to standard seat tracks, covering the folded seats. It has transparent walls that protect the walls and carpets from damage. A removable rubber mat makes it easily cleanable. And, once landed, it can be disassembled into three pieces and stored in a lightweight container. The aircraft can then continue normal operations.

"It is a simple solution but it is very effective," said Al Hazmi. "It saves time having to remove the seats."

Meanwhile, Lufthansa Technik is continuing to expand its business in the region with the development of a new facility at Dubai South (formerly Dubai World Central).

With the new base, Lufthansa Technik Middle East (LTME) becomes the 32nd members of the German family of companies.

"Over the past few months we have engaged very constructively with our partners at Dubai South. The aviation district has emerged as the ideal venue for us to host our new facility. It will put us in prime position as a leader in the aerospace supply chain sphere, and help us enhance value for our growing list of customers by offering optimised technical services, including our airframe-related component portfolio which features MRO services – literally from nose to tail," Al Hazmi said.

Milestone checked off

Volga-Dnepr Gulf, the Middle East aircraft MRO branch of Russia's Volga-Dnepr Group, has received European Aviation Safety Agency (EASA) Part 145 approval for C-check inspections and maintenance.

It has now completed the first C-check maintenance service for a B737-300, operated by Kyrgyzstan-based Avia Traffic Company.

The company, which this year marks its 20th anniversary of business in the UAE, and which operates a new 22,000sqm MRO hangar facility at Sharjah Airport, says it is now actively pursuing business from operators within a five-hour flying time of the UAE and is looking to expand its approvals ratings, including for the Boeing 747-8.

Gama aims to clean up

Sharjah-based VIP aviation specialist, Gama Aviation, is partnering with Go Aviation Middle East to access the company's suite of services, which ranges from light interior cleaning to complete paint and bright work restoration and polishing.

One of the main benefits of the new partnership is that Gama Aviation can provide clients with the option of a 7-star valeting service in a single location, which, according to Gama MD Martin Ringrose, will optimise aircraft asset values.

Ringrose said: "This agreement will enable our customers to combine the benefits of the convenience and low handling and parking charges at Sharjah with the 7-star cleaning capability of Go Aviation."

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THALES IN THE DRIVING SEAT FOR BIG GULF ORDERS

Thales InFlyt Experience is expecting, before June, to sign up "several big orders" from Gulf customers for its next generation in-seat in-flight entertainment and connectivity (IFEC) solution.

The system will offer passengers a connected experience, including customisable streaming TV content embedded in the seatback and via personal devices.

William Huot-Marchand, VP sales and marketing, said the expectation follows "very good feedback" from regional carriers.

Huot-Marchand, who has dubbed Gulf carriers as "IFE leaders" which are setting new design, functionality and connectivity norms with larger screens and more entertainment choices, said the next-gen system combined the strengths of earlier platforms with advanced technologies, such as screens with the highest definition capabilities, solid-state hard drives with higher memory capacity to store additional content and faster processors.

The company has already sold its new AVANT system to Qatar Airways for the A350 fleet and on many other Gulf carriers, including Saudia, Kuwait Airways and Oman Air.

Thales' systems also allow for the integration of passengers' personal electronic devices, so each can navigate seamlessly through the IFEC system and stream content. The in-seat screen will also feature 3D audio, giving a high fidelity, surround sound effect.

Thales is also working closely with the Airbus A350 programme team to make its Ka-band solution available on A350 XWB aircraft. Qatar Airways' Airbus A350, will be fitted with Thales connectivity system using an Inmarsat Global Xpress (GX) constellation, which will be operational this year. "Connectivity is the big thing," said Huot-Marchand

The systems are ultra-lightweight to reduce operating costs.

Qatar Airways has also selected the Thales Avii, a revolutionary hand-held media device that enables passengers to multi-task as they would on the ground, making the Doha-based carrier the first in the world to offer the product.

According to Huot-Marchand, Gulf airlines are heading the charge towards more robust and reliable IFE systems looking for 'home-in-the-air' solutions as they strive to "develop passenger engagement and build loyalty and brand commitment".

The next-gen systems are also ultra-light-weight to reduce operating costs. "The basic requirements of airlines remain more space, less weight and reliability," said Huot-Marchand.

EMIRATES UNVEILS B777 BUSINESS SEAT

Emirates chose ITB Berlin, the international travel trade show, to unveil its new Boeing 777 business-class seat. The design and shape of the seat was inspired by the interior of a modern sports car, captured in the diamond stitch pattern of a light grey full leather cover.

"Our current Boeing 777 business-class seats are already an industry-leading premium product, and what this new seat does is to take that design and comfort to the next level," said Sir Tim Clark, president, Emirates Airline.

"We gave the seat a fresh and modern look, retained all the existing features that our customers love and added a few more, while improving the seating and sleeping comfort."

The new seat has an ergonomically designed headrest, a pitch of 72 inches and the latest touchscreen controller, allowing it to be electrically converted into a fully flat sleeping position at 180 degrees. The improved layout also comprises 23-inch personal TV screens and additional amenities include a mini-bar, as well as a USB port to charge customer devices, and a HDMI port to stream content from their personal devices directly on to the IFE screen.

Emirates also redesigned the privacy panel between seats, the literature pocket, footrest, shoe stowage area, and expanded the personal meal table.

"It's evolution as well as revolution," added Clark. "We are always working towards the next big leap, but at the same time we continually look at the little ways we can enhance what we already offer. We believe this new seat further strengthens the experience and value proposition for our premium customers."

The new seat will be installed in all Emirates' new Boeing 777-300ER aircraft delivered from November 2016 onwards.

The next few months could see big decisions by many Middle Eastern carriers who have been putting off buying or upgrading their in-flight connectivity systems. **Steve Nichols** *reports.*

It's make your mind up time...

The reason it's decision time is simple – there are finally competing systems on the market that can offer true broadband speeds and an in-flight internet experience that gets close to what people are used to on the ground.

The first system, Inmarsat's Global Xpress (GX), is about to undergo a global commercial launch. This has been a few years in the making, but it is now poised to bring megabit speeds to aircraft, wherever they are in the world.

But competitors Panasonic, Gogo and Global Eagle also have some aces up their sleeves thanks to the launch of a new range of high-throughput Ku-band satellites (HTS). These will allow airlines with existing Ku-band equipment to take advantage of the higher bandwidths available from the new satellites' spot-beams.

But, back to GX. Inmarsat's Global Xpress uses much higher radio frequencies than either its predecessor Inmarsat SwiftBroadband or Panasonic, Gogo or Global Eagle's Ku-band alternatives.

70 times more bandwidth

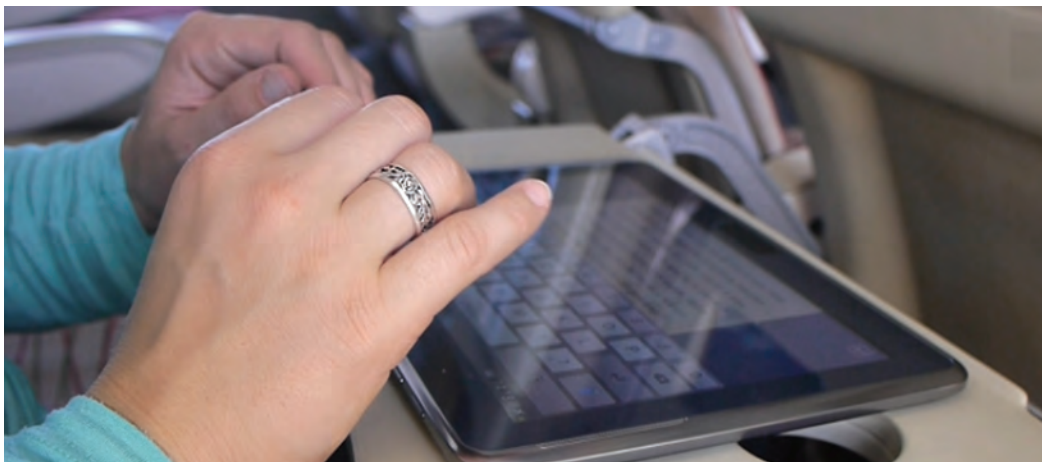
While SwiftBroadband, which is fitted to Emirates' A380s, offers just 432kbps to the whole aircraft, GX promises to deliver around 30Mbps – nearly 70 times more bandwidth.

It will make SwiftBroadband look like an old dial-up modem by comparison.

The new Ka-band GX service is still on course for its formal global commercial launch some time in the first half of 2016. The three Inmarsat I-5 satellites are in position and have now achieved global service introduction, plus supplemental type certification (STC) work on the fuselage-mounted Honeywell MCS-8200 Ka-band antenna for commercial passenger aircraft is under way on many platforms.

Inmarsat has plans for even more Ka-band satellites. The fourth is already being prepared at Boeing's El Segundo plant near Los Angeles.

Speaking after Inmarsat released its annual results in March, CEO Rupert Pearce, said: "We can now confirm that the group intends to launch its fourth GX satellite, Inmarsat-5 F4 ('I-5 F4') in the latter part of 2016.



"We continue to explore a number of different orbital locations, business opportunities and related revenues for this satellite."

Inmarsat had said previously that it wanted to see where the maximum demand for its GX services would be in order to work out the best orbital slot position for the fourth I-5.

In December, Inmarsat also announced that Airbus Defence and Space had been awarded a contract to design and develop the first two next-generation Inmarsat-6 (I-6) mobile communications satellites in a deal valued in the region of $600 million (€550 million).

Nine-metre aperture

I-6 F1 and F2 will carry a large nine-metre aperture L-band (SwiftBroadband) antenna and nine multi-beam Ka-band antennas, with the first satellite (I-6 F1) scheduled for launch in 2020.

Other companies are working on GX equipment and STCs for GX. EAD Aerospace, an Eclipse company, says it is working with two MRO companies to develop European Aviation Safety Agency (EASA) STCs for Honeywell's hardware.

The STCs will cover MCS-8200 installations on Airbus A320 family aircraft, A330, A340 and also Boeing 777. The current projects are all for undisclosed Middle Eastern customers.

Although these are for business aviation applications, the STCs could be easily made available for commercial use.

Thales is working on GX for Qatar's and Singapore Airlines' Airbus A350s.

Glenn Latta, CEO of Thales InFlyt Experience, said: "We are the sole provider of GX on the Airbus A350 and have secured deals for around 150 aircraft so far. We expect the first Qatar deliveries to take place later this year."

But GX isn't the only solution on offer to Middle Eastern airlines. Global Eagle is currently fitting its Airconnect Ku-band solution to Flydubai's Next-Generation Boeing 737-800 aircraft. The provider will use satellite capacity from SES and, although the actual bandwidth available to the aircraft is not known, it is likely to be more than 20-40 times the capacity of Inmarsat's SwiftBroadband.

Panasonic Avionics has also been supplying its Ku-band solution to Emirates for its Boeing 777 fleet and is also flying on Qatar, Etihad and Gulf Air.

Not to be outdone, Gogo now has its 2Ku dual-panel antenna on offer that can offer speeds that approach those of Ka-band systems. Gogo says 2Ku will keep airlines at the forefront of technology for the longest length of time.

Michael Small, Gogo CEO, said: "Our field tests show that 2Ku exceeds our expectations. Even with 40 passengers all streaming video, everyone still gets a good browsing experience.

Work on the fuselage-mounted Honeywell MCS-8200 Ka-band antenna for commercial passenger aircraft is under way on many platforms.

"In the long run, I'm confident that we will have a lower cost-per-bit than our Ka competitors. I think there is going to be a lot of decisions made now about what technologies airlines adopt and it is going to be very competitive," he added.

Gogo has also signed a deal with Intelsat and OneWeb to provide global Ku-band services using Intelsat's geostationary and OneWeb's proposed low-Earth orbit satellites. In time, Gogo says this could offer "hundreds of Mbps per aircraft on every part of the globe".

The launch of a new range of Ku-band satellites by Intelsat and SES also promises to close the gap between what Ku-band can offer and Ka-band.

In January, Intelsat 29e, the first of the company's EpicNG HTS, was launched successfully from French Guiana.

This is the first satellite, in a series of at least seven, of the company's next-generation, all-digital EpicNG satellite platform that combines wide beams and spot beams with frequency re-use technology and the sector's most advanced digital payload.

This will allow customers to seamlessly access and shift capacity to match their usage needs in a particular region. The company expects to launch the second EpicNG satellite, Intelsat 33e, which will serve Europe, Africa, the Middle East, and Asia, in the third quarter of 2016, with others in the pipeline.

James Collett, director mobility services at Intelsat, said: "What we are doing is supplying extra capacity for our customers to enable them to innovate and grow their businesses. We are giving airlines headspace to increase their bandwidth."

EpicNG will feature both wide and spot beams, giving a total capacity of about 25-60Gbps per satellite. This translates to around 200Mbps per spot beam with the new HTS services.

Important aspect

"This is a leap up from the less than 10Gbps available currently," Collett said. "The other important aspect of EpicNG is that we are putting the capacity just where it is needed, especially over high-density air traffic routes.

"We are sticking with Ku as it has a lot of momentum in the in-flight connectivity market and no hardware upgrades will be needed to take advantage of the higher throughout."

While the exact speeds available with EpicNG are unknown, many commentators say the higher-power spot beams could bring the speeds close to and even faster than Inmarsat's Ka-band GX system.

But is also means that these speeds will become available to aircraft flying with existing Ku-band equipment, without expensive and time-consuming upgrades.

David Bruner, Panasonic Avionics' vice president of global communications services, said that its deals with Telesat and Intelsat for HTS spot-beam Ku coverage will provide even more capacity.

"We will have more capacity in the MENA region and its key routes than any of our competitors. This will help airlines' economics, and help them provide a great service for their passengers at the right price."

Panasonic has also signed contracts with SES for HTS bandwidth over the Americas aboard its SES-14 and SES-15 satellites, due to be launched in 2017.

So do airlines go for Ku or Ka? And if they do, which supplier do they choose?

All of the MENA-based carriers remained tight-lipped about future plans, in terms of upgrades or new selections, for their in-flight connectivity.

But what is clear is that it is now decision time. Passengers will de demanding broadband in-flight connectivity – and will chose their airline accordingly.

So we can expect to see many announcements over the next six months as airlines decide the route they wish to take.

Could it be love at first sight? Watch this space!

Airbus has unveiled its new cabin option for its A330neo, which begins deliveries in 2017.

Samantha Wellard *was at the unveiling in London.*

Airspace is the name for Airbus' new cabin interior concept, which aims to create an "inspiring space" for passengers from first entry to the aircraft.

The manufacturer said it focuses around four separate factors, all acting together to create a feeling of relaxing, beautiful, living and inspiring space, while at the same time reducing cabin noise and increasing space.

"Airspace combines all the elements we have been working on over the years and is built on strong values and clear, simple attributes," said Ingo Wuggetzer, vice president, cabin marketing.

Airbus has worked towards creating a fully functioning interior, while keeping a sense of open space and comfort, and by maintaining a recognisable Airbus brand.

Although the space will be fully customisable, Dr Kiran Rao, executive vice president strategy and marketing, placed emphasis on creating a design that was uniquely 'Airbus'.

Recognise the brand

"There's a certain design, a certain functionality, a certain differentially. You recognise the brand through the manufacturing. Airbus has to move into a new space, its not just about fuel and performance, it is about marketing. It is the whole feel of the aircraft," said Rao.

Wuggetzer put it into context: "We want to ensure it will be love at first sight when you enter the cabin space," he said.

In order to create an atmospheric entrance for passengers as they embark, Airspace has a welcome area, which features a LED illuminated panel that can be customised depending on the customer's branding, created using 3D printing technology. The lighting panel uses more than 16.7 million colour variations, which allows airlines to show passengers the company's colours as soon as they enter the aircraft. This welcome area can be used in conjunction with 'gobo' projection, which illuminates the monuments either side of the entrance, heightening the aspect of customisation.

The inspiring space is also created by reduced noise within the cabin. In Airspace, cabin noise has been reduced by 3db, with noise energy being reduced by 50%.

Airspace also aims to create a relaxing space for its passengers.

"This is about our number one criteria for passengers: comfort. This is what we think passengers want, and deserve, today," said Wuggetzer.

Bright colours

The fresh cabin design works with bright colours to give a feeling of openness, and a larger cabin environment without an increase to cabin space. This is paired with an 18" inch seat width in economy class, and increased space for bags.

Wuggetzer continued: "This makes a huge difference if we talk about shoulder clearance. A 17" seat width can make you touch shoulders with your neighbour. The extra width creates comfort and privacy."

Cabin bins in the Airspace have 66% increased capacity, allowing for five bags to be placed in each overhead bin. They have also been redesigned to follow the seamless ergonomic design of the aircraft interior, incorporating new latches and integrated LED grip rail lighting.

A fourth-generation in-flight entertainment system has also been integrated into Airspace, with the incorporation of discrete electronic boxes to provide under-seat legroom, creating the maximum space for passenger comfort.

The new cabin is fitted with high-bandwidth connectivity services, and integrated social media.

"Design matters. Design is the decisive criteria for customers. We have a smart design philosophy of a seamless blend of design and functionality," said Wuggetzer.

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GI MARCHES ON

Torrential rainstorms and hurricane force winds led to two of the three days of the Abu Dhabi Air Expo being cancelled. The weather damaged aircraft and exhibition booths, with exhibitors and visitors having to take shelter in a hangar. But, as **Alan Peaford** *discovered, it didn't put a dampener on the plans of one new business aviation start-up.*

A new business model bringing affordable private air charter to the Gulf region emerged out of the gloom of a rain-hit Abu Dhabi Air Expo.

The privately owned Abu Dhabi-based start-up, GI Aviation, braved the weather to reveal its plans for launching a new service utilising the Pilatus PC-12 NG aircraft to provide safe, cost-efficient and flexible charter options to fulfil a growing need for affordable regional charter services of four hours or less.

Ali Alnaqbi, founding chairman of the Middle East Business Aviation Association (MEBAA), had already seen the need for such a service. Just a couple of kilometres down the road, at the Global Aerospace Summit, he had said that the region needed to broaden its business aviation appeal away from the wide-body jets usually associated with the area.

"There is a clear need for an operator to have smaller aircraft," he said. "This will broaden the use of business aircraft. For example, at the moment you might pay $10,000 to fly from Abu Dhabi to Bahrain. Using a turboprop, or a smaller jet, will make this service much more affordable and reach more businesses and individuals."

GI will meet that demand, the company said.

The first aircraft was purchased direct from the manufacturer, Pilatus Aircraft in Stans, Switzerland, and was ferried into Abu Dhabi for the show. The company is now progressing with the formal authority process to achieve its air operator's certification (AOC) from the General Civil Aviation Authority of the UAE (GCAA). When that is granted – probably during the summer – it will become the first of its kind to bring the Swiss aircraft into the Gulf region.

Operations are planned to begin in the last quarter of 2016. A second PC-12 NG is on order and will be delivered in the fourth quarter of 2016.

Marios Belidis has been appointed as general manager of the company. Belidis was previously with Jet Aviation in technical roles and, most recently, at Al Bateen Executive Airport, where he led business development and ran the award-winning DhabiJet fixed-base operation (FBO).

"We are aiming to fill a gap in the market, which is driven by a growing need for travel –

THROUGH THE GLOOM

from corporations and private individuals – that is affordable, reliable and fits with their travel schedules," he said.

"The PC-12 NG has a range of up to 1,200nm, enabling us to reach destinations such as Jeddah, Doha, Amman and Karachi. The aircraft can also service unpaved and short runways, gravel strips and can fly into a number of island airstrips that are just not viable for larger jets."

The first aircraft will be based at Al Bateen Executive Airport. "It is extremely exciting to bring a new aircraft type to the region. We expect some questions about the merits of turboprop and single-engine operations, but we researched this extensively before selecting the PC-12 NG as our aircraft of choice," said Belidis. "The PC-12 NG has all the benefits of jet aircraft, and more, but without the higher cost. It has a robust safety record and, with its outstanding Swiss engineering, the aircraft is extremely reliable and efficient."

The six-to-eight-seat turboprop has a cruising speed of 280kts (520km/h) and a pressurised cabin of up to 25,000ft, making it ideal for leisure and corporate trips.

"It is extremely exciting to bring a new aircraft type to the region."
MARIOS BELIDIS

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Return of the raging bulls

While the French pilots celebrated on the podium, it was the general public in Abu Dhabi who were the winners with a spectacular display to witness.

The Red Bull Air Races returned to Abu Dhabi for the culmination of the aerospace week. **Bjorn Moerman** *reports from the opening race of the season.*

First organised in 2003, the Red Bull Air Races have quickly become one of the fastest and most exhilarating motorsport series on the planet.

The Reno Air Races in Nevada, US, might be faster, but the championship organised by the energy drink maker is definitively more spectacular!

In the master class, 14 pilots are competing for the fastest time along a set course, laid out between 25 metre nylon pylons; a visual spectacle like no other.

While the first day is for qualifying, the second consists of a three race rounds, cutting down the number of pilots from 14 through eight and eventually four.

Two legends have left the race circuit this year; three times world champion Paul Bonhomme (UK) and mastermind and developer of the Red Bull Air Races, Hungarian Peter Besenyei. Both are making way for new pilots, who worked their way up through the rookie (now called Challengers) class.

Almost all of the Master class competitors for the 2016 race fly the Edge 540, while Nigel Lamb and Matt Hall are still using their MXS-R racers. The pilots of the Challenger class all fly the Extra 330LX, which is ideal for new race pilots.

Just as in previous years, the opening race for 2016 was held over the beautiful emerald waters of the Abu Dhabi Corniche in the UAE capital.

About five miles south of the track is the race airport – Al Bateen Executive – where the aircraft are meticulously prepared in what looks like a Formula One pit area.

The race had beautiful weather with light winds and blue skies; unlike the Abu Dhabi Air Expo, which, except for the last day, was pretty much rained out.

When the races returned in 2014 after a three-year hiatus, it brought with it the introduction of standardised engines and propellers, leading to a more level playing field and some stricter safety rules, after a few close calls in the preceding years.

Failure to fly along the racetrack correctly results in penalty seconds or disqualification, the latter being due to either excessive G-forces (>10g), a too high entry speed (200kts but 180kts in Abu Dhabi) at the start gate or breaching the safety crowd line.

Less common, but surely spectacular, are pylon hits – something Australian pilot Matt Hall, the race favourite, experienced in the round of 14. While they have to be sturdy enough to stand straight in stronger winds, the air gates are made of spinnaker fabrics, which rip immediately on impact.

In Abu Dhabi, both the first and third podium places were taken by French pilots; Nicolas Ivanoff won the final race by just a tenth of a second from the German Matthias Dolderer; while Francois Le Vot took his first ever podium place after having entered the Master class last year.

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The Opening Ceremony of Sofex 2014 included a spectacular rescue scenario by the Jordan Joint Special Operations Command's UH-60L Blackhawks and MD530Fs.

Daesh threat heightens SOFEX focus

Alan Warnes *looks forward to a highly significant Special Operations Forces Exhibition and Conference (SOFEX), which takes place at the King Abdullah Air Base in Amman, Jordan, from May 10-12.*

With the proliferation of religious extremists like Daesh, the Middle Eastern countries are increasingly fearful of the terrorists' barbaric brand of Islam crossing into their borders.

There are, undoubtedly, many 'special forces' groups from all over the world fighting Daesh in Iraq and Syria. It may not be acknowledged publicly, but they are there.

Specialist equipment, as well as highly trained troops, plays a big part in these covert wars, and companies eyeing a piece of the action will be out in big numbers at SOFEX.

This year's event, the 11th since its inauguration in 1996, is the first since Daesh fighters started their atrocities in Iraq during the summer of 2014.

The SOFEX organisers' vision, to be the premier international special operations defence exhibition, is now certainly within their grasp.

An impressive opening event will be the Royal Jordanian Special Forces demonstration. In 2014, it involved the AS 332M Super Puma, MD530F and UH-60L Black Hawk helicopters, and a chemical, biological, radiological and nuclear (CBRN) unit rescuing hostages from a terrorist group, all in front of His Majesty King Abdullah II, supreme commander of the Royal Jordanian Armed Forces (RJAF).

An airborne Schiebel S-100 Camcopter, operated by the Jordan Armed Forces Reconnaissance Squadron, and the RJAF's first Airbus AC-235 gunship supported the rotary-wing assets.

SOFEX is an event, from an aerospace perspective, where aircraft and system manufacturers, along with integrators, come together. Not too surprisingly, aircraft fitted with specialist equipment are also on show.

During SOFEX 2014, the USA's Orbital ATK, in partnership with Jordan's King Abdullah II Design and Development Bureau (KADDB), displayed its first CASA 235 light gunship. This year the pair, along with Airbus, might show a C295 in a similar configuration.

Airbus announced in June 2014 that a C295, currently operated by the RJAF, would be converted to a gunship by Orbital ATK to join two AC-235 gunships serving the RJAF.

The AC-295 gunship configuration will be based on the AC-235 Light Gunship, which includes integrated mission and fire control systems, electro-optical and radar sensors, Hellfire missiles, ATK's side-mounted M230 30mm chain gun, an integrated defensive suite, and 2.75inch guided rockets.

Several variants of small attack helicopters are expected to be on display, including the new MD530G, which completed its live firing qualifications in August 2014.

The MD 530G light scout attack helicopter made its maiden flight in 2013. It has a top speed in excess of 130kts and is designed for agile deployment with any rotary wing unit. The aircraft features increased capacity landing gear to support the 3,750lb max gross take-off weight, allowing increased useful load for additional range, endurance and weapons.

Launch customer

MD Helicopters announced on February 1 that the launch customer is the Royal Malaysian Army, which has ordered six. Deliveries will start in late 2016 and be completed in early 2017.

In 2014, MD Helicopters launched its new MD540A – with its six-bladed rotor head armed with Lockheed Martin Hellfire and direct attack guided rocket (DAGR), Raytheon M26 multiple-launch rocket pod and a M134 machine gun. It is fitted with a L3 Wescam MX-10 electro optical/infrared (EO/IR) turret and has a 4,500lb maximum take-off weight. This is more than three times that of the MD530F Cayuse Warrior scout attack helicopter.

The Afghan Air Force ordered 12 more of the type in January, adding to the 12 already delivered.

The Royal Saudi National Guard has been operating 12 MD530Fs since May 2014.

The RJAF already operates six MD530Fs, having beefed up its special forces assets in recent years.

Emirates trio stepping up

Emirates has announced three management changes in its commercial operations team to strengthen its market position in Africa, the Middle East and North and South America.

Orhan Abbas has been appointed senior vice president commercial operations Africa, and will lead growth efforts across the continent. He will report directly to Thierry Antinori, executive vice president and chief commercial officer.

Adil Al Ghaith is the new senior vice president commercial operations Gulf Middle East & Iran and will lead a number of Emirates' markets in the Middle East.

Rob Gurney is taking additional responsibility for Latin America, as he becomes the senior vice president of commercial operations.

Dalibard named as SITA CEO

SITA has announced that Barbara Dalibard has been appointed chief executive officer, effective from July, replacing Francesco Violante, who plans to step down after 13 years in the role.

Dalibard is joining SITA from SNCF, after serving as CEO of SNCF Voyageurs. She has also served as CEO at Orange Business Services.

Zambia switch

Emirates has appointed Thani Abdulla Al Ansari as a country manager for Zambia. Al Ansari's role will involve responsibility for business operations in Zambia, overseeing sales and service functions for passenger, cargo and airport operations. He was previously country manager in Uganda.

IATA'S NEW LEADER IS DE JUNIAC

Alexandre de Juniac, chairman and CEO of Air France-KLM, will succeed International Air Transport Association (IATA) retiring director general and CEO, Tony Tyler, at the organisation's annual meeting in Dublin, Ireland in June.

"We are very pleased to recommend de Juniac to lead the organisation," said IATA board chairman Andrés Conesa.

"Under Tony Tyler's leadership, IATA has grown stronger. This has been achieved by building partnerships across the industry and with governments, and by increasing the diversity of business models within our membership, which has grown to 264 airlines. Alexandre's broad experience in aviation and government makes him the ideal candidate to take our association to even greater heights."

AL MEHAIRI MAKES HISTORY

Etihad Airways has appointed Fatma Al Mehairi as general manager for Canada. Al Mehairi is the first female Emirati to be named general manager of a region at the airline.

"As a proud graduate of Etihad Airways' graduate managers development programme and now a part of the Americas team, I look forward to further increasing our already strong commercial ties within Canada – an important market for our airline – and raising awareness among corporate customers about the unmatched world-class product and hospitality offerings we provide for our guests," said Al Mehairi.

New Emirates regional manager

Rashid Al Ardha has been appointed Emirates regional manager for the western region of Saudi Arabia, which includes Jeddah and Medina.

Al Ardha began his aviation career with Emirates and has been with the company for more than nine years. He was appointed area manager to Sudan in 2009.

Sultan board move

Nabil Sultan, Emirates' divisional senior vice president, cargo has been appointed to The International Air Cargo Association (TIACA) board of directors. Sultan has more than 20 years' experience in senior management roles at the airline and was promoted to his current role in 2013.

Airships Albert

Airships Arabia has appointed Katharina Albert as logistics director. Albert has extensive experience in the analysis, modelling and simulation of processes, having undertaken work for a number of prominent logistics projects in the UAE and across the globe.

Meyer's UAE return

Wynand Meyer has returned to the UAE as a regional sales manager based at the headquarters of UAS, the international trip support company. For almost three years he had been in South Africa as the company's regional director.

Gulf Air appoints new Turkey manager

Gulf Air has appointed Shadi Raweh as its new country manager for Turkey.

With more than 15 years' experience and an in-depth working knowledge of the aviation and travel industry, Shadi has covered several management roles both within Gulf Air and in other industry organisations.

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Jeffrey Forsbrey

Marcella Nethersole *talks to the SVP sales and marketing at Aviointeriors.*

1

Can you tell me a little background of Aviointeriors?

Aviointeriors is based in Latina, Italy, and has been producing aircraft cabin interiors equipment and mainly passenger seats for more than 40 years. We design, certify, manufacture and deliver high-quality products to leading airlines and premium operators, as well as to all the world aircraft manufacturers.

The company directly controls the entire business cycle and it is strongly oriented towards product development and design through its team of designers and engineers, which ensures the continual stylistic and technical innovation that has always been a distinguishing feature of the company.

2

What are your main products?

We mainly produce business and economy class seats. In our economy product range we have the Columbus family, which can be tailored to the needs of any airline. We have a range of three Columbus designs at the moment, the modular design of the seat allows a combination of different solutions to suit different missions and aircraft.

We will be launching a new Columbus family member – the C4 – at Hamburg 2016. It is a new premium economy seat, offering improved recline and articulating seat pan, enhanced comfort and design.

For business-class, we offer four high-spec products; Perseus, Giotto, Andromeda and Zeus. We are currently finalising the selection of a new designer for our new BC product that will launch in 2016, probably at APEX in Singapore.

We also have two first-class products and we will be developing a super FC product, hopefully in 2017.

3

Who are your customers?

We are fortunate to number hundreds of clients on our books; airlines such as Iceland Air, Rossiya Airlines, Aegean Airlines, Iberia and Etihad Airways to name but a few. We were at AIME in Dubai earlier this year and got three great opportunities from the show, including a customer for one of our wide-body products, and another airline interested in a narrow-body product for business and economy.

The Middle East is a dynamic market and very exciting. Middle Eastern customers often want something more bespoke/individual as they work their brands globally.

4

What does your role involve?

I joined Aviointeriors in October 2015 after leaving Sogerma.

Since then, I have helped slowly build on our fantastic products. We have changed the way we do business internally, becoming more focused on things like improving our bid/no bid and proposal process.

We are growing our sales team by adding another sales manager into Europe and Asia for 2016. Thereafter, we will look to appoint one in the USA in 2017.

We have also changed our literature with a redesigned company catalogue, making it more product-driven, and devised some improved adverts to support specific shows and product launches.

5

What is new for Aviointeriors?

We have a new VIP product for the executive aircraft market and, as I said before, we are working with a number of design companies for new product development.

We plan to grow our sales, including retrofit and line-fit work. We see line-fit as a market we have to return to in order to grow our business.

We're also looking at lead-time reduction across the board in an effort to improve efficiency and meet customer expectations.

Product wise, now is the time for change in how we design and make our seats. We are looking forward to moving forward as a company and maintaining our position as a leading aircraft seating provider in the future.

At Aviointeriors we have some fantastic engineers and staff to make this all possible, so we owe it to them to ensure we move forward as a company and grow.

> ‘We plan to grow our sales, including retrofit and line-fit work. We see line-fit as a market we have to return to in order to grow our business.’

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