ISSUE 4, VOLUME 3: NOVEMBER 2011 – JANUARY 2012

ARABIAN AEROSPACE

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

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OMAN READY FOR TAKE OFF

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The Boeing Dream becomes reality

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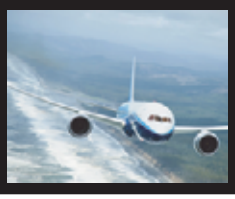

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The flexibility to change missions without changing your aircraft.

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Oman Air CEO Peter Hill discusses the airline's strategy with *Arabian Aerospace* editor Alan Peaford for this issue's cover story.

Helping people to look, listen and learn as the pace hots up

As the pleasantly warm winter days spread across the Gulf, the season for conferences and air shows begins.

It seems like almost every week now there will be an aerospace event somewhere in the region.

That in itself is a reflection of how much our industry has grown. A few weeks ago I was fortunate to be chairing the Smart Airports World Conference, organised by Terrapin. It took place in Dubai but speakers from Frankfurt, Toronto, Tokyo, Mumbai and London joined the CEOs and senior management teams from airports in Jordan, Bahrain and the UAE among others to share views on the challenges of future-proofing airports.

What I found most interesting was that, had this conference taken place five or so years ago, the audience would have been from the MENA region looking to learn from European or north American speakers. Now it is shared views with many of the audience coming to the region to learn themselves.

The Dubai Airshow offers that same two-way opportunity.

Hommaid Shemmari, the aerospace business head from Mubadala (featured on pages 127-128), told me recently that he is impressed by the number of Arab companies now exhibiting at shows like Dubai and IDEX. The aviation businesses have a way to go to catch up with the indigenous defence businesses but it is happening.

This region is continuing to present its credentials and every year it is getting stronger. The Dubai airshow is looking like being a record breaker.

Arabian Aerospace will be there with our daily newspapers, our radio programme and, for the first time, our daily TV News report, which you can see on our website or, if you have an Android, an iPhone or an iPad, through the special app that we are producing for the show. The app is available through the usual channels such as Apple's iTunes.

We will also be covering the news extensively for our online service (www.arabianaerospace.aero) at Dubai before moving on to cover AACO, when the heads of the Arab airlines meet in Abu Dhabi at the end of November. And look out for us too at the ACI conference, also in Abu Dhabi at the same time.

… And then we go to Bahrain for the second of the country's international air shows where, again, we will be producing dailies, the app and the TV show.

At *Arabian Aerospace* we are doing all we can to make the world sit up and realise the good things that are going on in our industry in this region. Together we can make more people look, listen and learn.

Safe landings. **Alan Peaford, Editor-in-Chief**

COVER: Peter Hill the outgoing CEO from Oman Air explains why his airline is punching above its weight.

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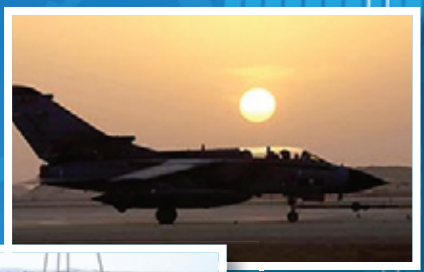

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Cargolux finally receives its B747-8

The controversial delay to the delivery of the first Boeing 747-8 Freighter to Cargolux – the company part-owned by Qatar Airways – is finally over after Boeing handed the aircraft over to the Luxembourg airline last month. Boeing, Cargolux and Nippon Cargo Airlines announced the initial orders for the 747-8 Freighter in November 2005.

UAE to develop own helicopter

A new family of civil helicopter aircraft is set for launch at the Dubai Airshow in November – with a UAE company behind the initiative.

The manufacturer is called Quest Helicopters and is backed by Quest Investments.

Sources involved in the project say the helicopter will be built in the UAE and will be brought to market in the fourth quarter of 2013.

The team involved are believed to include established business aviation personnel from the UK, UAE and engineering expertise from Ukraine.

Abu Dhabi airport continues growth

Abu Dhabi Airports Company celebrated a record month's performance as the UAE's capital airport continues its growth.

The company said its August figures showed a robust 14% growth over last year's figures with passenger traffic reaching 1.09 million. Cargo traffic was also on the rise reaching 39,841 tonnes.

The double-digit growth recorded at Abu Dhabi International Airport during August is mainly attributed to the healthy growth of all airlines operating at the airport, while also supported by the Eid holiday.

Lockheed Martin delivers C-130Js to Qatar

Lockheed Martin has delivered four C-130J Super Hercules airlifters to the State of Qatar.

The Qatar Emiri Air Force's new Super Hercules is the longer fuselage or 'stretched' variant of the C-130J. The aircraft will be used for humanitarian relief and military missions. Qatar is the first C-130J operator in the Middle-East.

Lockheed Martin is providing a complete solution package to support the sale. "The package includes the four aircraft; aircrew and maintenance training; spares; ground support and test equipment; and a team of technical specialists who will be based in Qatar during an initial support period," said Lorraine Martin, Lockheed Martin vice president for C-130 programmes.

IATA disappointed over lack of support

IATA has expressed its disappointment in the opinion of the Advocate General of the Court of Justice of the European Union, which did not support the air transport industry's challenge to Europe's plan to include international aviation in its emissions trading scheme (EU-ETS) from 2012.

A final decision is expected later this year.

"We are disappointed with the opinion but it is only part of a complex set of developments concerning the EU-ETS," said Tony Tyler, IATA's director general and CEO. "We support and need positive economic measures as part of our strategy to manage aviation's emissions."

Eurocopter in 'safety breakthrough'

Eurocopter has successfully tested a hybrid helicopter that combines a turboshaft internal combustion engine with an electric motor, marking a new innovation milestone.

For this initial breakthrough in exploring the hybrid concept, Eurocopter is using the supplemental electric system to increase manoeuvrability of a single-engine helicopter during an autorotation landing – which is performed by helicopters in the event of a main engine failure.

The demonstrator helicopter is a production version of Eurocopter's single-engine AS350, which has been equipped with a supplementary electric motor. In the event of an engine failure, the electric motor provides power to the rotor, allowing a pilot to control the helicopter very easily during the descent to a safe touchdown.

Najran Airport opens for trade

Najran, one of Saudi Arabia's fastest growing cities, has the opportunity to develop new domestic and international trade links following the opening of its new airport.

The new buildings include arrival and departure lounges, a control tower, service utilities, administrative and technical offices and other facilities.

Dubai Airports selects Amor Group

Dubai Airports has appointed Amor Group to implement a comprehensive service delivery measurement programme.

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Cordner and Falko develop converted jets for mining missions

Mining, quarrying and oil production facilities in remote desert areas could benefit from a new specialised model of the Multijet BAe 146/Avro RJ from Germany's Cordner Aviation Group.

Stewart Cordner, the company's president, said: "You might say we found a golden opportunity in this often overlooked market and the initial reactions to the Surveyor and our range of design concepts – resulting from many candid conversations with people in the mining industry – have been totally positive."

Falko, the new UK-based aircraft asset manager that bought the former BAE Systems business, also believes the type will appeal to companies operating flights to unpaved mining and exploration airfields in the Middle East and North Africa.

Falko's Chris Sedgwick said: "Over the past two years our extensive ABJ promotion has resulted in growing interest in the fly-in; fly-out' (FIFO) mining and exploration transport support sector. This is a role for which the aircraft with its 'SUV' qualities is particularly well suited and where we already have a lot of experience. So, while we will continue to offer platforms for conversion to executive layout, we now expect to turn our marketing efforts more towards this FIFO segment.

"The international FIFO market accounts for some 13 BAe 146/Avro RJs at present, mostly in airliner configuration."

Etihad signs Vietnam agreement

Etihad has agreed a codeshare deal with Vietnam Airlines, which took effect on October 30.

The agreement will allow Etihad guests to connect seamlessly through Bangkok to Ho Chi Minh or Hanoi on Vietnam Airlines' daily services.

Likewise, Vietnam Airlines passengers from either destination will be able to connect through Bangkok to Etihad's base in Abu Dhabi.

Emirates fined over baggage failings

The US Department of Transportation (DOT) has said it has fined Emirates $100,000 for limiting compensation for lost, damaged and delayed baggage to less than consumers were entitled under an international treaty.

US transportation secretary Ray LaHood said: "All air passengers, regardless of whether they are taking domestic or international flights, deserve to be compensated fairly for lost, damaged or delayed baggage. We will continue to take enforcement action when necessary to protect airline consumers."

The airline was investigated following a customer complaint and was found to have denied compensation.

The DOT said: "In its written responses to passengers, Emirates stated that its contract of carriage limited its liability for such items and incorrectly claimed that its practice complied with the convention. Emirates' website also stated that the carrier was not liable for valuables damaged while in the carrier's custody."

Turkish Technic signs with NIKI Luftfahrt

Turkish Technic has signed a contract with Vienna-based scheduled airline NIKI Luftfahrt GmbH to provide base maintenance and paint services for five Airbus A320 aircraft.

The deal is the first business agreement between the parties. The services will be carried out at Turkish Technic's Istanbul facilities between October 2011 and December 2012.

Turkish Technic general manager Dr Ismail Demir said: "Western Europe is one of the markets that we aim to lead and we are committed to providing quality services and satisfying the expectations of NIKI Luftfahrt GmbH to maintain our good relationship."

StandardAero in Falcon 900 'first'

Dubai Aerospace Enterprise MRO subsidiary StandardAero Business Aviation has announced its first installation of a FAA-certified high-Mach blended winglet on a Falcon 900.

In partnership with Aviation Partners (API), StandardAero is currently outfitting a Falcon 900EX scheduled for delivery in early November. The aircraft is also receiving airframe, paint and avionics work from the service centre while on the ground for the installation.

Falko offers RAM Dash 8-Q300 for sale

The newly-created Falko aircraft asset management company has announced its first sale deal since the business was formed to take over the former BAE Systems asset management division.

The company was selected by Royal Air Maroc (RAM) and given an exclusive mandate to arrange the sale of a Bombardier-built Dash 8-Q300 regional turboprop airliner.

Hamish Davidson, executive vice president business development said: "We are excited by the opportunity to work with Royal Air Maroc and also to market the Dash 8, which is a new aircraft type for us."

Egyptian Air Force receives C295

The Egyptian Air Force has taken delivery of its first Airbus Military C295. The aircraft, in military transport configuration, was delivered ahead of contract schedule and is part of a three-aircraft order placed by the EAF in October last year. The other two aircraft are to be delivered during the last quarter of 2011.

Libyan sanctions lifted by Europe

The European Union has formally lifted the sanctions on Libyan Airlines that were re-imposed in March. This clears the way for the airline to begin repairing or renewing its fleet as the country rebuilds after the uprising. The EU has also lifted the restrictions on purchase of equipment and services for the airport industry.

ADAC's single-source solution

ADAC has announced the completion of the first phase of the Oracle E-Business Suite implementation.

The first phase of the project has laid the foundations of automation and integration of key business areas like finance and budgeting, procurement, human resources and real estate management, as well as consolidating its diverse revenue billing streams in a single tightly integrated web-based solution. The suite replaces around 60 applications on to one common platform, thus providing a single source of information.

A J Walter into business aviation

A J Walter, the UK headquartered and Dubai-based independent provider of commercial aircraft spares support, is moving into the business aviation market.

The company operates its own Global Express business jet and previously a Challenger 604, and has now identified a new business niche for development – corporate and business aircraft spares support.

"We recognise that BBJ and ACJ operators have completely different needs to our airline customers so we have worked hard with our partner, Loudoun Aviation, to refine our approach to this specialist sector," explained president Christopher Whiteside.

"AJW is recognised universally for its customer-centric services and unparalleled flexibility – in particular for our global 24/7 AOG. So the efficient operation of our own GX aircraft across the world means we are ideally placed to share our expertise with this new market sector."

Sanad adds Virgin Australia to its list

Sanad Aero Solutions (Sanad), Mubadala Aerospace's component and engine financing solutions company, has executed a comprehensive financing and access agreement with Virgin Australia for the carrier's Boeing 737NG and Embraer E-Jet spare aircraft components.

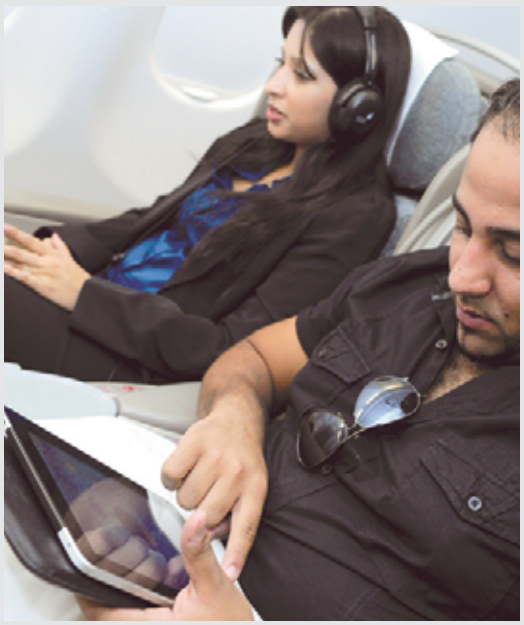
Troy Lambeth, Sanad CEO, said: "This agreement represents Sanad's single largest transaction to date and expands our partnership with Virgin Australia. These agreements create additional liquidity and fiscal flexibility for Virgin Australia and support SR Technics and Abu Dhabi Aircraft Technologies (ADAT) as they expand their long-term maintenance and technical training partnership with the carrier."

Boeing delivers UAE's fourth C-17

Boeing has delivered its fourth C-17 Globemaster III to the United Arab Emirates (UAE) Air Force and Air Defence from the company's final assembly facility in Long Beach.

Boeing delivered the UAE's first three C-17s in May, June and July of this year and will deliver two more in 2012.

The C-17 provides the UAE military with the versatility and reliability needed to complete its mission requirements. Colonel Ahmed Al Mazmi, the staff engineer, said: "The C-17 is the ideal choice for us as it can handle the vast distances and climate extremes in which our aircraft operate."



Gulf Air is live with TV

Gulf Air has become the first airline in the world to offer live television on board across its network.

The Bahrain airline has taken delivery of its first A330-200 aircraft, retrofitted with Panasonic Avionics Corporation's global communications suite.

The comprehensive communications and entertainment solution, 'Sky Hub', offers passengers full broadband connectivity to access internet, mobile phone services and, for the first time a live TV service giving customers access to areas such as live sports coverage.

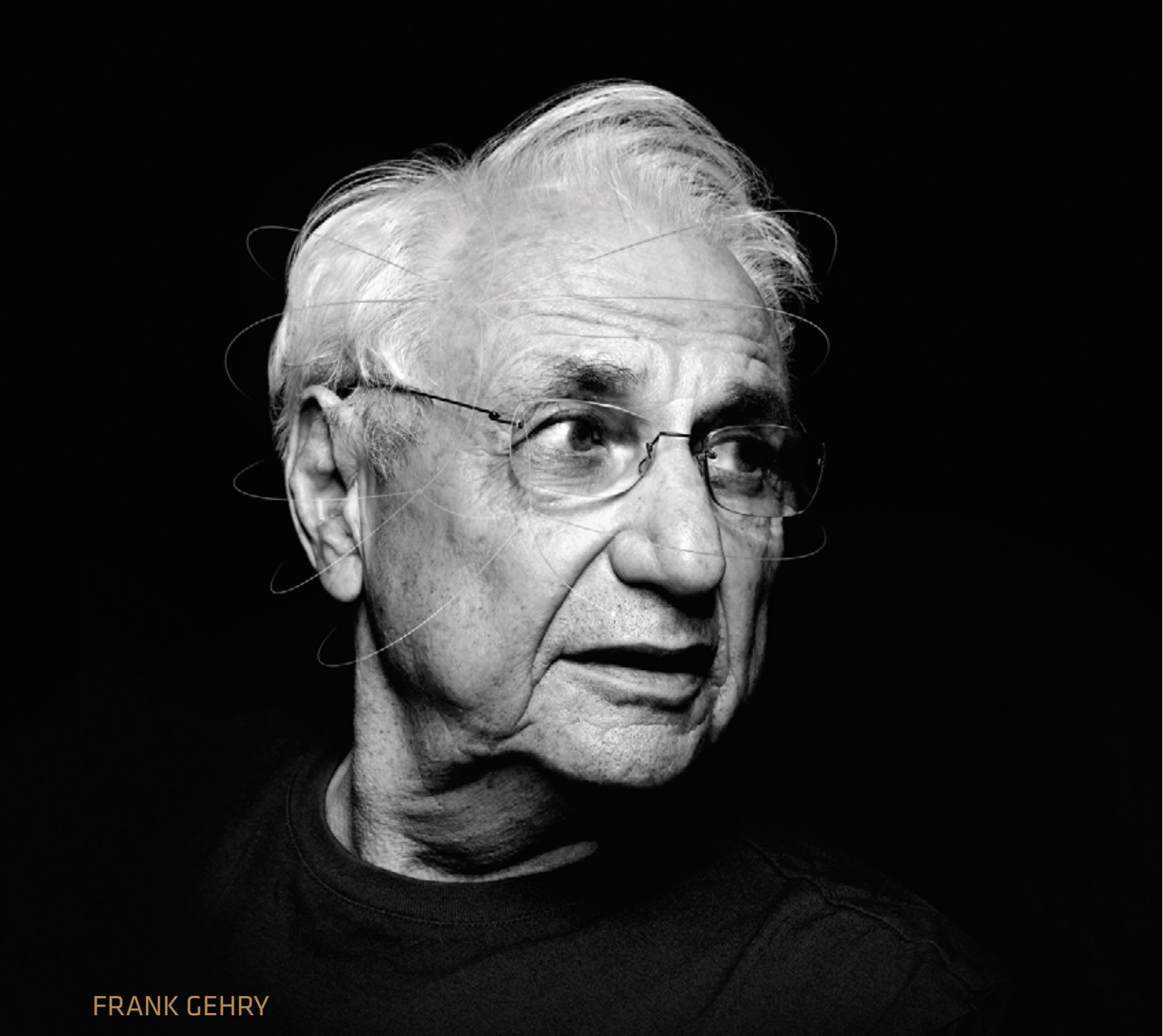
Panasonic's Global Communications Suite is being installed across Gulf Air's entire fleet progressively.

Alsalam signs new Aramco contract

Alsalam Aircraft Company has signed a new maintenance contract with Saudi Aramco for Boeing 737NG aircraft.

Alsalam counts Aramco among its major customers in Saudi Arabia, along with other key customers including Saudi Arabian Airlines, Royal Saudi Air Forces and National Air Services.

Alsalam is also the only designated warranty centre for Boeing Business Jets in the MENA region.



FRANK GEHRY

GLOBAL CREATIVITY

Few creative artists become legends in their own time. Among the exceptions is architect Frank Gehry, whose free-form masterpieces mark the globe. Without overstatement, his buildings have become as renowned as the people, performers and collections within. As enduring as Gehry's architectural legacy are the medical advancements made by the Hereditary Disease Foundation. His participation as a leading board member has helped the organization raise over fifty million dollars to support pioneering genetic research.

In appreciation of Frank Gehry's boundless creativity, Bombardier is proud to contribute to the Hereditary Disease Foundation.

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BOMBARDIER

Rolls-Royce exits IAE partnership

Rolls-Royce has agreed to partner Pratt & Whitney in developing engines for the future single-aisle aircraft from Airbus and Boeing and at the same time to sell its shareholding in International Aero Engines (IAE) to P&W, its former partner in the consortium.

IAE manufactures the V2500 engine used worldwide on Airbus narrow-bodies. It is a consortium created in 1983 by Rolls-Royce and Pratt & Whitney, along with German and Japanese partners to provide a four-nation alternative to CFM International.

The deal is estimated at $1.5billion.

ATR rewrites the record books

ATR is boasting a record 145 firm aircraft orders and an additional 72 options since the beginning of the year, with the European manufacturer claiming an 80% share of this year's regional aircraft market.

The value of these turboprop orders is estimated at $3.2 billion ($4.8 billion including the options), easily beating last year's previous record sales of 113 firm orders and 26 options).

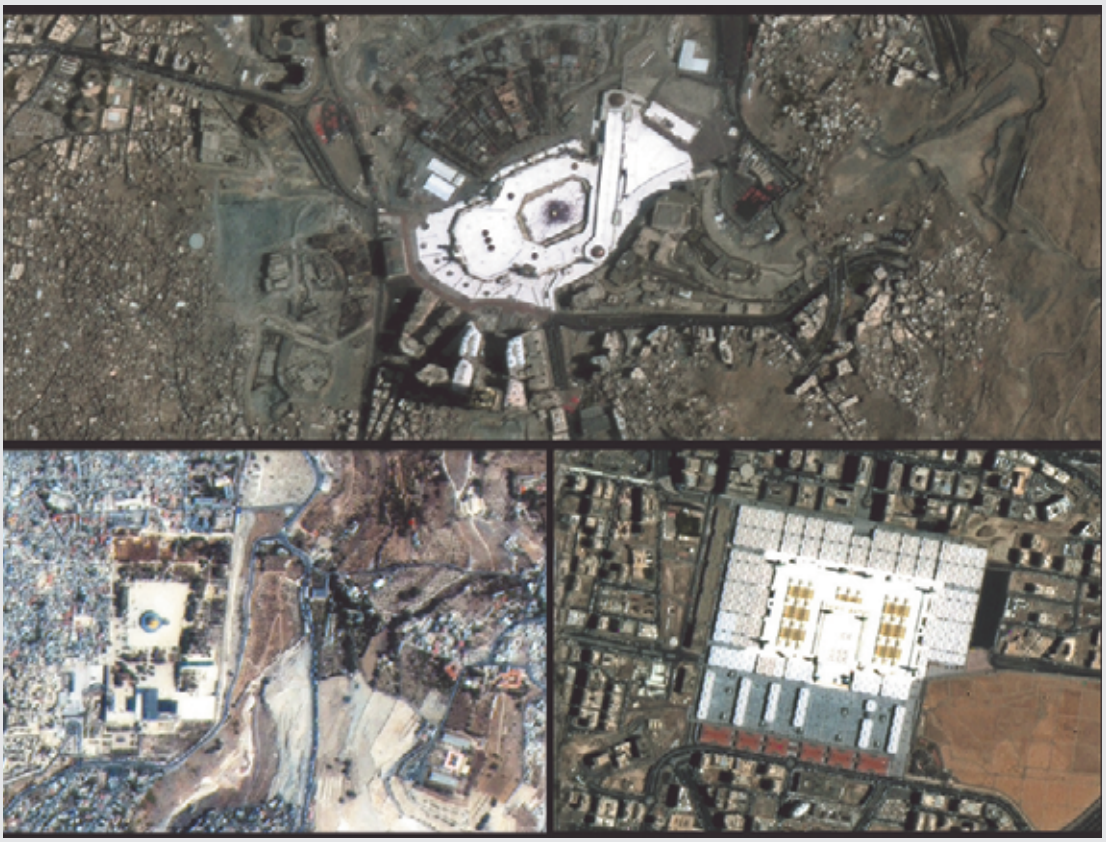
Iran goes-it-alone on MRO network

A senior official at the Iranian Aviation Organisation (IAO) has claimed the country has developed its own MRO network to ensure maintenance is continued on the country's ageing fleet while sanctions remain.

Speaking to the official FARS news agency, Mostafa Haqiqatjou director-general of the IAO's Office for Engineering and Flight Capability, said that the repairing process of different types of Airbus, Boeing and Fokker aircraft are currently under way inside the country.

"Right now, the detailed checking procedures of Airbus 310, 320, as well as the repair and maintenance of Airbus 300-600, are being conducted inside the country," Haqiqatjou said. "More than 95% of the repair and maintenance of our light planes and choppers is also being done inside the country," he added.

The move to create a domestic self-sustained MRO business has been under way for some time.



DubaiSat-1 captures images of Holy cities

DubaiSat-1, the UAE-owned and operated Earth observation satellite, has relayed images of the Holy cities of Mecca, Medina and Al Quds from outer space.

The pan-sharpened, multi-spectral images show the Grand Mosque in Mecca, the Prophet's Mosque in Medina and the Al-Aqsa Mosque in Al Quds.

The high spatial resolution images relayed by DubaiSat-1 are a valuable resource in infrastructure planning and development. The satellite images complement existing geographic information system databases and enable more efficient monitoring of environmental changes and natural hazards, in addition to identifying water quality in the Gulf.

Simulation stimulation for youngsters

Jordan Airline Training & Simulation (JATS) is the latest aerospace company to buy into the concept of introducing young people to the world of aerospace.

Final-year Madrasati students from two Mafraq high schools visited JATS at its premises at Queen Alia International Airport to hear about the training procedure every pilot, cabin crew and maintenance crew member has to undertake to keep their aviation licenses updated and in compliance with their respective civil aviation regulatory requirements.

Then the students witnessed a simulated live land and water plane ditching emergency evacuation and a practical economy class service application in JATS' in-flight safety department. They also piloted one of JATS' six simulators.

"It is a privilege to open JATS' doors to these students and to make a small contribution in exposing them to the aviation industry which, hopefully, might be of great value for them later in their life," said JATS general manager Amer Fakhoury.

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BOMBARDIER

ARINC aids airports' border controls

ARINC has announced the launch of its new intelligence-led border management system by its Europe, Middle East and Africa office. The system will enable state border agencies to cost-effectively manage security risks and facilitate the flow of passengers through airports and other border checkpoints. It will protect their borders against a range of threats, from terrorism to organised crime and illegal immigration.

Rapiscan supplies baggage security

The UK's Rapiscan Systems has been awarded a $3 million contract to provide state-of-the-art baggage, parcel and checkpoint inspection systems to an unnamed international airport in the Middle East region.

The systems include Rapiscan's high-speed explosives detection system, which is capable of screening up to 1,500 bags per hour and features advanced matrixing and networking capabilities.

Airbus Corporate Jet Centre boost

Airbus Corporate Jet Centre (ACJC) has been given a double boost from the Middle East with orders from Oman and Saudi Arabia.

The aircraft completions and MRO specialist has been selected by the Ministry of Defence of the Sultanate of Oman for the maintenance of the Royal Air Force of Oman (RAFO) ACJ320 fleet from 2011-2013. The contract includes C-checks for RAFO's aircraft fleet.

Meanwhile, the company has signed VVIP cabin completion contracts for the two Airbus ACJ319s ordered by Aviation Link Company (ALC) of Saudi Arabia at NBAA last month.

These two VVIP cabins will feature the highest level of comfort and the latest available communication and IFE systems including SatTV, Wi-Fi and iPad remote controls.

"ACJC is very well known to us through several projects over the past years" said Abdulaziz Al Rowaished, president and CEO of Aviation Link. "Major worldwide completion centres with a worldwide reputation in the market were invited to bid," he said. Aviation Link will become the largest operator of Airbus corporate jets in the Middle East when it takes delivery next year.

Iran needs $5 billion to modernise fleet

Iran needs $5 billion to purchase planes and navigation equipment, according to Iranian parliamentary member Mehrdad Lahouti.

"Of the 215 aircraft that form the fleet, 150 will have to be retired in the coming five years," Lahouti said. "To replace these with planes built in 2000, Iran will need to allocate $4 billion to buy aircraft and $1 billion for navigation equipment."

Lahouti added that the average age of Iran's passenger planes needed to be decreased from more than 22 years to 15 years.

Dubai Airports seeks brands for A380 hub

As the project to build the world's largest airside facility dedicated to the Airbus A380 continues on track at Dubai International, Dubai Airports is reaching out to world class food and beverage operators and service providers to submit expressions of interest for providing services at the upcoming Concourse 3.

Eugene Barry, vice president – commercial, Dubai Airports said: "The available brand concepts and calibre of services at our airports have to match, and even exceed, trising expectations of an increasingly international clientele.

"Our experience and success at Concourse 1 and 2 are the result of a similar customer-centric approach, but Concourse 3 gives us a blank canvas that will help us set a new and higher standard."

Maximus takes first Airbus freighter

Abu Dhabi-based Maximus Air Cargo has taken delivery of the first of three new Airbus A300-600RP2F aircraft freighters, representing the first phase of an $100 million expansion programme by the company.

The 46 tonnes maximum payload capacity plane has a non-stop range of 2,650nm at maximum payload and offers greater fuel efficiency than the older versions of the A300.

At a ceremony in Dresden, Germany, Maximus Air Cargo president and CEO, Fathi Hilal Buhazza, said: "The new aircraft will become a key part of our fleet. It is expected to make a major contribution to building the strength and network of our business," said Buhazza.

"The additional capacity will help us significantly expand our footprint in emerging markets such as Asia and Africa, as well as enhancing our worldwide charter services."

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DREAM TIME

Middle East queuing up for the world's breakthrough aircraft

As the first Boeing 787 Dreamliner enters service in Japan, Middle East airlines are waiting eagerly for their place on the production line.

Saj Ahmad *looks at the new Boeing wide-body and analyses the type's impact on the region's fleet.*

Now that the initial variant of the 787 Dreamliner, the 787-8, has been certified, all eyes turn to Boeing's efforts to ramp up production and get the aircraft to customers as quickly as possible.

And, while no one region is more important than another, the Middle East is eagerly awaiting this revolutionary all-new airliner.

With nine Arabian airlines and lessors from eight countries in the GCC placing combined orders for a total of 125 Boeing 787-8s and 787-9s, this represents just over 15% of Boeing's entire backlog for the 787 family.

IATA recently reported traffic figures for July 2011 and, yet again, the GCC stood out as the fastest growing region in the world, seeing a 9.7% rise in demand. This far outstripped the 8.9% rise in system-wide capacity and load factors remained resilient at 81%.

In a sign of continued buoyant demand second only to growth in Latin America, the Middle East saw a huge 9.7% rise in year-on-year revenue passenger kilometres flown (RPKs). The Middle East led the world's growth in freight tonne kilometres (FTKs) with an 8.4% rise year-on-year while IATA noted "airlines in the Asia-Pacific and Africa regions have seen the size of their air freight businesses decline".

While the woes of the 787's painful birth have been well documented since its public debut back in July 2007, the effect of the repeated delays on its customer base has been profound.

Delays have been met with compensation, additional new capacity coming in the form of 777s and Airbus aircraft funded through Boeing's financial redress to airlines.

The focus of the aerospace world now, however, is firmly on how Boeing aims to reach its intended production goal of churning out ten 787s a month by the end of 2013.

Alongside that industrial challenge lies the inauguration of Boeing's first all-new production facility in Charleston, South Carolina, which plans to build three 787s a month, while the Everett plant in Washington will produce the balance across the main line and a planned surge line in the now vacated section of the 767 factory.

Boeing seems to have turned a corner with the 787 programme in one key way. With certification and flight test efforts now at an end for the Rolls-Royce Trent 1000-powered 787-8 that entered service with All Nippon Airways in October 2011, the airframer is also close

Continued on Page 22

CONTINUED FROM PAGE 21

to completing certification efforts for the General Electric GEnx-1B engine too.

Of the announced engine selections so far, the majority of the Middle Eastern airlines that have ordered the 787 family have opted for the GEnx-1B engine with only LCAL, the Dubai-based aircraft leasing company, electing to go with the Trent 1000.

Much has been made about the swathes of orders from Arabian airlines over the last decade, with many observers claiming that over-ordering and riding too high on a wave of confidence and unsustainable demand would see Airbus and Boeing eventually lose many jets from their backlogs.

These critics have not only been proven wrong, but their short-sightedness in their analysis of the region underpins just why the 787, in particular, will be a big hit with airlines and passengers alike.

Fundamentally, the Arabian Peninsula stretching from the west horn of Northern Africa to the sands of Oman in the East, is one that is unlike any other region of the world. Where other areas like Europe and the United States, for example, have airlines that continue to operate some of the oldest, least efficient airplanes in the world, irrespective of whether they are wide-body or narrow-body, the Middle East has very few, if any, of such inventory that needs replacing.

Middle East airlines swooped quickly to secure 787 positions primarily because they want to expand and grow their businesses. The litany of orders across the Airbus and Boeing portfolios in recent years is earmarked to cater for the shift of international traffic that is surging through key hubs like Dubai, Abu Dhabi, Manama, Amman and other rapid growing cities for one-stop connections to practically anywhere on the face of the planet.

So why is it that the 787 has found so much success in the region?

Analysing every Arab airline, their requirements and business rationale for procuring the 787 is endless but, in summary, the 787 provides not just the benefit of 20% lower fuel costs and lower maintenance costs, thereby allowing more flying time than spent on the ground in overhaul, but also brings with it the capability to open up routes almost 8,000nm away.

Those sort of extreme routes have thus far been either relegated to other more expensive airliners like the 777 family, or have involved airlines breaking up the route with stops along the way.

That will be history as the 787 allows Middle Eastern airlines to open up direct non-stop routes to places in the United States across both the Western and Eastern seaboards, while giving passengers higher humidity levels to reduce jet lag and tiredness – all without the need to carry more passengers to make flights profitable.

Bigger stablemate

With the 787-8 optimised to carry between 200-250 passengers and its bigger stablemate, the 787-9, pitched to cater for 250-290 passengers, both models are not only complementary for the mode of operation, they allow Middle Eastern airlines to expand their operational footprint beyond the GCC. For some, expansion beyond GCC will be for the first time in their history – particularly in the case of Iraq.

The other critical element here is the GCC and Arabian region itself. A quick glance at a map and you can see that the region is home to over one third of the Earth's entire population. A five-hour flight radius from literally any GCC city puts that footprint at almost 2.75 billion people. That's a massive market in its own right. Critics who suggest Arabian airlines have gone overboard with aircraft orders never seem to grasp the size of the market here.

Many airlines are using the transit-traffic business model to great effect through their key hubs to provide one-stop connections anywhere in the world and this model is highlighted aptly by Emirates, Etihad Airways and Qatar Airways. For the latter two airlines that have 787s, they can use them at very long ranges with far lower seat and trip costs compared to any wide-body in service today.

Of course, the delays to the 787 programme have hurt their expansion plans and their plans to retire and withdraw older aircraft. Qatar Airways, for example, has made no secret of both its frustrations at the 787 being delayed repeatedly and its desire to convert its Airbus A330s into freighters and supplement its growing cargo business (as has recently been witnessed with its sizeable stake in Cargolux, the launch customer for the Boeing 747-8F).

Without singling out any of the airlines, there is one similarity that they all possess with their 787 procurement.

Much of current and planned route network expansion is aimed at leveraging the versatility of the 787 family. Of the two biggest Arab customers, Qatar Airways (30x 787-8s) and Etihad Airways (31x 787-9s), both will be using the types to replace ageing Airbus A330-200s and A330-300s currently deployed on routes to Europe. Both airlines are also customers of the Airbus A380-800, but while they have elected to defer deliveries and have no plans to match Emirates' orders for 90 A380s, both Qatar Airways and Etihad Airways aim to use the 787s to high yield destinations (such as Manchester or London Heathrow, for example) where they can maximise revenues while slashing costs and still make use of the generous cargo hold to fly freight without the need to buy even more dedicated freighters.

Another aspect of why the 787 stands out for Middle Eastern carriers is their desire to operate fuel efficient aircraft that need less labour-intensive maintenance and overhaul. Carriers like Royal Jordanian Airlines have made the move to join the oneworld alliance, partners in that grouping like British Airways and Qantas also have 787s on order and they hope to hone in on synergies with a common fleet and allow maintenance in other hubs as and when the need arises.

Given that the 787 Dreamliner is such a radical technological departure, being able to synchronise fleet operations with partners makes code-sharing activities and passenger connections that much more fluid and stress free, particularly in an age where the emphasis on security checks at airports always seems to be the one facet of a journey most passengers get delayed by and loathe.

For Boeing, the other aspect of the 787 that makes so much sense is the foray by lessors to step in and acquire such an advanced aircraft. Despite Dubai-based LCAL reducing its 787 orders, it still has five booked and plans to up its commitments once initial deliveries commence.

ALAFCO, however, is a different kettle of fish. Having successfully thrashed out a deal with Kuwait Airways in 2007 only to have the airline drop its planned lease deal, ALAFCO went on to

Boeing 787 family orders through July 2011 from Arab/Middle Eastern Customers

Customer Name	Country	Model	Engine	Order Date	Total
LCAL	UNITED ARAB EMIRATES	787-8	RR	16-May-05	5
Royal Air Maroc	MOROCCO	787-8	GE	29-Nov-05	4
ALAFCO	KUWAIT	787-8	GE	26-Sep-06	2
ALAFCO	KUWAIT	787-8	GE	14-Mar-07	2
Royal Jordanian	JORDAN	787-8	GE	30-Mar-07	2
Qatar Airways	QATAR	787-8	GE	5-Apr-07	30
ALAFCO	KUWAIT	787-8	GE	6-Jul-07	10
Royal Jordanian	JORDAN	787-8	GE	11-Nov-07	2
Gulf Air	BAHRAIN	787-8	TBC*	18-Jan-08	8
Etihad Airways	UNITED ARAB EMIRATES	787-9	GE	10-Mar-08	31
Gulf Air	BAHRAIN	787-8	TBC*	14-Apr-09	8
Republic of Iraq	IRAQ	787-8	TBC*	22-Dec-09	10
Royal Jordanian	JORDAN	787-8	GE	17-Jun-10	3
Saudi Arabian Airlines	SAUDI ARABIA	787-9	TBC*	4-Nov-10	8
Total					125

secure a deal with Oman Air for six 787-8s with deliveries due to commence in 2014.

With the advent of Islamic sources of funding taking more of a prominent role in the Middle East as an alternative to non-Sharia-compliant financing, ALAFCO will not be short of takers for the 787 from within the GCC. With its recent expansion plans to market itself as a lessor for other airlines, instead of the usual leasing agents like ILFC and GECAS, ALAFCO can boast the most modern airplanes in its inventory and charge a premium for these too.

Equally, the delays to the 787 over the past three years has forced airlines into rethinking their growth strategies because they won't have as many in service due to the knock-on effects in production. To that end, ALAFCO is poised to find that its early slots for the 787 will quickly disappear as airlines look to lessors to get more capacity. While there may be a degree of reticence from non-GCC airlines to approach ALAFCO to take these 787s, Middle Eastern airlines will not think twice.

In the way that the Middle East region has fewer ageing airplanes to replace, maturity of leasing companies here will take some time. That means opportunities for new players in the lease business. Carriers like Emirates and Egyptair are prime candidates and, while the former has significant orders for the rival Airbus A350XWB family, there is still ample opportunity for Boeing to secure 787 orders with the Dubai-based leviathan – especially if the planned launch of the stretched 787-10 occurs within the next 12 months. Emirates has been pretty vocal about wanting a bigger 787 model in contrast to the 787-9.

For Boeing, the strategic importance of the 787 Dreamliner family cannot be understated. Some airlines waiting for the 787 will end up seeing their deliveries pushed well beyond 2016. With the 787-8 and 787-9 sold out largely until the start of the next decade, Boeing now has other huge hurdles ahead of it.

With the August 26, 2011 formal certification from the FAA and EASA for the Rolls-Royce Trent 1000-powered 787-8, Boeing has yet more to do. Not only does it have to complete certification for the General Electric GEnx-1B engine, it also has to finalise the stretched 787-9, start its assembly and flight-testing and achieve certification by late 2013. In the background the diverse, fractured and troublesome supply chain across the globe has to simultaneously coalesce and converge their manufacturing processes if Boeing aims to achieve its stated goal of producing ten 787s a month.

This would be a record wide-body output for Boeing and, with a backlog of more than 800 aircraft to deliver to some 50-plus customers, demand will not be slowing down anytime soon. If anything, once the first few airlines start using the 787 and see just how fuel efficient it is and how well it performs in routine airline operations, that demand will start to swell again and it is entirely feasible that Boeing has total orders and options for close to 3,000 787s by the end of the decade – there are thousands of 747s, 757s, 767s, early-build 777s, A330s and A340s that need replacing and with fuel costs now making up the bulk of an airline's cost base, the drive for fuel efficiency as well as lowering operational costs is as urgent as ever.

Mind-boggling

The numbers for the 787 are mind-boggling but the reality is that it embodies the future, not just for Boeing but also for airlines.

To break the mould of the last 60 years in the way that airliners are made has not come cheap for Boeing. Switching to carbon-composite materials as a primary structure for a commercial airframe was totally unheard of until the 787 emerged. Coupled with three years' worth of delays and billions of dollars paid out in compensation to airlines as a result of not being able to deploy, Boeing is far from out of the woods.

The programme is laden with production and integration risks, especially as it gears up to increase production across the globe with partners such as Sprit AeroSystems and Alenia. While Boeing never discusses programme costs or break even numbers, the 787 programme teeters perilously close to a forward loss position. In short, Boeing would have to produce more 787s in order for the programme to become profitable.

For now, the cost of the 787 programme, including compensation to customers, is likely to be within the $10 billion-$15 billion bracket, if not more. Taking such costs into account and the near-zero margin deliveries it will assume on early-build 787s, the real turnaround for the programme may not be realised for some years to come – particularly as the costs for the 787-9 have also yet to be factored in as well.

Industry analysts predict that Boeing may have to produce around 1,000 units before the programme breaks even. That estimate has the sentiments of a bearish outlook, on the basis that the 787-9 is significantly delayed and the ten-per-month production target by 2013 is missed by a wide margin.

If Boeing can get close to that monthly target and avoid lengthy delays to the 787-9, there's no reason why the programme, which carries a higher overall sticker price per unit even after assumed discounts, cannot break even based on the current 827 orders it has amassed to date.

Boeing's focus now has to be on achieving and then sustaining deliveries. In a duopoly industry powered by itself and Airbus, Middle Eastern airlines do not have a third way.

Their aggressive expansion is limited only by the supply of the aircrafts they need to augment the growth in the businesses and continue to defy those who believe the region is over-committing itself.

The airlines may have had to curtail their expansion plans as a result of the delays to the 787, but it is the 787 itself that that will propel them not just further and wider on to the world stage, but it will put them ahead of other industry rivals that have been slow to adapt to the changing nature of the aviation industry.

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On September 26 Boeing delivered its first 787 Dreamliner to Japanese launch customer All Nippon Airways (ANA)… around 40 months late. Every airliner in history has been manufactured thanks to an extensive network of component designers and makers – the supply chain. But Boeing took the term 'supply chain' to a completely different level and the result was a nightmare of monumental proportions. **Geoff Thomas** *reports.*

Is the Dreamliner nightmare finally over for Boeing?

With the benefit of 20-20 hindsight, there are undoubtedly many people sitting in Boeing's offices in Chicago and Seattle who would do things differently on the Dreamliner project, given half a chance.

Since time immemorial, airliners have been built thanks to a wide range of suppliers, sub-contractors and partners. But the OEM has largely been responsible for the final assembly of a plethora of relatively small components and sub-assemblies into the finished article.

The trend, though, over the past couple of decades has been for OEMs like Boeing and Airbus to sub-contract the production of larger and more complex parts of their airliners to outside specialists before transporting huge sections to a final assembly hall.

With its Dreamliner, Boeing took sub-contracting and supply chain into a different sphere altogether.

When Boeing abandoned its proposed Sonic Cruiser nearly a decade ago and announced that it was, instead, going to design and build a conventional-looking – but very different under the (plastic) skin – airliner, the aerospace world sat up and took notice.

Despite delays, Europe's Airbus organisation was already well advanced with its A380 twin-deck 'super jumbo' airliner and Boeing seemed confident that it could design and build its newly-dubbed Dreamliner ready for delivery in May 2008.

Right from the start, the Dreamliner was intended to be produced by a team of worldwide suppliers from Japan to France, from Italy to Korea, from the USA to the UK… and many more besides. Boeing always intended its first third-generation jet airliner to be something very special indeed and the jury is still out on whether it will perform reliably, efficiently and cost-effectively now it has entered airline service.

What's pretty certain is that it will only use 30% of the fuel that the company's first jet airliner, the Boeing 707 of the 1950s, burned to do the same job. And in today's world, where the cost of fuel is massively important to airlines and their financially hard-pressed passengers (and also to environmentalists who have convinced politicians that commercial aviation is an industry well-worth persecuting because it's a relatively soft target) burning less of it is crucial.

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Boeing also decided early on that the Dreamliner would be an 'all-electric' aircraft. In other words, unlike all other turbofan-powered airliners around the globe, it would not use 'bleed air' from its engines' compressors to power any systems, including the cabin air supply, pressurisation and air conditioning.

In terms of manufacturing, Boeing claimed that its Dreamliner would be built faster, better and cheaper than any previous airliner and that it would also push the limits on the utilisation of composite materials and electrical systems.

The media soon started calling the Dreamliner the world's first 'plastic airliner'. And although this wasn't strictly true, the proportion of composite materials in the airframe is, indeed, far greater than on any previous airliner of any size – let alone a twin-aisle intercontinental people carrier.

The delays and myriad problems already experienced certainly mean that it hasn't been built faster or cheaper, at least so far. Boeing concedes that it intends to deliver ten 787s a month by the end of 2013. But, despite an order book currently standing at 821 airframes, estimates from respected business analysts Bernstein Research indicate that the Dreamliner may not be profitable until around 1,000 airframes have been sold.

Better fuel efficiency

Seldom has an aircraft been marketed as being 'better' in so many different ways. Boeing says that the Dreamliner will feature better fuel efficiency from its interchangeable Rolls-Royce Trent 1000 and General Electric GEnx engines; a better in-flight experience for passengers with larger windows, more storage and improved pressure and humidity; better maintenance intervals; and a better flying aircraft for pilots.

Its first revenue service, using the airframe delivered on September 26, will begin operations between Tokyo's Haneda airport, Okayama and Hiroshima on November 1 and nobody will be watching more closely how it's received by the public than the occupants of those offices in Chicago and Seattle… along with the 'members of the team' or the truly gigantic supply chain network.

Proving that nice dreams can indeed become nightmares and then sometimes return to pleasant dreams again, one only has to examine the chequered history of Boeing's 787. There have been strikes, design glitches, component failures, a shortage of specialised fasteners, manufacturing misunderstandings, an in-flight fire, an engine test-bench explosion… and that's by no means an exhaustive list.

Back in 2007 Boeing experienced a shortage of nuts and bolts used to assemble the Dreamliner. These specialised fasteners were in short supply as a direct result of 9/11, when the reduction of worldwide airliner production resulted in key manufacturers cutting their workforces.

And so there were delays on top of delays and the supply chain started to show signs of stress and strain as companies became more and more restless with the levels of investment that they had already committed to the project.

Boeing's innovative approach regarding supply chain flexibility – supposedly in order to improve the manufacturing operations – was a key issue in some of the problems it faced. Although designed to enhance the whole process, finding the right balance between outsourcing and maintaining operations in-house is crucial because swapping 'control' for 'flexibility' in this instance hasn't worked as well as the company intended. Maybe Boeing should have kept more critical supply-chain operations in-house, especially as the 'command and control' centre appeared to be lacking in some respects, particularly in the early days.

Right from the start, Boeing made the decision to outsource 60% of the design and production – a radical move just as important as the aluminium-to-plastic switch for the main structures.

Boeing contracted with more than 50 suppliers, 28 of them outside the USA. Initially, the move was lauded as visionary and brilliant with investment costs in

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Who's working on what

Company/Business Unit	Main location	Work undertaken
Boeing Commercial Airplanes	Washington	Airframe development, integration, final assembly, programme leadership
Alenia Aeronautica	Italy	Horizontal stabiliser, centre fuselage
Boeing Charleston (announced as Vought Aircraft Industries Nov. 2003)	South Carolina	Aft fuselage
Boeing Fabrication	Washington, Canada, Australia	Vertical tail assembly, movable trailing edges, wing-to-body fairing, interiors
Spirit Aerosystems Inc. (announced as Boeing-Wichita Nov 2003; Apr 2004)	Kansas, Oklahoma	Fixed and movable leading edges, flight deck, part of forward fuselage, engine pylons
Fuji Heavy Industries	Japan	Centre wing box, integration of the centre wing box with the main landing gear wheel well
Kawasaki Heavy Industries	Japan	Main landing gear wheel well, main wing fixed trailing edge, part of forward fuselage
Mitsubishi Heavy Industries	Japan	Wing box
Hamilton Sundstrand	Connecticut	APU, environmental control system, remote power distribution units, electrical power generating and start system, primary power distribution, nitrogen generation, ram air turbine emergency power system, electric motor hydraulic pump subsystem
Rockwell Collins	Iowa	Displays, communications/ surveillance systems, pilot control system
Honeywell	Arizona	Navigation, maintenance/crew information systems, flight control electronics, exterior lighting
GE Aviation (formerly Smiths Aerospace)	United Kingdom	Common core system, landing gear actuation and control system, high lift actuation system
Goodrich	North Carolina	Fuel quantity indicating system, nacelles, proximity sensing system, electric brakes, exterior lighting, cargo handling system
Messier-Dowty	France	Landing gear structure
Dassault Systèmes	France	Global collaboration tools/software
Boeing Interiors	Washington	Interior
Eaton Aerospace (formerly FR-HiTemp)	United Kingdom	Pumps and valves
Rolls-Royce	United Kingdom	Engines
General Electric	Ohio	Engines
Boeing Propulsion Systems Division	Washington	Propulsion systems engineering and procurement services
Moog Inc	New York	Flight control actuators
Kidde Technologies	North Carolina	Fire protection system
Toray Industries	Washington	Pre-preg composites
Thales	France	Electrical power conversion, integrated standby flight display, in-flight entertainment system
Labinal	France	Wiring
Parker Hannifin	Ohio	Hydraulic subsystem
Messier-Bugatti	France	Electric brakes
Latecoere	France	Passenger doors
Monogram Systems	California	Water and waste system
Air Cruisers	New Jersey	Escape slides
Delmia Corp.	Michigan	Software
Intercim	Minnesota	Software
Panasonic	Japan	Cabin services system, in-flight entertainment system
Bridgestone	Japan	Tyres
Ultra Electronics Holdings	United Kingdom	Wing ice protection system
GKN Aerospace	United Kingdom	Composite mat for the wing ice protection system
Korry Electronics	Washington	Flight-deck control panels
Ipeco	United Kingdom	Flight-deck seats
Diehl Luftfahrt Elektronik	Germany	Main cabin lighting
Jamco	Japan	Lavatories, flight deck interiors, flight deck door and bulkhead assembly, galleys
C&D Zodiac	Washington	Sidewalls, window reveals, cargo linings, door linings and door surrounds
Securaplane	Arizona	Wireless emergency lighting system
Donaldson Company, Inc.	Minnesota	Air purification system
Astronautics Corp. of America	Wisconsin	Electronic flight bag (EFB)
CTT Systems	Sweden	Zonal drying system
PFW	Germany	Metallic tubing and ducting
Saab Aerostructures	Sweden	Large cargo doors, bulk cargo doors and access doors
Korean Airlines - Aerospace Division	Korea	Raked wing tips for the 787-8
PPG Aerospace	Alabama	Electro-chromic windows
Vought Aircraft Industries	Texas	Longerons, stringers, shear- ties, and frame assemblies

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tooling and inventories being moved upstream – seemingly reducing risk to Boeing. In the early Dreamliner supply chain model, Boeing functioned purely as the final assembler and integrator. Supply chain and logistics information needed to be synchronised across multiple partners so that key components arrived at the company's Everett, WA, facility at just the right time for final assembly over a three-day period.

The bad news began early in the process, beginning with the announcement that fastener companies could not supply them quickly enough to meet early production demand. Then the bad news kept on coming.

Delays at a wide variety of worldwide plants simply compounded the challenges faced, while design issues around the areas where the wings attach to the fuselage had to be addressed urgently, as did other problems with the composite skin on parts of the fuselage.

Weight gain

Some of these design changes resulted in a weight gain (the airliner that weighs what the designers originally intended doesn't exist) and customers started to fret about range and take-off weight.

By the end of the first decade of the new millennium, what many people suspected was confirmed by Boeing's chairman, president and CEO Jim McNerney. Speaking on CNBC, he said that the company "may have extended the delayed 787 Dreamliner's supply chain too far and delegated too much engineering to other companies".

He continued: "The 787 was a bridge too far on a horizontal supply chain across too many time zones with too much engineering delegated to others. We need to get our feet underneath us as we go forward on that airplane and on subsequent developments."

The original plan was to have delivered more than 100 Dreamliners by the end of 2009. Instead, the company has around 30 partly-finished airframes dotted around airfields near its factory in Seattle, thus tying up more than US$16 billion.

And what of the sub-contractors in the supply chain? Depending on their contracts, many won't be paid until Boeing sees money in the bank for finished aircraft. That, so far, has been a long wait for some companies.

So September 26 was an important date for many people working in aerospace companies around the globe. More than 500 employees representing the 787 programme walked alongside the Dreamliner to present it to ANA executives as a crowd of thousands looked on.

"Today we celebrate a significant moment in the history of flight," said McNerney. "The 787 Dreamliner is the biggest innovation in commercial aviation since the Boeing 707 introduced the world to passenger jet travel more than 50 years ago. I want to thank ANA and all the employees of Boeing and our partner companies for the talent, technology and teamwork that have brought this game-changing airplane to life."

Psyching out the human flying machine

The all-new commercial jetliner boasts the industry's largest windows, in-seat power and USB ports, lower cabin altitudes, cleaner air and an electronic light-dimming function integrated into each window: all of which are part of the standard model.

Company spokesperson Lori Gunter added: "Passengers will know they are on a 787 the minute they walk on board."

I see what she means.

The Gothic-style vaulted ceiling and integrated mood lighting that greets passengers in the entrance area creates a welcoming ambiance. The sky-blue lighting Boeing recommends for passenger arrival on to the aircraft is changeable to a plethora of colours appropriate to the different stages of the flying experience – from a warm red for meals to a comforting purple for night-time flying.

The extra comfort of the 787 aims to revivify travellers. Gunter added: "We have designed the Dreamliner so that passengers arrive at their destinations feeling more refreshed."

The 787's much-anticipated windows – 47cm tall and 28cm wide – are 30% larger than those featured in the 767, and the largest on any aircraft today. They are a key aspect of the Dreamliner experience, explained Tom Galantowitz, Boeing 787 interiors director: "The size and location of the windows gives a really remarkable view of the flight. One of the key aspects is that any passenger can see out of the windows."

A traditional engineering perspective would suggest that larger windows present a challenge to aircraft construction because the loads carried are easier to deal with if the fuselage has fewer, or smaller, cut-outs: like doors and windows. However, because the 787's fuselage is manufactured from advanced composite materials rather than simply aluminium, it can handle the loads of larger window cut-outs. The 787's large windows, of course, mean passengers have an enhanced view of the ethereal horizon beside them.

Bigger windows would also usually mean that more, brighter light would permeate the aircraft's internal space. But the light-dimming function in each window allows passengers to manipulate the level of shade they prefer while maintaining a view out.

"A traditional lighting system is pretty much off, dim or bright," explained Galantowitz. But the push-button dimming technology, he added: "Offers a full spectrum of options".

A notable improvement on other commercial aircraft is the cabin altitude of the Dreamliner, which determines interior air pressure. Studies conducted at Oklahoma State University showed that reduced cabin altitudes improve in-flight passenger comfort; the Boeing 787 team have reduced the typical cabin altitude from between 6,500 and 7,000ft, to 6,000.

Wide cabins offer spacious aisles in both business (65cm) and economy (55cm) class 787s. And the wide fuselage allows an economy seating arrangement of eight-abreast to contain seats of up to 47cm in width.

The Dreamliner's interior will be unique to each airline. For instance, the launch customer of the Dreamliner, All Nippon Airways (ANA), has installed lavatories that feature 'washlet' technology – a toilet seat fitted with a hot water washer. Such toilets are ubiquitous in Japanese domestics; hence the airline was keen to tailor the aircraft's interior to convey a unique Japanese flavour.

ANA Dreamliners also contain only two classes – business and economy. The capacity differs from 158 seats for ANA long-haul flights (46 business, 112 economy), to 222 for short-haul (42 business, 180 economy).

And the business-class furnishing also depends on the flight length. ANA's long-haul offers full-flat Simca Skylounge seats, while short-haul Dreamliners provide Simca's cradle-style seating units up front. Economy-class sees Simca's AIRgnomic FX seating units installed for both flight lengths.

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Fujairah's future full of Eastern promise

A new regional airline is due to begin services from Fujairah, the most easterly of the seven emirates, in the first quarter of 2012.

Jill Stockbridge *meets one of the men behind the new operation.*

Eastern Express is a private airline owned by three Emiratis and Captain Alex de Vos, president & CEO, who believes that the policy of small turboprop aircraft and flexible scheduling will be a formula for success.

De Vos has been in the region for some time. Formerly running a private charter company in Bahrain, he came to Fujairah working on the airport development project and established his company, Al Hajjar Aviation. Linking with local partners he has secured the financial backing, reportedly around $3.5 million (Dh12.86 million), to fund the leasing of the first aircraft and launch the airline.

"We are on track to be in the air in the first quarter of next year," he said. "We have recruited for our commercial section covering sales, business development, ticketing, reservations, marketing etc. On the operational side we are working with Abulhoul Aviation, which will be the AOC provider until Eastern Express has secured its own AOC. In the meantime, Abulhoul is taking care of the core operations of the company."

The airline plans to launch a twice-daily service to Abu Dhabi early next year using a 29-seater turboprop. The second, as yet unconfirmed, GCC destination is planned to follow shortly after.

De Vos explained: "Our business model sees us going to GCC destinations initially, then to 11 states in the eastern part of Africa and the sub-continent. We are a niche carrier. We are not going to compete with Ethihad, Emirates or even Air Arabia. We are a regional carrier connecting the hubs and feeding into the networks of established carriers, which has not been done here before.

Established carriers

Although the airline will be serving the same destinations as the established carriers in the region, Eastern Express's approach is completely different. "We are connecting the GCC on business friendly times. Flights to Abu Dhabi from Fujairah will run in the morning and the late afternoon, so you can do a one-day business trip," he said.

The comparison has been drawn between Eastern Express and recent start-up budget airlines in the region, but de Vos is quite adamant about the company's role.

"We are a low-cost regional airline, not a

Fujairah's Airport is currently dominated by training flights and charter flights but soon space on the apron could be taken up with its own regional airline.

Below: Alex de Vos

budget airline. We are going to operate turboprop aircraft on regional routes, rather than wide-bodied jets. As a consequence, we can reduce our fares to a certain extent. However, we are serving food on board, we are making facilities available at the airport, we are not charging for bags. If you forget the size of the aircraft, then we have a comparable product to a flag carrier, but at a lower ticket price."

At the time of going to press, the company was in final negotiations with three different aircraft suppliers but was unable to confirm either the aircraft type or the configuration. However, de Vos did confirm it would be one or two class only and would initially be wet leased.

"We need to be flexible with our equipment and the way to do that is to gauge the market on a wet leased aircraft. After six months we will have a fair amount of data about routes and passenger loads, which will allow us to project future figures. At that point we can decide on larger aircraft, additional aircraft, or even a smaller aircraft. The moment you go for dry lease, you are committed to five years and can put yourself out of business very quickly. We have to be reasonable with our expenses."

The operative word here is adaptable. As well as the scheduled timetable, Eastern Express expects to undertake charter work, either on a semi-scheduled basis or by demand for groups such as sports clubs and government bodies. The small-size aircraft makes it cost effective for groups of 15-20 passengers.

There have been questions raised in the past about the viability of Fujairah Airport for commercial flights. Gulf Air services were frequently delayed due to high winds and the surrounding natural obstacles.

Second passenger terminal

The airport is currently undergoing an overhaul, with a second passenger terminal, a new 3,000m parallel taxiway and control tower, and cargo village scheduled for completion by 2025.

For Eastern Express, the size of the aircraft also makes a difference. "There have been some major improvements with the operational aspects of the airport and they are continuously improving the facilities," said de Vos.

"There are talks in progress to have a dedicated approach over the mountains, but the biggest difference is that we are not operating heavy jets into the airport, which means our maximum allowable tailwind component is completely different. We can live with a quarter of the runway. I don't believe that there will be any on-time performance problems from that aspect from Fujairah Airport and the continuous improvements will only make it better for us and anyone else who wants to operate out of Fujairah."

As Europe reels from financial problems and recessions and the Arab Spring sends tremors around the Middle East, some would question the timing of the airline launch in a region seemingly already well served.

Said de Vos: "There is an abundance of resources available now. Not just human resources but also infrastructure, equipment and services provided when the GCC was at its peak in traffic terms.

"These services have been upgraded but are now no longer under the same level of stress. All of this helps us to keep our expenses down and at the same time the region is picking up again. It gives us good opportunities at reasonably low cost. It would have cost us twice as much two years ago."

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The range capabilities of the 777F allowed EK to operate Sydney to New York non-stop in 17.5 hours.

FREIGHT FANTASTIC

Airlines in the Middle East are driving sales for the new 777 freighter. As deliveries continue, **Keith Mwanalushi** *explores the operational benefits by talking to the carriers that use it.*

An air carrier's choice of aircraft would normally be guided by the utilisation anticipated; the load factors expected, environmental credentials and forward views on fuel costs.

In terms of freighters, largely due to their low acquisition costs, they are traditionally converted after a long career in the passenger market.

However, the gains derived from new generation freighters, their operating efficiencies and cost reducing technologies, has been enough to sway the major Middle East carriers.

In November 2005 Emirates (airline code EK) announced its order for eight 777Fs. They were part of the largest-ever order for the 777 family that included 24 777-300ERs and 10 777-200LRs with purchase rights for 20 additional 777s.

The first delivery to EK was made in March 2009. A second aircraft soon followed, a third is being delivered in August and the fourth aircraft is expected in February next year.

Since the 777F's debut into the fleet two years ago, Hiran Perera, senior vice president cargo planning & freighters, seems content. "We have been extremely pleased with the performance of the aircraft – its fuel efficiency, payload capabilities, reduced emissions and range. We were the second airline in the world to take delivery of the 777F."

Perera's views are echoed by Emirates' Ram Menen, divisional senior vice president for cargo, who praised the aircraft for having the longest-range capability of any twin-engine freighter. "It's also quieter and uses less fuel per tonne than other freighters – that is important. This freighter is part of our long-term investment for Emirates SkyCargo, and we are excited about its performance so far and the possibilities it brings," added Menen.

The 777F is based on its record-breaking sibling the 777-200LR, sharing common features such as the airframe, power plant and fuel capacity. It is the sixth and youngest member of the 777 family. Its development was in response to market demand for a more efficient, long range, and high capacity freighter.

Boeing launched the 777F programme in May 2005 and the first

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delivery was made to launch customer Air France in February 2009.

One of the key selling points of the 777F is the 4,900nm (9,070km) range – the longest reach by any twin-engine freighter. From the operators' perspective this translates into significant savings in terms of fewer stops and associated landing fees, leading to quicker delivery times of shipments.

Earlier this year EK's freight division operated its longest-ever non-stop flight using one of its 777Fs. Flight EK 4931 was a 17.5-hour flight from Sydney to New York carrying a valuable consignment of horses that were potentially worth more than the aircraft itself, according to the airline.

Showers of praise have also come from the top of the Emirates chain. Airline president Tim Clark said he was particularly impressed with the fact that: "its break-even is as low as it is and that it would bring down the operating cost by as much as 30%".

The MTOW for the 777F is 347,450kg with a revenue payload capability of 103.9 tonnes. The aircraft accommodates 27 standard pallets (244cm x 318cm) on the main deck, ten pallets in the lower cargo hold and 17m³ (600ft³) of additional bulk cargo.

Significant commitment

Qatar Airways has also made a significant commitment to the 777. "We currently have 25 in our fleet," said CEO Akbar Al Baker speaking at the recent Paris Air Show. "The aircraft's payload and range capability, reliability and economics have made it the backbone of our long-haul fleet.

"We are expanding our international network rapidly and adding new routes and destinations that will extend Qatar Airways' reach across the globe, especially as we aim to open up more non-stop routes to popular and under-served cities around the world," he added.

The airline used the Paris platform to announce an additional order for six more 777-300ERs valued at $1.7 billion at list prices.

The Qatar Airways 777 fleet includes eight 777-200LRs, 15 777-300ERs and two 777F with a third freighter arriving this year. "With a total of three new 777 freighters joining the fleet in a little over 12 months, the airline's dedicated cargo capacity will effectively quadruple in size," boasted Al Baker.

Qatar received its first 777F in May 2010 and since the arrival of the second aircraft they have been deployed on several of the company's dedicated freighter destinations including Amsterdam, Lahore, Dubai, Karachi, Chennai, Sialkot, Frankfurt, Amman and a thrice weekly freighter service to Hong Kong.

According to the airline, the strategy is to allow the 777Fs to be used primarily on long-haul routes connecting East and West transportation lanes, extending from Hong Kong in the Far East to Chicago in the US.

Earlier this year the Qatari airline launched dedicated 777F operations from Doha to Hanoi with the return leg routed via Hong Kong. This followed the launch of passenger flights to the Vietnamese capital in November 2010.

The 777F is the backbone of the Qatar Airways cargo fleet.

The appeal of the 777F has also attracted Etihad Crystal Cargo. The Abu Dhabi-based carrier took delivery of its first aircraft in June this year. It joined the somewhat competing – but smaller – 70 tonne capacity A330-200F that has been the flagship of the Etihad cargo fleet so far.

Kevin Knight, Etihad chief planning and strategy officer, who also leads the Crystal Cargo division, is excited about the latest addition to the fleet and expectations are high. "We expect the 777F to deliver exceptional value to us and to our customers. With its proven track record, long-range capabilities and excellent operating efficiencies, this aircraft will allow us to economically deliver cargo further than ever before. Our decision to invest in the 777F helps ensure that we are well positioned," he said.

EK operates five 747-400Fs with orders for 10 747-8Fs. A design feature of the 777F complements the 747 cargo operations with easy direct-transfer shipments. The main cargo door on the 777F is sized to allow easy interlining with the 747 freighter, with the capability to accommodate the transfer of 10ft high (3m) pallets between the two freighters.

Popular aircraft

In general terms the 777F is showing every sign of being a popular aircraft just like its passenger counterpart. In terms of capacity it fits into the size gap between the larger 747-400F (110 tonne payload) and the MD-11F (90 tonne payload), while beating both types in the range department – 4,400nm for the 747-400 and 4,000nm for the MD-11.

Boeing has achieved 20-25% improved fuel efficiency over the 747-400F and uses 18% less fuel than the MD-11F. The GE90 engine technology reduces emissions by 18%.

Despite its long-range capabilities the airliner has proved its flexibility on shorter sectors as Emirates' Perera indicated. "We deploy them mainly on our Dubai-Hong Kong route but we also use them on regional routes such as Erbil and Baghdad in the Middle East and Nairobi, Entebbe and Lilongwe in Africa," he said.

Boeing has incorporated cutting-edge technologies into the 777Fs design. These include a new handling system with built-in test equipment and a load alleviation system, which helps distribute the load on the aircraft while in-flight.

Perera confirmed that the cargo loading technology on the 777F is effective. "The cargo handling system is lightweight and efficient and has the capacity of handling heavy loads, including heavy 20ft pallets. It also has the unique capability of centre loaded – and locked – 20ft pallet positions. The on-board camera system facilitates easier opening and closing of the main deck cargo door, which increases operational efficiency," he said.

Lowest trip cost

Boeing claims that the 777F provides the lowest trip cost and tonne-mile economics of any large freighter. There is no doubt that the 777F has already proven itself to be the leader in delivering twin-engine efficiency and lower operating cost but that does not come cheap – with a unit cost of about $269.1 million. It is perhaps no accident that the Gulf airlines and FedEx have dominated sales so far.

Airlines are continually bombarded with possible cheaper alternatives such as a 747-400 conversion that might set you back around $55/60 million. Conversions from older 777 and A330 passenger aircraft are also expected to enter the market.

At EK, however, the 777F seems to be doing the job just nicely. Perera said the aircraft has achieved excellent dispatch reliability of more than 99%.

It looks evident that new generation freighters will continue to shape the future of the airline's freight operations – 15 new 747-8Fs are expected join the Dubai-based fleet by 2013 or 2014.

For now, however, it seems the 777F is the star attraction. Perera explained the winning formula behind the successful integration into the EK fleet. "Our decision to acquire 777Fs came about because 65% of Emirates' cargo travels on our passenger aircraft, the majority of which are 777s. The economies of scale that come with operating a fleet of a single aircraft type are simply unbeatable."

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Cabin crew uniform is often the first thing that distinguishes one airline from another in the minds of passengers and, therefore, is vital for carriers to get right. **Kelly Green** *looks at how airline fashion is changing.*

THE CUT OF THE CREW

Much of an airline's reputation is entrusted to the care of its cabin crew who, as the public face of the organisation, can leave a lasting impression on passengers in an increasingly competitive and crowded industry.

This impression is ever more significant in today's fast-growing market, at a time when the once-glamorous vision of air travel is clouded by security threats, long queues and delays.

Today, airlines are building their brands through memorable crew uniforms and clever marketing campaigns (using cabin crew as the main selling-point) and with so much of an airline's public image resting on its crew, it is unsurprising that over recent years it has become popular for airlines to commission the world's best fashion designers to create stylish staff uniforms.

Gulf Air's online recruitment page boasts that "Gulf Air has a legacy of service and style built on more than 55 years of Arabian hospitality." Eager to maintain its style legacy, the airline chose to celebrate its 40th anniversary back in 1990 by commissioning world-renowned fashion house Balenciaga to design a new light-blue and peach cabin crew uniform – a stark contrast to the brown and cream outfit that had been worn by the airline's flight crew for the previous 20 years.

In 2000, the airline introduced its current dark navy blue uniform, designed by another renowned fashion house – Balmain of Paris. This was intended to reflect the changing face of Gulf Air and the motto: "Smart Airline, Successful Business". Marcus Bernhardt, Gulf Air's chief services officer, said of the uniform: "It is a reflection of what Gulf Air is all about – the hallmark Arabian hospitality, warmth, presentation, progression, modernity and, above all, a corporate statement."

Royal Jordanian (RJ) also chose to mark its 40th anniversary with a new uniform for its cabin crew, announcing in 2003: "A very public part of the airline's image is the RJ cabin crew's uniform and this year, as part of its 40th anniversary celebrations, RJ decided it was time for a change."

This was not the first time that RJ had revamped its uniform. Between 1976 and 1982 Lebanese designer Papou Lahoud created the uniform for RJ pilots and stewardesses, for which she won IATA's 'best uniform design' award in 1986.

Royal Jordanian: elegant and distinguished.

An Italian designer took over the responsibility of RJ's uniforms for the next 20 years. However, unlike Gulf Air, RJ did not engage a celebrated fashion house to provide its new design in 2003 but, instead, chose to reflect its role as a national carrier by enlisting a Jordanian company, Elzay Ready Wear Manufacturing Company. At the time, a spokesperson for Elzay said: "Royal Jordanian wanted a change; a new uniform for the new millennium that is more elegant and distinguished, and reflects the heritage of Jordan."

Colours were chosen to symbolise Jordan as a country – red, white and charcoal. "Red is a very prominent colour here and it was chosen for the women's uniform, while the men's is mainly charcoal."

A spokesperson for RJ told *Arabian Aerospace*: "The RJ uniform should always be consistent with the colours of the aircraft and, thus, of the RJ colours in its offices."

Teresa Stedman, managing director of Stedman Corporate Clothing Ltd, said the choice of colour plays an important role in uniform design. "The colour of a uniform helps present an appropriate impression as it has a psychological effect on both the wearer and their customer."

Qatar Airways' plum-coloured uniform must have hit the right note with customers, as it was voted 'most stylish' by Skyscanner users in a poll in September 2010. The deep-maroon uniform, a colour often associated with dignity, nobility, and power, reflects the airline's logo, which Stedman argued is important, so as to be easily recognisable.

Oman Air also chose to co-ordinate its uniforms with the company colours when, in September 1999, it unveiled a new eye-catching turquoise-blue outfit, designed by the house of Balenciaga, which matched its livery.

"Ultimately, a uniform enables staff to become ambassadors for their company and act accordingly. In being dressed in the company colours, staff immediately represent their airline," Stedman added.

As company representatives, airlines will often stress the importance of appearance to staff from the very beginning of their careers, as illustrated on Virgin Atlantic's online cabin crew recruitment page: "Finally, you'll be the face of the airline. As such, your grooming should always be immaculate – even after a long, tiring flight."

For this reason, uniform designers and manufacturers must carefully choose the fabric to be used, as Shane Bray, MD of European professional-wear provider Kwintet International, reportedly said: "Crew need to look as immaculate at the end of a long-haul flight as they did when they boarded the aircraft. Turbulence can wreak havoc when food and drink are being served, so stain-resistant fabrics and finishes are key."

Crew uniforms have always been used to evoke the glamour and romance of flying, an association that Virgin Atlantic played up to in its recent James Bond-style television advertising campaign, which portrays attractive flight attendants wearing the airline's iconic red uniform, skyscraper red heels, and glossy red lipstick. The sexually-charged global campaign no doubt assisted the airline in winning the accolade of 'most attractive' flight attendants in a

Above: Etihad made the Milan catwalk with its Italian style uniform while (left) the scarlet Virgin girls are always a hit.

survey of 1,000 British business travellers, conducted by Business Travel and Meetings Show (BTMS) in February 2011, with the airline receiving a massive 53% of the votes.

Middle East carriers also achieved highly in the poll, with Etihad Airways' uniform, designed by Italian haute couture fashion designer Ettore Bilotta, taking third place behind Singapore Airlines with 12% of the votes, and Emirates Airlines taking fourth place with 11%.

Etihad Airways has a strong relationship with the fashion world, as was displayed in September 2007 when it celebrated the launch of flights between Abu Dhabi and the fashion capital Milan with a catwalk show exhibiting Bilotta's new winter 2007 collection. James Hogan, Etihad Airways' chief executive, said at the time: "There has been tremendous excitement surrounding the start of Etihad's new Milan service, so what better way to mark this momentous occasion than to stage an Italian fashion show here in our home-base of Abu Dhabi."

Bilotta's philosophy in designing the Etihad uniform was "to communicate the welcoming hospitable values of the Arabian culture in an international, cosmopolitan context, while at the same time designing for the comfort of the crew in the air and the airline's ground staff".

While aesthetic considerations are obviously important for building and establishing an airline's brand, many more aspects are taken into account when designing airline uniforms, including the safety and comfort of clothing.

"Long skirts can restrict movement and are particularly dangerous when combined with high heels, which can become caught in hems. Ties, too, can be a safety hazard," Stedman explained.

It is also essential that uniforms can be adapted to suit different environments. "This is vital when the conditions on the ground for staff can vary from Sao Paulo in Brazil through Newcastle in England to Hong Kong in Asia," said Terry Daly, Emirates' senior vice president, service delivery, when the airline introduced its new staff uniform in 2003.Ultimately, perhaps more so for the aviation industry than any other, staff uniforms must inspire confidence and communicate a responsible corporate image, so that passengers are assured that their safety is in good (perfectly-manicured) hands.

"Figures of authority are traditionally identified by their uniforms," Stedman told *Arabian Aerospace*. "This is particularly true of airlines and certainly in the current environment of heightened security we take assurance in being able to easily identify official figures by their clothing.

"A uniform reinforces the expectation that staff are trained and competent professionals, providing additional assurances to customers that our trust is in safe hands. In the case of airline staff, this effect is multiplied, as our safety is entirely in their control."

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Libyan freedom… but at what cost to its airlines?

Where do Libya's two main airlines go from here? Long-standing plans for Libyan Airlines and Afriqiyah to merge are on hold, but **Alan Dron** *asks the question will either survive at all?*

Both Libyan Airlines and Afriqiyah were effectively barred from flying by United Nations sanctions in mid-March and few airlines can survive a total loss of income for six months.

Before civil war erupted in the country there should have been be no reason why flag-carrier Libyan Airlines and the more recently-established Afriqiyah ('Africa' in Arabic – the airline was originally intended to serve destinations on that continent) should not have combined satisfactorily.

Their route networks were largely complementary, with little overlap. Afriqiyah served a swathe of West and Central African destinations, while Libyan's was oriented towards Middle East/North African routes. In Europe, where both companies flew to around 10 destinations, the only duplication was at Milan Malpensa and Rome Fiumicino. Given Libya's long-standing connections with Italy – it was a substantial Roman outpost in antiquity, an Italian colony from 1911-43 and latterly provided around 25% of Italy's oil supplies – if there was one country to which both airlines wanted to fly, it was Italy.

A combined carrier could have made good sense, bringing economies of scale. And in October 2010, Sabri Shadi, chairman of the umbrella Libyan African Aviation Holding Company, said that governmental approval for the merger was expected within a month.

For whatever reason, that decision seemed not to have materialised, but there was no indication that the move had been called off, merely delayed.

However, airline analyst Saj Ahmad of FBE Aerospace, who has extensive contacts in the Middle East, has doubts whether the merger will go ahead – indeed, whether the two airlines will even continue to exist.

"Any merger seems a distant if not impossible outcome," he said. "With more of a pressing need to restore law and order, both carriers will dwindle with little government capital being injected into them and they risk outright collapse."

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Several aircraft from both fleets have been destroyed or damaged during the protracted conflict between government and rebel troops, but Ahmad said that the risks to the companies' survival went considerably beyond the loss of several airliners on the apron at Tripoli International.

Both business and tourist traffic was unlikely to reappear in the near future, he believed.

"There is unlikely to be any short-or medium-term revival in business travel. The uncertainty about the way the country is right now will put people off indefinitely."

Tourists and Libya may seem as unlikely a combination as kippers and custard, but the lack of leisure travellers to the North African nation has been due mainly to the reputation of the Gaddafi regime, its lack of interest in the leisure sector and the consequently arduous process of foreigners obtaining visas.

The country has a ready-made, if niche, attraction for educated travellers wanting to see the magnificent Roman ruins of Leptis Magna, some 130km east of Tripoli, and Sabratha, 60km west of the capital, which are at least as spectacular as those at Ephesus in Turkey and remarkably preserved.

There is also a market for those who want to venture south into the Sahara – German tourists, in particular, already beat this trail in neighbouring Algeria.

Libya's network of shared military and civil airports offers tourism opportunities.

Eavesdropping on conversations

And the few western tourists and journalists allowed into Libya over the years by the government in Tripoli found that Libyans – though wary of Gaddafi's secret police eavesdropping on conversations with westerners – exhibited the traditional hospitality for which Arab nations are renowned.

So, tourism remains a potential money-earner for Libya in the future – but will visitors return before the resources of Libyan Airlines and Afriqiyah run out?

Unsurprisingly, information about the current condition of both companies is difficult to pin down. Both airlines' websites have been inoperative for several months and establishing contact with officials has been virtually impossible.

They were effectively banned from operating by United Nations Security Council resolution 1973 of March 17 2011, which made the entire country a no-fly zone.

Precise confirmation of the airlines' activities since then has been difficult, even for Ahmad's contacts. "I'm told they sat idle, save for the odd humanitarian repatriation flights. I've seen nothing to suggest that either carrier had any active operations," he said.

He added that one Airbus A300-600 and one A320 of Afriqiyah had been confirmed destroyed at Tripoli, while one of the carrier's A330s had also been riddled with gunfire and was probably only good for scrapping, with extensive fuselage skin and engine damage. Libyan Airlines had also lost an A300-600 there.

Ironically, both airlines were in the midst of receiving extensive orders for new aircraft. Airbus's Orders and Deliveries section of its website shows that Libyan has had four of an order of seven A320-200s delivered, with a further four twin-aisle A330-200s on order, plus, further into the future, four A350-800s. Libyan also has eight recently-delivered Canadair CRJ900 regional jets.

Inability to pay

In August, however – perhaps a sign of an inability to pay – two A320s destined for Libyan were reported by premium airline news service Air Transport Intelligence to have been cancelled and instead diverted to Lao Airlines.

Airbus declined to comment whether the aircraft had been due for Libya, but a spokesman commented to *Arabian Aerospace* that switching the recipient of an airliner entailed "more than just painting a new livery and changing the colour of the seats". An A320, he pointed out, could come with one of three different powerplants and individual airlines chose the avionics.

As recently as March 4 – just days before the outbreak of civil war – Afriqiyah had converted an order for three Airbus A320-200s to the larger A321 variant. It had already received six A320-200s from what had been an original order for 11 (reduced to eight through the conversions). It, too, had ordered the forthcoming A350-800: six in its case.

The European Union lifted sanctions against Libyan Airlines in early September and similar action in relation to Afriqiyah was expected at the time of writing. Whether either carrier survives to take advantage of their restored operational freedom is another matter.

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After a long and often tortuous process, the UAE is understood to be in the final stage of negotiations for the procurement of about 60 Dassault Rafale fighters with many industry insiders predicting that contracts could be signed during the Dubai Airshow.
Jon Lake *reports.*

UAE's Rafale deal is no mirage

On September 8, Les Echos reported that Dassault had sent a negotiating team to the UAE 'last weekend' to wrap up the final details of its technical and commercial Rafale proposal, apparently due for delivery.

Until now, the UAE's plans to replace its Dassault Mirage 2000-9 fighters have been slow to come to fruition, though French president Nicolas Sarkozy's office first announced that the UAE government was in discussions to buy the twin-engined Rafale as long ago as June 2008, after the French fighter had originally lost out to the F-16 Fighting Falcon in 1998 (the Rafale having been shortlisted with the F-16 in September 1996).

The F-16E/F was never likely to fulfil the UAE's fighter need on its own, as the nation needed a tactical fighter that could carry categories of weapons that the US would never integrate on the aircraft in order to avoid upsetting Israeli and other regional sensibilities.

The Mirage 2000 was retained in the UAE inventory (and indeed the existing fleet was augmented by the purchase of new Mirage 2000-9s, and by the conversion of existing aircraft to -9 standards) specifically to give the UAE AF&AD a platform that could carry weapons like the Al Hakim stand-off PGM (though in the event this would later be integrated on the F-16E/F) and the Black Shaheen Cruise missile – a variant of MBDA's Scalp/Storm Shadow family.

The UAE needs a Mirage 2000 replacement that will also provide this kind of capability, either with the existing Black Shaheen, or with a new weapon in the same class.

US offers to provide the Super Hornet with SLAM-ER missiles probably did not meet the UAE's aspirations for stand-off missile range, and certainly did not match the existing range capability of Black Shaheen.

The UAE never ran a full competition to select a fighter to replace the Mirage 2000s and simply opened negotiations with Dassault aimed at acquiring an improved and upgraded Rafale.

The UAE has periodically looked at competing aircraft and has talked to other suppliers – fuelling regular reports of a change of heart over the French fighter. But despite requesting technical information on the Boeing F/A-18E/F Super Hornet in September 2010, the more recent reports of negotiations with Lockheed Martin for the supply of more F-16E/F Desert Falcons (because the French offering of an advanced Rafale version was reportedly seen as too expensive), and optimistic noises emanating from the Eurofighter consortium, the UAE's eyes have kept returning to the Rafale, which has continued to be aggressively and energetically marketed to the Emiratis.

In mid-December 2010 Sheikh Mohammed bin Zayed Al Nahyan, crown prince of Abu Dhabi and commander of the UAE armed forces, requested that France renew its proposal to sell up to 60 Rafales to the UAE during a visit to Paris.

France has been assiduous in enhancing and improving its relationship and military co-operation with the UAE and has established a permanent military presence in the Gulf, forming Base Aerienne 104 with a rotational deployment of Rafales and Mirage 2000s as a French enclave at Al Dhafra airbase, and also setting up a naval station at the port of Mina Zayed.

Many insiders now seem to accept that the Rafale is a 'done deal' in the UAE.

This is surprising in some respects as, although

the Rafale performed extremely impressively during recent operations over Libya, the UAE has made no secret of the fact that it requires an aircraft significantly more advanced than the current Rafale versions in service with the Armée de l'Air.

It specifies a longer-range active electronically scanned array (AESA) radar with ground moving target detection and tracking (GMTI/GMTT), 'interlaced' air-to-air and air-to-ground modes, a more capable version of the Spectra electronic warfare suite, integration with MBDA's Meteor long-range missile and, crucially, with more powerful versions of the Snecma M88 engines, producing more than nine tonnes of thrust (about 1.5 tonnes more than the current engine).

Over time, Meteor integration and some AESA and Spectra improvements have become a funded part of the core Rafale programme, but the Armée de l'Air has no stated or funded requirement for a more powerful engine, which the UAE reportedly still wants and which many analysts believe would be essential for long range air-to-ground operations with heavy weapons in the region (and certainly to allow carriage of a three-missile heavy strike loadout using the Black Shaheen). Nor are planned French radar and Spectra improvements believed to be sufficient to meet UAE requirements.

There may also have been a stumbling block in that the UAE is understood to have demanded that the existing Mirage 2000-9s must be 'bought back' by the French either for resale or for use by the French forces at an estimated unit price of €20 million – equivalent to about €1.2 billion for the whole fleet.

Historically, Dassault has tended not to use its own resources to fund military aircraft development, preferring its government clients to do so. In this case, the cost of developing the upgrades required by the UAE has been estimated at 4-5 billion euros – or more modestly at €2 billion ($2.9 billion), a sum which the UAE has reportedly expected the French side to pay.

Though the UAE has previously invested in the development of more advanced versions of fighters that it has bought (funding the development of both the Mirage 2000-9 and of the Block 60 F-16E/F in return for a share of profits from any export of aircraft with the features it had paid to develop), it seems not to have the appetite to do so for a modernised and advanced version of the Rafale, or it may be disinclined to be the launch customer and 'guinea pig' for such a variant.

The UAE's licensing-for-exports deals associated with the Mirage 2000 earned hundreds of millions of dollars when Mirage 2000-9 technology was sold to other customers, and similar arrangements regarding the F-16E/F promised to earn the Emirates more if other countries buy similarly upgraded versions of the F-16E/F. But being a launch customer can bring disadvantages and problems and the UAE may have wished to avoid these, or may have felt that further Rafale export sales are unlikely.

But whatever the reason for the UAE's unwillingness to fund the required Rafale improvements, it seems as though the deal is 'back on', perhaps with the UAE having scaled back its requirements, or perhaps with the French government having decided that it is willing to 'bite the bullet' and fund the necessary development in order to try to win what could be a pivotal first export order for the Rafale.

Typhoon survives Libyan baptism of fire

With potential export customers looking on fascinated, the Eurofighter Typhoon went to war in the skies over Libya. **Jon Lake** *investigates how it got on.*

The Typhoon demonstrated a multi-role capability as well as proving itself to be rapidly deployable and easily supportable when operating away from its home base.

That's the verdict following the operation known as Odyssey Dawn under US command and Unified Protector following NATO's formal assumption of command on March 31 (the UK element of the mission was referred to as Operation Ellamy).

Italian Eurofighter EF2000s from 4° Stormo (fourth wing) at Grosseto deployed south to Trapani to undertake air defence CAP missions over Libya. Subsequently, the Eurofighters were replaced by AMXs belonging to the 32° Stormo based at Amendola.

While active on Odyssey Dawn/Unified Protector, the Italian Eurofighters carried three drop tanks, four AIM-120C AMRAAMs and four short-range IRIS-T missiles. The chief of staff of the Aeronautica Militare Italiana, Lt Gen Giuseppe Bernardis, expressed his satisfaction with the Eurofighter's performance, highlighting its "good performance and reliability in support of attack forces", and opining that this operation was "the demonstration that we were right to hold back further developments and consolidate the aircraft's air superiority capability".

The British have taken a different position and have quite deliberately welcomed the Libyan operation to further work-up and demonstrate the aircraft's multi-role capabilities, and to give the lie to accusations of inflexibility and lack of multi-role competence.

The RAF's Typhoons were initially deployed in the air-to-air role and were dispatched very rapidly. Ten Eurofighter Typhoon FGR.Mk4s, 18 pilots and their ground support team were deployed to Gioia del Colle on March 20, the day after activation orders were received.

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"They were literally out there within 24 hours," Air Vice Marshal Greg Bagwell, AOC of No1 Group, and commander of the RAF element, said. "And had I asked for it, they would have been up on the CAP that first day. It was incredibly fast; the aircraft showed exceptional serviceability and we very quickly evolved in to a multi-role capability."

That the RAF Typhoons were deployed at all was a surprise to many, as the three-squadron front-line Typhoon force was only just able to meet its enduring commitments of sustaining two quick reaction alerts (QRAs) in the UK and of maintaining the Falklands air defence responsibility. Senior officers had gone on the record to express their belief that the Typhoon force would be unable to undertake any other commitments except 'at-risk', and that deployed air defence operations would not be possible until the Typhoon force had sufficient aircraft to hold that contingency safely.

The RAF Typhoons initially flew in a defensive counter air-to-air role, each armed with six AIM-120 AMRAAM and two ASRAAM air-to-air missiles, as well as their internal 27-mm cannon. They were in place when the UN-approved no-fly zone was established at 9am on March 21 and they flew their first defensive counter air (DCA) mission that morning.

The Libyan Air Force was quickly neutralised and attention turned to air-to-ground operations.

A so-called austere air-to-ground capability for the Typhoon had been developed under Project Gordian (also known as CP193), in case the aircraft had to be deployed to Afghanistan. This saw the integration of the Litening 3 targeting pod and the Enhanced Paveway II (EPW2) dual-mode GPS/laser-guided bomb but the capability was effectively shelved when it was decided that there was no need to deploy the Typhoon to Afghanistan.

Air-to-ground capabilities

The aircraft's air-to-ground capabilities were demonstrated during Exercises Torpedo Focus and Green Flag West in April-May 2008 and then again in Exercise Magic Carpet in Oman in February 2010 but training was not funded and only a small cadre of pilots remained multi-role capable.

Most of the RAF's highly skilled Typhoon pilots were not afforded the flying hours to allow them to become multi-role competent, nor to maintain currency in the role.

By 2011 Typhoon pilots were flying a bare minimum of 12.5 hours per month – which was just sufficient to remain current for quick reaction alert (QRA) and the Falklands air defence task, but lay far short of the 20 hours that Bagwell deemed necessary for proper currency for a swing-role capability, including air defence and ground attack.

"The idea that Typhoon was fully multi-role declared at this phase is not true," Bagwell said. "It was capable, but not declared; therefore the funding, the training etc, was held in abeyance. But fortunately No11 Squadron had done the work-up and we had air crews who were ready to go, so that when we made the call to turn into a multi-role, we did that within a two-day period."

The Libyan operation represented an unequalled opportunity to demonstrate that the millions of pounds spent on gaining an austere air-to-ground capability for the tranche 1, block 5 Typhoon had not been entirely wasted. The RAF quickly announced that four of the deployed Typhoons (the number had by then been reduced from ten to eight, including two spares for 'resilience') would be assigned to air-to-ground operations.

During these missions the Typhoons carried a swing-role warload consisting of two Enhanced Paveway II 1,000lb (454kg) precision bombs, two under-wing fuel tanks and a Litening 3 pod, as well as two AMRAAMs and two ASRAAMs, though some missions have been flown with four Enhanced Paveway IIs (leaving behind the two ASRAAMs to make way for the extra bombs).

Laser-guided modes

Some of the deployed pilots began a ten-day phased air-to-ground work-up, which was completed on April 21, after which the pilots were deemed qualified to drop air-to-ground weapons in both GPS and laser-guided modes.

Even before this work-up was completed, on April 12, a Typhoon dropped Enhanced Paveway IIs on two Libyan tanks south of Misrata and the Typhoon flew its first night air interdiction mission against a communications target on April 18.

On both occasions the Typhoon was flying in a mixed pair with a Tornado GR4, which 'spiked' (laser designated) the target with its own Litening 3 pod. This led many to assume that the Typhoons were flying as simple bomb-trucks, relying on the Tornados to provide designation. This was in fact far from the case, as Sqn Ldr Rupert Joel (No11 Squadron's XO) confirmed during a briefing at the Paris Air Show. Not only had the Typhoons been self-designating, Joel said, but also, "if the Tornado is going to 'lase' on one drop, the Typhoon is always ready to go, to take over and lase if anything goes wrong. That's just standard procedure".

The use of mixed pairs of Tornados and Typhoons during Operation Ellamy provided a particularly effective, useful and synergistic combination of capabilities within a single two-ship formation. The Tornado and its crews provided a wealth of ground attack experience and a wider range of air-to-ground weapons, including MBDA's dual-mode Brimstone missile and the Paveway IV precision guided bomb, while Typhoon carried only the 1,000lb Enhanced Paveway II, which is sometimes too powerful a weapon for some targets – especially where there could be collateral damage issues.

Squadron Leader Joel highlighted what Typhoon brought to the party. "The Tornado benefits from the Typhoon because we have a great air-to-air radar and fantastic air-to-air capability, so we look after them. Our defensive aids sub-system (DASS) is excellent and we have Link 16 [a military tactical data exchange network], which those guys haven't. So we get stuff passed to us and we can transfer it across to the GR4."

The RAF's Libyan missions have been long and arduous. The distance from Gioia del Colle to Brega, for example, is almost 600 miles, and then the Libyan coastline is almost 800 miles long. Aircraft are frequently re-tasked, perhaps having to fly as far as 400 miles to a new target area. Sorties are correspondingly long, averaging about five-and-a-half hours and relying heavily on air-to-air refuelling tanker support.

The Typhoon is well suited to such sorties, as Wing Commander Jez Attridge, the CO of No11 Squadron explained. "Despite spending on average seven hours in the cockpit per mission you could not find a more comfortable aircraft to fly.

"The cockpit is large by fast jet standards and the information from the radar, DASS and Link-16 is displayed easily and accessibly. This allows you to function at 100% capability throughout the sortie, not plagued by fatigue or a lack of situational awareness. Due to the aircraft's huge excess power it enables the flight from Gioia to Libya, some 650 miles, to take just over an hour, cruising at 40,000ft, 0.9 Mach, even with a warload of four Enhanced Paveway II 1000lb bombs, a Litening III targeting POD, AMRAAM and ASRAAM missiles."

Extended deployment

The Typhoon's serviceability has reportedly been excellent during its extended deployment, as Wing Commander Attridge told *Arabian Aerospace*. "During that three-month period we flew 1,500 hours, which is round about three times the normal amount we fly. We would normally get 24 hours a month from the aeroplanes but we have taken that up to 84 hours; we flew more than 300 combat missions and we dropped over 70 Enhanced Paveway 2 bombs."

As the RAF returned to the UK as the operation ended it was revealed that the Typhoons had undertaken 91 strikes in 348 sorties. Squadron Leader Joel said that these had included "probably around five or six self-designation attacks, because generally the most accurate way to go and drop the weapon is by GPS".

"But of course," he added, "we have got the ability to either use the laser to refine it or to employ the weapon against smaller targets and we do have the capability to co-operatively designate for the Tornado GR.Mk 4" which, he suggested, had only made "probably the same amount" of self-designation attacks. This would seem to imply a very high proportion of Brimstone and GPS-guided attacks, or perhaps that there have been more attacks made with designation provided by forces on the ground, which would naturally be politically difficult to acknowledge.

The Typhoon force gained invaluable experience in the Libyan conflict and demonstrated the rapidly-evolving and improving capabilities of this newest multi-role fighter.

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Iraq Czechs out second-hand trainers

While the British, Italians and Koreans were jostling for Iraq's trainer deals it was the Czechs that appear to have stolen a march.

Jon Lake *reports.*

As Iraq continues along the long road towards rebuilding some military capabilities, including a fully independent and capable air force, the acquisition of an advanced jet trainer aircraft is being accorded a high priority.

It seems, though, that the nation's interest has now switched from the BAE Hawk, KAI T-50 Golden Eagle and Aermacchi M-346 to second-hand Czech Aero L-159As.

The new Iraqi Air Force currently operates a number of mainly second-line types, including Cessna 172, UTVA Lasta and Hawker Beechcraft T-6 trainers, C-130E Hercules transports, Aerospatiale SA342 Gazelle, Bell OH-58, UH-1N and Mil Mi-17 helicopters, and a mixed bag of Cessna Combat Caravans, Beech 350ER-ISRs, and Jordanian-built SAMA CH2000s and Seabird SBL-360 Seekers operating in the ISR and armed reconnaissance roles.

Armed Bell 407 and Eurocopter EC635 helicopters have been ordered and the country has ordered 18 Lockheed Martin F-16IQ Fighting Falcons (Block 50/52) to form the nucleus of its future fast jet force, with some reports of Iraqi interest in another 18 F-16s.

Eventually, Iraq wants to acquire about 96 fighters, sufficient to equip six squadrons, as part of its drive to establish a self-sufficient and full-spectrum air force with 350 aircraft and some 20,000 personnel by 2020.

Building such an air force will take years and will require a whole new generation of pilots to be trained. The acquisition of the T-6A Texans and UTVA Lasta 95s has allowed the opening of a fixed-wing flying training school near Kirkuk, but an advanced, lead-in jet trainer is still missing.

At one time it seemed most likely that the Iraqi Government would buy 24 Hawk trainer jets and support in what was touted as being a £1 billion deal, though the T-50 and M-346 were also under consideration. Iraqi Air Force pilots visited Britain in May and June 2010 to evaluate the Hawk, which had previously been selected by the Iraqi air force in the late 1980s. At that time, a contract to sell 50 Hawks was blocked by the British Government in the face of concerns that the deal would contravene arms embargoes put in place during the Iran-Iraq war.

But prospects of a Hawk buy receded during 2011, as Iraq started to look at cheaper and more affordable options. Following a visit to Iraq by the Czech prime minister in late May, attention switched to a package of 24 Aero L-159As – part of a batch of 38 aircraft withdrawn from use and stored in 2004 (and subsequently increased to a pool of 47 aircraft, of the 72 production aircraft built).

On August 12, Ladislav Simek, the head of Aero Vodochody, revealed that Iraq was negotiating for a larger batch of 36 aircraft, which would be exchanged for crude oil.

The L-159A is an advanced, single-seat light multi-role derivative of the older L-39 Albatros, powered by a 6,330lbst Honeywell F124-GA-100 turbofan. The Czech air force uses it in the lead-in fighter-training role, under the designation L-159ALCA. The original two-seat L-39's rear cockpit is retained in the L-159 but accommodates a fuel tank in the L-159A, making conversion to two-seat trainer configuration relatively straightforward, and a production two-seat variant, the L-159B, was flown in prototype form.

Advanced and capable

A number of L-159As have already been converted to L-159T1 standards for the Czech air force and, if Iraq acquires the aircraft, it is expected that some or all will be similarly converted.

The L-159 is an advanced and capable aircraft, with comprehensive air-to-air and air-to-ground combat capabilities. The L-159A is fitted with the multi-mode FIAR Grifo-L pulse Doppler radar, selected in preference to the US Westinghouse AN/APG-68. The Grifo-L has nine air-to-surface modes and five air-to-air modes, including track-while-scan, and can simultaneously track up to eight targets.

The modern NVG-compatible glass cockpit provides the pilot with full hands on throttle and stick (HOTAS) functionality and is designed around two multi-function colour displays and a flight vision FV-3000 head-up display, using analogue instruments only for back-up.

The digital integrated avionics system is based upon MIL-STD-1553B databuses, and incorporates a Honeywell GPS navigation system, with Ring Laser Gyro INS, as well as NATO-compatible secure radios.

The L-159 is capable of carrying a wide range of NATO-compatible weapons on six under-wing and one centreline hardpoints.

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FINMECCANICA

Kings add majesty to Royal Saudi Air Force

Jon Lake *looks at the world's best selling turboprop and its new special mission role in the Middle East.*

The Royal Saudi Air Force has augmented its two Boeing RE-3 Sigint aircraft (broadly equivalent to the RC-135 Rivet Joint) with a pair of ISR-configured Hawker Beechcraft King Air 350i aircraft.

The King Airs, which join No 19 Squadron at Al Kharj air base, were delivered from Wiley Post Airport in Oklahoma on August 5, routeing via Bangor, Goose Bay, Keflavik, Shannon, and Vienna, before arriving in the kingdom.

The new aircraft closely resemble the USAF's 'Project Liberty' MC-12W, which entered operational service in January 2009, and which has already proved highly successful in operations over Iraq and Afghanistan.

The USAF's MC-12Ws flew more than 2,000 missions in their first six months in Iraq.

The MC-12W gathers and disseminates real-time full-motion video and signals intelligence, using MX-15Di high-definition surveillance and targeting turrets and an undisclosed Sigint sensor suite. The aircraft is fitted with airborne communications-on-the-move (COTM) terminals using an ArcLight Ku-band mobile broadband system, configured for data rates up to one Mbps off the aircraft.

Great interest

There is great interest in aircraft in the same class as the MC-12W among a range of potential export customers, including Saudi Arabia and the United Arab Emirates, but there are some obstacles in the way of exporting the full USAF-standard aircraft. L-3, Raytheon, Boeing and Lockheed Martin have, therefore, been working on similar aircraft using other systems, or exploiting key technologies from non-American suppliers, in order to avoid ITAR issues and to minimise export clearance requirements.

L-3's 'Spiderworks' mission integration division (MID) displayed its Spydr King Air 350 ISR aircraft at the recent Royal International Air Tattoo, equipped with a fuselage-mounted electro-optical/infrared turret, a fuselage pod with a 100-pound payload, a tactical data link, satellite communications, and a full signals intelligence system. It offered systems like SELEX Galileo's PicoSAR radar, and optics from Zeiss.

Many expected this aircraft to win a number of export competitions that were believed to be running.

But though L-3 had the advantage of producing the MC-12W, the new Saudi aircraft appear to have been produced by Raytheon, wearing ferry registrations allocated to Raytheon Co Air and Space Systems.

Major facility

The Saudi aircraft are fitted with a comprehensive array of blade antennas, indicating a Sigint suite similar to that used on the RAF's Shadow, and like other Sigint King Airs the Saudi aircraft mount a capacious belly pannier, though this differs markedly to those fitted to the MC-12W and Shadow, and also to that fitted to the Iraqi version.

The Saudi aircraft are fitted with a FLIR turret (though some sources suggest that this may be the MX-20D HD surveillance and targeting turret rather than the MX-15Di used by the MC-12W), and this is mounted at the forward end of the belly pannier. They do not seem to have radar, unlike the Iraqi aircraft, which have an as-yet unidentified synthetic aperture radar – possibly the AN/APS-134 Sea Vue or APS-143 Ocean Eye or the AN/APS144 or APY-12 Phoenix or the RDR-1700 or (like the US Army's Project Odin C-12 Horned Owl aircraft) an AN/APY-8 Lynx II radar.

Unlike some aircraft in this class, which wear colour schemes designed to 'ape' commercial light twins, the two new Saudi King Airs wear full disruptive two-tone grey camouflage and Royal Saudi Air Force markings and titles, though on delivery they lacked any obvious signs of comprehensive defensive aids, chaff/flare dispensers and missile warning systems.

At their new base at Al Kharj, the King Airs will operate alongside No 19 Squadron's RE-3A and RE-3B.

The first T129 ATAK helicopter prototype assembled by Turkish Aerospace Industries (TAI) made its maiden flight on August 17. **Jon Lake** *looks back over the programme.*

Turks are on the ATAK...

The TAI T129 ATAK (AgustaWestland AW729) is an attack/tactical reconnaissance helicopter under development for the Turkish Land Forces Command (TLFC Army). It is a modernised and enhanced derivative of the existing, combat-proven AgustaWestland A129 Mangusta, and production machines will be 100% Turkish built, with TAI as the prime contractor and AgustaWestland and ASELSAN acting as TAI's subcontractors.

The aircraft that flew on August 17 joined the second Italian-built prototype (the first having been lost in an accident in March 2010).

Four further aircraft are scheduled to join the flight test programme over the next few months, leading to customer deliveries from the third quarter of 2013.

Delivery of the first serial production helicopter is scheduled for June 2013, with the next seven aircraft following every two months, and with subsequent helicopters being delivered on a monthly schedule out to the end of 2016.

TAI and AgustaWestland already enjoy a successful long-term partnership, with TAI responsible for manufacturing fuselages for the new generation AW139 medium twin helicopter.

Under this programme, which began in 2004, a total of 250 AW139 helicopter fuselages are being manufactured by TAI facilities between 2005-2017. The first fuselage was shipped to AgustaWestland on December 21 2006.

The ATAK programme represents the beginning of a new phase of this relationship, which both companies describe as evolving "into a strategic partnership". This will further enhance the technological capability of the Turkish defence industry.

Under the terms of the ATAK programme, AgustaWestland will establish a joint-venture company with TAI, and will transfer the A129 programme and related technology to TAI, including the production line and all software source codes. TAI will, thereby, become the sole source for the production of the whole fuselage, including final assembly and flight operations.

TAI and AgustaWestland will share ownership of the intellectual property rights for the new T129 configuration, and TAI will have full re-export rights (except to Italy and the UK) and will be responsible for marketing the new attack helicopter to the world.

Turkey was one of the earliest operators of dedicated attack helicopters in the wider Middle East, purchasing ten AH-1W SuperCobras in the early 1990s, and then augmenting these with 32 ex-US Army AH-1P Cobras. The survivors (about six AH-1W and 20-23 AH-1P) now equip the Taarruz Helikopter Taburu at Ankara/Güvercinlik and Diyarbakir.

Hoping to expand

Turkey has been hoping to expand and modernise its attack helicopter force since the mid-1990s, drawing up a requirement for some 91 new attack helicopters, which it wanted to co-produce rather than simply purchase off the shelf. Protracted negotiations with Bell Helicopter aimed at licence production of the new AH-1Z Super Cobra were eventually abandoned in 2004, in the face of irreconcilable differences over price and licencing terms, including exportability and software codes.

A new competition was launched in February 2005 and the RFP was re-drafted in May 2005 following objections from some manufacturers. The changes were not sufficient to prevent the US suppliers Bell Helicopter and Boeing from dropping out.

In July 2006, the Turkish Defence Ministry eliminated the Franco-German EADS Eurocopter Tiger and the Russo-Israeli Kamov/IAI Ka-50-2 Erdogan from the competition, shortlisting the Denel AH-2A Rooivalk and the AgustaWestland A129 International.

The basic A129 Mangusta did not meet Turkish requirements, being found wanting during hot and high trials in Eastern Anatolia. AgustaWestland, therefore, offered the A129 International variant, which had an uprated transmission and was powered by a pair of 1,200shp Allison-Garrett LHTEC T800 turboshaft engines in place of the original aircraft's Piaggio-built 1,035shp Rolls-Royce Gem 2 Mark 1004D turboshafts.

The International also featured a five-bladed main rotor and a nose-mounted Alenia Difensa TM-197B 20mm cannon, a license-built version of the General Electric M197 three-barrelled Gatling gun, in an OtoBreda turret.

By this time the Turkish requirement was for 30 helicopters with 20 options, with through-life integrated logistics support.

On March 30 2007 Turkey announced that it was negotiating with AgustaWestland for the purchase of 51 Agusta A129 Internationals with another 41 on option under the same terms. The contract was signed on September 7 that year and became effective on June 22 2008, with the ATAK helicopter programme formally starting on July 2 2008.

By this time, the configuration of the aircraft had been finalised and it had been designated as the T129 (later gaining the new internal AgustaWestland type number AW729).

AgustaWestland opened a new dedicated T129 facility at its Cascina Costa headquarters in 2009, manned by an integrated team of 70 Turkish and AgustaWestland personnel, with an assembly area for the T129 prototypes. The facility was designed to bring together the integrated team into a single location to enable all of the industry partners to work together in the most efficient manner. The facility served as the headquarters for early test and development work, before the focus of activity shifted to Turkey.

The first T129 prototype, known as P1, was converted from an existing Italian aircraft and made its maiden flight in its new guise on September 28 2009, at Vergiate. This aircraft was lost on March 19 2010. A second prototype (actually P3) joined the flight test programme in March 2010.

Aircraft P6, the first to be built by ATAK programme prime contractor TAI, made its maiden flight at TAI's Akinci-Ankara facility on August 17 2011, in the hands of test pilots Adnan Meral and Gokhan Korkmazturk. It flew with a nose-mounted Aselsan AselFLIR-300T targeting system and a mock-up of a 20mm cannon. P4, P5, P2 and P7 will join the flight test programme during the next few months. P7 will be fully representative of the full ATAK configuration and is an extra aircraft, added to replace the lost P1.

In its production form, the T129 promises to be an extremely formidable and capable machine, with a number of significant improvements over the original A129.

The Turkish T129 is powered by a pair of state-of-the-art 1,361shp Rolls-Royce/Honeywell LHTEC CTS800-4A/N turboshaft engines. These will be manufactured under licence by TUSAS Engine Industries (TEI). They will give the T129 a speed of up to 145kts (269kmh) and will confer excellent performance in 'hot and high' conditions, allowing the aircraft to carry a heavy load of weapons, while giving an endurance of up to three hours and a maximum range of 303nm (561kmh). The new engines, coupled with the new five-bladed rotor system will confer a high degree of agility.

The T129 promises to be the most advanced variant of the Mangusta, with a digital cockpit architecture and a new, highly integrated flight, mission and fire control system being jointly developed and integrated by TAI and its sub-contractors, including new indigenous mission computers, avionics and weapons systems.

The integrated mission equipment package includes a new generation ASELSAN AselFLIR 300T advanced targeting and sight system (consisting of FLIR, CCTV, and laser designator), an integrated helmet mounted sight and display, secure communications and data link, and precision navigation equipment. These give the T129 genuine all-weather day and night capabilities.

Well armed

The T129 is well armed, too, with its three-barrelled 20mm chin turret, and four fuselage-mounted pylons, qualified to carry a wide variety of stores, symmetrically or asymmetrically, including podded 12.7mm machine guns, unguided 70mm Hydra rocket pods and a range of anti-tank guided missiles including TOW, Spike-ER and the AGM-114 Hellfire, as well as Stinger or Mistral air-to-air missiles.

The T129 has good survivability characteristics, with a low visual, aural, thermal and radar signature, as well as integrated aircraft survivability equipment and a high degree of 'designed in' ballistic tolerance and crashworthiness.

Of the 51 T129 attack helicopters on firm order, one will be retained by the Turkish Ministry of Defense as a test-bed for systems development, upgrades, etc. The remaining 50 will be delivered in two distinct 'blocks'. The first 30 will be to Turkey unique configuration 1 (TUC-1) standards, with an indigenous mission computer, indigenous EW and countermeasures systems, the indigenous Aselsan AselFLIR-300 targeting system, a Thales helmet-mounted cueing system, and a foreign-built ATGM – either Hellfire II or Spike ER.

The remainder will be to TUC-2 standards, and these will introduce the indigenous Aselsan AVCI helmet-mounted cueing system, as well as an indigenous ATGM in the shape of the new Roketsan UMTAS/LRAT anti-tank missile, up to 12 of which will be carried by the T129. The new Roketsan Cirit laser-guided 70mm (2.75in) rocket will also be carried by the TUC-2 standard T129.

The first T129s will not be delivered until 2013 and in order to meet short-term requirements, the Turkish army has ordered an additional nine T129s (increasing the number ordered to 60), which will be built in Italy by AgustaWestland for delivery in 2012.

On June 30 2010, Turkey's defence minister, Vecdi Gönül, raised the possibility of leasing nine further A129s, in addition to the earlier decision to buy nine Italian AgustaWestland-built A129 attack helicopters. This plan was subsequently abandoned.

Though the original A129 and T800-engined A129 International were not successful in export competitions prior to the 2007 Turkish order, with just 60 (plus prototypes) being built for the Italian Esercito, TAI has high hopes of T129 exports. Under the agreement with AgustaWestland, TAI has full marketing and intellectual property rights for the T129 platform, with no restrictions imposed on the export or transfer of the platform to third countries. Jordan, Malaysia Pakistan, Saudi Arabia, South Korea and the UAE have all been reported as having 'shown interest' in the new type, which is arguably the Arab world's first locally built and purpose-designed attack helicopter.

Has the Eagle landed a deal or not?

Jon Lake *looks at the background.*

Conflicting signals surround Saudi F-15 deal

At the same time that rumours circulate about a dramatic scaling back (or even cancellation) of Saudi Arabia's long-announced but 'yet-to-be-signed' requirement for 84 new F-15SAs (and for the upgrade of up to 70 more existing F-15S aircraft to the same standard), there are also strong indications that the programme may already be much further ahead than has been acknowledged.

Senior sources at Boeing have indicated that particular features intended for the upgraded and improved F-15SE Silent Eagle would only be flight-tested when funded by a customer.

Advanced F-15SE 'features' include the AESA radar (funded by Singapore), the new conformal weapons bays and large area display (funded by South Korea) and the new digital fly by wire system, digital electronic warfare system (DEWS) and new outboard under-wing weapons stations, all understood to rely on Saudi funding. It has become apparent that work is already pressing ahead on these elements.

Under-wing pylons

Work on reactivating the outboard under-wing pylons (1 and 9) seems to be proceeding apace. These under-wing stations were intended to be used for the carriage of a stillborn ECM pod on the 'fighter' F-15A-D, and then as part of the proposed F-15 SEAD configuration for the carriage of AGM-88 HARM anti radar missiles. They were finally deleted from the F-15E altogether.

Though it looks like a USAF F-15E, the existing Saudi F-15S is a significantly downgraded aircraft, with reduced capabilities.

The F-15S has a downgraded ECM system and the aircraft's AN/APG-70 is deliberately degraded to APG-70S standard, with only 16 channels instead of 32, 60% less bandwidth and fewer modes, and with detuned Doppler beam-sharpening capability.

As a result in 'high resolution mapping' mode the APG-70S has lower mapping resolution, capable of discerning targets of 4.7m across, compared to 0.67m with the full-standard APG-70 used in the F-15E.

Because the Saudi F-15S has a modified ASW-51 flight control system that lacks a TFR interface, the aircraft cannot undertake 'hands-off' automatic terrain-following flight. Finally, the F-15S uses AN/AAQ-20 Pathfinder and AN/AAQ-19 Sharpshooter pods in place of the F-15E's more usual AN/AAQ-13 and AN/AAQ-14 LANTIRN pods. Compared to LANTIRN, the Pathfinder/Sharpshooter combination provides no terrain following capability, and provides no compatibility with weapons like the laser-guided AGM-65 nor any air-to-air modes.

This has made the F-15S a more limited aircraft than its USAF counterpart, and helps to explain the RSAF's continued reliance on the older Panavia Tornado, which does feature fully automatic terrain-following radar, and which enjoys some advanced radar targeting modes.

The RSAF is believed to be determined that it will not accept a similarly downgraded Eagle in the future, and the new F-15SA is intended to be the most capable version of the aircraft when it enters service.

The new F-15SA will, therefore, be fitted with Raytheon's AN/APG-63(v)3 radar – the latest AESA radar developed for the Eagle and the same as is currently used by the Singaporean F-15SG. It will be the first Eagle variant to be fitted with the BAE Systems North America digital electronic warfare system (DEWS), developed from the EW system of the F-35 Joint Strike Fighter.

Navigation pods

The new aircraft will be delivered with third-generation LANTIRN Tiger Eye navigation pods and AN/AAQ-33 Sniper targeting pods and the AN/AAS-42 infra red search and track (IRST) system, similar to that used by the Singaporean F-15SG.

Despite all of this, normally reliable sources have reported renewed Saudi interest in a further batch of 'about 72' Eurofighter Typhoons, while others have reported the abandonment of Saudi plans to upgrade its 70 or so surviving F-15S aircraft to F-15SA standards, and yet others suggest that the 84 new-build aircraft covered by the DSCA notification to Congress will not be contracted.

In view of the difficulties that continue to grip the Typhoon programme (in particular the long wait to achieve meaningful air-to-ground capabilities and the apparent problems with achieving local, in-country assembly), it seems most unlikely that the F-15SE will be abandoned altogether in favour of the more advanced, but arguably less mature Typhoon.

Some suggest that the most likely outcome might be for the Saudis to press ahead with their planned F-15S upgrade in the short term, but then to augment the upgraded F-15SEs with Typhoons from about 2017 – which was about when new-build F-15SEs might have been expected to enter service. Such a solution would result in no diminution of the Saudi fast jet force and would avoid any undue reliance on a single type, while 'buying influence' with both the USA and the four European Eurofighter partner nations.

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The 64th National Business Aviation Association (NBAA) annual meeting and convention took place in Las Vegas, USA, from October 10-12. **Alan Peaford** *was there.*

Comlux named as SBJ launch partner

Bahrain-based Comlux will become the launch customer for the VIP version of Sukhoi's Superjet 100 airliner – just months after the Russian manufacturer announced the concept at the Paris Air Show.

The order for two Sukhoi Business Jets (SBJ), plus two options, was unveiled at NBAA by SuperJet International, the joint venture between Alenia Aeronautica and Sukhoi, which markets the jet outside the former Soviet Union and Asia.

Comlux is headquartered in Switzerland.

The aircraft will be delivered in 2014, and will be completed at Comlux America, the charter operator's Indianapolis outfitters, with auxiliary fuel tanks installed by Sukhoi.

Comlux president Richard Gaona said the company opted for the SBJ because - next to considerably more expensive Airbus Corporate Jets or Boeing Business Jets – its five-abreast cabin offered the market's largest interior in the market.

"It gives customers a large-cabin option from London to New York or Moscow to Dubai at a lower price than an Airbus or Boeing," he said.

Comlux will market the fly-by-wire jet in Moscow and Kazakhstan, two of its key business areas, and if it proves popular, "we may push the orders up to 10", said Gaona.

SuperJet International chief executive Carlo Logli admitted his company was initially "sceptical" about prospects for a corporate variant of the Superjet. "But in the last two months there has been a considerable push. We have had so many requests from the market," he said. He believes there is a market for 100 Sukhoi Business Jets over 20 years.

Cessna unveils new light business jet

Cessna has launched a new light business jet that fills the gap between the Citation Mustang and the Citation CJ family called the Citation M2.

The aircraft will replace the CJ1 when it enters service in 2013.

A cabin mock-up of the M2 was on display at NBAA. The new aircraft features Garmin G3000 avionics, engines similar to those found in the Citation CJ series and an all-new cabin design. The aircraft is an aluminium airframe with a T-tail and a straight wing that includes LED lights.

With room for two crew and up to six passengers, the $4.195 million Citation M2 has a maximum cruise speed of 400 knots true airspeed (741km per hour) and a range of 1,300nm (2,408km). It can operate at airports with runways as short as 3,250ft (991m) and will climb to 41,000ft (12,497m) in 24 minutes.

From the cockpit divider aft through the rear lavatory, the main passenger cabin of the Citation M2 is 58 inches wide (1.47m) and 11ft (3.3m) long with a five-inch dropped aisle providing a cabin height of 57 inches (1.45m).

The first flight is planned for the first half of 2012, with certification anticipated the following year.

Kodiak bares its new look

Kodiak, the utility aircraft from Quest Aircraft originally built for missionary and humanitarian duties, made its debut at NBAA and showed an executive cabin.

The competitor to the Cessna Caravan has addressed a number of different sectors since certification three years ago – including parachute jumping and freight – but now could take on tourism and desert work with its new executive version.

The Kodiak now includes air conditioning, the Garmin GWX-68 weather radar, and features a new executive interior designed by Wipaire – the prototype of what soon will be available via a supplemental type certificate (STC).

The aircraft on display also featured a newly certificated external cargo compartment, which offers an additional 65 cubic feet of storage space and is the first external compartment certified to the latest flammability and system protection regulations for lightning.

"We continue to listen to our customers to develop and offer the options they are most interested in having on the Kodiak," said Steve Zinda, director of sales and marketing.

"The ECC has been a highly requested option since its development, both on corporate and utility configurations. This Kodiak also has the single point refuelling system installed, another option proving quite popular."

The executive interior on display featured a full club seating area, tables and cabinets veneered with hardwood accents, modular sidewalls with arm ledge, forward refreshment cabinets, premium wool carpet, and a lavatory with privacy curtain.

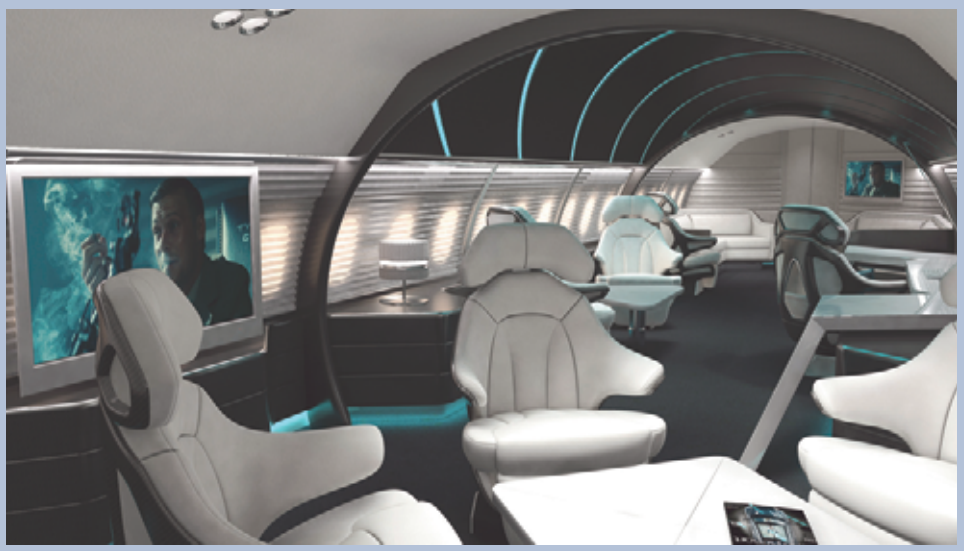
The executive seats recline and swivel and have forward, aft and side-to-side tracking capabilities. Executive seating for up to six passengers is available with this interior.

"We are excited to be at NBAA with the Kodiak," Zinda said. "We have been to the show before but this is the first time we have brought the aircraft. We see a lot of potential for the executive configuration, as well as our Tundra and Timberline interiors."

Since beginning customer deliveries in late 2007, the Kodiak has been deployed in more than 10 countries around the world in a variety of applications. Kodiaks are in service with charter operators, small businesses, personal owners, skydiving operations, US and international governments, and humanitarian organisations.

The Kodiak's rugged aluminium construction delivers great performance, taking off in less than 1,000ft fully loaded. It features a Pratt & Whitney PT6 turbine engine, has the ability to land and take off from unimproved surfaces and is capable of working off floats without structural upgrades.

A three-panel Garmin G1000 integrated avionics suite, including synthetic vision technology, is standard equipment on the aircraft.



Bond would be shaken and stirred by Q...

Falko and leading UK design consultancy Design Q unveiled a new concept for business jets based on the platform of the Avro Business Jet (ABJ).

The ABJ Q is the fifth of five concepts developed by Design Q for the ABJ and offers a contemporary living and working space for its owner, which it described as being in contrast with the traditional business jet interiors of today.

The interior is bristling with technology and gadgets that are discretely concealed in the beautifully crafted furniture but available at a moment's notice.

"We called this version the ABJ Q in homage to 'Q' the head of Q branch, the fictional research and development character made famous in many James Bond films and who specialised in creating devices that were hidden away in everyday objects," said Gary Doy, director of Design Q.

The clever money is backing SmartDeck

Esterline CMC Electronics was reported at NBAA as being in "final discussions" with two airframers, which have chosen the company's SmartDeck integrated avionics suite for two unannounced programmes.

Sources close to the company suggest these could be the VulcanAir twin and the Kestrel single-engine turboprop

CMC has had a whirlwind one-year integration of SmartDeck, originally developed by L-3 and certified for the Cirrus SR22.

The company has had as many as 75 engineers working on the SmartDeck programme at any one time during the integration of the new product.

Greg Weldon, CMC president, said SmartDeck, which the company licenses from L-3, gives it a "broader portfolio" in the avionics business, adding to its T-6B military trainer and Lockheed C-130 cockpit retrofit avionics programmes.

The deal also makes the synthetic vision and digital map technologies L-3 developed for SmartDeck available to other CMC avionics systems, such as the Cockpit 4000 integrated avionics suite for the T6-B.

"There are a lot of spin-offs we are working on," said Weldon.

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MENA leads world on business jet buying

Middle East and African purchase plans for business jets have moved up from 2010 levels and once again exceed the overall world average, according to the latest Business Aviation Outlook unveiled by aerospace technology firm Honeywell at NBAA.

Purchase expectations of nearly 38% recorded in Africa and the Middle East were up almost nine points from 2010 levels.

Asian purchase plan rates rose about five points over 2010 levels in the current survey, and at 45% lead all world regions.

In its latest report Honeywell forecasts sales and delivery of approximately $230 billion in new business jets from 2011 through 2021 which, it said, represents approximately a 2% increase in total expected industry sales value compared to the prior ten-year horizon that the company forecast in 2010.

Honeywell estimated deliveries of 600-650 new business jets, down approximately 15% from 732 in 2010, which it attributes to continued slow global economic recovery.

While 2012 deliveries are expected to be below 700 airframes, Honeywell anticipates higher delivery levels than in 2011.

While five-year buyer interest remained steady versus 2010, based on the reduced economic growth outlook and this year's survey responses, the industry appears to be positioned to begin another period of expansion in 2012, which is consistent with Honeywell's current industry outlook.

Honeywell surveyed more than 1,500 flight departments around the world for its annual business aviation outlook.

Aggregating all regions, five-year purchase expectations remain at a 30% level. Purchase expectations trended up in Asia and the Middle East, but retreated in other regions, most noticeably in Europe and to a lesser extent Latin America.

Rob Wilson

"The level of caution continues to be tied to concerns specific to each region," said Rob Wilson, president of Honeywell's Business and General Aviation business unit. "We noted over the last two years that the timing of planned purchases in the five-year window was heavily shifted in most regions to the post-2010 timeframe. That still remains the case, with roughly 80% of planned purchases timed for 2013 or after."

As far as the MENA region is concerned, the revisions in purchase plans came from improvements in both replacement and fleet expansion rates. Even with the prospects of slower near-term economic growth worldwide, operators in the region expect to be active buyers. Operator purchase plans are still timed sooner in Africa and the Middle East than in Asia, but Asian operators reported strong buying intentions for 2013. Planned purchases, if realised, will result in more rapid regional growth in Asia and the Middle East and Africa, than is expected in North America, Europe or on a worldwide basis.

Honeywell said that confidence in Asian and Middle Eastern economic growth in the intermediate and long-term remains high, boosting interest in longer-range, larger aircraft with better operating economics.

Ring of confidence for Nextant 400XT twinjet

Nextant Aerospace began deliveries of its Nextant 400XT twinjet at NBAA. And since the FAA certification of the remanufactured Beechjet 400A and Hawker 400XP aircraft was announced recently telephones at the Cleveland, Ohio offices have been ringing with enquiries from prospective purchasers.

Priced in the $4.2-$4.3 million range with "average" equipage, the aircraft features Williams International FJ44-3AP engines, Rockwell Collins Pro Line 21 avionics and a Rockwell Collins Venue cabin suite.

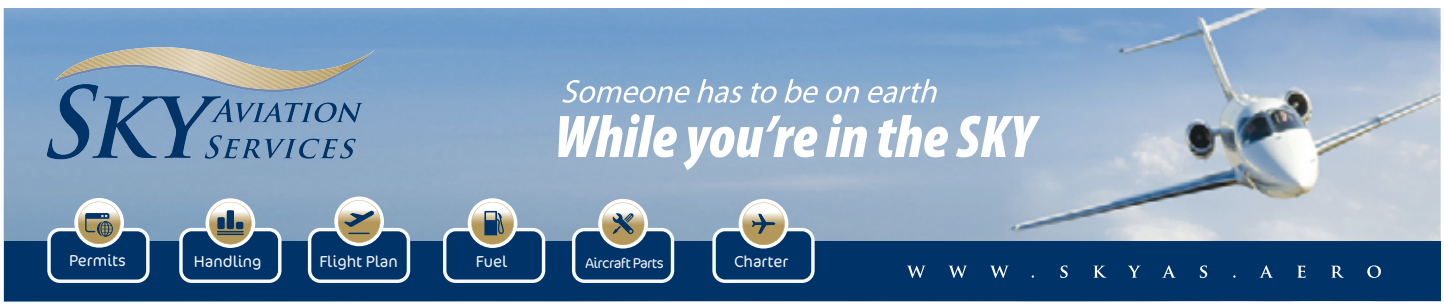
The company said the upgrades give the XT a 460kt (850km/h) cruise speed, a 50% increase in NBAA IFR range to 2,005nm (3,713km) with four passengers and a 25–30% boost in fuel efficiency.

The 6,000 man-hour process takes all life-limited components to zero-time status, either through replacement or overhaul.

Aerodynamics improvements include a streamlined engine cowling, straightened engine beam and mounting system and an improved horizontal stabiliser.

Nextant is offering a two-year tip-to-tail warranty with "a full suite of support services" co-ordinated by the company.

The 400XT will compete directly with Hawker Beechcraft's remanufactured version of the same Beechjet, now in the certification process. Called the Hawker 400XPR, the $4.2 million aircraft features Williams FJ44-4A-32 engines, Rockwell Collins Pro Line 21 avionics and Hawker composite winglets.



Renamed Gulfstream's impressive stats

Gulfstream used NBAA to update the market on the latest performance figure for its newly renamed Gulfstream G280.

The aircraft is aimed at the Chinese market, where the previous G250 tag was considered unlucky. But this impressive super midsize is also a likely contender for the Middle East.

Set for entry into service with customers in 2012, the Honeywell HTF7250G-powered twinjet has met and exceeded its launch specifications, based on testing of the three pre-production aircraft taking part in the certification programme.

The company revealed that it has demonstrated a 367km (198nm) increase in the G280's maximum range – from 6,297km to 6,667km – while flying at the long-range cruise speed of M0.80, carrying four passengers and IFR fuel reserves.

It also demonstrated that the G280's take-off distance at maximum take-off weight has been cut by 64m (210ft) from 1,512m to 1,448m.

Piper in tune with its customers

Piper Aircraft is adding efficiency, comfort and money-saving upgrades to its turbine-powered Meridian, piston-powered pressurised Malibu and piston-powered unpressurised Matrix aircraft, the company announced.

The improvements include LED landing and interior lights and aircraft-powered Bose noise-cancelling A20 headsets in the cockpit as standard.

Along with improved ventilation for better cabin comfort, the cockpits also feature sculpted side panels that give the pilots more elbow room, larger map pockets that can hold an iPad, and seat modifications that make it easier for pilots to get to the cockpit from the cabin entrance. The access is dramatically improved by having the tops of the rear-facing club seats and the co-pilot's seat fold down.

BBJ delivery delay

The Gulf owner of the first Boeing Business Jet (BBJ) based on the new B747-8i will have just a little bit longer to wait.

Speaking at NBAA, BBJ president Steve Taylor said delivery will be "right at the end of the year" and admitted the delays were due to issues in the flight test programme. Originally the company said it expected up to five deliveries to be made by the end of 2011. Customers include Qatar and Kuwait.

Boeing Commercial Airplanes CEO Jim Albaugh said in July the company planned to deliver its first green 747-8I to a completion centre in early December. Boeing forecasts delivering 25 to 30 747-8 and 787 aircraft in 2011 and Taylor declined to discuss any potential impact on that estimate.

Dassault cautious

French manufacturer Dassault said it remained cautious about the path to recovery at the top end of the business aircraft spectrum, despite prices of used Falcons stabilising and the pre-owned inventory shrinking.

"Commercial activity has significantly increased in the past few months – particularly with the 7X – and this is having an impact on new aircraft sales," said Dassault CEO Charles Edelstenne. "But we are still way behind 2007 activity levels."

Edelstenne said the hope came from the booming markets of Brazil, Eastern Europe and India but that Dassault faced challenges in addition to the market collapse that hit the whole industry, and it also has "the competitive disadvantage of a very strong euro".

Hawker Fusion deal

Hawker Beechcraft's global customer support group announced an exclusive arrangement with Rockwell Collins for Pro Line 21 synthetic vision upgrades as well as for the avionics maker's new Pro Line Fusion retrofit capability for the company's aircraft.

Available in late 2012, the SV kit is expected to be available first for the King Air line of twin turboprops and then for the remainder of the Pro Line 21-equipped fleet.

A further upgrade from Pro Line 21 to Rockwell Collins' new Pro Line Fusion platform is expected to be certified and available to all Pro Line 21-equipped aircraft, with a target price of $300,000 installed.

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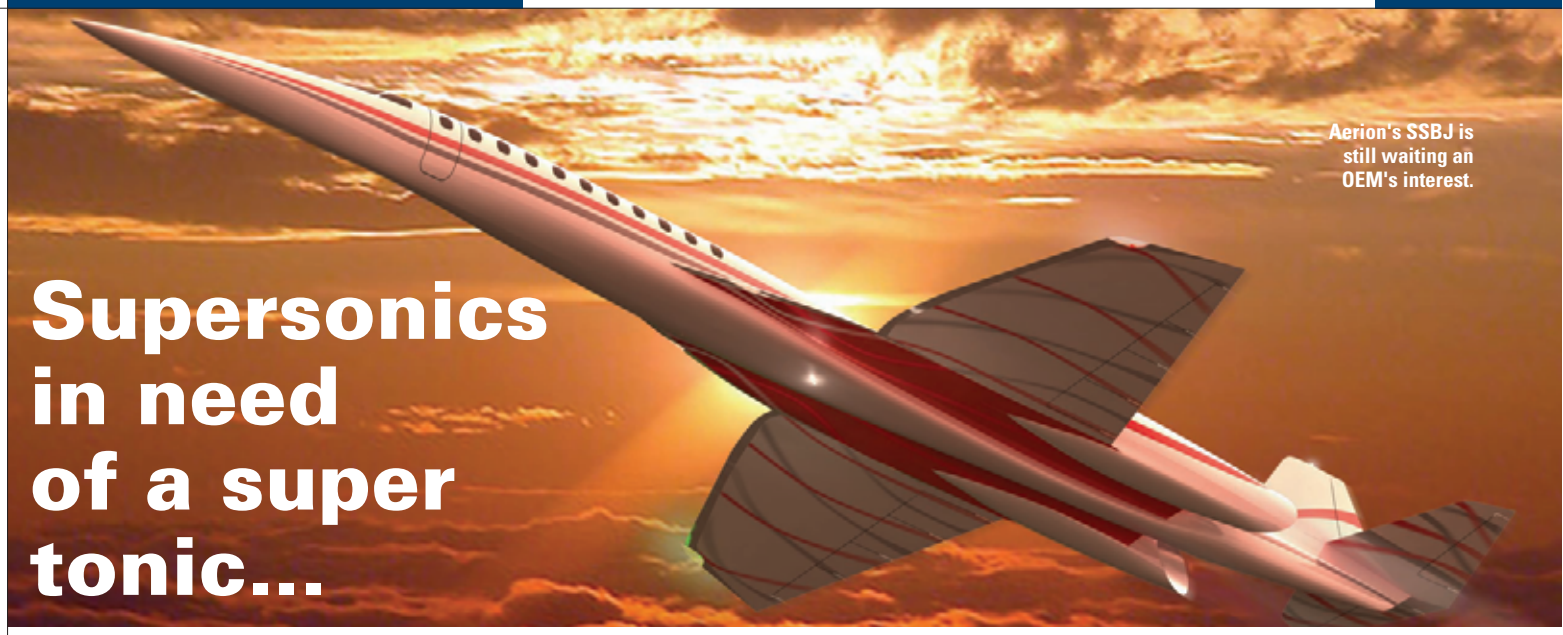


Aerion's SSBJ is still waiting an OEM's interest.

Supersonics in need of a super tonic...

Flying faster than the speed of sound is the stuff that dreams are made of. Since the demise of Concorde in 2003, several inventors have attempted to relight the supersonic fire for civil aviation. **Liz Moscrop** *reports.*

The latest person to throw his hat into the supersonic ring is US designer Richard Lugg with his company HyperMach Aerospace. He unveiled plans for the 20-seat SonicStar V-tailed, supersonic business jet (SSBJ) at the Paris Air Show in June.

Lugg says his Mach 3.6 aircraft will take no more than one hour 45 minutes to get from Paris to New York. Scheduled to fly in 2021, SonicStar may even be certified by 2025. With such a punishing production calendar from clean sheet design to entry into service, the firm will be at the Dubai Air Show on the hunt for new investors.

Executive vice president, global sales and marketing for HyperMach Europe, Judith Moreton said: "Our main focus is meeting the right people. We're looking for entrepreneurial customers with a passion for aviation, who are excited about this technology's future. There is obviously a higher risk at the start, but they will get more return on their investment than they would at a later stage when the technology is proved."

The key technology behind the SonicStar comes from one of Lugg's other companies, which developed the SonicBlue S-MAGJET five-stage electric-turbine hybrid supersonic 4000-X series engine. Another feature includes a magnetic spike on the nose that uses plasma waves to dampen the sonic boom. The idea is that there will be two shock waves as the aircraft approaches supersonic speeds; the second will have greater pressure and will partially mitigate the impact of the first.

This is crucial as a major hurdle to supersonic development is that it is so noisy that it is banned over land in many parts of the world. Shock waves develop around aircraft as they near speeds of Mach 1, and at ground level these are perceived as a loud double boom or bang.

According to Moreton, there has been strong interest from at least one major engine manufacturer, though she remained tight-lipped until contracts are formalised, which realistically would have to be within the next few months to meet the production timeframe.

Paris also saw another supersonic proposition via The European Aeronautic Defence and Space Company (EADS), which unveiled the Zero Emission Hyper Sonic Transport (ZEHST), an aircraft slated to fly above the atmosphere to avoid dumping pollutants. Most of the descent would be unpowered, using engines only for the final approach and landing phases. ZEHST would fly at Mach 0.8, potentially using rockets to get up to Mach 4 plus, offering a Paris-Tokyo flight in 2.5 hours. EADS says demonstration flights could happen by 2020.

Other contenders to build the next in-service supersonic aircraft include Aerion, which says it has secured around 50 orders for its $80 million SSBJ. The company is still looking for someone to build the aircraft, which would carry 8-12 passengers and travel at both supersonic and subsonic speeds.

Airframers investigating supersonic flight include Gulfstream and Dassault. However, Dassault seems to have parked its plans for the time being as it concentrates on other products.

Quiet spike technology

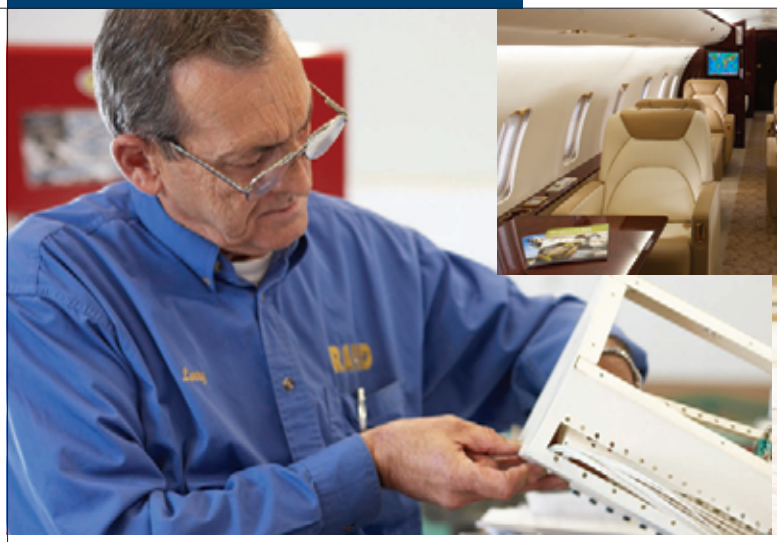
Gulfstream has experimented with sonic boom noise reduction using 'quiet spike' technology on a NASA F-15 flight test aircraft capable of flying in excess of Mach 2.0. The company has developed a telescopic spike that extends from 14ft in subsonic flight to 24ft in supersonic flight. This spike flattens out traditional 'N'-wave sonic boom pressure waves into more rounded shapes, roughly like a sideways 'S.' The OEM says this modification creates a sound that is quieter than Concorde by a factor of 10,000.

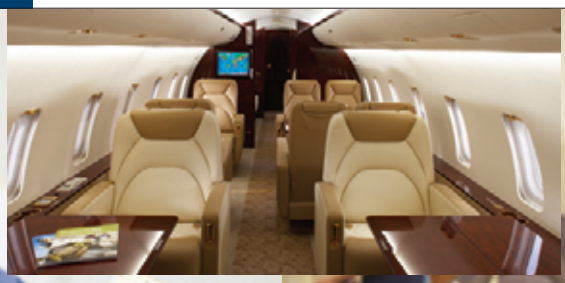
Italian giant Alenia was reported to be in talks with Russia's Sukhoi to bring a new supersonic business jet to market by 2015. The plane is slated to fly at more than Mach 1.6 and carry eight passengers. Fellow Russian airframer Tupolev has also developed concepts for a supersonic business jet the Tu-444.

Others are trying to muscle in.

In 2001, Michael Paulson founded Supersonic Aerospace International to fulfil his late father's wishes. Allen E Paulson hired Lockheed Martin to complete a feasibility study for a 'low boom' supersonic aircraft, which resulted in the design of the QSST, an aircraft that would have a sonic signature 1/100th that of Concorde at a speed up to Mach 1.8 and a range of 4,000nm.

Interestingly aviation giant Boeing has also said that supersonic aircraft could be economically and environmentally viable. With such a powerful advocate, supersonic aircraft may be flying again sooner than we think.





Family growing into the challenge of Challenger

As the first Challenger 850 enters service in the Middle East, **Liz Moscrop** *meets the Canadian family behind the impressive interior.*

Readers in the Middle East are well aware of the power of family-run businesses. Many of the region's greatest companies are owned and operated by tight-knit clans.

Across the world in Peterborough, Canada, Flying Colours Corporation bears witness to the value of a growing a company within a family. Founded by John Gillespie in 1989, today the completions centre and maintenance, repair and overhaul firm employs 250 people across two sites, has a partnership with Bombardier and is part managed by twin brothers Sean and Eric. Sister Kate Ahrens heads up the design team, while several key staff have been with the company for decades.

In 2009 the firm bought JetCorp Technical Services based in St Louis, MO, enabling it to offer US customers a location closer to home. Both facilities hold supplemental type certificates for components on a range of aircraft models including a CRJ 200 auxiliary fuel system, a CRJ 200 executive interior, and a green CL 850 executive interior.

The company has a full team of trained technicians at both the Peterborough and St Louis plants. Each centre can perform both major and minor maintenance inspections on Learjet, Challenger, Global, Hawker, Cessna, and Falcon models. The split is in favour of the creative work. Peterborough currently has a ratio of 70:30 completions to MRO business, whereas in St Louis that figure is nearer 60:40.

Flying Colours is well known for its Bombardier CRJ 200 refurbishment and modification work, such as its own Execliner and collaboration with Dubai-based Project Phoenix. However, this June ExecuJet Middle East took receipt of a Flying Colours-completed new Challenger 850 on behalf of a private customer, marking the first time that the company delivered this type of aircraft to the region.

Sean Gillespie said: "We have already experienced some success with our Execliner CRJ conversion in the Middle Eastern market. We anticipate this will be the first of many as we understand our clients in this region prefer larger aircraft, and our specialist skill-set enables us to complete them to their demanding standards."

The ExecuJet aircraft features a luxurious interior, including euro-burl veneer, customised gold inlays, and fine leathers and fabrics. In-flight connectivity comes courtesy of True North's Simphone Broadband Wi-Fi, and the aircraft is able to cope with iPad and Smartphone apps.

According to Eric Gillespie, the company has seen "a steady rise" through 2011 in international interest for its interior completion and conversion services on both new and pre-owned business aircraft. A further four Challenger 850s are undergoing completion with three in process at the Peterborough, Ontario facility, and one undergoing work at the St Louis JetCorp facility. All four are destined for delivery to Asia in the next 12 months.

Eric reckons that although many customers prefer new jets, there is still a robust appetite for pre-owned airliners. He pointed out: "You can spend US$600,000 to 800,000 for a 10,000-hour aircraft and then with a conversion it will cost you $12-18 million – half the price of a new Challenger."

As *Arabian Aerospace* went to press Flying Colours was converting three airliners to Execliners for US-based customers, all of which are private buyers. Each aircraft has been highly specified, and one will feature an aft cabin with a full-size bed and Tailwind 500 satellite TV system. This is the most unusual project the company has been asked for recently and will require some technical wizardry. However, Eric said: "Whenever someone asks us can we do something, our first answer is always 'yes'."

As the company grows, it needs to up its staff and processes. To keep up with both, it has created a training unit on site, attracting students from the local community and offering courses to develop skills. It is also working towards obtaining an AS9001 quality management system, which will reduce waste, improve processes and provide a template as it expands into new markets.

The family has greater ambitions for expansion. According to Eric, the company is actively looking for partners in the Middle East and China. Closer to home Peterborough Airport is investing $20 million and expanding its runway in 2012-13.

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AgustaWestland's new workhorse

AgustaWestland says the AW189 – a further stretched derivative of the best-selling and market-leading AW139 – demonstrates its commitment to offer the most advanced, versatile and cost-effective helicopter in its class.

It competes with the Eurocopter EC175 and with helicopters in the heavier sector of the market like the Sikorsky S-92 and Eurocopter EC225 and is designed to meet growing demand for higher payload, longer range and higher productivity, especially in the offshore gas platform (OGP) sector.

As such, the aircraft is an affordable, twin-engined multi-role helicopter in the eight tonne class. It has a spacious, unobstructed cabin configured with 16 seats as standard and with seating options including an 18-seat high-density layout and an ultra-long-range 12-seat configuration, including a number of forward and rear-facing layouts.

Cabin and cockpit air conditioning can be operated using the standard auxiliary power unit without the main engines running, which will allow greater passenger comfort in offshore operations in the Gulf, where the helicopter is likely to find considerable success.

Though described by the company as a new generation helicopter, the AW189 uses the same basic airframe, systems and equipment as the company's AW149 medium military transport helicopter.

It is expected to have the same advanced glass cockpit as the smaller, four-tonne AW169, with four large 8in x 10in active matrix liquid crystal displays and probably incorporating AgustaWestland's new synthetic vision system now being offered on the Grand New helicopter.

Maintenance operations have been optimised to reduce downtime, with extensive use of health monitoring and advanced diagnostic tools so it should be well suited to flying a wide range of roles including passenger and VIP/corporate transport, long-range search and rescue, and a variety of parapublic missions, with enough cabin area and volume to accommodate various mixes of seats, mission consoles, dedicated mission equipment and stretchers/litters according to the operational requirement.

Reims helps to put Tunisia on the map

Tunisia turns to French manufacturer GECI to meet a new high-tec mission.

Alan Peaford *reports.*

A major mapping of some of the remoter areas of Tunisia is now under way using the latest aerial technologies – and the flexible platform of the Reims Aviation F406.

It was back in December 2008 that the Office de Topographie et de cartographie, through the Tunisian Ministry of Defence, issued an international invitation to tender for the mapping of its territory using high-tech systems.

While many platforms were considered, it was the technical solution proposed by IGN France International and Reims Aviation that won the day.

After the uprisings in the North African country had settled, Reims and IGN delivered the aircraft to Tunis and through the summer delivered initial training in Tunis. Subsequently, they have brought the Tunisians back to France for advanced training.

The aircraft was the 97th F406 manufactured by Reims Aviation, a division of GECI International. With the twin-turboprop aircraft particularly well suited to light airborne surveillance missions and integration of the latest generation systems, it is proving useful for cartography.

The aircraft is also excellent in the fight against pollution as well as surveillance of fishing grounds, borders, passenger and freight transport.

To carry out the Tunisian missions the F406 is equipped with a Hexagone brand large format DMC digital camera, a console dedicated to the handling of the camera and a screen to allow the pilot to line up with the axes of the flight plan defined in advance.

The DMC digital system replaces the film-based photography equipment that has been used until now. Substantial technical support for the aerial photography is also provided based on test flights, image processing and aerial triangulation.

The F406 could be about to enter a new lease of life and the French manufacturer is eyeing other potential prospects in the MENA region. The 100th model is scheduled for delivery at the end of 2011 – the first of five on order with an unnamed Chinese charter operator – and the company is in talks with a number of customers for the sale of up to 70 more aircraft.

The special missions market accounts for around 55% of F406 sales, with airline and charter operators soaking up the remainder.

To support its expanding customer base GECI is boosting its product support network with new offices in Kuala Lumpur and Brisbane planned; plus there is a possibility of a centre in the Middle East.

The vintage Reims F406 was developed from the Cessna 404 Caravan II. Since GECI took over the ailing company, life has been breathed into the programme.

The first of the new aircraft was been delivered to Tunisia's tourism ministry and an opportunity for more prestigious interiors to suit VIP or well-heeled tourism markets is under debate.

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ArabSat-5C launches from French Guiana

Arabsat-5C was safely launched by Arianespace from Kourou aboard an Ariane 5 on the evening of September 21 this year.

The satellite was built by Astrium and Thales Alenia Space for satcom operator Arabsat, based in Riyadh, Saudi Arabia. Astrium supplied the Eurostar E3000 platform and handled satellite integration, while Thales Alenia Space supplied the payload.

Once positioned at its 20 degree East geostationary orbital location, Arabsat-5C will deliver capacity in both the C- and Ka-bands for a range of communications services.

Fitted with 26 active channels in C-band and wide band transponders over 10 spots in Ka-band, Arabsat 5C will also provide TV broadcast services for the Middle East and North Africa with a design life exceeding 15 years.

The original launch date had to be put back a day due to a strike by the Trade Union of French Guiana Workers (UTG), which would have caused telecommunications problems for Arianespace.

ArabSat-5C shared the launcher with SES-2, which will be utilised by Europe's SES.

This team is also upgrading the ground control segment for the extended Arabsat satellite fleet with the series of fifth-generation spacecraft.

Arabsat's first satellite – Arabsat 1A – was launched in 1985 on an Ariane 3 vehicle. A total of eight Arabsat spacecraft have been launched to date by Arianespace, including Arabsat-5A, which was orbited by an Ariane 5 in June 2010.

Rockwell Collins seals Inmarsat GX deal

Inmarsat has reached an agreement in principle with Rockwell Collins to develop, produce and distribute user terminals for its upcoming Global Xpress (GX) aeronautical services.

With support from Rockwell Collins, the in-flight testing of the GX aeronautical services will begin after the launch of the first Inmarsat-5 satellite, scheduled for mid-2013.

Global Xpress services for commercial air transport, business aviation and government customers are scheduled to commence in 2014.

Under the agreement, Inmarsat and Rockwell Collins will enter into exclusive negotiations that are expected to lead to definitive agreements by late 2011.

Global Xpress will be the only global broadband system operating in the Ka-band, with transmission speeds at least double that of its Ku-band counterparts.

Meanwhile, Inmarsat users looking for more bandwidth on their existing L-band installations can now access up to four SwiftBroadband channels per aircraft after the two-channel restriction was lifted on October 1.

SwiftBroadband for helicopters is also being introduced, with new interleaving bearers (waveforms) being developed that re-arrange information packets across a longer burst, making it more robust in tough conditions, including beaming through helicopter rotors.

These new bearer designs are planned to be available by the first quarter of 2013.

Inmarsat has also outlined plans for oceanic safety services via SwiftBroadband, also currently targeted to be introduced in 2013.

The plan is for SwiftBroadband to become the bearer of the existing safety services, with enhanced functionality being added, including a prioritised IP pipe to the cockpit and aircraft positional data.

SwiftBroadband Safety services will be introduced following the launch of the Alphasat satellite, which will provide additional coverage over Europe, Asia, Africa and the Middle East, where it will be positioned at 25 degrees East.

Inmarsat will provide a higher-performing solution for safety and operational traffic than previously available via satellite, and at a lower cost to end-users.

Yahsat's Ka-band satellite terminals

Hughes Network Systems has shipped its first advanced Ka-band gateway equipment and satellite terminals to Abu Dhabi-based Al Yah Satellite Communications (Yahsat).

The shipment of four system gateways, network control centre (NCC), and an initial order of Ka-band terminals, will be used by Yahsat to provide its "YahClick" next-generation, high-speed satellite internet service.

Due to launch in 2012, the new service has been developed to bring high-performance broadband access to unserved and underserved regions of the Middle East, Africa, and Southwest Asia, and is on target to reach 26 countries. Yahsat is now on track to have the YahClick ground system in place and ready for its Y1b satellite launch later this year.

In addition to providing gateways and terminals, Hughes is also under contract to deliver a complete operational support system and business support system (OSS/BSS) solution, as well as to operate and maintain the network for a three-year period.

Thales and Al Yah have also signed a memorandum of understanding (MoU) to offer highly secure satellite communication services to military forces and government agencies.

Yahsat will provide its Ka-band satellite resources under it's product "YahSecure", while Thales will provide its associated ground segment secure solutions.

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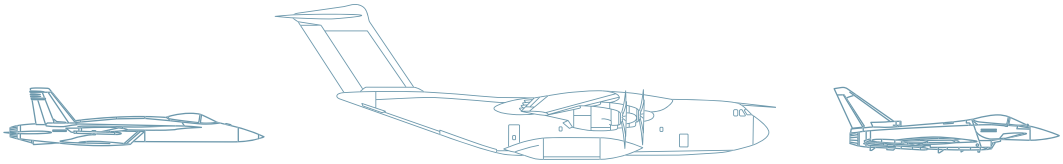

Oman waking up to its true potential

The Sultanate of Oman is a relatively sleepy country but with hard work from the ministry of tourism and Oman Air, this formerly quiet place is starting to shout out to the world that it has woken up and can offer visitors a true taste of Arabia. **Marcelle Nethersole** *reports.*

Oman is the third largest country located on the southeast coast of the Arabian peninsular and is the oldest independent state in the Arab world. Once an empire, it has had its share of power struggles, including with the British and the Portuguese, for influence in the Gulf.

But, since its development of new foreign policy in 1970, the country has turned a corner.

Today, it is one of the more traditional countries in the region. Unlike two of its neighbours, Saudi Arabia and the UAE, it is not about impressive skyscrapers and huge shopping malls but more about authentic culture and tradition – something the government wants to maintain even as the country develops.

With the ministry of tourism and Oman Air working hand-in-hand, Oman is already making its presence known to the world.

"Oman is a relatively new entrant to world tourism but it's already making an impression in many markets," said director-general Ali Khaburi of the ministry of tourism.

"Based on studies on how to best nurture tourism, the ministry was formed by royal decree in 2004, followed by Omran – the Government's lead agency for tourism development – in 2005. This structured approach is intended to facilitate a managed approach to industry development, particularly to avoid a situation where tourism demand exceeds the capacity to provide a quality visitor experience that showcases Oman's attributes, natural and cultural values.

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Muscat's new opera house stands out as a beacon for an attraction for cultural tourists. Above: the more traditional delights such as the Sultan's palace (top), a date grove and the Muscat Corniche.

CONTINUED FROM PAGE 75

"At the same time, the government divested its interest in Gulf Air in favour of a greater stake in Oman Air, so the airline could transform from a regional to an international carrier.

"There is also a focus on taking a responsible approach to sustainable development. Aviation reforms have enabled Muscat to become a gateway to the Gulf, as it was for thousands of years a major port for the maritime silk trade."

As with other countries in the region, oil is the mainstay of the economy but the country is a modest producer. While fishing and agriculture remain major sources of income, tourism is fast becoming important to the country's economy.

Oman is boosting its profile in the coming year with new awareness campaigns. Its focus is to ensure visitors experience an authentic Arabia and have the opportunity to see its beautiful landscapes and natural environments.

"Oman is untouched land. You can see true Arabia here," said Khaburi. "We have vast unspoilt beaches, valleys, mountains, and sand dunes. We can offer the tourist a diverse option of activities, from trekking in the mountains to camping in traditional Bedouin style in the desert."

Remote villages

And, while visitors to Oman will see the odd western brand, they will also pass by remote villages, picturesque date farms, and frankincense groves.

Khaburi added: "We are in easy reach of the Gulf's mega hubs, or visitors can fly non-stop to Oman with Oman Air, which now offers business class stop-overs. Experienced travellers to the Gulf should consider using Muscat as a gateway and enjoy our hospitality at the same time."

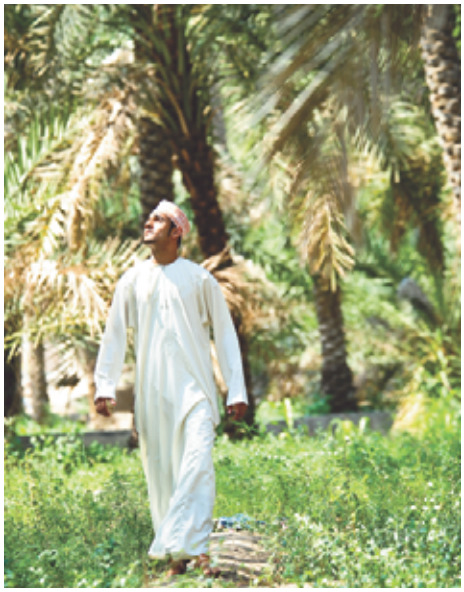
Muscat is Oman's burgeoning capital with forts, palaces, the old walled city, museums, traditional souks, and beaches. It also has some great restaurants offering a range of international cuisine, including fish restaurants serving fresh catch of the day.

Development has long been improving with hotels and resorts in Muscat, as well as other projects including its new convention centre aimed at bringing in more business travellers.

"Our state-of-the-art Royal Opera House Muscat opened last year. It is not just a landmark in Oman but in the entire GCC as it is the only opera house in the region," said Khaburi. "Already we have a list of the best opera singers in the world who will perform here.

"In 2014 we will also see the opening of the Oman Convention and Exhibition Centre that will enable us to bid for internationally significant business events. It will accommodate 3,000 delegates and include four hotels with a 1,000-room capacity. These kinds of developments open new segments for Oman and allow activities to take place in summer, traditionally a quiet time for us."

While Oman has blue-skies all year round it can be hot in desert cities such as Muscat during the summer. The coolest time to visit is after September.



Travelling around Oman there is plenty to see from the rural oasis towns, the souks with traditional headgear, and even fresh tuna for dinner.

But Oman has a secret up its sleeve – the city of Salaha. Located in the Dhofar region, this is Oman's second major city and is dominated by mountains, valleys, and the Arabian Sea. It's lush with greenery and shrubs and offers a cool alternative away from the dry desert heat. Oman's tourism performance has been remarkably good in the last few years – proof that travellers are discovering this friendly country. The years 2009 and 2010 saw arrivals growth to Oman of 5% and 18% respectively. For the year ending July 2011, IATA data shows total passenger arrivals to Muscat International Airport increasing to 2.23 million, up 15% over the same period in 2010.

"The highest growth is from Italy (60%), UAE (31%), Germany (22%), France (14%) and The Netherlands (8%)," said Khaburi. "Our performance has been helped by strong growth in domestic tourism made possible by sustained economic growth. More Omanis are travelling around Oman, visiting family and exploring new destinations. This year we saw a jump in visitors to regional destinations like the Hajar Mountains and to Dhofar for the Khareef and Eid holiday."

Build on its brand

The future of tourism in Oman is looking very positive and the ministry of tourism is continuing to build on its brand.

"Our strapline is: Beauty has an address – Oman. We have led the roll-out of Oman's brand mark since its launch in mid 2008 and we are now seeing the benefits of this," said Khaburi.

"We are in a strong position, although on-going global financial problems will have a negative impact on medium and long-haul markets. We have seen some cancellations from Europe but we expect these will be offset by new business from the Swiss and Russian markets that will open with the start of Oman Air services. Also, Oman is seeing more services from low-cost carriers and this will stimulate leisure travel from the Gulf and India. Cruise ship arrivals are also on the way up.

"Additionally, around 1,000 new hotel rooms will come on to the market, including the Salalah Beach Resort at Salalah, adding to the recently opened City Seasons Hotel and the Sifawy Boutique Hotel about 60km east of Muscat."

Khaburi said that Oman is not in competition with any of its glitzier neighbours and that it is an individual country offering a different mix of segments.

He explained: "We think Oman has a unique offering. We work to position Oman in the international market as the destination for an authentic Arabian experience that is made more special by our rich cultural heritage and diverse landscapes and environmental diversity. We want people around the world to think of the sultanate as a young, progressive and outward looking country that is special. It's a peaceful and culturally rich destination with year-round attractions."

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Oman Air has moved from a little known regional carrier to a renowned international airline brand. **Alan Peaford** *meets the outgoing CEO of the airline to find out what lies ahead.*

HILL SET TO BOW OUT ON A HIGH

When 16-year-old London schoolboy Peter Hill was rejected by the Royal Air Force because of childhood asthma, he thought his aviation dream had come to an end.

But a friend of his careers officer at school found him a commercial trainee post with British Airways and the rest, as they say, is history.

At the end of 2011 Hill will step down as chief executive of Oman Air, having seen more than 50 years' service to the industry and been at the leading edge of some of the great success stories – with Oman Air the latest of them.

He was due to retire in September with a five-week tour of New Zealand coinciding with the Rugby World Cup finals before settling down in his beloved Sri Lanka to work with his wife on their foundation, helping Sri Lankan youngsters understand dance and traditions from the island's ancient culture.

But the Omani government – owners of Oman Air – had other plans and persuaded him to stay on another three months to help get a successor in place. Hill agreed – but only after the rugby trip was completed. "I was there in Sydney when England won, I went to the tournament in Wales and I wasn't going to miss this one," he said.

Hill was one of the founding team that set up Emirates Airline, working with Sheikh Ahmed, Maurice Flanagan and Tim Clark in those early days when the aviation world doubted the sanity of the team's ambitions to create a world-leading airline.

"I learned a lot from my time at Emirates," Hill said.

He left Dubai in 1996 for what turned out to be a two-year sabbatical. "I was travelling five days out of seven and was burnt out. I went back to London to recharge my batteries and opened a pub called The Constitution in Camden Town with a business partner. But, after two years, Tim Clark walked in and asked me if I'd had enough time pulling the pints and fancied coming back into the business. I did. I realised I was never going to go back to the pub. I was back in the airline business."

The job was to head Sri Lankan as Emirates had taken a major stake in the airline.

"I had a great time there. After that relationship ended I went back to Dubai. I was approaching 62 and thinking of retiring but at that time Ghaith al Ghaith was starting up flydubai. Ghaith and I go back a long way and he was happy to have me alongside and we got it off to a great start.

"Then, out of the blue, came the offer from Oman. Sadly the CEO had died. They were in a bit of a pickle without a natural successor and, of course, 18 months earlier they had separated from Gulf Air. So I came down here in July 2008 for two years. Those two years came knocking very quickly and the chairman said stay another year, and I did," Hill said.

Global renown

In the three years of Hill's reign, Oman Air has been transformed from a small, largely unknown, regional carrier into an airline of global renown. This year the French travel industry voted it airline of the year; the UK commended it as runner-up behind Etihad; Germany rated it the best leisure airline; the world's passenger experience association awarded it top prize for connectivity and the icing on the cake came with a four-star rating from SkyTrax and the title of the world's best business class seat, a mantle that turned some heads of airlines further up the Gulf.

"We've got off to a good start created a good image," Hill said. "People can see what we are doing. We are making waves and I like seeing our peer group taking flights with us to find out why people are talking so much about this airline with just its seven wide-bodied aircraft."

After the 2007 break-up of Gulf Air, the fledgling Omani airline had seen the need to start flying to international destinations and leased two long-haul aircraft to begin operations to London Gatwick and Bangkok.

"That whole thing was an interim product but it didn't do them much good because the product itself wasn't really very good. It might have been better to start afresh with the new Airbus A330s. So, we had a real hotchpotch of a long-haul operation and a sound solid base of regional operations around the Gulf and the Indian sub continent. But we had seven A330s starting to arrive in 15 months. There was also a doubling of the 737 fleet from eight aircraft to 15 and the ambitions to launch a whole range of new routes to use the A300s. But nothing much had been done," Hill said.

The challenge took Hill back to the early days at Emirates when they had to start an airline in six months. "I realised that what we did then was appropriate to what we needed to do now," Hill said. "Assemble a good team of people who can do the job and pass on their knowledge to other people in the organisation to help bring them through.

"It's a lot more challenging to try to bring on an existing organisation than it is to start with a clear sheet of paper like we did at Emirates. There is a whole range of challenges. In Sri Lankan I had it with the unions, while here it was a lack of exposure to the requirements of a top class international airline and a need to match the products we were going to be facing from our competitors in the Gulf. We were jumping in at the deep end. The government was prepared to invest.

"They had specked up the new aircraft very nicely and had already put a lot of the gizmos in, which was visionary from the chairman at the time. So clearly they wanted to go down the high quality route. We had to create a niche and

differentiate the airline from the products our competitors had."

Many people raised eyebrows at the commercial wisdom of the quality offer from Oman Air but Hill defends the logic.

"We have a country virtually unknown outside this region but is getting recognition as a result of what it has to offer. It is different from the rest of the GCC. It is truly a potential holiday tourism resort because of the diversity, history and natural beauty that the country enjoys.

"There are still people in the world prepared to pay for that exclusivity, that solitude, that peace and quiet. It is probably exactly the opposite to how Dubai has been positioning itself over the last 20 years but very complementary in being able to attract the same type of customers – the very well-heeled people who are prepared to spend to enjoy.

"We set about defining what we could do and making ourselves known as the Gateway to Oman, promoting point-to-point and then following with a network. Being a hub is the by-product. This strategy is completely opposite to the other Gulf carriers. Our country is our soul – not the strength of our network."

Oman Air targeted wealthy business hubs in Germany, the UK, France and Italy as well as Thailand and Malaysia, where there were already good ties with the Omani people.

"We need to get Oman on the map," Hill said. "We work closely with the ministry of tourism and there needs to be money spent on attracting tourists. In the last three years I have not seen the level of tourists coming into Oman that we would have hoped for after having put the airline on the map in the way we have. As a result we are carrying far too many people through Oman than we are to Oman. There is only one way to do it and that is spend money and get out and do a solid marketing campaign at the target markets.

Half the battle

"We have won half the battle. But if people don't know what Oman has to offer then they will keep by-passing and using Oman Air just to get to traditional destinations."

Oman Air's move to become the first to bring full connectivity throughout all cabins was seen as a coup for the relatively small airline. "It was fantastic," Hill said. "We knew all airlines would do it eventually but it was great to be first. And that offer worked with our fantastic cabins – great designs with open space."

The airline also includes 15 Boeing 737s in its fleet, which Hill says could be refurbished soon. "The colours are wrong, bulkhead designs are 20 years out of date and feature the Khanjar (the dagger) and that doesn't reflect the Oman of today."

More recently Oman Air has been purchasing Embraer 175s to run thin routes and increase frequency. "The Embraer is a totally different experience," Hill said. "It is a smaller aircraft but you feel there's more space. We are very happy with them and there are more coming. They are half the cost with half the seats; 70 people on a 737 you lose your shirt, 70 people on an Embraer and you make money."

Hill said he would be sad to say goodbye to so many friends made in the industry over the past half century – but typically he is looking forward and not back.

"Oman Air has great opportunities. In 10 years time it will have got its network expanded and taken some more wide-bodied aircraft on. I would expect it to use the 737s and E175s to penetrate new markets in Eastern Europe. But it needs all that traffic to come to Oman and the tourism industry in Oman needs to get its act together to make it a serious destination for serious travellers. If we can do that, Oman has a great future and Oman Air has a great future too."

Turning sights on the Russian market

In 1993 Oman Air operated its inaugural flight to Salalah, Oman's second major city. Since then the airline has steadily grown and expanded to more than 40 destinations. "The next two destinations to add to our network will be Moscow and Zurich," said chief officer management affairs, Abdul Aziz Al-Raisi. "Russia is a massive market in tourism, so we feel it has a place in our thinking, as does Switzerland."

The airline is looking into the destinations it feels can contribute to Oman's tourism.

"Tourism is key for the airline and the country," said Al-Raisi. "The airline carries the flag to make Oman known to the world. So, while we want to explore countries that can contribute to Oman, at the same time we want to offer the people of Oman more travel options. We're looking to attract the premium class tourists – that is why we have designed high-class cabins. It goes hand in hand."

Al-Raisi confirmed the aim for the airline in the next three years is to introduce its long-haul operations, new aircraft, new routes and maintain its award-winning facilities on board.

"In three to five years we don't expect to be like the giants of our neighbours in terms of fleet or routes," he said. "Oman Air tends to be the opposite – we have limited network, smaller fleet, but we are more focused. We treat our customers like family."

Staying fleet of foot on aircraft purchase

Abdulrazaq Alraisi, Oman Air's chief commercial officer, sees a major part of his role as aircraft purchase. "The Oman Air brand has grown quickly and we have to make sure we are on the ball when it comes to aircraft purchase," said Alraisi.

The airline currently has two Embraer E-175s on order. "We will receive one next year and the other in 2013. We have six 737s on order and delivery should start between 2014 and 2016."

With the first delivery of Boeing's Dreamliner to ANA in September and Oman Air signing an MOU with ALAFCO, how close is the airline to receiving one?

Alraisi said cautiously: "Well, we have signed an MOU for six of the aircraft but as yet we haven't finalised the deal. We are still working on the process with ALAFCO but we have an agreement that we will buy them; it's just a case of it not being finalised yet."

Alraisi is keen to point out that while the airline has won many awards already he realises the need to maintain its standards on future fleet.

"With our A330 fleet, which started in late 2008, we created something special, from the seat and the connectivity to the general look and feel of the aircraft; we did a great job. So, right now we need to maintain the next fleet on the same level – no matter which aircraft we purchase. We want to gradually expand."

Georgiou turning Oman Air into the 'real thing'

Oman Air's spate of award wins over the past couple of years has made Phillipe Georgiou's job as chief officer, corporate affairs, somewhat easier.

Georgiou came to the airline from a career with Coca Cola – world renowned for its marketing capabilities – and began applying his knowledge to help the airline make a transition from being a local player to a global one in a highly competitive world.

"As we started flying to Europe we had to transform our approach in things like attitude, character, behaviour, expectations. The relationship with our customers changes," he said.

Oman Air is opening a customer service centre in the UK by the end of the year. "We will have someone who will take the calls from Europe, who will understand the issues that arise in a different way that somebody would understand it in Oman," Georgiou said.

Advertising is different too. "Thinking locally is part of that transformation," he said. "We advertise differently in Europe than we do in India and Pakistan.

"We have small PR agencies in each of the countries which guide us about how we are seen in the countries we are flying to."

There is a central theme to the Oman Air campaigns. "We first create visibility for Oman, then we suggest the best way to go is to take Oman Air. Co-ordination with the ministry of tourism is absolutely key."

As a niche airline, Oman Air has to position itself differently. "There is no point in us doing the same as the others with much deeper pockets," said Georgiou. "We need the destination to be the main thing, so we have aligned with the vision of the country. Our target is the discerning tourist rather than mass tourism."

Sponsorship reflects Oman's strengths. The airline supports Oman Sail and competes in the Extreme 40 class with a boat skippered by British Olympic champion Ben Ainsley.

It was behind the Tour de Oman cycle race and gets local attention by backing Omani motor racing pin-up Ahmed Al Harthy.

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Small air force with

The Royal Air Force of Oman (Al-Quwwat al-Jawiyya al-Sultaniyya al-'Umaniyya) is not the largest air arm in the GCC, nor is it the most modern, but it is one of the most professional air forces in the Arab world, enjoying an enviable reputation and long operational experience.

Jon Lake *reports.*

Never colonised, Oman has benefited from a long and close alliance with Britain, which helped transform the tribal levies and palace guard of Muscat and Oman into modern armed forces.

It was a process that was accelerated following a 1953 dispute over the ownership of the Buraimi Oasis with Saudi Arabia, and following the Saudi-supported rebellion in the Jebel Akhdar region. Sultan Said bin Taimur regained control of the area in 1959, with the help of British air power, and on March 1 1959 the Sultan of Oman's Air Force (SOAF) was formed, with seconded British personnel and two (later four) Scottish Aviation Pioneer CC.Mk 1 aircraft and three (later five) Provost T.Mk 52s transferred from the RAF. Four DHC-2 Beavers were also transferred.

The new air arm operated from Bayt al-Falaj, near Muscat, and consisted of seven seconded RAF pilots, with maintenance by Airwork Ltd.

The new air arm was initially equipped with a variety of liaison and transport aircraft, but with the start of the Dhofar Rebellion in 1962, 12 armed Percival Provost T.Mk 52s were taken on charge, and these saw extensive use in the close air support role.

The rebellion, initially supported by Saudi Arabia, intensified in 1967, with the establishment of the People's Democratic Republic of Yemen (PDRY), which gave the rebels an adjacent source of arms and supplies, and which radicalised the Adoo rebel forces, whose aims went from greater autonomy for their region, and an improvement in living standards, to an overthrow of the Sultanate.

The campaign moved from a tribal revolt into a major communist rural insurgency backed by the USSR and the Peoples Republic of China. Jet-engined BAC Strikemaster Mk.82s entered service in 1968 (the order increasing from four to 12 and later to 24), and these were augmented by Dakota transports and later by DHC-4 Caribous and Short Skyvans and five second-hand Vickers Viscounts. Pilatus PC-6 Porter air ambulances were also used extensively during the conflict.

By 1969, the situation was becoming critical but the following year the reactionary Said bin Taimur was overthrown by his son, Qaboos bin Said, in a palace coup. The nation became the Sultanate of

a big reputation

Left: SEPECAT Jaguar OS. No.s 8 and 20 Squadrons, Thumrait. Right: PAC MFI-17 Super Mushshak, 1 Squadron (Sultan Qaboos Flying Academy), Masirah.

Oman (rather than the Sultanate of Muscat and Oman), and the air force was renamed as the Sultanate of Oman Air Force (SOAF).

The new Sultan was a professionally trained military officer, a graduate of the Royal Military Academy, Sandhurst, having served with the 1st Battalion of the Cameronians. Qaboos reorganised the armed forces along more modern lines and instituted a re-equipment programme. He also launched a series of liberal social reforms, using income from the oil industry to improve Oman's infrastructure and especially its schools and hospitals.

The Sultan also instigated an effective 'hearts and minds' campaign aimed at winning over the population of Dhofar. This proved successful and a number of Firqat irregular units were formed from surrendered rebels.

The reorganised and modernised armed forces, ably supported by British SAS and (from 1971) Iranian detachments, and by RAF, IIAF and SOAF air power, drove the rebels back into their heartland, and the rebellion was finally declared to be over in 1976.

The ramifications of a failure to hold the line in Dhofar would have had far reaching effects upon the whole Gulf area and, indeed, upon the rest of the world, had the revolution spread to the other Gulf States. Instead, this was claimed to be the only time a sovereign state overcame a full-blown communist insurgency in the field.

In 1974 the SOAF placed orders for eight Britten Norman BN-2A-21 Defenders, three BAC One-Elevens, together with a BAC VC10 for the Royal Flight. The SOAF's capabilities were also expanded by the induction of a fleet of 20-35 Agusta-Bell AB205s, which equipped Nos 3 and 14 squadrons at Salalah and Seeb.

The Omanis received four Agusta-Bell AB.206s, eight AB.205s and two AB.212s from Italy, and five Bell 214s from the USA. These were augmented by two squadrons of Bell 205s, placed under Omani orders by the Imperial Iranian Army.

Even more significantly, the Sultanate received some 31 Hawker Hunter fighter ground attack aircraft donated from both Jordan and Kuwait.

About 15 or 16 Hunter FGA.Mk 73A/Bs and FR.Mk 10s, as well as two or three T.Mk 66s from the fleet, were maintained in flyable condition with No 6 squadron at Thumrait, with the remainder being used for spares or as attrition replacements. The newly acquired Hunters undertook a five-week offensive across the Yemen border against supply routes and gun positions, exposing Yemeni vulnerability, and undermining Yemen's support for the PFLO rebels.

Some of the Hunter FGA.73A/Bs were subsequently upgraded by Singapore Industries with Tracor AN/ALE-40 chaff/flare dispensers, LORAN navigation equipment and extra wing pylons to allow carriage of the AIM-9P Sidewinder air-to-air missile.

The Hunters were soon augmented by an initial batch of ten SEPECAT Jaguar OS single-seaters and two Jaguar OB two-seaters, ordered in 1976 and delivered between 1977 and 1978 to equip No 8 squadron at Thumrait. A second batch of 12 Jaguars (again including a pair of twin-stickers) delivered in 1983 enabled the establishment of a second squadron, No 20, at Masirah.

Single ex-RAF single- and two-seaters were delivered subsequently as attrition replacements; 21 surviving Jaguars were upgraded with the Ferranti FIN

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1064 nav-attack system in 1986-1989, and many were subsequently further upgraded. Like the Hunters, the Jaguars had an important air defence capability, using the AIM-9P Sidewinder.

Like most SOAF types, the Jaguars were flown primarily by seconded RAF 'exchange' or contract pilots, though during the 1990s and the first decade of this century Oman has made great strides in training local pilots.

British Aerospace began the construction of a modern integrated air defence system (IADS) in 1974 and this was complete to its original specification by 1978, though it was much improved subsequently. Airfields were linked together by a centrally-controlled communications system and an early warning radar control and reporting network was established.

The development of this IADS was the main driver in transforming the SOAF into a truly modern air force. Low-level air defences were strengthened by the acquisition of two squadrons of Rapier SAMs, which were subsequently upgraded and improved through the addition of Blindfire radars in 1983.

Though Oman has maintained its relationship with Britain, it has also strengthened its links with its neighbours and, during 1981, with Bahrain, Kuwait, Saudi Arabia, Qatar and the United Arab Emirates formed the Gulf Co-operation Council (GCC). Oman assigned an infantry battalion to the GCC's Peninsula Shield force during the Iran–Iraq War, which began in September 1980 and lasted until August 1988.

Re-equipment and modernisation

Oman continued its re-equipment and modernisation programme during the 1980s. The IADS was enhanced, and ground-based radars were upgraded (and augmented by new equipment including Martello 5713 long-range 3D radars and their associated MACE display and data-handling systems) after 1982. A new control and reporting centre (CRC) was established and existing CRCs and sector operations centres were upgraded and improved. Three C-130H Hercules were ordered to strengthen the transport arm.

In 1990 SOAF was renamed as the Royal Air Force of Oman (RAFO), and it supported operations Desert Shield and Desert Storm. Some CAP missions were flown when it appeared as though Yemen might back Iraq, and coastal patrol/maritime reconnaissance missions assumed a new importance. The Hunters and Jaguars worked with USAF, USN, USMC, and Royal Air Force units as they worked up, and made simulated attacks against USN carrier groups. An Omani battalion served in Saudi Arabia, as part of the Saudi Arabian-led Task Force Omar – which, in turn, formed part of the GCC contribution to the ground forces used to liberate Kuwait. RAFO C-130s based operated from Seeb to supply these forces.

In 1993 and 1994 the RAFO replaced its Hawker Hunters with four BAE Hawk Mk 103 lead-in fighter-trainers and 12 single-seat Hawk Mk 203 light ground attack/interceptor fighters, equipped with Westinghouse APG-66H radar. These equipped No6 squadron at Masirah which, with No1 squadron, formed part of the Sultan Qaboos Flying Academy.

PICTURE: GEOFF LEE

Pilatus PC-9(M), 1 Squadron and BAE Hawk 103, 6 Squadron (Sultan Qaboos Flying Academy), Masirah.

No1 squadron used a mix of PAC Super Mushshak primary trainers, with Pilatus PC-9s taking the basic training phase, before student pilots moved to the Hawk for advanced flying training. Rotary wing students fly the Bell 206 and Super Lynx Mk 120 with No3 squadron at Salalah.

New combat aircraft

After evaluating a number of new fighter aircraft, the RAFO decided to delay the procurement of new combat aircraft, and instead opted to upgrade and extend the service lives of its remaining 17 SEPECAT Jaguars, following the example of the RAF's Jaguar 97/GR.Mk 3A upgrade. This gave the ageing Jaguars a new AMLCD in the cockpit, GPS navigation, and compatibility with the TIALD laser designation pod. A contract was placed with the United Kingdom Ministry of Defence in September 1997 for the $40 million upgrade, which extended the Jaguar's planned service life until well into the second decade of the 21st century.

But increased tensions in the region saw Oman deciding to expand its fast jet force, augmenting the two Jaguar squadrons with a new unit. This would be equipped with 12 Block 50 F-16 Fighting Falcons, ordered in May 2002. Eight single-seat F-16Cs and four two-seat F-16Ds were delivered during 2005/2006 under the Peace A'sama A'safiya (clear skies) programme, equipping the newly formed No18 squadron at Thumrait.

The acquisition of the F-16 allowed the Hawk 203s (Oman's first fast jets to be equipped with search radar) to be relegated to advanced training duties, and gave the air force expanded air-to-surface capabilities. The Omani F-16s also have a vital reconnaissance role, using the BAE Systems' airborne reconnaissance system (ARS). BAE Systems was awarded a $27.5 million 'foreign military sales' contract in 2004, for the delivery of two ARS pods and a ground station to Oman. BAE Systems announced it had successfully completed the in-country commissioning of the pod on November 27 2007.

As well as ordering F-16s, the RAFO set in train a major helicopter re-equipment programme. In January 2002 a contract was signed with Westland Helicopters to provide 16 Super Lynx 300s. Oman was the first customer in the Middle East for the new CTS800-engined Lynx, and was the first customer to operate the aircraft in a multi-role configuration, equipped for a wide range of overland and maritime roles including utility and troop transport as well as search and rescue and coastal patrol.

The first three Super Lynx 300 helicopters arrived in Oman on June 24 2004, just 28 months after contract signature. The type equips No3 squadron at Salalah and No15 squadron at Al Musana, with a SAR detachment at Masirah.

As the first Lynxes entered service in July 2004, Oman also ordered 20 larger NHI NH90 Tactical Transport Helicopters (TTH). The first pair were delivered on time on June 23 2000 after a gruelling in-theatre two month evaluation. This marked the first delivery of an NH90 in the Middle East.

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Oman Police also decided to modernise its rotary winged fleet, placing an order for the AgustaWestland AW139 helicopter. The first of these were delivered from 2005, initially replacing the four Police Bell 214STs, which finally retired in 2008.

In January 2007, the RAFO signed a contract for two A320 Airbus Corporate Jetliners, primarily for VIP transport duties, but with an important secondary trooping role. The delivery of the A320s to No4 squadron allowed the retirement of the RAFO's ageing trio of BAC 1-11s, the last of which was officially withdrawn on July 14 2010 after 35 years' service.

Today, the RAFO remains organised along British Royal Air Force lines, with aircraft currently grouped into 12 numbered squadrons at five main bases and one smaller airfield. Historically, the four main bases were located at Thumrait and Salalah in the south, close to the Yemen border, the former RAF base on the offshore island of Masirah (which now houses the Sultan Qaboos Flying Academy and the Technical Air College) and the main transport and logistic base at Seeb, which also functions as Muscat's International Airport.

There is also an air base at Khasab, on the strategically vital Musandam peninsula – an exclave of Oman separated from the rest of the country by the United Arab Emirates but commanding the Strait of Hormuz, through which passes 20% of the Western World's oil. The base houses three No14 squadron AB205s on permanent SAR detachment.

The key RAFO bases have benefited from a rolling programme of hardening and improvement. Runways have been lengthened and strengthened; aircraft shelters have been constructed and extensive support facilities – ordnance depots and fuel dumps – have been added.

To allow further civilian traffic growth at Seeb, the RAFO has built a new base at Al Musana'a, about 75 miles west of Muscat.

Oman is also building a further new air base at Adam, about 100 miles southwest of Muscat. The construction of RAFO Adam started in early 2010, and the base is expected to host the first Eurofighter Typhoon squadron.

There has been an intensified effort to 'Omanise' the armed forces and all three C-in-Cs are now Omani nationals, whereas as recently as 1993 all were seconded British senior officers.

Great emphasis is placed on training and for the RAFO this is primarily achieved via the Air Force Technical College (AFTC) at RAFO Seeb (responsible for airman training) and at the Sultan Qaboos Air Academy (SQAA) at RAFO Ghala (officer training) with flying training at the Sultan Qaboos Flying Academy at Masirah, and ATC training at the Aircraft Control College at Seeb.

The RAFO today enjoys an impressive spectrum of capabilities and its inventory includes some of the world's most advanced aircraft. There remains a pressing need to replace the Short Skyvan in the light transport role, since the nation's attempts to acquire the Alenia C-27J Spartan (first reported after the 2003 Dubai Airshow) have come to nothing.

High profile requirement for fighters

Even more urgent is the requirement to replace the related Short Seavan – a Skyvan aircraft fitted with radar and special navigational equipment and used by the RAFO for maritime reconnaissance and anti-piracy missions as well as for anti-pollution and EEZ protection patrols.

Oman's most high-profile requirement is for a replacement for its ageing Jaguars and, indeed, to provide a more robust air defence and air superiority capability than can be guaranteed by its Block 50 F-16s.

The front runner to provide a new generation fighter is widely believed to be the Eurofighter Typhoon and there have been reports that the type has already been selected (and perhaps even ordered), with senior UK RAF officers talking about the need to replace the 12 Tranche 3 Typhoons that are to be diverted from UK orders. It has been reported that the RAFO will eventually receive 18-24 Eurofighter Typhoons, perhaps refurbished and upgraded ex-RAF Tranche 1 aircraft.

Saab's JAS 39 Gripen was also reported to have been under consideration by Oman, though this fighter now seems to have faded from the scene, while French offers to sell the Dassault Rafale to Oman, made by French president Nicolas Sarkozy during a meeting with Sultan Qaboos bin Said in February 2009, also gained no traction.

Surprisingly, in August 2010, the US Defense Security Cooperation Agency notified Congress of a possible sale of 18 F-16 Block 50/52 fighters to Oman. The proposed $3.5 billion contract included the upgrade of Oman's existing 12 F-16s. It remains uncertain as to whether Oman plans to expand its F-16 fleet to augment its new Typhoons, or whether its interest in the F-16 represented a 'fall-back option' or even a negotiating tactic.

RAFO Air Order of Battle

Royal Air Force of Oman	
Adam (construction started in early 2010)	
Unknown Squadron	Eurofighter Typhoon
Oman's first Typhoon squadron is expected to stand up at Adam	
Al Musana	
15 Squadron	AgustaWestland Super Lynx Mk.120
14 Squadron Det	Eurocopter SA330J, NHI NH90 TTH
Khasab	
14 Squadron SAR Det	Agusta Bell AB205
Masirah	
1 Squadron	Super Mushshak, PC-9(M)
6 Squadron	BAE Hawk 103, 103A, 203
15 Squadron SAR Det	AgustaWestland Super Lynx Mk.120
1 Squadron and 6 Squadron form part of the Sultan Qaboos Flying Academy	
Muscat/Seeb International	
2 Squadron	Short SC7-3M-4022 Skyvan, SC7-3M-4022 Seavan
4 Squadron	Airbus A320-214CJ
14 Squadron	Agusta Bell AB205, AB212, Eurocopter SA330J, AS332C, AS332L-1
16 Squadron	Lockheed C-130H, C-130J
Air Force Technical College	No assigned aircraft
Salalah	
3 Squadron	Agusta Bell AB206B, AgustaWestland Super Lynx Mk.120
5 Squadron	Short SC7-3M-4022 Skyvan
Thumrait	
8 Squadron	SEPECAT Jaguar S, Jaguar B
18 Squadron	Lockheed Martin F-16C, F-16D
20 Squadron	SEPECAT Jaguar S, Jaguar B
Royal Flight of Oman	
Muscat/Seeb International	
Royal Flight	Eurocopter EC225LP, Eurocopter AS550C3
	Gulfstream G-IV, Airbus A320-233
	Boeing 747SP-27, 747-430
Royal Oman Police	
Muscat/Seeb International	
Fixed wing element	CASA CN235M-100, Dornier Do228-100
Helicopter Wing	Agusta Bell 205A-1, AgustaWestland AW139

Hamood sees dawn of opportunity

The aviation industry in Oman has been closely managed with many of the companies providing services being separate subsidiaries of the government or the national airline.

But the doors are opening for new competition and one man who is pushing at that door is Kamil Hamood, the owner and managing director of Fatahill Trading.

Hamood is an electrical engineer by training, having graduated in Oman and then completed his studies in Florida, USA.

Florida is a hub for aviation spares and equipment and Hamood saw many opportunities.

When he came back to Oman he decided to set up his own company.

"It was hard at first. There is that frightening moment in the first four months when you wonder if you have done the wrong thing," he said.

Hamood began contacting manufacturers and became an approved agent for a number of separate products.

"We provided the headsets for air traffic controllers and also recording equipment and started from there. Many of the equipment companies came from Florida and I knew them from my time in Boca Rotan," he said.

Now, three years after start-up, Fatahill employs its own aeronautical engineers and technicians and is supplying support to aerospace engineering functions.

The company achieved breakthrough when it was brought in to supply equipment and services to the Royal Oman Air Force. These included the fire-fighting equipment on the military base and a contract for cleaning aircraft.

Fatahill is aiming to offer this service to the civil market and is working for approval with the civil aviation authority. "I believe we have a lot to offer airlines coming down to Muscat. We hold parts for AOG problems and we are looking at getting a facility on the new airport for cleaning, where we will be very competitive compared to services that are being offered in the UAE and elsewhere," Hamood said.

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Airport gears up for dramatic growth

Oman's transport sector is being developed with air travel at the heart of the investment. **Alan Peaford** *finds out why the new airports are key.*

Oman's airport capacity is about to grow dramatically as the infrastructure is put into place to meet the potential demand.

Like many other places in the Gulf, air strips had been built around military or oil exploration requirements and it was not until 1974 that Seeb Airport was opened just outside Muscat, replacing the rather treacherous approach of the former landing strip in the valley of Bait al Falaj that had served the country since 1929.

The ruler, HM Sultan Qaboos bin Said, landed at Seeb – at what is now Muscat International – to begin a new era in the country's links to the rest of the world.

Today, the airport is clearly a work in progress with giant tower cranes toiling to meet the new vision to create a flexible new airport that will meet growth demands to 2050 and beyond.

"It is an exciting project and we fully expect it to be open in 2014," said Waleed Al Harthy, Oman Airport Company's vice president airport marketing.

But it is not just the capital's airport that is getting the investment. Salalah, close to the Yemeni border and a busy summertime destination for many people from the Gulf with the cooling fareef (monsoon) an attractive option to the heat and humidity of the Gulf, is quadrupling in size.

There are four new airports in the plan. The royal city of Adam, the industrial cities of Sohar and Al Duqm and the tourist region around Ras Al Hadd will all have new terminals and fully equipped airfields.

"Until now, goods and people would have to travel by road," Al Harthy said.

Muscat International has been suffering from capacity restraints. As Seeb, the airport was a regular refuelling and technical stop on routes between Europe and the Far East but as aircraft changed that demand stopped.

"We lost a lot of that traffic but things have changed considerably now," said Al Harthy. "Oman is happening – economic development, industrial development, tourism and sport are all growing. There are more people flying here."

Continued on Page 90

In order to cater for the growing demand which, with

Waleed Al Harthy: "Oman is happening – economic development, industrial development, tourism and sport are all growing. There are more people flying here."

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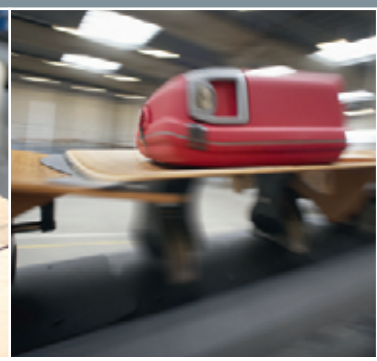

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the addition of Indigo just a few weeks ago, has developed to 28 airlines serving 56 destinations, Oman Airports has carried out a series of interim expansions.

"We have added new aircraft parking stands, new departure gates, we have extended the arrivals area and added 20 more check-in counters," said Al Harthy. "We have increased the passenger circulation area along with new retail and food and beverage facilities, all to make it a better passenger experience."

The airport has seen a 13% growth year-on-year and with this expected to continue, Al Harthy and his colleagues are keen that the new airport development delivers on time in 2014.

Variety of movements

All of the stats are looking healthy with passenger, freight and movements all showing a similar increase. There is a variety of movements as Muscat International is actually four airports rolled into one. "We have civil, military, the royal fleet and the Royal Omani Police all sharing the same runway, taxiway and ATC but with separate terminals, aprons, entrances and so on," Al Harthy explained.

Indeed, passengers waiting to board their aircraft are often treated to an array of aircraft types lining up from F16s to BBJs.

The airport expects to see its passenger numbers pass an annual six million mark for the first time in December.

The new airport will initially cater for 12 million passengers but has been designed with the flexibility to grow to meet demand with phases adding additional 12 million capacities until it tops out at 48 million.

Munich Airport has been awarded the contract to ensure the new airport achieves operational readiness at the time of handover.

Dutch firm bags €50million contract

Dutch-based global company Vanderlande Industries has come out on top of a field of four in winning the major baggage-handling contract for the new passenger terminals at both Muscat International and Oman's Salalah airports.

Awarded by the Omani government, the contract is worth around €50-million (US$71.6 million) and work is scheduled for completion in early April 2014.

A company spokesperson said: "The choice of cutting-edge baggage-handling systems for installation at Muscat and Salalah airports is in line with the government's goal of positioning Oman as a future gateway for tourist and business traffic into the Sultanate and the wider region."

Project management will be handled through Vanderlande's office in Oman, ensuring close liaison between the technical, maintenance and operations crews.

Energy efficiency is maximised through the smart use of both software and hardware. Each group of motors will only start when the presence of bags is detected then, after a pre-planned interval to ensure that the last bag has reached the end of the conveyor, the timing device will stop the relevant motors.

The system for Muscat International Airport will be capable of handling a total of 12 million passengers per annum, while at Salalah International Airport the system is designed to cope with around a million a year.

Major contracts have been awarded with Thales providing the air navigation systems, Indra the ATM and Raytheon the radar. Betchel is producing the new midfield terminal and Turkey's TAV joint venture with CCC is undertaking the civil works, including the new 4,000m runway, taxiways and aprons.

Vanderlande is developing the baggage-handling works and the UK's Ultra has the IT contract.

Once the airport is handed over the existing runway will be decommissioned for complete renovation. It will be A380-capable.

At the heart of the new development is the 97m tower. Designed to soar above the different building phases it will give controllers a clear view across the entire field.

New maintenance hangars will be built and outside the perimeter will be a new headquarters building for the civil aviation authority and for Oman Air.

The national carrier plays a major part in the airport operation with an exclusive arrangement for supplying ground-handling, cargo-handling, catering and engineering. The Omani government is believed to be reviewing this, with the option of allowing competition for these key areas.

One industry sector affected adversely by the airport's constraints is general and business aviation. Although the airport features an impressive VIP terminal, private flights are restricted.

Business trip

"If someone is coming here from Kuwait on a business trip and the aircraft arrives out of peak time and goes off again after dropping the passenger, then there is not a problem," explained Al Harthy.

"But if the operator wants access at our peak times (22:00 - 02:00 and 09:00 -11:00) then we have a problem. A private jet takes the same stand space as a B737. We hope that when the new airport is operational we will be able to build our general aviation business."

The growth at Muscat is mirrored at Salalah, which currently serves fewer than half-a-million passengers. The new airport is designed to cater for one million when it opens in 2014 and, like Muscat, has the flexibility to be built in incremental one million passenger stages to a maximum of four million.

"With new hotels being built, we are already seeing a charter flight direct from Scandinavia operating through the winter," Al Harthy said.

OAC is actively marketing the new airport. "We are working in line with the tourism ministry but there are key areas we see. The Far East is interesting. Only Thai comes here now, and Oman Air only serves Bangkok and Kuala Lumpur. That is a fast-growing region so we are talking to airlines," Al Harthy said.

Charter and low-cost carriers were also on OAC's meeting list at the recent World Route Development Forum in Berlin, where carriers from Eastern Europe were also seen to be taking an interest in Oman as a destination.

"Almost 80% of all passengers arriving in Oman are here to visit and 20% are in transit," explained Al Harthy. "We are looking forward to welcoming even more."

Handling a growing success story...

As operations grow at Oman's airports, life becomes busier for Oman Air Airport Services, which has the responsibility for airport operations in the country.

The division looks after both cargo and passenger traffic for all airlines coming to the country, with responsibility for ground-handling and the customer services.

With new airports being built to create a domestic network, the Airport Services will be adding cargo handling to Sohar and Duqm.

Amar Nasser, general manager development for Oman Air, said: "We will be covering all of the airports as well as looking after the handling for flights to the oil fields for Occidental and PDO."

The department has been working hard on encouraging Omanis to work in the airport and, according to Nasser, it has been a successful exercise. "We have close to 80% of the Airport Services workforce being Omani," he said.

The Airport Services team has seen a dramatic change in the number of visitors. "In 2000 we handled 36,000 aircraft movements for Muscat but last year that had increased to more than 67,000," Nasser said.

There has been a further increase in 2011 and Airport Services is steeling itself for a further growth. The new airport has been designed to allow for a second ground-handler. "That is up to the government to decide," Nasser said.

Meanwhile, recruitment is continuing to be a key issue for the airline. "We have a challenge and we have been investing in training to help bring more local people into the company."

Nasser believes training is key to the Oman Air team keeping customers if a second ground-handler begins offering services. "We use the latest ground-handling agreements and have had IATA look at what we are doing. We are aiming at the higher level IASO standard," he said. "We are already cost competitive compared to other airports in the Gulf."

Training the next step in Oman Air's future

Oman Air chooses its pilots and crew very carefully, according to Captain Sulaiman, who formerly worked as the company's senior manager training and standards between 2008 and 2010.

Captain Sulaiman is keen to make sure his new busy role is done efficiently and effectively.

"Flight operations lies in the heart of Oman Air's work," he said. "In my role I look after the pilots and cabin crew. I also look after the dispatch, rostering of people, movement control, as well as being in charge of performance and navigation control."

Each year Oman Air offers a pilot programme where it invites between 16 and 18 cadets.

Captain Sulaiman explained: "We take potential cadets from colleges around the world. After that, an assessment is done with us, then the successful cadets go 'outside' and do their initial training."

'Outside' in this case means cadets are sent for training in Australia. The Southern hemisphere country has been the chosen destination for training with Oman Air for the last few years, but the airline is looking at changing schools in the future, possibly to Europe.

"Once the cadets graduate they come here to Muscat for instruction with Oman Air pilots and trainers," said Sulaiman.

"As yet, we don't have a simulator and so the cadets do this in either Dubai, at the Horizon College, or in London, wherever we can find slots for simulators – but we have plans to get a simulator here in Oman."

Oman Air's pilots come from all over the world with 63% being expats and the rest being Omanis.

Oman Air offers cadets sponsorship, with the airline paying 80% of the cost.

"We get the cadets to pay 20% as we want to make sure they work hard and don't just think they're on holiday in Australia," laughed Sulaiman. "There is a plan for Oman Air to work with various companies and set up a flying college here in Oman, but this is still on the drawing board. However, it is certainly something we are keen to get on with," said Sulaiman.

Oman Air's deputy chief officer of flight operations, Captain Ali Hassan Sulaiman, explains the process behind pilot and cabin crew recruitment.

Oman Air cabin crew members are also trained 'outside' – currently in European countries. "But once they come to Oman a programme is set for them," said Sulaiman. "Most of the ground school and service training is done here. Recently we received our own mock-ups, designed by Spatial Design. They are in the final stages to be fully operational for the 737 with the A330 to follow. Once they are up and running the training will just be done here."

Cabin crew training takes approximately four weeks.

Sulaiman said: "Like all airlines we follow the guidelines on training for both pilots and crew but we really look at proficiency of the candidate. For cabin crew they also need to be the right sort of person; someone who can make the passenger feel almost at home. It is also all about being efficient in the managerial roles," he added. "Working in operations is lot of work; it's not just the training but the efficiency behind it. We have large fuel bills in front of us, so we are trying to be as efficient as possible."

Sulaiman started his career as a student pilot at Gulf Air in the 80s and was appointed a captain in 1992. He is experienced in flying a range of aircraft and in 2009 received the honour of piloting Oman Air's first A330 from Toulouse to its base at Muscat International Airport.

An Omani national, he now has 30 years' professional experience in civil aviation. He was formerly chief operations officer at Gulf Aviation Academy in Bahrain before joining Oman Air.

Still a keen pilot, Captain Sulaiman makes sure he keeps his hours up.

Raise a glass to the best possible flying experience

Creating a unique customer experience is what Oman Air is all about. **Ella Nethersole** *meets the woman behind the service.*

Linda Celestino: "The future is to maintain our standards."

Linda Celestino has quite a lot to be happy about. Since being asked by Peter Hill to step out of her flight operations role to head up in-flight services for Oman Air in 2009, her feet have barely touched the ground.

If it's not enough to have a string of awards already under her belt for Oman Air, last month Linda was elected as new vice president for the Airline Passenger Experience Association (APEX).

"In-flight services came into fruition in 2009 when we were preparing to launch the new A330 long-haul route," said Celestino. "Within 11 or 12 weeks we pulled together a bare skeleton team and created Brave New World for the launch on long-haul, which was September 2009. Since then, we haven't stopped in our efforts to maintain the award-winning products we have created."

Celestino and her team are basically in charge of everything the customer touches.

"We design the food, develop the menu and the entire customer experience. We have suppliers, such as a cater supplier, a china supplier, a product supplier. I have a caterer in Germany and one in London. We are very much involved with the caterers as they produce to our specs," said Celestino.

A la carte menus

Oman Air's a la carte menus are designed by a trained chef from the ground up.

"We have a menu format and workshop with every caterer. We literally go around the world all year to each and every caterer and work together. We offer a bespoke menu for the particular destinations," said Celestino. "These menus are on a cycle; they change every three months so we have four cycles a year and they change in every direction."

With Middle Eastern sectors, where there is more frequency of travel, there is a ten-day cycle.

Oman Air has also won an award for its wine selection.

"We have a sommelier but also the executive management team decide on the wine. We recently won the Cellars in the Sky award for our current selection, best business class champagne, and we were runner-up in best first-class for red wine."

Celestino says she likes to make sure the customer is offered a touch of luxury in the sky, down to the award-winning best first-class and business-class amenity kits.

"Our amenity kits include a range of creams and scents from Amouage. It is a premium and luxurious brand here in Oman and we are in collaboration with them."

Celestino is also responsible for the in-flight entertainment (IFE).

"My department choose the films," she said. "We have a contents service provider in London which sends us three months in advance films that have been released for airline viewing, with new releases every month.

"Our IFE system from a size point of view is not as big as Emirates but we're as big as Etihad and Qatar now."

Oman Air recently won the title Best In-flight Connectivity and Communications in the Passenger Choice Awards held in Seattle.

Celestino said: "We're the first airline in the world to have complete connectivity on the aircraft offering both mobile phone and Wi-Fi aboard our Airbus A330 fleet. We have received consistently positive feedback from our customers. It is clear that they value the opportunity to make voice calls, send text messages, check e-mails, update social media and surf the net. Given we're a relatively new airline, this is quite an achievement."

Celestino, who started her career as crew for Qantas, is always looking to future challenges.

She said: "We are currently looking at customer usage data with our connectivity. From facts and figures it seems people are accessing info from their phones, such as work e-mails. We're still collecting information to work out what all the usage is in the coming year and then we're looking at purchasing our own bandwidth. We will use some of that bandwidth to have automatic upload of newspapers using the current IFE system. We need to reduce weight and our footprint."

Celestino added: "The future is to maintain our standards. We need to be more efficient as a business but not in a way the customer notices. We are already looking into new products. I wait for a brand strategy and then work on that with a smell, a look, a feel.

"Oman Air is more than point-to-point travel, which anyone can buy. We want to offer the best experience possible. The challenge for us is to keep creating an experience."

Aaron Claxton: "It's an initiative to give a seamless passenger experience."

Authenticity the key to catering success

Oman Air Catering takes care of all the catering needs of airlines to Oman. "We have a team of 430 Oman Air employees," said Aaron Claxton, general manager. "Our primary role is to support the airport in supply of catering services to all passengers flying in to Muscat. We are a monopoly caterer here – there is no other caterer. That is the same throughout the Gulf."

Oman Air Catering employs an international set of chefs.

Claxton said: "Around 65% of our staff are Omanis but we have 15 different nationalities working for us. We need authenticity in the product so, if we are preparing an Indian-style menu, we make sure there is an Indian chef. We have Lebanese, Egyptians, Italian chefs and so on. In doing this, it is defining the product. We have 228 chefs in our production kitchens based here."

As the supplier to the in-flight services department, Oman Air Catering assists in the design and development of the menus.

"We make sure we work closely together, along with our chefs and production team," said Claxton.

Besides Oman Air, the catering department supplies to 17 other customers, including Lufthansa, Thai Airways and Indian Airlines.

Claxton added: "We also supply the Royal Flight and the military and VIP jets – all bespoke menus for the airlines. But Oman Air is 85% of our business. Because we're the hub here we basically return cater the majority of our flights."

The facility has been based at Muscat International Airport for 12 years but it is expected to move within the next three years once the new airport opens.

Claxton said: "This unit has a capacity of around 19,000 meals a day. The new unit will be three-and-half times the size and should produce 28,000 meals a day once we have grown in terms of tourist figures."

Oman Air Catering also looks after the laundry and supplies magazine and newspapers on board. Seat and headrest covers, liquor and duty free, are also all down to them.

Claxton has been general manager with Oman Air Catering for the last 18 months, after joining the airline from Gulf Air. He is also the man in charge of Oman Air lounges.

"Our lounge here in Muscat was handed to us to operate in January this year," explained Claxton. "It's an initiative to give a seamless passenger experience. From check-in to the lounge to on board and arrival, we want a continuity of branding and product."

The lounge, which is for Oman Air customers only, was designed by James Parker associates in London. It has an Arabian theme but it's also modern and simplistic.

Claxton explained: "We have a lot of services in there. We have a chef in the first class lounge exclusive for first class guests. We have a spa and a limo service to take our premium first class passengers to the aircraft and we have an all-day dining option in business class, which is a different menu to the one on board the aircraft."

The lounge, which overlooks the runway, also has a children's play area, quiet areas, prayer rooms, and full washroom facilities.

"When we move to the new airport in three years we will have a bigger lounge to further improve on our product," said Claxton.

There is also a lounge at Oman's second international airport in Salaha, and another about to open in Bangkok.

"We have taken the same attributes from the Muscat lounge to the Bangkok facility," said Claxton. "We were using the Emirates lounge in Bangkok but it was very expensive. We have 12 flights a week to Bangkok and the flights are chock-a-block every day so we're expecting at least 40 passengers a day will utilise that lounge."

ATR: TOP OF

ATR has just delivered the first of its new generation of turboprop regional aircraft to Royal Air Maroc. Former Red Arrows pilot **Pete Collins** *joins the Arabian Aerospace team to fly the aircraft and find out what the fuss is all about.*

It was August when the very first example of the ATR 72-600 was delivered to Royal Air Maroc at its Casablanca base. Early indications are impressive with the aircraft achieving a perfect technical despatch reliability of 100% over its first six weeks of service.

This may come as no surprise to the other 175 ATR operators, in 94 countries spread across all five continents, where the despatch reliability for the whole ATR fleet (with 845 aircraft presently in service) equals 99.6% and marks out the company as the world's No1 turboprop manufacturer.

The first delivery of the ATR 42 (48-50 seats) was in 1985, followed by the first ATR 72 (68-74 seats) in 1989. This latest -600 series represents another step by ATR along a highly focused and predetermined path of significant product improvement.

Building on the success of the -500 (engines, advanced six-bladed propeller, vibration damping and high levels of passive cabin noise suppression, etc), the -600 introduces a completely new, fully digital flight deck, supporting all the latest civilian aviation avionic requirements and featuring a five-screen, full 'glass cockpit' layout supplemented by (as an option) two, large, Class 2 electronic flight bags (EFB), one for each pilot.

This new flight deck is now married to a re-modelled, ultra modern and luxurious cabin – named the 'Armonia Cabin' – designed by the Italian company Giugiaro Design.

Other cabin options include an in-flight entertainment system, a dual-class cabin (with three abreast wider business class seats forward and with the new prestige or classic seats four abreast to the rear), a forward passenger entry door and jet-bridge docking capability.

ATR has already taken more than 220 orders for the -600, including 130 firm orders in 2011 alone. The current order backlog stands at more than 270 aircraft and the company plans to ramp up production to 72 aircraft per year (or more) from 2012 onwards, at which stage all ATR 42/72 will be produced to the -600 specification.

The present order breakdown per type is approximately 10% for the ATR 42 and 90% for the ATR 72. Both types (and also at present both the -500 and the -600 series) are assembled on the same production line at Toulouse.

The ATR 42/72 have 90% commonality of parts, including the engines (PW127M), which are 'chipped' electronically to suit the individual power requirements of the ATR42 or the ATR72 and then with options for power increases to suit very short field or hot/high operations.

ATR is a 50/50 partnership between EADS and Finmeccanica. EADS produces the wing with Finmeccanica delivering the complete fuselage and fin/tail. Pratt and Whitney delivers the engines and Ratier (a division of Hamilton Standard) delivers the highly swept, six-bladed, 3.93m diameter propeller (incidentally, Ratier also deliver the advanced propellers for the Airbus A400M).

Composites in the ATR 42/72 -600 make up around 20% of the airframe, primarily used in all of the tail structure and large sections of the front and rear wing structure. Large parts of the airframe are designed and standardised using the CATIA system, ensuring that the delivered parts

THE PROPS

fit perfectly on the production line without any need for rework.

The Toulouse ATR production line sits alongside that of Airbus and the link through EADS to Airbus engineering allows ATR to directly utilise state-of-the-art aerospace technology, as employed on the latest Airbus A380. This now grants the -600 series a level of technical and avionic sophistication not seen before on a regional aircraft or among its closest competitors.

Economics

The regional air transport aviation world in 2011 is now a very different place from the same industry as seen in 2000. Then, the reasonably low cost of oil and a new generation of small, more fuel efficient, jet engines allowed new regional jets to predominate and threatened to make regional turboprops extinct, with Saab, Fokker, Dornier and BAe Jetstream all going bankrupt as aircraft manufacturers. However, the inexorably rise in oil prices and the fact that all international agencies agree that the price will only continue to increase over the next 20 years, means that a new generation of advanced regional turboprop airliners, that the ATR -600 series now represents, is already back on track to recapture their former market place.

On a typical 250nm sector length, flight times are almost identical regardless of an aircraft's ultimate top speed but a regional turboprop will always remain unbeatable in terms of economics, to such an extent that it can reduce an airline's direct operating costs by up to 45%, when compared to a similar size regional jet airliner.

To put this into some form of perspective, if an airline was equipped with a 20-strong regional turboprop fleet it could save itself in excess of $33 million on annual fuel costs alone (at May 2011 fuel prices) when compared to a similar fleet of 20 regional jets and when flown at the same typical levels of annual utilisation.

In addition to rising fuel costs are the massive potential extra costs of complying with future carbon emissions trading schemes, starting in Europe in 2012. The turboprop will again save money by producing several tons less CO2 per flight hour.

ATR is quoting a purchase price of around $18 million for an ATR42-600 and around $22 million for an ATR72-600; prices that it states are considerably cheaper than its nearest competitor.

ATR forecasts that airlines will need more than 3,100 new turboprops in the period 2011-2030 and this is predicted to generate a market for manufacturers valued at $73.5 billion. Around 70% of that total (2,100 units) is represented by 50-70 seat turboprop types and ATR sees great potential for its aircraft in the emerging markets of Latin America, Africa/Middle East and Asia/Pacific.

The company presently has more than 60% of the 50-70 seat turboprop market but the ATR -600 series now represents its determination to build on that with an aircraft that can leapfrog both its jet and turboprop competitors and with a product that both 'technically' for its crew and 'look and feel' for its passengers, far exceeds present industry perceptions.

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First impressions

My evaluation flight took place in early September from Toulouse-Blagnac (LFBO) using ATR42-600 registered F-WWLY. The aircraft was at production standard (so it can be converted and sold as a production unit at a later date), but retained a test instrumentation equipped cabin and a small amount of additional cockpit test instrumentation for on-going avionic development by the flight test department.

On entering the cabin, it was gratifying to see that no part of the wing spar impinged into the upper cabin roof and no part of the main gear impinged into the lower cabin walls, so the cabin itself was a perfectly uniform tube. The large, numerous and closely spaced cabin windows let in a tremendous amount of natural light.

After the flight I was shown the full production Armonia Cabin by ATR head of communications, Sonia Dumas. With new lighting, new seats, remodelled and larger overhead bins, an internal cabin width of 2.57m, an aisle width of 0.47m and an internal cabin height of 1.91m from a flat floor, the overall effect was nothing short of visually stunning and beautifully modern. I believe passengers in the ATR-600 will have the feeling that they are travelling in a 21st century aerospace 'air vehicle' but where the aircraft's type of propulsion is now virtually immaterial.

On entering the cockpit I was immediately struck by how roomy, ultra modern and uncluttered it looked and how Airbus-like it felt, including the overhead panel, and with all switches adhering to the 'dark cockpit' philosophy. The Thales 6"x8" liquid crystal display (LCD) electronic flight information system (EFIS) display screens, set five abreast, completely dominate the front of the cockpit and are supplemented by two, lower, Thales flight management system (FMS) computer display units (CDU).

Just below each FMS CDU is a small numeric pad that allows each pilot the ability to control the entry of digits into each virtual control panel (VCP) located in the lower part of the EFIS multi function displays (MFD) with 'on screen' boxes detailing NAV 1/2, COM 1/2, Transponder 1/2 and other selections. This removes the need for a separate radio management unit (RMU) and is a system that I much prefer because of the way in which it centralises vital information for the pilot within his/her area of regard.

The central EFIS screen acts as the engine and warning display (EWD) and shows engine data, aircraft system synoptic pages, electronic checklists, system failure warning messages and corresponding automatic 'pop up' abnormal/emergency procedures. The outboard EFIS screens, on either side, are the Primary Flight Displays (PFD) and support an attitude based aircraft flight symbol and cross-pointer flight director (FD).

The central power lever quadrant also looks like that of a modern jet airliner with the combined parking brake/emergency brake lever, power levers, condition levers and flap lever (0/15/25/35) all contained within an elegantly neat and clean installation. The condition levers feature integral lights to indicate the correct lever to close in the event of engine fail/fire and are gated at AUTO = Np (propeller speed) automatically governed as per pilot selected power mode (TO/MCT =100% Np and CMB/CRZ = 82% Np) or MAX = 100% Np irrespective of selected power mode. The engine power levers have rear triggers to protect the gate into the ground idle/reverse range and the forward quadrant has spring detents at take off (TO = approx 90% TQ) and at go-around (GA = approx 100% TQ) before the final mechanical limit of approx 115% TQ.

In the event of an engine failure during take off, with the power levers set at the TO detent, the ATR has an automatic autofeather of the dead engine and an automatic torque (TQ) 'up trim' of the live engine up to 100% TQ without the pilot needing to move the power lever of the live engine forward from the TO detent, and an auto-rudder trim function to balance the yaw generated by the asymmetric power.

The flight director (FD) and autopilot (AP) flight mode panel (FMP) mounted centrally on the grey coloured glare-shield is well laid out with function buttons and knobs logically grouped and differentiated by tactile shape, colour and position. My only recommendation would be to move the speed control panel, presently set outboard of each PFD, up to join the main FMP so that control of all the FD/AP modes are glare-shield mounted. FD/AP flight and power modes are now shown armed or active in separate and designated flight mode annunciator (FMA) columns in each PFD, just as they would be in any modern Airbus-like aircraft.

Power modes are pilot selected TO/CLB/CRZ/MCT on a centrally positioned rotary switch on the cockpit front face, meaning that the pilot flying (PF) does not have to move the power levers away from the TO detent starting from the take off roll up to the point of descent, if required to retard them, or on the approach. The aircraft does not have auto-throttle (AT) but does have FD/AP indicated air speed (IAS) mode that can be FMS programmed/controlled.

The digital cockpit now supports TCAS II, EGPWS, terrain mapping, a RNP 0.3 navigation standard and aircraft communications addressing and reporting systems (ACARS).

The aircraft is Cat II ILS certified as standard and this can be upgraded, as an option, to a Cat IIIA ILS (50ft radar altimeter decision height) capability. Other avionic improvements in development at ATR for the -600 series include a satellite based approach system (based on EGNOS or WAAS) and ADS-B. The aircraft is certified for steep approaches, including Lugano in Switzerland.

The trailing link main landing gear is carried in fuselage-mounted side pods granting it very soft touchdowns and avoiding the complexity of 'long' main gear legs when they are mounted in high wing engine nacelles. The ATR -600 series has a demonstrated crosswind landing capability of 45 knots and ATR is in the process of certifying the aircraft to land with up to 20 knots of tailwind – a simply staggering set of operating limits!

Flight evaluation

My safety pilot was ATR chief test pilot Eric Delesalle on the right hand seat and project flight test engineer Jean Piatek on the central jump seat. I would take the left hand seat and fly the complete sortie.

My single objective was straightforward; having never flown an ATR aircraft of any type before and arriving almost directly to the test aircraft at Toulouse-Blagnac with absolutely no cockpit familiarisation and only a very short pre-flight briefing, could I forget that I was flying a turboprop and simply believe I was operating the latest type of 21st Century aerospace airliner?

The zero fuel weigh (ZFW) of F-WWLY was 12,000kg and with 3500kg of fuel our ramp weight was 15,500kg. The ATR42-600 has a max take off weight (MTOW) of 18,600kg and this is allied to an almost unbelievable max landing weight (MLW) of 18,300kg! Blagnac OAT was

19C and QNH 1021hpa. Take off speeds were V1 =105kts, Vr =105kts, V2 = 112kts.

The ATR 42/72 does not have an APU, to save weight and reduce cost, but instead uses an electronic propeller brake activated on to the right hand engine (hotel mode).

Engine start was straightforward with each engine stable and fully set just 30 seconds after start selection. The electronic checklists were short and simple to follow and this all added to the real impression of a paperless cockpit. The avionics and aircraft were rapid to programme and configure and there were no 'first flight of day' additional checks. As crew, we wore Senneheiser noise cancelling headsets, which made the flight deck almost unnaturally silent.

Take off is always made with flap 15. The -600 aircraft is protected by a take off configuration warning system (trim, park brake, flaps, power management) that can be seen as another advanced aircraft safety feature. The rudder is effective from around 60 KIAS, so nose wheel steering using the tiller is utilised up to that point.

The power levers were advanced by me from a rolling start in a 'slam' type action up to the TO detent and the aircraft regulated the power in a completely jet-like way. In fact the ATR42 -600 series delivered its power in such a smooth, linear and predictable way throughout the evaluation and in all flight phases, that I really did feel that I was flying a jet. Also, because the power was so well balanced it actually felt as though the total power was coming from a single source rather than from two, which in part may also be due to assistance from the sideslip cancellation function associated with the auto rudder trim function (as activated through the yaw damper). Along with the excellent tactile feedback granted by the power levers in relation to the power quadrant spring detents, the ATR42-600 had the best/most easily regulated power response of any twin turboprop (large or small) that I have ever flown.

During the take off roll the aircraft required just the merest hint of right rudder to keep straight once the tiller was released. V1/Vr was reached in a very respectable 20 seconds after brake release. Trim changes with gear/flap retracting were minimal. The FMS (magenta) speed bug was followed in manual flight at 160 KIAS in IAS mode towards our level-off altitude of FL200

The ATR has mechanical controls with the ailerons and rudder each being operated through a spring tab and the elevator through a balance tab. Lateral roll control is supplemented by a hydraulically-actuated spoiler (one per wing) acting in conjunction with aileron position. Control mechanical characteristics were good in all axes, with no freeplay, small breakout, excellent centring, light control forces, well harmonised and adhering to the classic control force ratio (aileron: elevator: rudder) of 1:2:5

FL200 was achieved 20 minutes after take off. Vmo at FL200 is 250 KIAS then converting to Mmo of M0.55 up to the service ceiling of FL250. The stabilised cruise speed of 204 KIAS we achieved gave a true airspeed of approximately 300KTAS. During the climb and at all times and in all flight modes, the digital cockpit, the EFIS displays, the FD/AP FMP selections or FMS inputs etc, allowed me to completely believe I was operating a latest generation, Airbus-like aircraft.

Returning to FL150 we set up for un-accelerated, power idle stalling. Our first stall was clean (flaps 0). The PFD showed visual indication of stall approach by a solid red line on the PFD vertical speed tape. Stick shaker started at red line speed tape entry at around 105 KIAS and was supplemented by an audio 'continuous stall warning tone'. Had the AP been engaged during approach to stall, stick shaker activation would have automatically disengaged it. A positive, spring-assisted, stick pusher activated at 97 KIAS.

A second stall was conducted with the automatic stall protection system (shaker and pusher) manually turned off. Here, distinct aerodynamic buffet occurred at around 98 KIAS with a clear nose drop occurring at around 95 KIAS and without wing drop. However, the effectiveness of the automatic stall protection system was evident and with the system re-engaged for a flap 35/gear down stall, stick shaker occurred at 82 KIAS and stick pusher at 72 KIAS with no wing drop. Applying power as a 'slam' up to the TO detent in the stall recovery was again delightfully easy and height loss was minimal.

Before recovery back to Blagnac, I set up the aircraft in a climb, manually flown, flap 15, at TO power, 117 KIAS (V2 +5kts), with yaw damper engaged and had Eric rapidly close one of the engine power levers to idle. The result was – absolutely nothing! Apart from me lowering the nose slightly to follow the FD in speed command, the rudder auto trim system had completely and instantly taken care of the asymmetric yaw. It was truly an amazing demonstration.

For recovery to Blagnac, we set up for ILS/go-around runway 32R. Once again, the level of avionic sophistication regarding such things as FMS set up, selection of COM/NAV, FMA indications on the PFD, navigation displays shown on the MFD, etc, was equal to any of the latest generation of jet airliners. Vref for our weight of 14,900kg was 95 KIAS.

Go-around was initiated by pressing the go-around button in the centre of the side face of the power lever and pushing the power levers through the TO detent and up to the GA detent, with flap and gear following in stages. Once again, a high workload event in older jets or older turboprops was made to look easy.

Our final landing was made from a pseudo steep approach to runway 32L. The EGPWS was re-datumed by pressing the small 'steep approach' button on the side panel and the condition levers set to MAX (100% Np). Vref of 95 KIAS was then held manually in a 5.5 degree visual descent. The aircraft felt very speed stable and from a 35' flare I made a soft touchdown (unusual for a test pilot) into a ground roll of no more than 400m using reverse power and virtually no brakes.

On shutdown, after a 1 hour 20 minute flight, we had used just 730 kg of fuel.

Conclusion

The test objective I had set myself was easily answered; from literally the first point of slamming the power levers up to the TO detent at the start of the take off roll, the ATR42-600 looked and felt like a 21st century airliner that just happened to be designated as a regional transport aircraft and which was equipped with a propulsion system that provided simply the smoothest and most easily controlled power response of any twin turboprop aircraft, of any type or size, that I have ever flown. This feeling never left me during the evaluation.

The ATR-600 series will be an undoubted success and one that, I predict, will have many airline executives examining their present fleets of regional jets as the expense of jet operation starts to bite and when a new generation ATR turboprop starts to make those jets look outdated!

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Smart Aviation's General Wael El-Maadawy (left) at the handover of the first Q400 with his deputy and managing director, Captain Emad Sallam.

Nothing softly-softly about this quiet revolution

Ask anyone about a turboprop and the chances are the memories of flying in one are drowned out by the noise. Now Smart Aviation believes it has just the answer to change that perception and offer affordable air travel in Egypt and the surrounding countries.

Phil Nasskau *reports.*

Key to Smart Aviation's success will be a fast adoption, by the flying public, of the Bombardier Q400 NextGen aircraft. With the first two aircraft delivered in mid-September featuring a 74-seat cabin at 31-inch pitch, Smart Aviation chairman and managing director General Wael El-Maadawy said: "The noise misconception comes from people thinking that it's a piston engine aircraft; that it's a piece of junk. They don't necessarily understand that it's a state-of-the-art aircraft.

"We have spoken with Bombardier and in co-operation with them we will do some marketing campaigns. However, additionally for the first three to four months, I don't care about earning any money from our flights. We will use this time purely for promoting the aircraft by making lots of flights to different Egyptian cities, showing it to different demographics and letting people use the aircraft for a very special low fare to visit new places."

Bombardier's Chet Fuller, senior vice president, sales, says the campaign is really focused on branding and awareness.

"You have to do this in a new market so that people understand how this is different and why it's different."

For El-Maadawy the bidding process was "without prejudice" and completed with full transparency.

"In the decision-making process we didn't look at absolute performance as the basis of the aircraft choice. We looked at the routes we would fly and the mission profiles; we then chose the best aircraft for those profiles. There was a proper bidding process and there was no prejudice in our selection of the Q400, it was simply the most suitable aircraft for our needs," he said.

"We also looked at relative price, where we assigned a score to each technical aspect of the aircraft and totalled this up and then divided this number by the price to give us our relative price. Even though the Q400 is more expensive than the ATR 72-600, when it came down to relative price the Q400 won."

While El-Maadawy says he doesn't like having to make comparisons between the two products he added: "The Q400 gives us 10 extra passenger seats, it goes further than the ATR, the cargo area is much larger and certainly the cabin is more comfortable. It's also faster."

Other advantages, according to Fuller, included that fact that the Q400 has an auxiliary power unit and, therefore, could provide cooling while on the ground. It has a stand up baggage area and, over a 300nm sector, is only around six minutes slower than a 737 or A320.

El-Maadawy reckons that the turboprop is a no-brainer in today's climate, especially in Egypt. "When we thought about what we wanted to do, domestic and close regional flights, we thought not only about the aircraft, but also the infrastructure that we need to expand in Egypt. If you want to expand the culture of using an aircraft in Egypt, you need to build airports to do these things.

"Because we are a growing country we need to limit the budget to whatever we can, and then we thought that the turboprop was the right aircraft to be used. Certainly the distances flown in Egypt are not that long; secondly it doesn't need massive infrastructural investments. It can use secondary airports like the oil airport by the Red Sea. A lot of tourism is by bus, we can connect easily with a turboprop," he said.

Tourism will certainly be a big feature for the aircraft's use. He expects to offer a variety of routes throughout Egypt and other cities, such as Beirut and Jeddah as well as flights into Jordan and Turkey.

"We are planning to have five aircraft operational within two to three years and ten aircraft after five years. Yes, we have had some difficulties with the logistics of this, because of the revolution. But we're glad to see the courage of the bank to finance this."

A snapshot of Middle East aviation

Every two years Dubai throws open its doors to the aviation world, which descends in its droves upon the Middle East's modern metropolis for the extravaganza that is the Dubai Airshow. **Kelly Green** *meets one of the team behind the event.*

Over the 22 years since the inaugural event in 1989, the Dubai Airshow, organised by F&E Aerospace, has become the region's foremost aerospace event and when it returns to Dubai this November it is set to be bigger and better than ever before.

During the past ten years, F&E's managing director of aerospace, Alison Weller, has seen the Dubai Airshow double in size. Taking place at the city's Airport Expo on November 13-17, the 2011 edition will host 1,000 exhibitors from 50 countries (marking a 12% increase on 2009's edition) and 55,000 trade visitors with more than 100 aircraft on the static park.

This will be the last time the show is staged at the Airport Expo as it is projected to move to its new home at Dubai World Central near Jebel Ali for 2013.

"Something like the Dubai Airshow offers the Middle East an opportunity to showcase its achievements in aviation on its own doorstep, which it can't do if it goes to Farnborough or Paris," said Weller.

"I always say that the airshow is a barometer to what the Middle East achieves in aviation – you get a glimpse of it every two years, for just five days. We'll probably hear a lot of order announcements

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F&E's Alison Weller.

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during the show, particularly from Middle East airlines, which always gives a sort of overall picture of just how booming the aviation industry is out here, and what potential there is."

Organising an airshow of this scale is no mean feat, so it's fortunate that Weller has 20 years' worth of experience in global aviation communications. Having launched her career at the Shepherd Group, organising aerospace and defence conferences and exhibitions, followed by "a stint at Flight International (now Flightglobal) as the business manager", Weller moved to F&E ten years ago, and is now the managing director of its aerospace division.

"Since I joined the company the airshow has doubled in size. That's not down to me, of course; there's a whole team of people helping us to achieve that," she said. "I've also launched four new events for the company in the aerospace sector: MEBA, GATE, MRO Middle East with our partners Aviation Week, and Aircraft Interiors Middle East (AIME). And we now manage and organise the Al Ain Aerobatic show on behalf the Al Ain Tourism Authority. So we've significantly grown our portfolio in the ten years I've been here.

Fast-growing air show

"We have a large team of people and it grows ever bigger as the show grows," Weller continued. "Since I joined F&E ten years ago we've probably tripled the team. It's a very fast-growing air show and we try and keep up with that, not just by bringing in more companies, but also by following the latest trends to keep it up-to-date and develop it."

With this ambition to always keep the airshow current, Weller promises that the celebrations for the UAE's 40th anniversary (which falls two weeks after the Dubai Airshow finishes) will form a prominent part of the event this year. "The UAE was formed in 1971, so the Dubai Airshow 2011 is going to be used as a bit of a platform to help celebrate and join in the celebrations, but also to showcase what the UAE has achieved in aviation in the past 40 years," she said. "We're also going to look ahead to what it's going to be achieving and what the future holds for aviation in the Middle East."

In keeping with the theme of UAE national day, there are two major new developments for 2011's airshow. "This year we have introduced 'Futures Day', which will be on the final day of the show – November 17. While UAE national day will focus a lot on what the industry has achieved over the past 40 years, Futures Day will look at what the industry can achieve going forward for the next 40 years and beyond. This will involve getting the youth interested and building a passion for aviation," explained Weller.

The focus of Futures Day will be the recruitment, education and training of home-grown talent in the UAE and the event will see universities from across the UAE participating.

"As the industry is growing so rapidly, we're going to face huge staff shortages and staff requirements going forward. So something like the

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DUBAI AIR SHOW KEY FACTS

- Dubai Airshow organiser, F&E Aerospace, is predicting it may pass the 1,000 exhibitor mark for this year's show – the last to be held at the city's Airport Expo.
- Running from 13 to 17 November it will be the biggest yet, attracting more than 55,000 trade visitors, an almost four percent increase from the previous show in 2009.
- At more than 325,000sqm, The Dubai Airshow is the largest trade show in Dubai and, in addition to covering three exhibition halls, includes 103 chalets, 11 pavilions and a large static aircraft display area for up to 100 aircraft of varying types and sizes.
- Show-goers will get to see a number of aircraft making show debuts. These include Bell/Boeing's V-22 Tilt Rotor, a unique aircraft that can perform both vertical take-off and landing and short take-off and landing; and the MA600, manufactured by China's Xi'an Aircraft Industry Co. Ltd. The 60-seater will be seen for the first time outside of China.
- For the first time ever, and reflecting the 40th anniversary of the UAE, the flying display will open with the country's own aerobatic team – Al Fursan – which will fly Alenia Aermacchi aircraft. The display will also feature the Patrouille de France aerobatic team, flying the Alpha jets.
- The static park will display an F18, F15, C17, C-130J and an Apache MH-60 from the US government and an array of business jets from companies such as Gulfstream, Bombardier and Cessna.
- Helicopters are also making a big appearance at this year's show, with companies such as Russian Helicopters, Sikorsky, Bell and MD Helicopters, plus Quest, who will be launching the first-ever helicopter programme to be built in the UAE.
- The Dubai Airshow is organised under the patronage of HH Sheikh Mohammed bin Rashid Al Maktoum, Vice President & Prime Minister of the UAE and Ruler of Dubai, and in co-operation with Dubai Civil Aviation Authority, Dubai Airports and the UAE Armed Forces.

CONTINUED FROM PAGE 103

Dubai Airshow, which is a very hands-on, face-to-face meeting event, offers a fantastic opportunity for the youth to come along and develop a real passion and interest for aviation and also meet their future employers," Weller added.

And, while getting new people interested in aviation is crucial for the growth of the industry, there is also the equally important matter of training the recruits. Show organisers have got this covered too.

This year's Dubai Airshow will play host to the first annual Gulf Aviation Training Event (GATE), which will take place on November 14 and 15, focusing on future flight training requirements for the Middle East's rapidly growing air transport industry.

"GATE will discuss the issues that are currently facing flight training in particular, and the selection and training of flight crew for the next generation," Weller told *Arabian Aerospace*. "Obviously there are new modern technologies, new aircraft, new rules and regulations, and everybody has got to keep up with the rest of the world and make sure that they're up-to-date with all their training."

Weller also expressed her excitement about the "two amazing keynote speakers" who will be sharing their expertise in the field of aviation training at the event.

The first is Captain Randolph Babbitt, administrator of the United States Federal Aviation Administration (FAA), who will open the conference, speaking on the agency's concerns surrounding airline pilot and technician recruitment and training in the rapidly expanding Middle Eastern air transport market.

On day two, William Voss, CEO of the Flight Safety Foundation, a worldwide aviation safety advocacy group, will present his organisation's views on the current state of air transport safety, with particular emphasis on recent industry concerns over the impact of cockpit automation on the capabilities of pilots to adequately control aircraft in the event of system failure.

In addition to the conference, GATE 2011 will feature a pavilion within the Dubai Airshow exhibition halls to showcase companies providing flight training products and services.

While exhibitors and visitors to the Dubai Airshow 2011 pack their bags and put the finishing touches to their travel arrangements, work for F&E Aerospace doesn't cease, and the team has already started organising the 2013 Dubai Airshow.

"Each airshow takes more than two years to produce," explained Weller. "We've started working on the 2013 show already because we have to work on the venue and we have to work on marketing and our campaigns and what we're going to try and do and how we're going to develop the show. Organising starts way past the two-year mark, and we obviously use benchmarks such as other international air shows to see where we're going to give our big pushes in terms of marketing and sales."

Getting to the show

Dubai Airshow is held at the Airport Expo at the eastern end of Dubai International Airport.

The RTA runs the taxi service in Dubai. You can usually get a taxi from your hotel or the airport – taxis can also be flagged down on the road.

Airshow organisers warn however that there are only a certain number of taxis in Dubai and at peak times, such as the end of the show at 5.30pm, there can be a long wait for taxis, sometimes up to an hour. "As show organisers we do our best to get as many taxis on site as possible but taxi supply is beyond our control - visitors may wish to consider one of the alternatives."

There are a number of options.

Dubai now has a Metro system that covers many key locations in Dubai. The nearest metro station to Airport Expo is Al Rashadiya. It is a 15-minute walk from the show site and there will also be regular shuttle buses running to and from the Metro station.

There are also complimentary shuttle buses to a number of main hotels in Dubai. It is worth noting that even if your hotel is not listed on the route map you can get off at a hotel stop near you and pick up a taxi from there.

If you have a hire car, you can park at the off-site visitor parking where there will be complimentary shuttle buses to take you to and from the show site. If you are an exhibitor and have a parking pass you can park at the show site. Please be aware that parking spaces are however very limited due to the lack of space at Airport Expo.

Platform for innovation and opportunity

The Dubai Airshow is seen as a platform of opportunity for exhibitors from all over the world with an array of official delegations and national pavilions. We profile a few of the leading participants.

The UK aerospace industry is the largest in Europe and the second largest in the world. It will be present in the pavilion hosted by the UK aerospace, defence, security and space trade organisation ADS.

ADS represents more than 900 UK member companies of various sizes and aims to continue developing British productivity both nationally and internationally by seeking out opportunities in global markets and setting-up a dialogue with potential patrons.

David Scotter, director of aerospace market development and exhibitions for ADS said: "We take pavilion groups to the major air shows, as well as defence and security exhibitions around the world to markets where we believe there are significant opportunities for members."

Importantly for Scotter, the Dubai show offers a forum for both ADS and the Middle East aerospace sector to engage in beneficial discussion.

Scotter said: "The UK's status as a leader in the aerospace and defence industries we offer a wide range of experience and expertise across all aspects of the aerospace and defence sectors."

The Middle East markets remain a priority for the UK aerospace and defence industries due to the dramatic growth of aerospace requirements in the region.

"Since its inception, ADS has been present at every Dubai Airshow," said Scotter. "Since as far back as 1964, when BAC worked with Saudi Arabia, UK aerospace and defence companies have recognised the importance of engaging with the Middle East. And the Dubai Airshow provides an unparalleled setting for business forums in the industries we represent.

"Our member companies can offer leading-edge technologies to any indigenous programmes that emerge in the Middle East markets. And this is the importance of our role in Dubai – to raise the profile and awareness of our member companies."

David Scotter: "Unparalleled setting."

This year the UK pavilion will be home to a range of businesses. Scotter said: "Many excellent and varied companies have already been confirmed to appear at the UK pavilion including UK Trade & Investment Defence and Security Organisation (UTI DSO), MB Aerospace, FlyWell Power UK Ltd, Avia Technique and TIMET."

UKTI DSO will be at the centre of the UK pavilion. The organisation offers expert trade advice and practical support to UK-based companies wishing to grow their business overseas. And, importantly, UKTI DSO sets-up a necessary government-to-government dialogue to secure visits by overseas delegations to UK companies.

Castle Metals Aerospace (CMA) will also be in the pavilion. It supplies high-performance metals and supply-chain solutions to the global aerospace and defence industries.

Farnborough International Ltd (FIL), which runs the Farnborough International Airshow, will feature at the show.

Amanda Stainer, FIL exhibitions and events director, said the show provides it with a good opportunity to meet prospective aviation companies: "FIL will be meeting with exhibitors to help them plan their presence at next year's Farnborough International Airshow and to promote key features of the show which may benefit their business, such as news on delegations, conference and seminar programmes and feature zones within the show," she said.

"FIL is also promoting the Bahrain International Airshow 2012, which takes place in January."

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Why the US team will be out in force

Kelly Green *meets the people behind the huge American presence at the Dubai show.*

This year there are more than 90 American companies exhibiting and 41 within the US International pavilion.

Kallman Worldwide is, once again, in charge of the organisation and management of the US International pavilion, representing the largest contingent on display outside of the Middle East.

Gerri Cozic, Kallman's director aerospace and defence, said: "The Dubai Airshow is an important event for the US market as the Middle East represents an area of growth and sustainability in a somewhat turbulent global economy.

"Furthermore the United Arab Emirates and the United States share the common goal of stability and peace in the region through a continued partnership of counterterrorism efforts, military, diplomatic and financial support.

"There has always been a large US presence at the Dubai Airshow and the US pavilion was organised by Kallman Worldwide from 1995 until 2001.

"We decided to re-visit the idea of a US pavilion at the Dubai Airshow again in 2007, as our customers were encouraging us to get involved. Since 2007, the pavilion has grown by 125% and encompasses more than 550sqm at the 2011 show."

Kallman, a family-owned business, is a world leader in the marketing and management of

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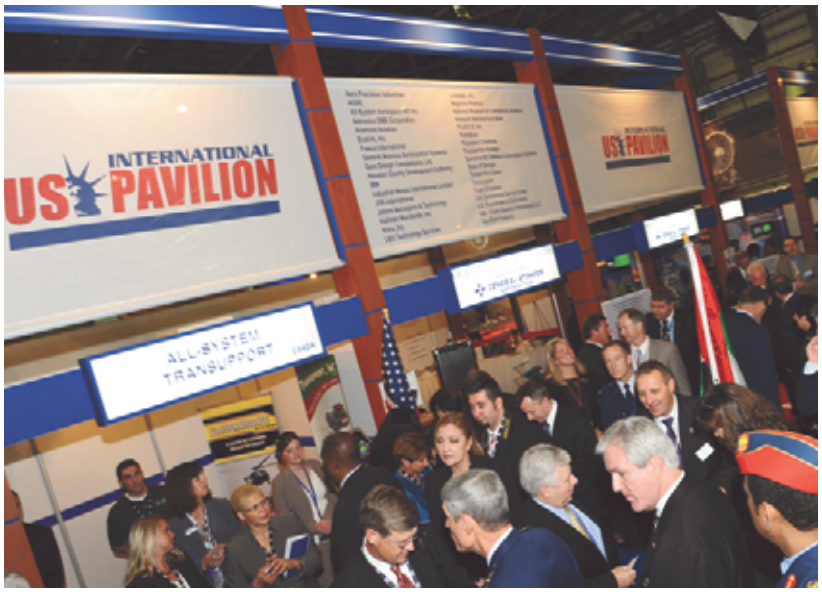

The US Pavilion.

exhibition space, and specialises in aerospace, defence, maritime, energy, mining and healthcare.

Best known for producing award-winning US pavilions, Kallman works hand-in-hand with US Government entities (particularly the Department of Commerce, Department of Transportation, and Department of Defense), as well as appropriate trade associations and NGOs, to provide preshow and onsite support for clients.

Since it was founded in 1963, Kallman has helped more than 10,000 multinational companies and government agencies maximise their trade show investments and exhibit around the world.

The Kallman group of companies has been involved with more than 900 exhibitions in Brazil, Canada, Chile, China, Cuba, Czech Republic, Egypt, France, Germany, India, Japan, Korea, Malaysia, Peru, Russia, Saudi Arabia, Singapore, Taipei, Thailand, Turkey, United Arab Emirates, United Kingdom and the USA.

According to Cozic, now is a good time for Middle East companies to "buy American". "US companies offer quality products and technology that can be purchased at a very competitive price because of the current economic climate. The international buying power is stronger, enabling companies to get more for their money when buying US products."

Cozic argued that US companies have a lot to offer the Middle East. "In terms of military products and services, not only does the United States offer hardware and systems that are combat proven, they represent the finest quality the world has to offer.

"More importantly, however, the market is well established, especially in terms of large-scale purchases of military equipment.

"When you buy from the USA you are also beginning a relationship, a partnership so-to-speak, which extends far beyond the shelf life of the individual product or service.

"Buyers like to do business with Americans because our products are well designed, tested, guaranteed, and very often endorsed by the US Department of Defense or other qualifying agencies. America stands with its partners under the most challenging of conditions – so I guess the question comes down to, if you buy a US weapons platform, what kind of after-sale relationship would you want to find yourself in – one involving and backed by the US Government and private sector values, or … another?"

Cozic added: "In terms of civil aviation products and services here again the US sets the standard for safety and efficiency in the air. From ultra-modern ground control radar systems to streamlined Dreamliners, the American tradition for excellence is well documented and maintained by the current body of industry leaders.

Reliability and consistency

"America has delivered steadily and without fail through the complete cycle – highs and lows – of economic environments and Middle Eastern buyers, any buyers, in the aviation business know how important reliability and consistency is for planning and growing their programmes."

One company exhibiting within the US pavilion this year is Avionica, which will be making the trip from Miami, Florida to Dubai to showcase its flight data and communications management solutions, comprising both airborne and ground support equipment. Airborne products include the miniQAR, now available with 3G wireless data interface, and satLINK, the fully ARINC 741-compliant iridium satellite data unit.

Ground support equipment includes the RSU II, a hand-held multi-use platform for flight-data recorder monitoring and download, portable data-loading, and database analysis.

California-based General Atomics Aeronautical Systems (GA-ASI) will also be showing the Middle East what it can offer in terms of unmanned aircraft systems (UAS) and tactical reconnaissance radars. GA-ASI also manufactures high-resolution surveillance systems, including the Predator/Gray Eagle UAS series and Lynx multi-mode radar system. GA-ASI provides long-endurance, mission-capable aircraft with the integrated sensor and data link systems required to deliver persistent situational awareness and rapid strike capabilities.

Also to be found in the US pavilion is Gore Design Completions, a leading supplier of custom aircraft interiors with extensive experience in head-of-state and VVIP aircraft, including the latest generation in wide-bodies. The San Antonio, Texas-based company performs interior design, engineering, avionics and project management services for customers worldwide.

RCF Technologies, manufacturer of a wide variety of parts, all based on an exciting material called Rishon, is also attending the show. It specialises in products using a proprietary elastomeric composite, which operates within a temperature range of -180F to +850F. The material is fireproof for more than 15 minutes, can be used as insulation; can be either non-conductive or conductive and is compatible with a wide range of chemicals. Standard products include ducting; seals; metal connectors; isolation mounts; grommets; gaskets and many specialty items.

Southeast Aerospace, founded in 1993, is a stocking factory authorised sales and service centre for avionics manufacturers, including Honeywell, Rockwell Collins, Garmin, L3, and more. It also provides a range of engineering and technical certification services and specialises in optimal solutions for special mission military avionics integrations.

Dutch suppliers play a key role in manufacturer supply chains.

Backing for the Dutch NAG

The Netherlands has a reputation for innovation. **Tom Billinghurst** *finds out what the country brings to the UAE.*

The Netherlands Aerospace Group (NAG) will organise the Dutch pavilion, giving visitors an opportunity to connect with the country's aerospace industry.

According to Lt Gen (Ret) D Starink, chairman of the board at NAG, the Netherlands aerospace industry is readying itself for an upturn in growth in the wake of the global economic downturn: "Innovation will play a key role in enhancing the competitive position of the Dutch aerospace sector in the global market and NAG has bought together the innovative endeavours of all its members, from large corporate organisations to small to medium-sized enterprises (SME) that are active in the sector, to present them to the market," he said.

Frank Jansen: "Growing importance."

NAG is the national trade association encompassing aerospace companies and organisations engaged in education, R&D, engineering, manufacturing and MRO of civil and military systems and equipment. And NAG's 100-plus member companies generate annual revenues of more than $3 billion.

"NAG acts as an intermediary that assists its members by helping them to find the right business contact in the aerospace sector," added Starink.

Aerospace potential

The Dubai Airshow remains one of the most significant events to showcase the region's aerospace potential. Frank Jansen, managing director NAG said: "The Middle East is of growing importance to the Dutch aerospace industry because of the many local initiatives and the fitting capabilities of our industries.

"To continue a presence in the region after the Dubai Airshow we are organising an aerospace trade mission to the region in the beginning of 2012. The Dutch industry has been present at the Dubai show since the very beginning. Representation at the show has always been a key element in our activities because of the region's excellent business perspectives."

The Dutch pavilion will host a range of companies including AkzoNobel Aerospace Coatings, which has attended the show since 2001. The company develops, manufactures and supplies high-quality coating solutions to serve the requirements of the worldwide aviation industry.

A spokesperson from AkzoNobel explained: "Among the products we will feature is the new Alumigrip range. The products boast the latest development in topcoat technology. Associated with environmentally progressive coatings and technological advances within the aviation sector, the new Alumigrip products add to the portfolio of coatings solutions for the general and business aviation markets."

Also attending the Dutch pavilion will be Avio-Diepen, a specialised provider of supply-chain management services. The company serves airlines and manufacturers of aircraft and aircraft components throughout the world. Its operations can be divided into three groups: sales and distribution of aircraft components; supply-chain management; and technical sales.

High-quality materials

The Defence Materiel Organisation (DMO) is also exhibiting. It was established as a separate entity to the Ministry of Defence in 2006 aimed at delivering and maintaining modern, safe and high-quality materials to operational users throughout the armed forces. DMO is responsible for all material within the defence organisation – from procurement to disposal.

Daedalus Aviation Group offers a 'one-stop shop' concept to support military aviation customers worldwide. A spokesperson said: "In close co-operation with its partners Daedalus Aviation offers its own competences as well as the specific competences of each of its partners.

Another exhibitor, Fokker Services, combines OEM design knowledge and independent after-sales MRO support to produce aircraft MRO services.

With a number of operators based in Africa, Eastern Europe and the Middle East regions using the Fokker 70, 100, 50, F27 and F28 the company recognises the importance of the Dubai Airshow as a platform.

"Just being at the event reconfirms the quality of our solutions, our key position in the independent aviation services market. Our goal is to meet many current customers, do lots of industry networking and attract new custom," said the spokesperson.

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Turkish delight: Celebrating the new Istanbul FBO is Hakan Caglayan, general co-ordinator; Ayca Kocabas, station manager and Mark Hardman, operations director ExecuJet Middle East.

ExecuJet enjoying its delightful partnership

Locally based companies will be using the show to demonstrate regional capabilities. ExecuJet is one of these.

Visitors to the ExecuJet booth at the Dubai Air Show this year could find themselves being greeted with a cup of Turkish coffee and maybe some Turkish Delight as well.

The Swiss-owned private aviation business has some Turkish delight of its own as its new partnership – announced at EBACE earlier this year – has become operational.

Istanbul has been added to ExecuJet's impressive list of FBOs through a new strategic partnership it made with Bilen Air Services (BAS).

"This has become the 11th FBO in the ExecuJet network with seven in Europe, two in South Africa and now two in the Middle East," said Mark Hardman, Dubai-based operations director for ExecuJet Middle East. "This is a real win-win deal for both ExecuJet and for Bilen."

ExecuJet is also in talks about adding a 12th FBO to the list before the end of the year – this will also be in the MENA region.

The partnership combines ExecuJet's experience as a major FBO operator and Bilen's local knowledge and focus on traditional Turkish hospitality.

"The team at Bilen bring a real passion for service," Hardman said. "The leadership team is involved in the front-line and it shows by the commitment everybody has to deliver great customer focus."

The FBO is based at Istanbul's main Ataturk Airport and is the prime business aviation centre in the genel havacilik (general aviation) area of the airport.

Bilen already offers crew facilities, passenger lounges at the general aviation terminal with two private hangars and ramp parking, technical assistance, flight and landing authorisation, flight plans and weather reports. But with ExecuJet's involvement the new dual-branded facility will reach out to a global customer-base through ExecuJet's many offices and partners worldwide.

"A lot of homework and research goes into ensuring there are synergies between the selected partners and ExecuJet with an absolute commitment to customer service, safety and standards being essential," Hardman said.

"We are planning a Turkish themed event at the Dubai Air Show in November, not only to introduce the Bilen team and highlight the partnership but also to illustrate Turkish hospitality at its very best."

The existing FBO at Ataturk has been processing around 1,000 movements a year but Hardman is confident that will grow. "There are a lot of exciting things happening in Turkey – growth in both the business and leisure sectors as well as major international sporting events. We know that by working together we will see a significant increase in numbers."

Back on home ground ExecuJet has also seen a lot of developments in its Dubai business.

Since the last Dubai Air Show it has added a second hangar alongside its existing Dubai facility. The new maintenance base adds 5,000sqm to the 2,500sqm of hangarage already alongside the FBO.

"The business in Dubai is also growing," Hardman said. "People recognise the quality of the service. We have seen something like 3,000 movements in the last year."

ExecuJet has also added to its managed fleet of business jets operating from Dubai. The most recent aircraft to join the UAE register under the ExecuJet AOC is the Bombardier Challenger 850.

"We have lots to talk about at the show," Hardman said.

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Are airmanship and systems management mutually exclusive flight training goals? That's the question asked by **Captain Ed Davidson**, *vice president of International Aviation Programs at Tetra Tech AMT, a Washington, DC-based air transport consulting firm with both government and airline clients worldwide. He was formerly the senior vice president - fleet for Emirates Airline in Dubai.*

Has pilot training become the aircraft's weakest link?

What follows are different, diametrically opposed, opinions about the skills needed by today's airline pilots. Take Bernard Ziegler, former Airbus senior VP for engineering who, in 2009, said: "Flying for the airlines is not supposed to be an adventure. From take-off to landing the autopilots handle the controls. You're not supposed to be the blue-eyed hero here. Your job is to make decisions, to stay awake and to know which buttons to push and when. Your job is to manage the systems."

Contrast that with the 1996 view of Captain Greg Crum, system chief pilot, Southwest Airlines, who said: "I don't want monitors here. I want pilots. Our whole philosophy is that the pilot is in charge of the airplane. We're very anti automation here at this airline."

To many current airline flight ops executives in the Gulf's burgeoning air transport industry who, according to recent manufacturer estimates, will need to hire and train almost 32,700 pilots between now and 2019, the decision on which philosophy of pilot training holds sway with their regulator will have far-reaching economic and operational consequences.

Bill Voss, president and CEO of the Flight Safety Foundation, recently said: "The Foundation's position has consistently been that training needs to be upgraded to reflect the new realities in the cockpit." Unfortunately, some of the Gulf's civil air regulators seem to be clinging to the old model of annual recurrent training that does not acknowledge the realities of the automated flight deck.

The administration of a series of unconnected, highly structured aircraft manoeuvres that do not approximate the 'real world' of line operations is coming under an ever-increasing level of attack by both pilots and training organisations. These 'box ticking' exercises, as they are affectionately referred to by the instructor who must administer them, are anchored in how we flew the B707 or the BAC 111 and not the highly sophisticated, computerised fly-by-wire aircraft that comprise the overwhelming number of new aircraft orders in today's Gulf-based fleets.

Bernard Ziegler: "Flying for the airlines is not supposed to be an adventure. Your job is to manage the systems."

Another 'reality' Mr Voss is clearly referring to and one which is likely to be debated in light of the Air France 447 accident data analysis, is the growing perception among some veteran aviators that automation is perhaps a bit too automated and which, over time, robs the pilot of those basic motor skills necessary to maintain aircraft control when the automatics fail.

As a result, there is an increasing cacophony of voices now being raised in support of allowing line pilots to practise 'hand-flying' during recurrent training and line operations.

These suggestions can also fly in the face of many carriers operating manual requirements largely built around the belief that automation provides both a safer and more efficient flight operation.

On November 14 at the Gulf Aviation Training Event (GATE 2011) held in conjunction with the Dubai Airshow, the adherents from both camps will have the opportunity to set upon each other in a two-day conference that will include this policy debate. I oversee the conference where, on closing, we will produce the first issue of what will become the annual "GATE Memorandum".

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AFT
ATLANTIC FLIGHT TRAINING

Pilots need an automatic wake-up call

Fatal crashes of passenger aircraft in Libya and the south Atlantic have raised alarming questions about the interface between pilots and the new highly automated flight decks. **Alex Fox** *talks to training organisations and safety experts to find out what trainers can do to help.*

On Monday June 1 2009 Air France flight 447, an Airbus A330 en route from Rio de Janeiro to Paris carrying 228 people, crashed into the Atlantic Ocean. Until earlier this year the cause could only be speculated. However, at the beginning of May, during phase 4 of the search and recovery operation, the wreckage and, importantly, aircraft flight data recorders (FDR) and cockpit voice recorders (CVR) were located 4,000 metres below the ocean. What investigators found has brought new resonance to the on-going debate about pilot training and flight automation.

In May 2010 another reported loss of control accident occurred when Afriqiyah Airways flight 771, also an Airbus A330, crashed short of the runway at Tripoli International Airport in Libya. While investigation efforts have been hampered by the on-going civil war in the country, it has been reported that the pilot disengaged the autopilot to bring the aircraft in for a manual landing. When the pilot realised he was in trouble he tried to climb and re-engage the autopilot but it was too late – the aircraft crashed 900 metres short of the runway, killing 103 of the 104 people on board.

While this accident occurred at low-level, unlike Air France 447, it is the apparent manual mishandling of the aircraft that bears similarities.

A US advisory board recently concluded that long hours flying on autopilot might have dulled the skills of airline flight crews. The board recommended that airlines build into existing operating procedures more manual flight time for pilots to counteract the problem.

The concerns of the board are highlighted by a number of accidents that have occurred during the last decade; with perhaps the Air France crash being the most well known. The accident occurred over the Atlantic off the coast of Brazil. When the crew received warnings that the aircraft was stalling at high altitude, after the autopilot disengaged, they failed to recover the aircraft from the stall and rapidly descended from 38,000 feet into the ocean. French investigators found that pilots had failed to acknowledge stall warnings and had also not received high-altitude manual flight training for such scenarios.

The crash of a Colgan Air commuter plane in the US in January 2009 further highlights concerns that manual flying skills are becoming dulled with over-reliance on autopilot. The Dash 8 Q400 crashed in icy conditions after the pilot countermanded aircraft system recommendations as well as airline and FAA standard operating procedures, subsequently leading to it stalling. The pilot then failed to recover from the stall, suggesting he had forgotten, or perhaps not been trained in some key procedures.

The Colgan Air and Air France accidents both involved the aircraft stalling, not in itself an irrecoverable condition of flight. The fact that in both cases pilots failed to recover, even when prompted, and that the Afriqiyah pilot lost control while manually handling the aircraft, could be indicators that manual handling skills are

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deteriorating. Is this the case? Could automation be the key catalyst in this problem? Or is automation still the safest option?

It is worthwhile noting that in the Air France and Colgan Air scenarios, there is a common misconception that the reactions of the pilots were wrong because they had 'forgotten' the correct technique for stall recovery as it is taught during ab-initio flight training – where recovery involves reducing back pressure on the control column (to reduce the angle of attack and unstall the wing) and to increase power to full (to minimise loss of height). However, it must be noted that stall recovery in modern airliners differs depending on the aircraft, configuration and phase of flight.

It is apparent from transcripts of the Air France CVR that the crew appeared unaware as to why there was a loss of control. Flightglobal's David Learmount suggests that a pilot must do three fundamental things with the information received from the instruments: recognise it, believe it and understand it. It is possible that Air France 447 could have been recovered had the crew recognised and understood early on the situation they were in. However, it is entirely possible that the crew were carrying out recovery actions for another scenario and were so far outside the tested flight envelope that nobody knows if it was even possible to recover. Actions on board suggest the crew recognised most of what was displayed to them; that airspeed indicators were not functioning correctly and that flight controls had changed from 'Normal Law' to 'Alternate Law' (where flight envelope protection is not given and the aircraft can be stalled) the crew did not acknowledge the stall warning.

Training has not evolved

Learmount further suggests that the misapprehension that occurred on board after the autopilot disengaged was certainly not inevitable, but it was – and remains – a likely product of the way aeroplanes have changed, while training has not evolved to take account of the differences in the modern flying task.

These sentiments are echoed by Don Bateman, chief engineer at Honeywell and inventor of both the ground proximity warning system (GPWS) and enhanced GPWS – systems that have significantly reduced controlled flight into terrain (CFIT) accidents since being implemented in the 1970s. Speaking at the 2011 Flightglobal Flight Safety Conference in London on the subject of loss of control (LOC) accidents, Bateman suggested that the industry as a whole needs to "revisit pilot training" in a "practical and low-cost manner" and also suggested the "startle effect" is a huge factor in LOC accidents. In almost every instance the crew were not expecting to lose control and the issue also needs addressing through proper training, he concluded.

Bateman suggested a number of engineering solutions could also help, stressing these must also be "simple, practical and low-cost" and should "utilise existing cockpit systems". Solutions such as visual recovery arrows displayed on the attitude direction indicator (ADI); revisiting frequency-separation attitude displays, which give pilots instant feedback on control inputs; and the use of synthetic vision systems (SVS), which display the outside world in low-visibility conditions on the primary flight display (PFD) are just a few ideas Bateman believes can improve the man-machine interface and reduce LOC accidents.

"The industry as a whole needs to "revisit pilot training" in a "practical and low-cost manner."

Don Bateman

From a flight training organisation perspective, it is again training that is believed to be unsuited to the modern airliner cockpit. Bill Roe, managing director of the Saudi Aviation Flight Academy (SAFA) and type-rated pilot on the Phenom 300 (a highly automated aircraft), believes the issue is rooted in training. From ab-initio right through to airline recurrent training, there needs to be new focus on the fundamentals of flying, he said. If the autopilot fails a pilot must be capable of hand-flying the aircraft and, in all but the worst case scenarios, power and pitch will still enable an aircraft to fly safely. An aeroplane is still an aeroplane and the principles of flight and aerodynamics still apply.

Roe also acknowledges that analogue instrumentation is a thing of the past in most modern airline fleets today and, as such, "we need to find a way to teach the basics in a glass cockpit".

That is not to say, though, that pilots should be flying on autopilot immediately. "Pilots must be proficient in manual handling before being taught to use cockpit automation."

Roe noted how many Gulf carriers have begun adapting SOPs; encouraging pilots to hand-fly sectors to keep manual skills current. In fact, according to Captain Martin Mahoney, SVP flight training at Emirates Training College, Emirates worked with the automation working group in the US to create an automation policy, introduced in 2010, which encourages pilots to consider the threats on the day before deciding what level of automation to apply.

Regulatory minimum

Emirates also conducts a lot of simulator training, over and above the regulatory minimum, of which much focus is placed on manual handling. Emirates believes it is important that sufficient simulator time is given to manual handling skills as well as flight deck automation. "Pilots have to be knowledgeable, proficient and competent in flying today's advanced aircraft in both modes," said Mahoney.

Marwan Atalla, CEO of Ayla Aviation Academy in Jordan, said: "Automation can always be turned off. However, it is company regulations that dictate when pilots must use it – with most requiring pilots to use autopilot shortly after take-off until shortly before landing. It might be the right thing to do but then it has to be offset by additional manual training."

The problem with this is that it will cost airlines more money – even going back to grass roots flying in light single/multi-engine piston aircraft incurs additional costs – and while comparatively cheap compared to an airliner, it is still an extra cost that many airlines would feel aggrieved by, even more so in these days of reduced operating margins.

Some commentators have suggested pilots spend more time hand-flying in everyday operations. Rory Kay, executive air safety chairman of the Air Line Pilots Association (ALPA) has stated that pilots need more time hand-flying aircraft to alleviate the dulling of manual flying skills caused by over-reliance on automation.

United is one airline that actively encourages pilots to operate manually and Kay often hand-flies the aircraft below 18,000 feet – something Roe advocates as he, too, flies manually from take-off to cruise altitude before engaging the autopilot.

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Critics of this approach would

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argue that this is more expensive as hand-flying tends to be less efficient and that it is safer to let the autopilot handle the aircraft, with fewer 'level busts' and flight path deviations. Indeed, in some airspace, where reduced vertical separation minima (RVSM) apply, use of autopilot is mandatory.

Captain Lloyd Watson, commercial director of type training at Oxford Aviation Academy, also presented at the Flight Safety Conference and firmly believes that a rethinking of the content of type training and recurrent training is needed. After conducting a gap analysis he found that the cost of training is key. Whether it is the airline or the student that foots the bill it seems that in most cases only the minimum amount of training, as set by regulators, is undertaken to minimise the final cost.

Currently there is no requirement for type ratings to include training in such things as PRNAV, use of head-up guidance or economical flight procedures; all of which are used in modern cockpits. Subsequently, these systems are usually not trained for during type-training – to save money – and this is where the gap emerges. The resultant gap is then bridged during line training and on the line. This poses the question, is the line really the best place to learn how to operate these complex systems? Captain Watson believes the answer is no and that ultimately the problem lies with regulators who set minimum requirements for license and type-rating issue.

Practice and training

The Gulf Aviation Academy (GAA) agrees: "An aircraft with passengers on board is not an appropriate training medium. Skills are developed, enhanced and rectified through practice and training and the best and safest training tool for that is a simulator."

GAA further argues that pilots are exercising manual flying skills less frequently because modern aircraft are designed for, and pilots are encouraged in, maximum use of automation. If appropriate measures are not taken to ensure fluency this could become an issue. In terms of incorporating more manual flying in everyday operations, GAA doesn't believe this would be of benefit, stating that pilots require practice in simulators under abnormal, degraded environmental conditions, ensuring that in addition to sharpening piloting skills, pilots will build confidence as well.

In terms of adapting training GAA notes that the industry is already introducing programmes such as the advanced qualification program (AQP) and evidence-based training (EBT) where training and checking is tailored and customised to individual operator's needs to address unique deficiencies.

Former Royal Jordanian captain and personal pilot to His late Majesty King Hussein of Jordan, Captain Bader Steityeh, also believes a gap exists in airline pilot training. He said: "The problem lies not in automation but in bridging the gap between

a basic aircraft pilot and fly-by-wire technology. When manufacturers first introduced fly-by-wire aircraft, the type-rating course was fully comprehensive and dedicated a lot of time to showing pilots the difference between conventional and fly-by-wire aircraft."

Additionally, said Captain Steityeh, type-rating ground school and refresher courses were conducted by instructors who, through dialogue, could pinpoint weaknesses in pilots' knowledge. Now computer-based training has replaced classroom instruction and any shortfall is not picked up unless a student fails the computer-based exam. Also, owing to airline financial constraints, the expanded type-rating course was cut by almost half, giving less time for pilots to become familiar with the intricacies of fly-by-wire aircraft.

However, Captain Steityeh goes on to say: "Automation is still the safest option provided pilots are trained not only in how to use it, but also how to correctly identify any problems that may arise. In my opinion, safety must not be jeopardised by cost-cutting."

Harry Nelson, experimental test pilot and deputy SVP flight and integration tests at Airbus, added: "While there have been great advances in aircraft technology over the last 30 years which have had a very positive effect on the safety of air travel, it would seem from recent events that, with one or two exceptions, in general the training of today's crews has not kept pace with that rate of change... some of the recent incidents and accidents have revealed significant weaknesses to the general approach being taken in the worldwide training scene."

He further argued that too much focus is placed on testing where it should be on training.

Hank Krakowski, former COO at FAA Air Traffic Organisation and former VP flight ops at United Airlines, believes automation is not solely to blame but that "certain operational environments also facilitate a 'dulling' of basic flying skills – long-range flights have limited opportunity for hand flying with insufficient frequency of take-offs and landings." He added: "Like any skill, if unpractised, atrophy is inevitable."

Steam gauge airplanes

Richard Ellis, flight safety manager at Florida-based Spirit Airlines and former 707, 747 and A320 pilot, who describes himself as "one of those old guys... the kind that grew up on 'steam gauge airplanes'," believes there is an over-reliance on automation in the modern cockpit.

"We are now sometimes completely subservient to the whims of the automation on these 'new airplanes' and seem to abrogate authority to the aircraft as if it's a living, breathing, authoritative entity," he said.

Ellis acknowledges that modern aircraft have far better safety attributes but argues these attributes have led to pilots "losing the professional abilities [they] strive so hard to master in flight school".

He further maintains that modern fly-by-wire aircraft lack the tactile feel of older aircraft, which may be an obstacle to better manual flying. He accepts that "we live in a different era, with different aircraft and certainly different attitudes", but argues, "two things will never change – we have to understand that basic airmanship will always save the day and that we, as professional pilots, are still captain of the ship".

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Maritime patrol gets Canadian treatment

Provincial Aerospace specialises in intelligence, surveillance and reconnaissance (ISR) providing customised airborne maritime surveillance and search and rescue (SAR) solutions.

For the last year the Canadian company has been conducting maritime patrol aircraft (MPA) training and its first group were students from the UAE Armed Forces.

"In February 2009 we were awarded a contract by the UAE Armed Forces to supply modifications for two MPA", said Roger Mombourquette, senior VP special missions operations and training. "The contract was valued at $1.071 billion AED to supply the modifications, which includes the design, modification and integration of two Bombardier Dash 8 Q300 aircraft, as well as training and integrated logistics support."

The MPA are specialised long-range aircraft that are designed to patrol the UAE territorial waters, monitor pollution and support search and rescue activities. In order to operate such a complex piece of machinery, the UAE Armed Forces had to provide 30 specialised personnel to train in the UK and Canada in four groups for up to four months each, and 12 qualified pilots and co-pilots.

The UAE trainees receive instruction from Provincial Aerospace flight MCO instructors, all of whom are previous military flight instructors from the Royal Canadian Air Force and Royal Canadian Navy.

The UAE Ambassador to Canada Mohamed Abdulla Al Ghafli with the latest graduates and their Canadian instructors.

The students also have strong support from their embassy in Canada. "The UAE Ambassador to Canada is interested in providing support and attended a graduation exercise in December 2010," said Mombourquette.

The company continues to provide pilot training and mission system operator training in support of the programme. Additional training will take place in the UAE as the MPA aircraft are delivered.

COO Brian Chafe said: "We are confident that additional training programmes will be added and Provincial Aerospace is looking forward to being a long-term supplier to the UAE Armed Forces."

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Why three students crashed the rodeo party

Many students whose project crashed and crashed again would have given up. But a group from the UAE just kept going – and ended up presenting their concepts of a pair of unmanned air vehicles (UAVs) to a world gathering of unmanned experts at the AUVSI convention in Washington DC.

Team members were able to attend the event thanks to a project by defence manufacturer Northrop Grumman in conjunction with AUVSI Foundation and local Abu Dhabi UAV manufacturer ADASI.

Northrop Grumman has been working closely with the UAE government with demonstrations of programmes such as Fire Scout, for use with the UAE armed forces. "The country has a great interest in aviation in particular and is working to develop greater education in areas such as technology, science and maths," said Northrop Grumman's Thomas Twomey.

The company launched an Unmanned Air Systems Rodeo and saw 11 teams from Dubai, Abu Dhabi and Al Ain take part. Three of the five members of the winning team from Dubai Men's College were at AUVSI with their successful aircraft – and with the prototype of a new unmanned helicopter that they have been inspired to build since winning the competition in May.

Khalil al Balooshi, Yaqoob al Awadhi and Salem Almheiri explained how they had crashed their aircraft nine times before finally engineering the model that remained airborne for more than 21 minutes – five minutes longer than their nearest competitor.

"We just kept crashing, working out what was wrong, improving it, crashing again and so on," said al Balooshi.

Wes Bush, CEO of Northrop Grumman said: "The rodeo provides an opportunity to transfer knowledge and technology to the younger generation, which is an important element of the strategic vision established by the UAE leadership. I'm confident that the enthusiasm we saw at this year's rodeo competition will inspire its expansion and will further encourage tomorrow's generation of Emirati scientists and engineers to develop similar ground-breaking technologies."

Khalil al Balooshi, Yaqoob al Awadhi and Salem Almheiri

Northrop Grumman has confirmed that there will be another UAE Rodeo in 2012 and the team from Dubai College is determined that it will win again.

"It was great fun," al Balooshi said. "And there is a message there about keeping trying. We are sure it will be very close."

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Demand forces ECFT to open second facility

Emirates-CAE Flight Training (ECFT), the joint venture between Emirates Group and CAE, is planning to open a second facility in Dubai to provide additional training capacity for airline pilots and aviation maintenance technicians. **Jill Stockbridge** *finds out why.*

Scheduled to open in 2012, the new ECFT facility will initially house four full-flight simulator (FFS) bays with plans to expand to as many as 10. The first will replicate the Airbus A320 and Boeing 737 families of aircraft.

"Continued strong airline growth in the Middle East and neighbouring regions is driving the need for additional highly qualified flight deck crew and maintenance personnel," explained Gary Chapman, ECFT chairman.

"Our partnership has proven, over many years, the ability to consistently provide world-class training programmes that leverage market-leading simulation technology."

Jeff Roberts, CAE's group president for civil simulation products, training and services added: "The agreement between Emirates Group and CAE to launch ECFT was announced 10 years ago in July 2001, so it is quite fitting that we announce another centre to further serve the growing training needs of the region.

"Our partnerships with respected organisations, such as Emirates, have enabled us to serve their crews as well as the training requirements of numerous airlines throughout the region."

As with the current equipment, the new facility will be available for use as a fully commercial operation, open to airlines and private individuals from around the region. The decision has been made due to the constant demand for the current facility, which is operating to capacity.

The location of the new facility has not yet been decided; with constant expansion meaning that space is at a premium at the current Emirates Aviation College campus.

The current ECFT facility has played an integral part in the UAE's aviation industry and was the first facility of its kind in the Middle East to be approved by Joint Aviation Authorities (JAA), Federal Aviation Administration (FAA) standards and UAE (GCAA) standards.

Located at the Emirates Aviation College campus near Dubai International Airport, the centre opened in 2003 with six FFS bays and is approaching full capacity with 12 full-flight simulators. Training is provided for Airbus A320/ACJ, Boeing 737 NG/BBJ, Boeing 777, Bombardier Global Express, Dassault Falcon 7X, 900EX EASy and 2000EX EASy, Gulfstream IV, V and 550, Hawker Beechcraft 800, 800XP and 800 XCPi, and Bell Helicopter 212 and 412 aircraft types.

The news of the new training facility comes as the Emirates Aviation College weighs up the merits of the deluge of candidates it received for the first JAA-licensed pilot training programme.

Since the announcement of the 17-month programme, the college has been flooded with enquiries. However, candidates have to be clear that the connection to Emirates is purely through the college. The course does not offer a position at the airline, or training on a wide-bodied jet. Emirates does not recruit pilots with fewer than 1,000 hours experience, except through its own national cadet programme.

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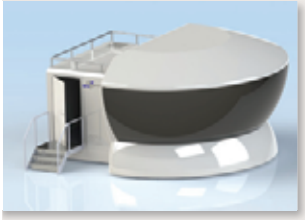

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Online option from CAE

CAE recently announced it is further expanding customer training options with a new programme that enables business aircraft pilots to study recurrent training course requirements over the internet.

The CAE SimfinityTM Virtual Ground School features regulator-approved web-based study of the same systems and procedures course material that people would cover in an instructor-led classroom.

The first programme for the Gulfstream 550 aircraft is now available. It is the first web-based regulated recurrent training programme for business aircraft pilots to receive approval from the US Federal Aviation Administration (FAA). Courses are in development for other training programmes for Bombardier, Cessna, Dassault, Embraer, Gulfstream and Hawker Beechcraft aircraft types.

The course will be available to the pilot in advance of scheduled training centre sessions. Pilots have the option of studying the e-learning modules at their own pace, tailored to their personal schedule. E-learning progress can be monitored through the CAE learning management system (LMS).

Graduates from the programme will obtain a frozen air transport pilot licence (theory) and commercial pilot licence with instrument and engine ratings, as well as an ICAO language proficiency certification.

Each applicant will undergo a pre-selection process consisting of psycho-technical tests, oral and written English exams, and a personal interview.

At around $117,000 the course fee is around three times the cost of obtaining the same licence locally, but it is inclusive of full board accommodation in Lisbon, three tickets, visas, books and materials.

The programme is expected to launch early next year.

Dr Ahmad Al Ali, senior vice president Emirates Aviation College, said: "There is a worldwide shortage of pilots, which is set to grow, especially in this region. We wanted to offer a European pilot's licence and chose Lisbon as one of the best international schools. Qualifying as a JAA-licensed pilot is the first step in a career in aviation.

"The first seven months of theory and ground school will take place at the college in Dubai, followed by residence at flying school in Lisbon for 10 months."

With more than 30 study programmes offered locally at the college, the courses in avionics, aviation management, logistics and IT management will take centre stage over the next few years as the aviation sector continues to grow regionally.

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Hommaid Al Shemmari: "In 20 years I believe people will be talking about Al Ain in the same breath as Toulouse or Seattle."

Diversity the route to Abu Dhabi success

Mubadala is the biggest name in the Middle East's aerospace and defence support services with MRO, manufacturing, finance and training all part of a strategy to make Abu Dhabi a centre of aerospace excellence. **Alan Peaford** *finds out how the investment arm of the Abu Dhabi government is achieving this goal.*

Mubadala has interests in energy, telecommunications, healthcare and real estate but central to its development and the future of Abu Dhabi is its aerospace division.

The word Mubadala means 'exchange' in Arabic, and as the investment arm of the emirate's government it has a clear task – to move Abu Dhabi away from reliance on income from energy and to develop opportunities for Emiratis with careers not jobs.

For Hommaid Al Shemmari, the executive director of the aerospace unit, it is this sector that will enable Abu Dhabi to become a world-class centre.

"In 20 years I believe people will be talking about Al Ain in the same breath as Toulouse or Seattle," he said.

Shemmari sees the Mubadala family of businesses – which stretch across MRO, manufacturing, spares and finance as well as training – helping to deliver a diversified economy to Abu Dhabi along with high potential jobs for the country's nationals. "We are a long-term investor in the industries we have identified. Aerospace was seen as a key one when we built the strategy in 2006 and we knew then that this is a highly cyclical industry," Shemmari said.

"We recognised that we had to have a business that was capable of weathering such circumstances as we have seen in recent years with the financial distress. In the past year we have restructured our businesses to be agile, flexible and more capable of weathering the conditions.

"We are building diversification. We had been dependent on MRO but are now adjusting with some initiatives such as Sanad, and we are ready for the

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next cycle to be more adaptive to circumstance."

MRO is still at the heart of the Mubadala story through its ownership of ADAC and SR Technic. "We are positioning ourselves as a global player. Deals with GE and Hamilton Sundstrand, our relationship with Boeing and Airbus and bringing Sanad solutions into the pack of MRO companies to provide financing linked with MRO revenue, has made us become a bigger and more influential global player," Shemmari said.

"We are not a traditional MRO provider. That is a recipe for failure in our minds. We are a differentiating player, a total solutions provider. Bring us your plane and I'll do your airframes, your engines, your components and I'll also finance it for you.

"I will work with other partners. The customer just focuses on aviation; on their passenger operations. That has been a great value proposition for us. We had great successes. Swiss Air, EasyJet, Etihad, Virgin Blue – you can look at each of our deals and see how it is changing. Two years ago SR Technics was doing its deals, ADAT was doing its own too. But now we are doing it as a single team."

While looking at the whole branding issue, Mubadala can see advantages for a single name but recognises that with different certification and registration there are also advantages for continuing with different brands for different markets.

Developing new markets

This also helps with developing new markets. Mubadala still has the US and Asia on its radar. "The US is a very mature market," Shemmari said. "Any entry for us into that market has to be with a partner, not just a straight acquisition. We have to have a partner that understands that market and how to navigate the terrain of that market. But that is down the line. My prime focus is on Asia at the moment. We have managed some relatively small deals in India and Australia but we have our foot in and we are building from that."

Success in the different international markets has changed the perception about future careers for UAE nationals. "It is becoming easier and easier to prove to UAE nationals that this is the way forward," Shemmari said. "Now we have the strategy and a global presence we are building Abu Dhabi Inc with the universities. With the different players in the aviation sector in the UAE, we have more specific programmes so people have a career. We have sent individuals to NASA, to Airbus. We sent eight to Airbus recently and a UAE national female finished top of the group."

"We want to develop leaders. From NASA we had feedback about how good the UAE people had been. This is about change and it is happening."

Mubadala has seen success this year with the delivery of the first work programmes to Airbus by its aero systems manufacturers Strata.

"The Strata team did us proud," Shemmari said. "It delivered two work packages to Airbus and will deliver the first to ATR by the end of the year. It proves to the world how serious Abu Dhabi is about aerospace. We have proven to our partners like GE and Airbus that this is not a one deal agreement. EADS leadership visited recently and told us they want us to become a tier one supplier. We are also hoping to do a similar sort of deal with Boeing by the Dubai Airshow.

"But we are also having discussions about composite manufacturing with other players like Lockheed Martin. We are not just Boeing and Airbus. We will look to diversify the risk."

The company is also going one stage further and finalising plans for how to realise its ambitions to develop a new business jet.

At the Dubai Airshow two years ago Shemmari told a cynical audience that the company's goal was to bring the new aircraft to market around 2018. There are few cynics around any more. "It is most definitely going to happen; why would you doubt it?"

Shemmari continued: "We will deliver on time. Since 2006 we have been building blocks to get to this – building indigenous businesses and tapping into partnerships."

A cornerstone of these ambitions was the acquisition of a third of the Italian business aircraft builder Piaggio, which it shares with India's Tata Group and Italy's Ferrari family.

Shemmari has been reported as looking for more partnerships. "I feel we still need someone of stature to help us out to make sure we can deliver a successful programme," he said.

Dassault is a favourite to be working with Mubadala but this could be a two-way relationship. "The links between Abu Dhabi and Dassault go back a long way," Shemmari said. "They sold us our first fighter aircraft almost 40 years ago. That is a great relationship."

Shemmari sees the future as being a lot more than just one business jet.

"There will be other programmes. Who makes the whole plane these days? It's about supply chain management. We will develop the partnership. We want to move to other aviation sectors. UAVs are the trend now. Unmanned autonomous systems are the future.

"Boeing EADS and GE are all doing it. Look, we won't be building an A320 or B737 in my lifetime but we want to be risk sharing partners and Tier 1 suppliers in the next programme that comes out of Boeing or Airbus."

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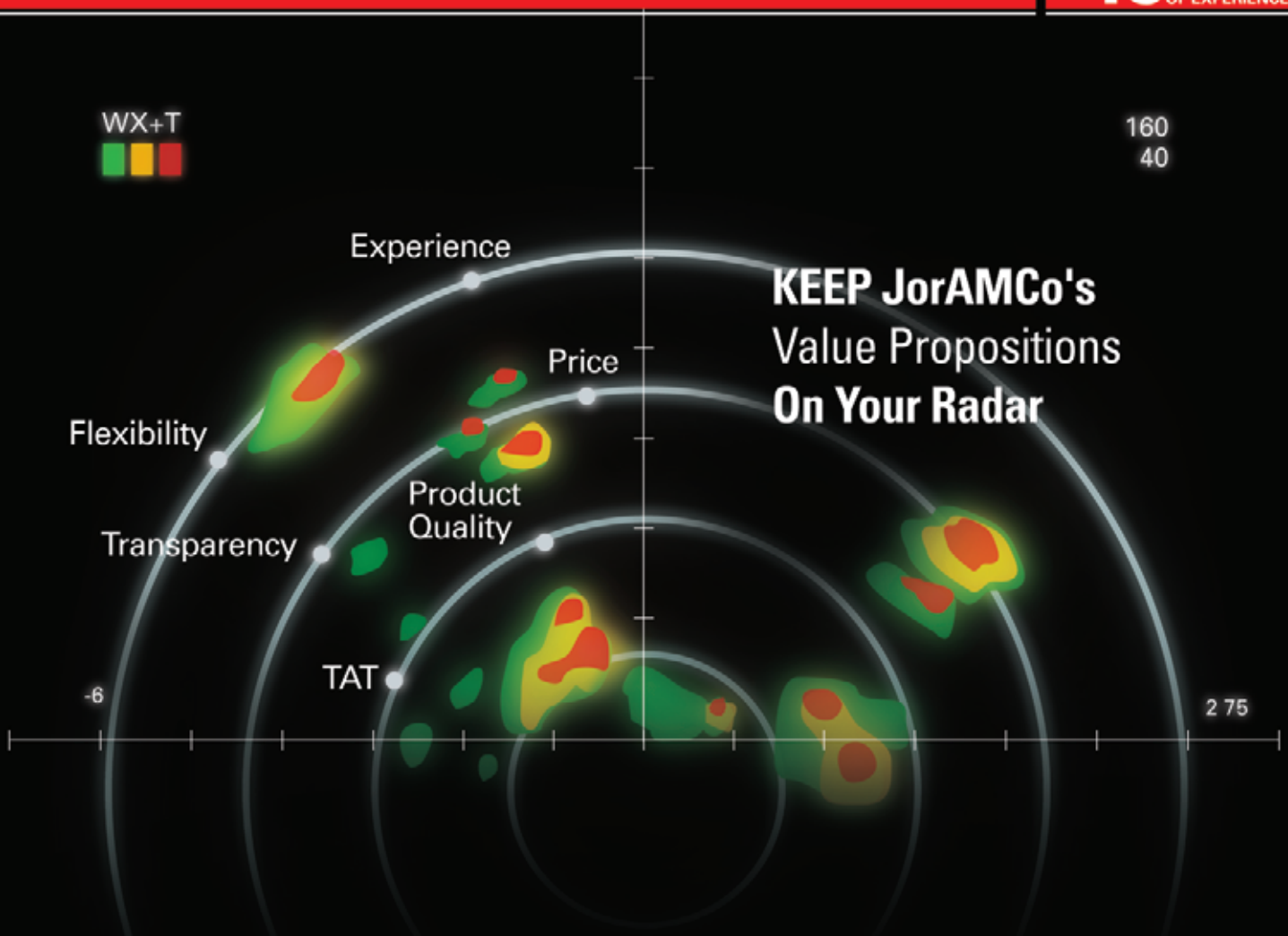

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Why MENA is becoming the MRO centre of choice

MRO is becoming big business in the MENA region. As airline numbers grow, many operators opt to stay in the region where more and more services are being offered. **Geoff Thomas** *reports.*

Istanbul-located MRO, MNG Technic, will be entering a new business arena before the end of 2011 with the current conversion of the first of up to six ex-China Southern Airlines Airbus A300-600 passenger airframes to freighters.

If this proves successful, the Turkish company will look at further passenger-to-freighter (P2F) conversions, possibly involving Boeing B777s, B767s and Airbus A330s. Four of the aircraft have already been acquired by MNG Airlines (part of the same group), two have been delivered to Istanbul and conversion of the first is well under way.

MNG Technic has taken over the supplemental type certificate (STC) that Seattle-based Flight Structures developed some years ago in competition with EADS' A300/A310 conversion production line in Germany.

Following removal of the entire cabin interior, the STC involves the installation of a main deck freighter door together with associated floor reinforcement. Once converted, the A300-600s will be able to carry around 52 tonnes of freight.

When the Turkish MRO was created towards the end of 2002, it was operating from a 5,000sqm hangar on the edge of Istanbul's main airport. Now the company has a huge new 25,000sqm asset and a 5,000sqm paint-shop that is booked out until January 2012. As a direct result, its annual revenues are set to rise from US$45 million in 2010 to a projected total ofUS$120 million in 2012/13.

Most of the region's MRO providers have a heritage as in-house operations of state-owned airlines. And they believe that this gives them a major advantage when combined with lower costs and a more convenient location, compared with many of their 'western' competitors.

Bahrain is the latest Middle Eastern state to announce its presence in the third-party MRO marketplace. The kingdom's Gulf Air has agonised over its MRO options since Bahrain's split with former fellow-owners, Abu Dhabi, Oman and Qatar.

Singapore-based SIAEC has been handling the maintenance of all Gulf Air's 34 aircraft at Bahrain International Airport from a temporary hangar since 2009. However, a new agreement between SIAEC and Bahrain's Mumtalakat holding company's maintenance business called Gulf Technics means the venture will be widely promoting a new facility in 2012 to handle both Gulf Air and third-party work.

The move is part of a wider strategy by Bahrain to regain some of its status as the regional centre of aviation following the emergence of Abu Dhabi, Dubai and Qatar as major hubs for international traffic in the past decade.

Increase the pressure

Bahrain's move could increase the pressure on Jordan Aircraft Maintenance (Joramco). In the ten years since it split from its one-time parent, Royal Jordanian, Joramco has built a third-party business – specialising in Airbus and Embraer E-Jets – representing around three quarters of its revenues.

In the region's biggest MRO facility, at Dubai International Airport, Emirates has begun to offer third-party work. The 55Ha (136 acres) engineering centre, opened in 2006, has seven hangars, each capable of handling Airbus A380s.

The region's other major airline, Qatar Airways, has its line maintenance facility in Doha. Heavy maintenance is put out to tender, with the final choice varying, depending on aircraft type and work required.

Goodrich was one of the first OEMs to establish a dedicated support and overhaul centre in the Middle East, opening its 10,000m2 (107,600ft2) facility at Dubai's Jebel Ali free trade and industrial zone. The centre handles nacelles, evacuation systems, icing systems and cargo equipment for both Airbus and Boeing types.

Last year it added electronic engine controls for the Rolls-Royce Trent 500, 700 and 800 and it then signed a letter of intent with

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Emirates to become exclusive provider of evacuation system MRO services for the airline's on-order A380s.

It is said that the size of the Middle East MRO market, the second fastest growing region in the world after Asia-Pacific, is around $1.8 billion in terms of contract value.

And despite 2011's uprisings and revolution in North Africa, business is still growing. Egyptair Maintenance and Engineering is still looking to boost third-party customers' share of volume from 20% to 50% by 2018 – despite its parent airline's dramatic growth, which has seen its fleet double in four years.

This year, the MRO began offering third-party engine services from a shop it opened as a joint venture with Rolls-Royce and Lufthansa Technik in Cairo in 2009. The facility has full overhaul capability for International Aero Engines V2500-A1/A5 (A320 family) and CFM International CFM56-5C (A340-200/300) powerplants.

For the airframe maintenance business, the company plans to build four new hangars by 2025. Currently, three hangars are available to work on up to nine aircraft. Construction of the first new, three-bay hangar will begin in 2014. Two more facilities with four bays each will follow in 2016-17 and 2020-21 and the fourth hangar is due to go up in 2025.

Hangar 6 hoists ADAT into new territory

Mubadala's continued investment in the MRO sector was publicly aired last month when subsidiary, Abu Dhabi Aircraft Technologies (ADAT), the region's largest independent MRO services provider, officially opened its new hangar

The state-of-the-art hangar covers 46,200sqm and boasts special design features such as dedicated satellite control rooms, tool cribs, stores and a flexible concept with no fixed docking system, but flexible tele-platforms instead.

Every detail relating to the design of what is called 'Hangar 6' has been meticulously thought out – whether it be the goods hoists that are located centrally in each bay and have the capacity to move major aircraft components with ease between floors, or the main cabin maintenance workshops, located on the first floor, that provide direct access at mezzanine level to service wide-bodied aircraft and optimise productivity when working on aircraft cabin interiors.

Chairman Homaid Al Shemmari said: "This is a great day for everyone who has worked so hard at ADAT since construction began back in September 2008 and I am proud to say that through this continuing investment in facilities and its workforce, ADAT is cementing its place among the world's leading MRO providers."

Senior management from SR Technics, ADAT's sister company headquartered in Zurich, Switzerland, and Sanad, Mubadala Aerospace's component and engine financing solutions company, also joined the hangar opening celebration.

The hangar's flexible work concept design means that is able to service a wide variety of aircraft, including new generation aircraft such as the B787 airliner and the A380 airliner. Indeed the hangar's unique design means that it can service and house up to three A380-800 aircraft at any one time.

This flexibility, coupled with the state-of the-art facilities, has attracted other new contract wins for ADAT. The opening and official launch of the hangar coincided with the announcement that ADAT has secured a further deal with Etihad Airways to carry out heavy maintenance checks across most of the Etihad fleet.

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Strong support for Bahrain show a boost to local confidence and economy

The second Bahrain International Airshow is going ahead with confidence and is being strongly supported by the international aerospace community.

Chalets are now virtually sold out with only one unit remaining for the event, which will take place at the Sakhir Airbase, from January 19-21.

"We are confident that the show will be a sell out by the time we get to the end of the Dubai Airshow," said Events & Exhibitions Director, Amanda Stainer from Farnborough International, which is co-organising the exclusive five star event alongside Bahrain Civil Aviation Affairs.

New developments to the 2012 show have been finalised, including a VIP gala dinner which will be hosted by His Highness Sheikh Abdulla bin Hamad Al Khalifa and attended by the official delegations, ministerial and government representatives and industry leaders.

Companies confirmed to participate in the show include Airbus, Boeing, Lockheed Martin, Cessna, Bombardier, GE and Sikorsky.

Local Bahrain companies have stepped up to support the event with sponsorship. The show will boost the local economy and national confidence, which was hit badly after the Grand Prix was cancelled due to civil uprising earlier this year.

Sponsors include Gulf Air and Batelco, which were both headline sponsors of the launch event. BMW has signed up as official vehicle provider through exclusive Bahrain importer Euro Motors, and petrochemical company, GPIC, has come on board as a gold-level sponsor.

Stainer said: "There are still opportunities to take part in the show in terms of sponsorship and corporate hospitality and I would urge interested parties to contact us as soon as possible."

Two shows in one for Dubai

With the growing MRO activities in the MENA region it will be no surprise that MRO Middle East – organised by *Aviation Week* magazine from the US – will attract a high number of delegates and speakers at the event, which runs alongside Aircraft Interiors Middle East Conference (AIME).

The co-located shows at the AirportExpo, Dubai, take place on February 1-2 and are strategically designed to offer the newest and most innovative concepts and best practices.

The agenda highlights growth opportunities, cost reduction, and management strategies that are cutting expenses and maximizing efficiency.

Record numbers set for Airport Show

The Airport Show is to move to every two years after the 2012 edition, which will take place at the AirportExpo Dubai from May 22-24.

This will also be the last time that the show will take place at the AirportExpo venue.

Organiser Reed Exhibitions is anticipating record numbers this year as investment in the airport industry in the MENA region tops $90 billion.

Airport Show was launched in 2001 and the combined exhibition and conference has grown consistently to become the largest airport build, supply, operations, security, technology and services event in the region.

Last year's event saw 160 international and national exhibitors take part.

Details are on: www.theairportshow.com

ACI hosting is a first for ADAC

The Middle East is hosting Airport Council International (ACI), Europe and Asia-Pacific's major annual gathering, for the very first time.

Abu Dhabi Airport Company (ADAC) is the host for the Airport Exchange 2011, which takes place from November 28-30 and brings together more than 1,500 aviation senior professionals to take part in a conference programme addressing the key issues affecting the air transport sector.

The dynamic three-day event will host various conferences around the six key themes: security; airport operations; airport development and environment; IT, facilitation and customer service; commercial; and network planning.

These fora provide a unique opportunity for delegates to share ideas, strategies and best practices with key players across all sectors and will be delivered by a prestigious list of speakers from leading organisations in the aviation community.

Keynote speakers include:
Tan Sri Bashir, managing director, Malaysia Airports and president, ACI Asia Pacific;
Kosaburo Morinaka, president and CEO, Narita International Airport Corporation;
Declan Collier, CEO, Dublin Airport Authority;
James Bennett, CEO, Abu Dhabi Airports Company;
Kevin Knight, chief officer of strategy and planning, Etihad Airways;
Temel Kotil, CEO, Turkish Airlines;
Iftikhar Ahmad, director of aviation, New Orleans Aviation Board;
Arnaud Feist, CEO, Brussels Airport;
John S Pistole from America's TSA.

Airport developers are increasingly incorporating design strategies that are particularly effective in an arid climate. New airport projects emerging from the MENA region have been instrumental in identifying solutions associated with the challenges of desert architecture. **Keith Mwanalushi** *reports.*

DESIGNS ON THE DESERT

Airport designers and planners have had their work cut out. Developing state-of-the-art facilities in what can be characterised as an extreme environment requires a unique understanding of the local environment.

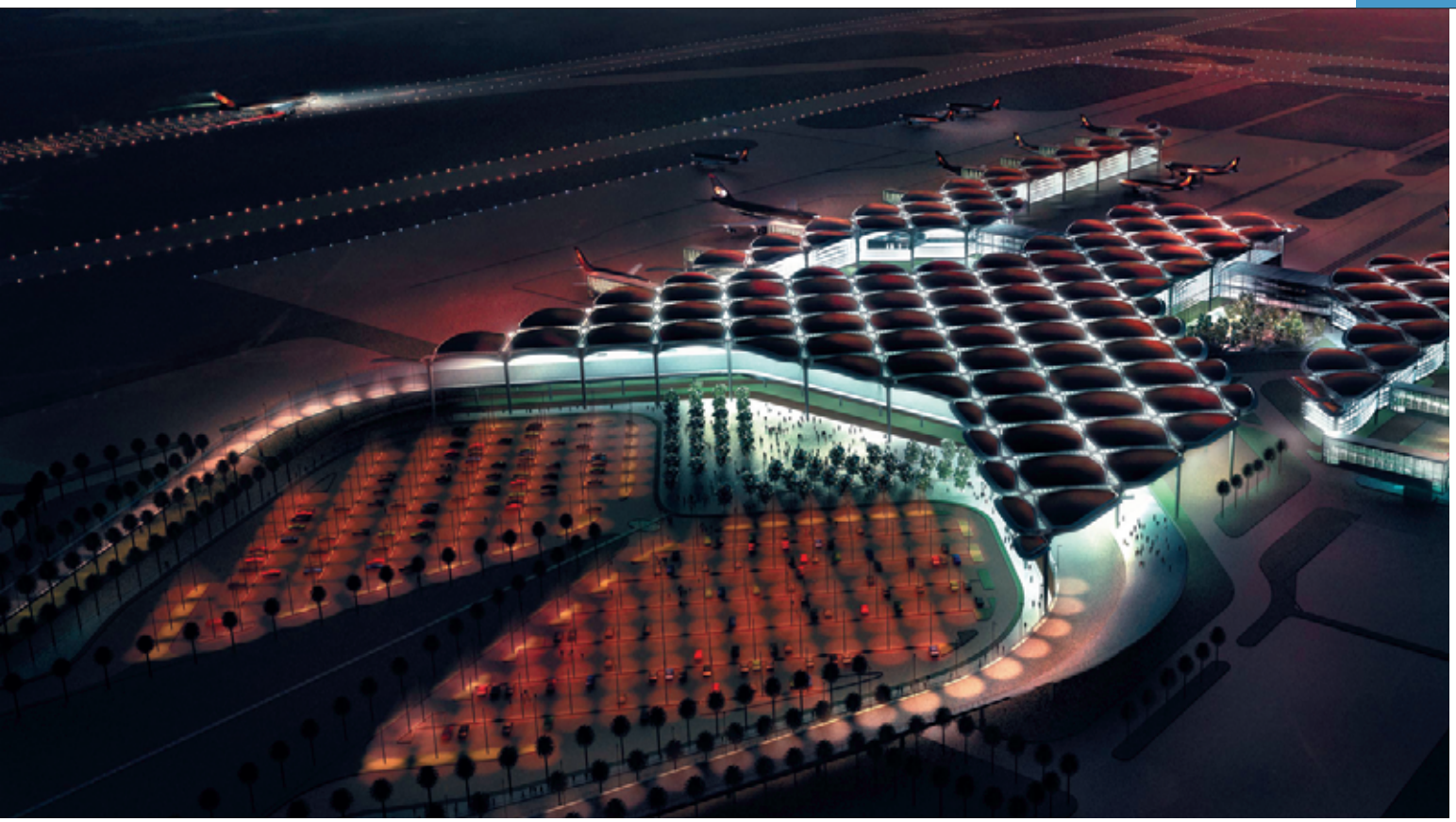
The main challenge is the desert climatic conditions. Depending on the location, the hot and high climate can result in temperatures that peak above 40 degrees for more than half of the year. The scarcity of water resources and the pollution associated with sand and dust are also cited as problems.

Foster + Partners is behind the design of the on-going Queen Alia International airport 20 miles south of Amman. The company was challenged in its quest to design an energy-efficient terminal building that would provide a comfortable environment for passengers and the operations of the airport.

"We apply a combination of passive and active strategies," said Mouzhan Majidi, chief executive at Foster + Partners. "This can mean making the most of filtered daylight, encouraging natural ventilation or, in some cases, integrating photovoltaic installations that take advantage of the abundant sunlight to generate power."

Majidi quickly points to the problem of dust and sand: "This can make maintenance a challenge. There is need to choose robust and durable materials for the building's facade."

The issue also comes up when talking to Claire Mazelet – building, engineering and environment director at global architectural and engineering



firm ADPI. She warns that proper filtering devices are required for ventilation systems in order to preserve indoor air quality.

ADPI is a specialist in the design and construction of airport passenger terminals of all sizes and in the renovation of terminals in operation. It is project manager for Muscat International airport as well as Salalah airport in Oman.

The firm has been involved with several other MENA airport projects, including sites in Libya, Egypt and the Dubai International terminal three. In Saudi Arabia, ADPI has been involved in the design concept for King Abdulaziz International airport, for the construction of a state-of-the art terminal that will handle up to 30 million annual passengers once complete.

"Precautions should always be taken to prevent sand and dust accumulating at specific locations such as air intakes or rain collection downpipes to avoid deterioration of filters, or clogging of the network," said Mazelet.

"When external temperatures are in the range of thermal comfort during a limited period of the year, natural ventilation should be envisaged. When outside temperatures are fluctuating throughout the day, a large thermal mass within the insulated portion will contribute to the building's overall performance."

Mazelet explained that the dense materials used gradually heat up when exposed to daytime solar energy. "These materials then gradually cool down during the night, thus radiating heat during the cool evenings and coldness during the hours of daylight."

Mouzhan Majidi,chief executive at Foster + Partners. Photo: Nigel Young Foster + Partners

The on-going construction at Queen Alia is scheduled for completion in 2012. The new facility is designed to allow the airport to grow by six % per annum for the next 25 years, increasing annual capacity from three million passengers to 12 million by 2033. The plan is to equip the airport with the capacity to become a hub for the Levant region.

First experience

"An airport is the first thing you see when you arrive in a country and your first experience of its culture, so the design of a terminal must be of its place," points out Majidi. "Our work is equally driven by an understanding of and respect for local traditions – hospitality, for example, is an important part of Jordanian culture, so our design for Queen Alia airport is conceived as a welcoming gateway."

According to Foster + Partners inspiration for the Queen Alia terminal building is drawn from traditional architecture of the region. The design incorporates a variety of outdoor spaces and open-air gardens. In the courtyards, water pools reflect daylight into the building and form a natural focus that directs passenger movement. A broad canopy, its dark external surface evocative of Bedouin tents, shelters the large external public area and evokes the excitement of a Middle Eastern bazaar.

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A closer look at the design of the

Airports in an arid environment can provide rare opportunities to utilise natural energies. Photo - NDIA

CONTINUED FROM PAGE 135

underside of the roof unveils a geometric pattern inspired by traditional Islamic forms. "We worked with a local artist to develop the pattern for the carpet in the piers," added Majidi. The design also responds to social customs: the forecourt has been enlarged to create a landscaped piazza where relatives can gather to welcome or bid farewell to passengers.

Successful construction of airports in such regions has increasingly taken into account the issue of sustainability, in addition to the usual on-time and budgetary target demands.

However, this arid environment can provide rare opportunities to utilise and benefit from the use of natural energies. Intense and regular sun exposure is excellent for renewable energy – thermal or photovoltaic – said Mazelet, but she also pointed out that it does not always represent a realistic solution.

"This is in a context where there is no benefit from any subsidies and relies on very low energy costs that would result in very low profitability. Night ventilation concepts work in buildings where maximum occupancy is not at night – which did not apply to Muscat Airport – and where significant differences of temperature occur between day and night."

At Queen Alia, Majidi indicates that the terminal has taken a highly efficient form and Fosters + Partners designed a number of features that will reduce energy demand, before looking at active measures to generate power.

"Firstly, the roof has a deep overhang and a sequence of horizontal louvres that shelter the facades from direct sunlight. Again, maintenance can consume a great deal of energy in a desert, so the louvres are perforated to avoid a build up of sand and dust," he said.

The roof also has an innovative double skin. A metal canopy sits above the concrete and shields the structure from direct sunlight. Majidi said that a cavity between the metal and concrete allows hot air to be released. "There are also environmental benefits in building a concrete structure. It acts as a thermal store for the heating and cooling of the terminal, plus it means we can incorporate local gravel as a material, which harmonises with the natural shades of local sand."

Majidi points out that one of the key challenges in a hot dry climate, where the sun is so intense, is to illuminate the interior with indirect sunlight so that the passenger areas are comfortable and easy to navigate without generating excessive heat.

"We have filtered daylight into the terminal through split beams at the junctions between the concrete domes – the effect is a little like a desert palm whose leaves extend and widen from very slender branches close to the trunk," he said.

Environmental strategy

The airport's open-air courtyards also contribute to the environmental strategy. They feature modest linear pools, which are lined with dark tiles so that they are highly reflective – they 'bounce' indirect daylight back into the baggage reclaim areas.

It seldom rains in desert regions such as Oman but when it does these rains can turn into heavy downpours. One of the biggest challenges is to provide adequate drainage of the construction area.

At Muscat Airport one of the areas where rainwater collects on its way into the sea is a flat, low-lying section where the new runway is being built. The ground was raised by three metres to prevent the new runway and roads from ending up underwater. This was achieved by driving almost 12 million cubic meters of desert sand and crushed rock to the site.

Protecting the rest of the airport involved the installation of three giant outlets to the Bay of Oman with a combined capacity of 500m² of water a second.

"For Muscat Airport, an extensive drainage system of open concrete channels and culverts was constructed as part of the preliminary works and before building construction started," said Mazelet.

"The overall drainage design is based on a modelling simulation that considered the worst scenarios to make sure critical operational areas of the airport would not be affected in case of heavy rain falls." Following cyclone Gonu in 2007, modifications were made to the design, whenever it was possible.

Mazelet said the design should incorporate maintenance aspects to guarantee the full capacity of the drainage system at any time. "Oil interceptors are implemented for the drainage areas of runway and taxiway systems, aprons and roads to avoid pollution of ground and surface water," she said.

"Water conservation and re-use measures should be especially encouraged to reduce potable water demands," she added.

At Dubai International's terminal three the statistics from the Dubai Airports Company are eye-watering.

The mega-project required the excavation of more than 10 million cubic metres of earth, enough to fill 4,000 Olympic-size swimming pools, and some 2.4 million cubic metres of concrete, enough to fill 950 Olympic-size swimming pools, was used in the construction of the project. As much as 450,000 tonnes of steel was used for reinforcement and another 33,000 tonnes of steel was required for the structure; that's approximately the weight of 850 A380s.

Proud to be welcoming the 2011 Airport Exchange to Abu Dhabi.

Abu Dhabi Airports Company has great pride in hosting the ACI Europe and ACI Asia Pacific 2011 Airport Exchange in Abu Dhabi, the first time this prestigious event has been held outside Europe. With Abu Dhabi International Airport having been awarded both 'World's Most Improved Airport'* and 'Staff Excellence: Middle East'** awards, this great honour is yet another indication of our commitment to realising our vision of becoming the world's leading airports group.

*2009-2010 Skytrax Awards **2010-2011 Skytrax Awards

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Bahrain has mapped out its economic vision to transform into a globally competitive economy by 2030. **Keith Mwanalushi** *looks at how Bahrain International Airport is gearing up to play an increasing role in contributing to the socio-economic progress.*

BAH points the way to Bahrain's bright future

Considering the scale of airport development across the MENA region, no one can afford to rest on their laurels – and Bahrain International Airport (BAH) is no exception.

With the arrival of Gordon Dewar as chief executive of the Bahrain Airport Company in March 2010, the management team began work on several fronts to lay the foundations for change.

In June, Dewar announced the launch of an expansion project aimed at boosting capacity by 50% to 13.5 million by 2015.

"The project addresses all aspects of the terminal operations and passenger facilities and ensures that both capacity and quality improvements will be delivered throughout," Dewar said.

The preliminary plan shows that the expanded airport will increase the terminal footprint by 40,000m² with room for 40 additional check-in counters. Four contact departure gates with air bridges will be added to the existing seven. Nine more remote departure gates will also be added. Other new features will include an expanded arrival baggage-reclaim area, with four more reclaim belts added to the current seven. Increased departure security facilities, a larger immigration processing hall and new airline lounges are also in the plan.

BAH actually saw a two per cent decline in passenger numbers in 2010 with 8.8 million people travelling through the airport. This compared to the pre-crisis traffic growth of 20% experienced back in 2008. BAH was particularly affected by a couple of underlying factors – notably, the switch in fleet strategy by home carrier Gulf Air to

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Gordon Dewar said expansion at BAH (above) is based on current and future needs.

BAH expansion project will boost capacity to 13.5m by 2015.

CONTINUED FROM PAGE 139

operate smaller capacity aircraft and the change in operational strategy by Bahrain Air from a low-cost carrier to a more traditional operator.

Despite the slight drop in passenger numbers last year, BAH took top honours at the Skytrax 2010 World Airport Awards after bagging the 'Best Airport in the Middle East' award. At the time, Edward Plaisted, chairman of Skytrax, said the Bahrain Airport authorities might have been surprised to have won the award as they did not attend the awards ceremony.

"Despite being very different in size and style to Dubai Airport, BAH is testimony to the fact that passengers are looking for the easiest airport experience nowadays and, as a relatively small airport, Bahrain wins out in this area," Plaisted said.

The political revolution that spread through many parts of the region stagnated growth at some airports during the first six months of 2011. The impact of the Bahraini uprising in February trickled down to affect traffic volumes at BAH during the first half of this year.

Figures from the Bahrain Civil Aviation Affairs Air Transport Directorate indicate that passenger throughput between January and June 2011 declined by 16% to 3.6 million compared to 4.3 million during the same period in 2010. Cargo tonnage also dropped 16% from 166,511 tonnes to 139,569 tonnes for the same period.

However, Dewar stressed: "The expansion and development work at Bahrain International Airport will be based on its current and future needs and that of its customers and the nation as a whole. By developing the airport to fit these needs, we will ensure that we deliver the best airport for Bahrain and strengthen Bahrain's position as an aviation hub."

The expansion strategy clearly puts emphasis on increasing non-aeronautical revenue; a source of income that generally helps fund investment in airport infrastructure. The plan for BAH calls for 3,000m² of retail space in addition to a recent retail complex that was built adjacent to the main terminal building.

BAH has seen considerable refurbishment over the years. In 2006 a $300 million investment launched the creation of a multi-storey car park, retail complex, a new perimeter fence, new security systems and the resurfacing of the main runway.

"Upgrades have been made organically over the years," said Dewar. "Recent significant improvements included the building of our departures coaching station with five contact gates, and increasing the number of parking spaces for the public to a total of 4,200.

"We are also rolling out an additional remote aircraft parking apron that will accommodate 17 aircraft of code C (A320 or 737s) or six aircraft of code E (A330 or 747) size types."

Master plan and design

Dar Al-Handasah, (Shair and Partners), the international engineering design and supervision consultants, will lead the $11.6 million contract to provide the master plan and design for the latest expansion project. It has 55 years experience with planning, designing and implementing large-scale development and infrastructure projects throughout the Middle East, Africa and Asia.

Bassam Shakhshir, director of operations, said the design for the BAH initial phase is expected within the first quarter of 2012.

The close proximity of hub airports in the region, particularly around Dubai, Doha and Abu Dhabi, has raised considerable debate over the past year. Some analysts believe that, apart from Dubai and Doha, other locations such as Abu Dhabi and Bahrain cannot justify the magnitude of facility expansion taking shape.

Dewar disagrees: "Bahrain's terminal expansion is actually a much needed solution to meet our capacity and capability challenges and demands. Our plans are scaled and structured to Bahrain's needs," he said, citing the airport's role as a key cargo and logistics hub.

Figures from the Bahrain Economic Development Board show that the kingdom is investing $2.9 billion to upgrade its logistics infrastructure. With its strategic location, Bahrain provides easier access to the large economies of Kuwait, Saudi Arabia and Iran.

The $360 million Khalifa bin Salman Port (KBSP) opened in April 2009 as part of this significant investment, followed by the $280 million Bahrain Logistics Zone (BLZ) that opened in 2011. BLZ is the Middle East's first multi-model logistics hub focusing on re-export and value-adding logistics activities. It is designed to be one of the region's largest shipping and transport hubs, capitalising on the kingdom's proximity to Saudi Arabia. With a distance of just 13km from BLZ to Bahrain's airport, it's claimed to be the shortest logistics transfer time between sea and air in the region.

Dewar fully backs the investment being made to support logistics infrastructure. "The expansion and development project at BAH will serve all the facilities and services at the airport. As it stands today, BAH already boasts impressive cargo and logistics capabilities, services and advantages; not least due to its geographical location, close proximity to sea and land ports and the fast and efficient services provided at the airport," he said.

Dewar believes that partnerships with key players such as DHL (in June this year the company signed a new contract to maintain its regional headquarters at the airport for a further eight years) and other stakeholders in Bahrain's aviation industry will propel the airport's growth.

"We are building the largest new private and general aviation hangar complex, which will be developed and operated by MENA Aerospace, offering a comprehensive suite of services for the business sector and new opportunities to additional operators," he said.

The deal involves MENA Aerospace investing in the development of a dedicated general and private aviation complex at BAH to provide comprehensive maintenance and support services to private and corporate aircraft. Development of the complex is under way on the North West fringe of the airport. Once complete, the first phases will include a hangar, private taxiway and apron in addition to office and workshop areas; supposedly making it one of the largest such facilities in the region.

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PARK AND FLY

As regional traffic grows there is need for leading-edge systems to control and monitor increasing air traffic movements. Park Air Systems is responding to a market requirement.

Keith Mwanalushi *reports.*

The sheer magnitude of airport development in the MENA region means airports are increasingly introducing ATC modernisation and upgrade programmes.

Northrop Grumman's Europe-based subsidiary, Park Air Systems, supplies a range of communication, navigation and surveillance solutions across the Middle East.

Back in 2007 it announced a $16 million contract to provide integrated air traffic systems for the Al Maktoum International Airport project. "The contract for Al Maktoum consolidated our position in the Gulf region," affirmed Andrew Fiamingo, sales and marketing director Northrop Grumman Park Air Systems Norway.

The deal included the provision of ground movement radar (GMR), voice communications control systems (VCCS), very high frequency radios (VHF) and ILS systems.

Fiamingo said: "The core of efficient ground surveillance is our Nova 9000 advanced surface movement guidance and control system (A-SMGCS), which fuses information supplied by various sensors located around the airfield."

Nova 9000 manages the tracking of aircraft and vehicles on the ground using surveillance systems based on radar and multilateration. The system is configured to assist the efficient management of air traffic, particularly in periods of high traffic volume and during adverse weather conditions.

The system enables air traffic controllers to manage a greater volume of traffic by offering automated assistance in monitoring and predicting events, and by reducing off-screen distractions through presentation of all required information on the same display screen

The user is presented with a traffic situation display showing airport map, target labels with position and identification, aircraft information and other relevant targets on or near the airport manoeuvring area. Other textual and graphical information is available for presentation in various windows according to the tasks to be carried out at any particular controller working position.

Park Air Systems has previously provided GMR and ILS at Dubai

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International airport and Fiamingo points out that the technologies being installed are part of a continued effort as the airports expand. "Our involvement in the airport and airspace expansion will be one of continued support and evolution of the systems already supplied," he said.

"The solutions supplied are designed to be expanded as the airports get bigger, thus helping the Dubai airport authorities to realise safe and efficient expansion to larger and more modern systems as and when required."

Doha International Airport chose an integrated air traffic management system to help facilitate the anticipated rise in traffic volumes over the next few years. The package supplied by Park Air is a ground-to-air communications system, a surface movement guidance and control system, including surface movement radars and multilateration sensors, the ILS, and a digital voice and radar recording system.

End-to-end communication

At Al Maktoum International, Park Air supplied integrated digital end-to-end communications to provide ground-to-air voice communications with all aircraft that use the airport. The company said the system is a seamlessly integrated combination of the multimode digital radio and the VCCS.

It enables controlling and monitoring of key radio functions directly from the ATC operator position.

During the implementation stage at Al Maktoum, Park provided daily on-site support over several months to ensure that all necessary electrical and electronic infrastructure in the control tower and associated technical building met design and schedule requirements. The European systems provider also performed the role of air traffic control integrator, with responsibility for planning, designing, delivering and installing a structured cabling infrastructure.

A-SMGCS has a number of nifty features. It is basically a surface movement radar (SMR) data processing system, which controls the surface movements of all aircraft and vehicles.

It provides a daylight-clear picture of the airport operations area regardless of visibility conditions, with target and labelling displays. It also provides the capability to separate aircraft and vehicles, as well as differentiate between aircraft sizes.

Nationwide air-traffic

Earlier this year, the company was awarded a contract by Spanish information technology company Indra Sistemas to supply A-SMGCS technology for the on-going Muscat International and Salalah International airports in Oman. The contract forms part of the nationwide air-traffic management modernisation and upgrade programme for the Directorate General of Meteorology and Air Navigation Services in Oman and is expected to be completed in April 2015.

"We are a sub-contractor to Indra Sistemas in Spain and we will be supplying the A-SMGCS display processing and multilateration system to Indra for both Muscat and Shalala airports," explained Fiamingo

Park Air Systems has also delivered air traffic management solutions for other airports in the neighbouring Emirates and Gulf states. Works concluded in the UAE include the provision of a new communications suite of radios at Abu Dhabi International Airport. Also adding to the portfolio in the region is the delivery of the digital end-to-end communications system at the General Civil Aviation Authority in Abu Dhabi and an upgrade of the approach radar display system at Fujairah International Airport, which included short-term conflict alert, and minimum safe altitude warning functionalities.

"At the heart of the NOVA 9000 ATC automation and display system is the fusion engine, built-in to the surveillance data servers," said Fiamingo.

"The fusion engine is designed to interface with any signal giving aircraft position with minimum customisation. Through decades of experience, our human machine interface has been refined to assist air traffic controllers in efficient management of aircraft in their daily operations."

During the bidding stage, the developers of Al Maktoum International sought an efficient and state-of-the-art ILS system. Park Air Systems proposed its Normarc 7000B ILS solution. The system is installed at about 700 airports worldwide and various operators have reported that the design is cost-effective and easy to install and operate. It was developed in 1995 and has since gone through several updates and upgrades and it's widely considered the most reliable and precise ILS on the market.

Operational runway

Park Air Systems delivered two complete Cat III-b ILS systems, one for each end of the first operational runway, at Al Maktoum International. There are three main categories of ILS and Cat III-b is currently the best available system on the market.

ADS-B technology now provides air traffic controllers and pilots with much more accurate information to help keep aircraft safely separated, providing a live picture of the airspace and the aircraft in it. Both pilot and controller for the first time see the same real-time displays.

ADS-B effectively sidesteps radar surveillance. Radar is limited to update rates that are determined by the rotation rate of its antennas and, since it is a beam system, accuracy declines as an aircraft flies further away. ADS-B continues to expand globally with parts of the Middle East, South East Asia, India, Europe and North America already fully ADS-B compliant.

Fiamingo notes the importance of this technology: "We see ADS-B as yet another technology giving us aircraft positioning information which is interfaced to the NOVA 9000 automation and display system. The inclusion of the ADS-B tracks strengthens the integrity of the information presented to the controller."

The US FAA estimates that delays could be reduced by at least 35 to 40% with full ADS-B coverage by 2018. A typical twin-engine ADS-B equipped transatlantic flight could save 350lb of fuel per trip because aircraft are able to take a more direct route to their destination.

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GET SMART...

OnAir is the biggest provider of in-flight connectivity in the Middle East, currently flying with six airlines in the region, with three others signed up. As a result it now has detailed data on how people are using the service and what they are using to access it. **Steve Nichols** *spoke with OnAir CEO Ian Dawkins to find out more.*

Ian Dawkins has been CEO of Geneva-based OnAir for just over 12 months. He says that when he first joined a lot of airlines appeared to be hesitant about installing connectivity on their fleets, but that is now changing.

"In June 2010 the market was difficult. There was a lot of confusion about whether airlines wanted GSM or Wi-Fi on board. I think a lot of people were also burned by the failure of Connexion by Boeing and preferred to just wait and see how connectivity developed," said Dawkins.

"But fast-forward 12 months and all that has changed. Passengers are now beginning to expect connectivity on an aircraft and are actively seeking out companies that can provide it.

"We are the only operator offering a full voice and data service worldwide and airlines are also seeing the value in having connectivity for cabin crew applications as well."

Dawkins says that the data OnAir has now gathered makes fascinating reading.

"What has become obvious is that people want to use their smartphones rather than their laptops," Dawkins said, adding

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that while there has been an increase in the number of people using iPads the rate of growth has not matched smartphone use.

"The figures show that 95% of people use their smartphone when they are on board. This is because it is similar to the way they operate on the ground. They don't want to stream video or do heavy internet work – when you're travelling you just want to open up your phone, check your e-mails, check your messages, look at Facebook and make a few calls. A smartphone is ideal for that type of access."

The Mobile OnAir system works by creating a GSM network inside the aircraft, with very low transmission power from the phone, enabling it to stay comfortably within the limits for safe operation.

Surprisingly, OnAir has found that also having Wi-Fi connectivity on an aircraft has not been the pull some people thought it would.

"When passengers have the choice of using either the mobile phone network or WiFi, they overwhelmingly choose the phone network. On flights equipped with both Mobile OnAir and Internet OnAir, 95% of usage is Mobile OnAir," revealed Dawkins.

"With a GSM/GPRS connection people pay via their normal monthly bill at international roaming rates. Many providers are now bundling data as part of their packages so this type of use is increasing.

"Also, many business users never actually see their monthly bill so they're not that bothered. Contrast that with an on-board Wi-Fi connection where they have got to log-on, sign-up and swipe their credit card before they can do anything and you can see why GSM is so much easier."

Ian Dawkins: "95% of people use their smartphone on board."

Consistent connection

Dawkins also adds that the service you get via GSM on an aircraft is far better than you get on the ground. "The service when driving from A to B will vary dramatically," said Dawkins. "But you get a very consistent connection on an aircraft that can't be broken."

Dawkins thinks that a lot of re-education needs to be done to encourage people to use their phones on an aircraft. He said for years we have brainwashed people NOT to have their phone switched on. Now we have to explain that a) we now WANT you to use your phone and b) no the plane won't crash due to you interfering with the navigational equipment.

OnAir is currently flying on a number of MENA carriers including: Royal Jordanian – Airbus A320 (started 2008) and A340 (2009); Oman Air – Airbus A330 (2009) and the first airline to take OnAir's integrated GSM and in-flight WiFi service; Qatar Airways – Airbus A320 (end 2009) and Boeing 787 (May 2010); Saudi Arabian Airlines – Airbus A330 (Mid 2010); Egypt Air – Airbus A330 (2010) and Libyan Airlines – Airbus A320 and A330 (2010).

Afriqiyah Airways (Airbus A319, A320 and A330) and Jazeera Airways (Airbus A320) are customers who have yet to introduce the service, while Emirates plans to use OnAir across a fleet of 90 Airbus A380 aircraft, with service beginning in June 2012.

OnAir is also on six VIP aircraft worldwide. The company also expects to announce another major Middle Eastern corporate customer shortly.

Hazem Sunbul, Saudi Arabian Airlines' general manager, product management, says that the airline's data backs up OnAir's experience. Texting (SMS) and GPRS data (web browsing) has proved more popular and in-flight smartphone use has proved more common than laptop use.

"Business travellers are depending more and more on smartphones," said Hazem. "This may be because they find it harder to use laptops in an aircraft seat, or because they don't want their neighbours to see what they are doing. Either way they tell us they love the facility."

The company has now had more than 200,000 in-flight mobile customers who have sent more than 40,000 SMS messages and received around 100,000. They have also transferred more than 4Gb of data.

Broken down, total airborne data usage has been:

Voice calls out – 11%
Voice calls in – 19%
SMS messages out – 20%
GPRS data use - 50%

Saudi Airlines has found that online payment via credit card is often seen as a barrier to usage and is working on a voucher system. In terms of promotion, leaflets are handed out to passengers and they are also shown a video telling them how to use the system. This has resulted in increased usage.

Other statistics from the airline show that: in-flight internet usage is typically light; in-flight text and mobile data usage among passengers is similar to ground-based patterns for subscribers using their roaming mode when out of their native country; voice remains an important feature of in-flight usage.

Dawkins said: "Some of the airlines we are talking to will be introducing services that go beyond e-boarding tickets, such as confirmation messages that your luggage is on board, and personalised messages such as 'Welcome Mr Dawkins we know that you prefer a low-fat meal'.

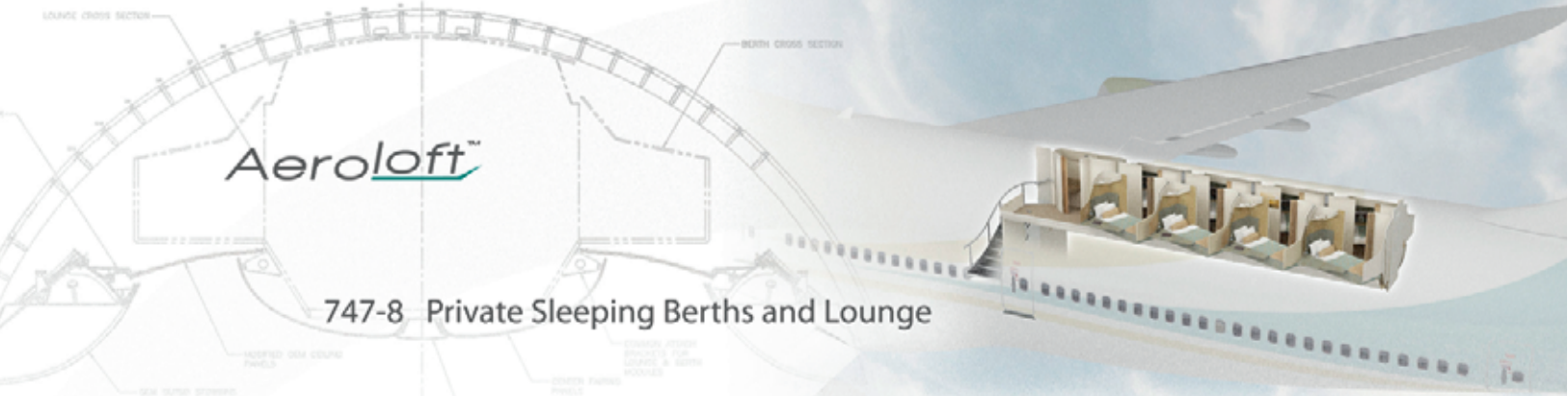
Newspaper updates

"They're also looking at allowing you to book a chauffeur or theatre tickets while in the air. Newspaper updates could also be offered."

OnAir delivers its service via Inmarsat's L-band SwiftBroadband service, but is looking at that company's Global Xpress Ka-band service, which will come online when Inmarsat launches its I-5 satellites in a couple of years.

"Inmarsat currently offers a global service and there will be an easy upgrade path to the higher-bandwidth Ka-band services when they arrive – it will only involve adding a different antenna. Ka and L-band will be complementary anyway; if there is not enough capacity on Ka the aircraft will fall back to L-band," said Dawkins.

"We're not using all the L-band capacity now, so while we are certainly looking forward to Ka it is not stopping us from growing – it's just the next logical step."



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The big sleep...

Lack of deep sleep and relaxation during journeys is a major challenge facing airline passengers but UK passenger entertainment solutions company IFE Services believes it has a solution. **Marcelle Nethersole** *speaks to managing director, Andy McEwan.*

IFE Services knows the importance of entertaining passengers. It supplies a full range of services to enable its clients in both the airline and cruise ship industries to provide a first class entertainment experience to passengers. These include movies, TV programmes, audio channels, safety and destination films, portable entertainment systems, on-board publications and AVOD technical support and management.

Another important service is sleep and relaxation applications.

"We have produced a system to help combat the problem of lack of deep sleep and relaxation that many passengers experience," said McEwan. "The pzizz is a system of unique, patented audio soundtracks that is effective at inducing sleep, boosting energy and reducing stress.

"There are two modules available – 'pzizz Sleep' induces a deep sleep of up to 10 hours and is ideal for passengers on long-haul flights, whilst 'pzizz Powernap' delivers a short, deep sleep of between 10 and 90 minutes and is perfect for short-haul flights. Its a fantastic product that will help airline passengers get the sleep and relaxation they often want during flights."

IFE Services has an agreement with the manufacturers of pzizz to exclusively distribute the system to airlines for inclusion in the in-flight entertainment package and it is currently being used by nearly 500,000 people worldwide.

"IFE Services has a long history of bringing new and exciting innovations and technologies to benefit the passenger experience and we're confident pzizz will be another big hit," said McEwan. The IFE Services regional office is located in Cheshire, England, but it also has offices in Madrid, California and Singapore.

"IFE Services started life in the 1990s," explained McEwan. "It started off serving local UK charter airlines but has since grown a global client-base to include more than 50 airlines of all sizes, as well as some major cruise line operators. We've won around a dozen new clients in the past 12 months alone and, despite the tough trading conditions, we're on course for a particularly strong year. Besides being extremely innovative in offering the latest systems, we are cost-effective."

Andy McEwan

The company also supplies airlines with portable entertainment systems such as the Sony PSP. Airlines rent these hand-held devices to passengers to increase on-board revenues or offer them as a customer service extra to first and business class passengers. Additionally it has its own in-house creative team that produces original productions such as safety films, promotional videos, entertainment guides, pre-recorded announcements and user interfaces for audio visual on demand (AVOD) systems. "We scour the market for innovative new solutions that we believe will enhance the passenger experience. If we think an app will significantly improve the passenger experience then we're interested in acquiring the distribution rights in the airline sector and pzizz is a great example of this approach," said McEwan.

Carefully customised

Its production team works closely with its customers. McEwan explained: "All of our in-flight packages are very carefully customised for each client based on a number of factors. Before proposing an IFE package to an airline, we carry out extensive research into its passenger demographics and tailor the content accordingly in line with the available IFE budget. Other important factors we always consider are the airline's route networks, seasonal changes, cultural sensitivities and the success of movies, TV shows and audio content across relevant regions.

"Our production team is able to tailor all of the extra creative work required to fit in with the airline's branding. Safety films, entertainment guides and promotional videos can all be produced and tailored to our client's exact specifications."

IFE Systems customers cover all territories ranging in size from South African Airways, LAN, and Iberia to smaller charter and regional airlines. And one region it has got its eye on is the Middle East.

"The Middle East is a very important region for us," said McEwan. " The aviation industry there is growing very rapidly and the business opportunities are very attractive to us. Airlines in the Middle East have set the standard for passenger comfort and enjoyment globally. The customer experience is given a very high priority and we believe we're in an excellent position to provide airlines with great, cost-effective in-flight entertainment passengers will love. Our experience is that passengers want a good selection wherever they travel in the world and Middle East airline passengers are no different."

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At the age of 52 dnata is having a mid-life change. The company is shedding its dowdy but reliable profile and emerging bright, bubbly and brimming with confidence as it revamps its image and highlights its position as a global player in the aviation industry. **Jill Stockbridge** *reports.*

Why 'little d' dnata has such big ideas

Dnata – or dnata as the company now wishes to be known – has come a long way. From five men and a couple of bikes at the launch of Dubai National Air Travel Agency in 1959, the division has quietly expanded around the world.

It now has a presence in 73 airports, in 38 countries, on five continents, with more than 65% of its 20,000 staff working outside of the home hub of Dubai.

Part of the recent renaissance is a makeover that sees not just a new branding but, for the first time, the gathering of all the disparate entities under the dnata name. Instead of relying on the reputations of the companies that have been acquired, dnata is at last confident enough to trade under its own name solely.

Gary Chapman, president group services and dnata, explained the change: "We have moved from a Dubai-centric business into one that is truly global. We are handling more passengers, more cargo and more aircraft outside of Dubai, so that triggers a new way of thinking about the business."

Through a series of acquisitions and expansions, dnata has quadrupled revenue in the last six years. The purchase of Alpha in December 2010 was a watershed event. It was the fifth significant acquisition in the airport services sector in four years and consolidated dnata's position internationally. But change was in process even before that.

"We started the review of the way dnata is positioned in April 2010 but it was a long process," said Chapman. "We asked our customers and staff how they saw dnata. The answer was a little surprising. They saw us as dependable, solid and reliable, but lacking spark or oomph.

"We were seen as being able to get the job done but even our own staff did not really appreciate how big we were. We needed something to improve our communication. We needed to lift that image, to bring sparkle, imagination and delight to our customers."

On April 28 this year, the company launched the new 'one dnata', with a flourish, showcasing the new logo, vision, mission and values.

Chapman said: "Initially I wasn't looking for a new identity. We had been very successful. We had won awards. I was worried that it would be interpreted that we hadn't done well. We had; we just could do better."

Following the launch, senior management undertook a series of visits, introducing the new concepts to the staff and customers. According to Chapman the new fresh, clean and uncomplicated

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dnata
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identity has been well received by both groups.

The rethink is more than external dressing. Chapman wants to ensure that the standard of service Cathay Pacific receives in Australia is the same in Singapore, Pakistan, Switzerland, London and Dubai. "I have to make sure that we are delivering the same standards to the same expectations. Where they see dnata they know they can rely on us to be consistent, so that is why they should see dnata, not Plane Handling or Toll Dnata. It was understood as business to business, but the staff were separated. When we spoke to the subsidiary companies it became obvious that they also felt it was time to embrace dnata," he said.

"We have 10 working groups going on at the moment, looking at processes, the standards that we set, our safety standards and communication. We are looking at the ratings and certifications that we get. We are looking at how we procure our equipment."

Although coming under the dnata name, this does not mean everything will be run from Dubai. Chapman is not in favour. "Centralising is not the answer; I want to give them more freedom, but having some governance in place and strong communication. I don't have to procure all the equipment centrally but I do need to be able to link it together so that I can get the best deals from suppliers. I need to know that we are co-ordinated.

"We also can't afford to have a problem in one area spilling over and creating problems elsewhere. I want to get the synergies and the benefits of what is going on and what we are learning in other locations. There is a phenomenal amount of experience right across the network, which we need to tap into."

Opportunities to staff

The new way of thinking should also bring opportunities to staff across the group, with greater movement between countries. Chapman said: "We have had Singapore staff going to Australia to work on projects and staff from Australia in Singapore. We have also had people from Plane Handling going to Erbil, helping out there and wanting to go back. The interesting challenge is how to get everyone plugged in so that we can make them aware of opportunities. We will create the right platform for that. Then it is up to them."

Staff will also be recognisably one company, with a standard uniform being introduced globally, from the ramp staff to the travel agencies – no mean feat given the wide range of climatic conditions and cultural considerations.

Chapman is pleased with the progress: "User trials are on-going, with uniforms in the material we are going to use and the design, but not the patterns or the colours. We are keeping that until the launch in May next year. It will be head turning.

"There is a tendency for the ground handlers not to have the same polish and impact as airline staff such as cabin crew and we want to step it up both in training and appearance. We have groups working

on both of those aspects. It has got to be something that the staff are proud to wear. If you can't get that pride then it is going to be a constant challenge to make them feel pride in what they are doing."

One criticism levelled at the division in Dubai is that it is easy to be successful when you are the only player, as dnata is the only ground-handling option for carriers using Dubai International. Chapman dismisses the challenge. "There is a very western connotation of monopoly, implying high prices, poor service, and exploiting the situation," he scoffed. "That does not work in this environment, where aviation is so strategic to Dubai and to the region.

"If for one minute Dubai felt that we were overpriced or offered poor service, I would not have a job and we would not be allowed to continue in that vein, as it could have an impact on Dubai's aspirations in the aviation industry. There are checks and balances that make sure it doesn't happen.

"Talk to an airport owner and ask which model they would prefer? Would they like to have four, five, or six ground handlers, all with their own equipment, congesting the airport, all on margins that perhaps don't allow them to invest in people and equipment? Or would they prefer to have a single professional high quality operation, which is good value for money and can invest in new equipment and safety and standards and people. It is a no brainer.

"So while we get a bit of criticism from time to time, what makes the other model the right one? Our prices are 50% cheaper than India, and one quarter or one fifth of prices in France, Germany or the UK. So don't tell me that our model is not the right model."

The president believes that the company's global spread has improved performance in Dubai as the group learns and applies best international practice. He said: "We have put a lot more emphasis on the customer focus. We listen to our customers here in Dubai, as we do elsewhere around the globe, because we have to."

The rapid expansion may have slowed for the moment, but new ventures in the ground-handling and catering areas are currently under consideration. As it has done in the past, the division will continue to look at opportunities. Chapman is prepared to wait for the right proposition. "We are not driven by a desire to have a global presence for the sake of it. We are not in the Americas in any significant way and I have no plans to. It is a very mature and difficult market in which to operate, but there are lots of opportunities elsewhere, particularly in the Far East, where we see a lot of growth and potential, and the African continent."

The success of past acquisitions has been a combination of strategy and opportunism, with the management team proving a canny ability to pick up good prospects at a fair price.

Chapman said: "We have been quite smart and focussed. We have looked at businesses that are at our standard already, but also where there is room for improvement, where we feel confident that we can bring about that improvement. We have to get what we consider a reasonable return.

Core business

"When we do acquire businesses we don't trade them or sell off parts. It is our core business and we invest in it. In the UK we have invested about £5 million in equipment. In Singapore this year we have invested Sing$11 million and our customers and staff see that," he added.

So will the new, confident, independent dnata look to break away from the overshadowing sibling and the shelter of the Emirates Group? Chapman says not now.

"While dnata is a core part of the Emirates Group, we run our businesses quite separately in terms of the management, the accountabilities and the financial performance. Dnata serves many international airlines and is the general sales agent in Dubai for nearly 40 airlines, which are competitors of Emirates. We need to make sure that we deliver a service independent of any group consideration. We have to do what is right for our customers. I think that we have proven that we can do that and that we are objective.

"On the other hand, there are obvious benefits to being part of the Emirates Group. We have common services and support costs, which perhaps work to our advantage. There are times when you can benefit from being part of the Emirates Group and there are times when it may not be the best path. Overall do I think it is the right thing? Yes I do. I think we are very much embedded in so many ways. This is Emirates' home base. We operate and support its growth here in ways that a traditional ground handler might not, in terms of the airport and the investment required in facilities, manpower and equipment."

He added: "It is interesting what is going on out there. It is a competitive environment and there is a lot of uncertainty in the aviation world. But I think our businesses have a solid base and we are trading well at the moment, and long may it continue."

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BRAINS ON THE WATER

Peter Landquist: "The irony of the humidity problem in an airliner is that the humble economy passenger, who pays the least for his ticket, fares far better than his companions."

The natural accumulation of water within an airliner's cabin is costly and can even become a serious hazard. Ironically, an increasing reduction in cabin humidity as a long flight progresses also poses different, but just as real, problems. Now one Dubai Airshow exhibitor has the answer.

A small pioneering specialist Swedish company, CTT Systems AB, is ready to address the seemingly opposite humidity problems that cause problems on long-haul flights.

The company will be exhibiting at Dubai Air Show and, having already seen airlines like flydubai fitting the kit to its new fleet of B737s, business jet operators putting it to good use and other major manufacturers welcoming it, there is no surprise that CTT will looking for more orders.

Located in Nykoping, south of Stockholm, CTT has devoted its considerable expertise to solving the humidity problems for almost 20 years and is now recognised as undisputed world leader in these complex technologies.

With around 400 airliners in worldwide service equipped with its systems, together with nearly 50 corporate jets, ranging from B737s and A320s to B777s, B747s, A380s and soon the B787 'Dreamliner', the company's reputation is soundly founded. But how and why did all this come about?

Careful investigation of different airlines' aircraft showed that, within the 'crown area' of the fuselage (the area between the inner ceiling panels and the outer metal skin) water accumulates and saturates the fuselage insulation blankets.

According to the company's Peter Landquist, vice president for sales, marketing & customer support it became evident that there were two reasons for the presence of this water – "condensation caused by the natural effect on the atmosphere within this space of the warm cabin interior and cold outer fuselage skin and the sum of each passenger normally exuding the 100 grams of moisture each per hour, as we all do," he said.

The investigation of the insulation blanket condition in different aircraft types showed that they could accumulate and hold up to 500kg of water.

This unwanted water presented four significant problems: clearly the extra 'payload' penalty, requiring

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CONTINUED FROM PAGE 157

more fuel (and thus more cost), which naturally caused greater emissions; the development of bacteria and fungus within the blankets which never completely dried out, with serious attendant health hazards; an increased risk of corrosion; and a greater incidence of electrical failures, since much so-called 'unprotected' wiring is situated in the 'crown area'.

CTT devised what is now known as the zonal drying system (ZD) to cure this water accreditation difficulty. The number of installations per airframe depends on aircraft size and which areas within it need drying – each unit weighs 29kg, and saves 200kg of water.

One is needed for a B737, for instance, and up to three on an A340 – the drying technique incorporating a special evaporative moisture removal procedure that harmlessly dumps overboard the purified excess water constantly, during flight.

A very recent Gulf customer for ZD equipment is flydubai, with an order for 31 of its new Boeing 737-800s. Zonal dryers can be fitted either on the production line or retrospectively, say during major overhaul checks or other heavy maintenance. Both Boeing and Airbus include the system in their official B737 and A350 customer option lists and, in a significant breakthrough for CTT Systems, the system comes as standard equipment on the new B787.

Rain-in-the-plane

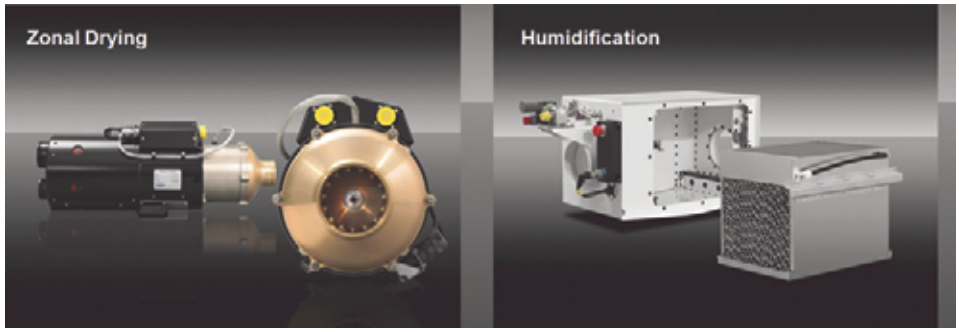
So much for curing the excess internal water problem, which can also manifest itself as 'rain-in-the-plane' (many of us have experienced this). But what of passenger and crew comfort and health affected by low humidity on long sectors?

Landquist said: "Correcting this is the second, quite exceptional, gift that CTT Systems has brought to the world's airline industry.

"With the untimely demise of the Concorde in airline service, all long-haul flights have returned to their former, relatively leisurely pace – one which has, incidentally, remained almost stagnant for half a century (perhaps incredibly, since air travel's only real benefit is speed).

"So we often have to endure non-stop flights of 15 hours or more, during which time cabin humidity levels can, and do, drop to extremely low levels of between 3% and 5% when average humidity anywhere should average no less than 20% – in your house, in your office, in your car and in your airliner."

A huge reduction in humidity of this magnitude is not only extremely uncomfortable, but can negatively affect health for passengers and crew alike. The major hazard with low humidity is that it leaves us less resistant to disease and other maladies. It also contributes to many symptoms seasoned air travellers have come to reluctantly accept, including tiredness, aches and pains, stiff joints and difficulty in sleeping. Yet another unwanted result of low humidity in airliners (and corporate jets alike) is that airborne food, perhaps rarely the most delicious, tastes even worse – a fact borne out several years ago by some detailed research carried out by KLM.



"The irony of the humidity problem in an airliner is that the humble economy passenger, who pays the least for his ticket, fares far better than his companions in expensive business or first class seats and far better than the average pop star or captain of industry in a corporate jet. The reason is simple: there are far more passengers seated in a given space, all usefully making their contribution of 100 grams of moisture per hour each," Landquist said.

So, with all this in mind, CTT came up with its 'Cair System', which fundamentally distributes a purified, but invisible, water mist into either the passenger cabin, flight deck, crew rest area or all three as needed. The overall installation naturally utilises ZD as part of its operation. Again, the number of installations depends on aircraft size and areas to be humidified.

"Whereas operators flying short-to-medium distance routes have a reduced need for 'Cair', since flight times are so relatively brief that humidity levels do not drop greatly, there are nonetheless avid ZD customers on five continents," Landquist said.

"Long-haul airlines find that 'Cair' installations return humidity levels in excess of 20%, thus restoring the health and comfort of both premium travellers and corporate jet users alike, as well as importantly endowing a better and more efficient working climate for both flight deck and cabin crews. Already, Lufthansa, for example, is operating 'Cair' in the first class cabins of its prestigious Airbus A380 fleet.

"It is of significance that the particular climatic conditions of the Middle East and Asia are attracting the serious attention of several of the region's discerning carriers to the possibilities offered by CTT Systems' unique solution," he said.

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Technical solutions to reduce fuel costs, help with flight planning and assist with the move to free flight are fast becoming commonplace. Emirates, for example, uses a number of IT solutions from Lufthansa Systems to do just that.
Steve Nichols *looks at the airline's experience with the company's systems.*

Lufthansa Systems helping Emirates achieve economies

Lufthansa Systems' Lido/FlightOps suite, which has been in use at Emirates for more than 15 years, has evolved with the airline as it's grown from a small start-up of 15 aircraft to its current fleet of more than 150.

Lido/Flight is generating fuel savings of up to 5% as it provides dispatchers with a host of optimisation options over flight time, fuel consumption and the costs of each flight.

Emirates operates some routes that take the aircraft to the limits of their range capabilities, so fuel calculations are especially important. When operating its Boeing 777-300ER on extended range twin operations (ETOPS) flights over the North Pole to San Francisco, the capability of Lido/Flight to calculate the required amount of fuel very precisely and reliably means that the aircraft can take more payload on board and generate higher revenues.

Flight planning system

Bob Everest, vice president flight operations support at Emirates, said: "We still believe that Lido/Flight is the best flight planning system on the market. Based on how everything is integrated – from NOTAMs to weather data – it provides us with an efficient way to obtain the optimum flight plan.

"With its flight optimisation capabilities for every route, it helps us reduce over-flight fees and fuel consumption. It, therefore, has a measurable effect on our bottom line."

Emirates is one of two airlines involved in the iFlex programme, launched by IATA in September 2010. The goal of the project is to reduce fuel burn and carbon emissions on certain long-haul flights by 2% by using all new flexible routes without any restrictions, such as waypoints and airways.

Early modelling of the iFlex programme before its launch suggested that airlines operating a 10-hour intercontinental flight could cut flight time by six minutes and save 3,000 kilograms of CO2. "The FreeFlight module of Lido/Flight has been very useful in measuring the effectiveness of iFLEX on our flights between Dubai and Sao Paulo," reported Everest.

Since January 2002, Emirates has also been using Lido/FMS in the on-board flight management systems of its aircraft to provide pilots with high-quality, up-to-date navigational data.

The system's comprehensive navigation database contains all relevant aeronautical and topographic data with worldwide coverage. The flight management system (FMS) database is used directly by the flight management computer guidance system (FMCGS), which performs the complex function of controlling the autopilot in the cockpit of every modern commercial aircraft.

Navigation performance

Lufthansa Systems has also worked with Emirates to tailor specific RNAV (aRea NAVigation) and required navigation performance (RNP) approaches for airports like Seychelles, Sanaa and Khartoum.

The same database is being used to generate navigation charts for Lido/RouteManual and Lido/eRouteManual, which Emirates selected in 2008.

Lido/RouteManual offers a one-stop service, giving you all the navigation charts you require for your flight including ground charts, departure charts, en-route charts, arrival charts and airport facility charts.

Emirates started by using Lido/RouteManual paper charts and later gradually implemented the electronic version.

Today, 40 Emirates jets are already equipped with integrated Class II electronic flight bags (EFBs) featuring the complete Lido/eRouteManual application, including airport charts. Introducing electronic charts saved Emirates not only the cost of paper but took weight off the aircraft.

After successfully using Lufthansa Systems' airport mapping database Lido/AMDB for the moving map application in the cockpits of its Airbus A380 fleet, Emirates recently decided to equip its remaining fleet with Lido/AMM airport mapping as well.

Both solutions increase pilots' situational awareness during taxiing at the airport, even in adverse weather and visibility situations.

"Another benefit of Lido/AMDB is that it provides all data required to use the 'brake to vacate' (BTV) system of the Airbus A380," said Everest.

BTV allows pilots to select the appropriate runway exit during the approach to landing and regulates the aircraft's deceleration after touchdown.

More than 20 airlines in the Middle East now rely on the products and services of Lufthansa Systems. Two of the latest are Pegasus Airlines and IZair, a 100%-owned subsidiary of Pegasus, which is optimising its flight planning processes with Lido/Flight.

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ARINC's additions give borders the edge on analysis

ARINC's International Division has reported achieving significant contract wins and developments in its commercial aviation, business aviation and airport sectors. **Steve Nichols** *finds out more.*

Created 11 years ago, ARINC International is now the fastest growing part of ARINC Inc, accounting for 30% of profits compared with single percentage contributions five years ago.

As well as engaging on a major electronic flight bag (EFB) integration programme with Cathay Pacific, its airports sector has seen more than a dozen key wins, supported by ARINC's investment in new services and products tailored to the international market.

The expansion of ARINC's GLOBALinkSM/VHF data link network has been accelerated in 2011, focusing on improving coverage in Asia, particularly India and Pakistan, the Middle East and Africa, as well as reinforcing European coverage in VDL Mode 2.

It also launched three new modules to enhance its APIX system for border control agencies at AvSec World, Amsterdam in October.

The new additions are APIX +PNR providing advanced passenger information (API) messaging with passenger name recognition (PNR) verification; APIX+iAPI providing interactive messaging; and APIX Infinity, an entry-level passenger data analysis tool.

PNR data is a rich source of traveller intelligence and enables border control agents to build a threat assessment on a traveller before departure or at the point of booking.

Flat-rate pricing

It has also introduced AviSec as a new flat-rate pricing concept to help airlines manage their costs for transferring API to destination governments. Secure delivery is essential for airlines, which must transmit API in the form of batch flight manifests to border control agencies in the destination country. Any failure by an airline to comply incurs a significant fine.

ARINC Direct has also continued to enhance its flight planning solutions, giving companies compliance with the risk assessment pillar of their safety management system (SMS).

The SMS risk factor form, as recommended by the US FAA and ICAO, allows a user to assign a specific numerical value for any given risk – resulting in a total risk score for a flight. Integrating this feature was a critical initial step to support clients' risk assessment needs. ARINC Direct has now entered into a partnership with FlightRisk (www.flightrisk.com) to provide additional safety risk assessment services and enhanced pre-flight risk awareness.

ARINC has also launched its new Cabin Connect Suite of products – targeted at commercial carriers who want to offer on-board WiFi to passengers and cabin crew using Inmarsat's SwiftBroadband satcomms service.

Access the internet

With Cabin Connect, airline passengers can access the internet directly from their personal electronic device (PED), smartphone, tablet (iPad/Playbook), gaming devices (DSi/PSP) or laptop. Passengers simply log on to the on-board hotspot, similar to how they would on the ground in an internet café or hotel.

Airline operators can choose whether to provide the service free or as a potential revenue generator, charging passengers directly with a new flat-fee structure (per hour, per flight, per month).

AirCrew Connect (part of the Cabin Connect Suite) gives additional value to an airline by making it easy to respond to a customer service issue while in the air via a direct link back to the airline's headquarters or ground operations department.

Cabin crew can book on-board transfers, track lost baggage, find a hotel room and more. It also enables real time fault finding – any problem with on-board systems can be remedied in flight or engineers can be booked so they can be on hand for the aircraft's arrival, reducing the amount of downtime the airframe requires.

ARINC also launched a new iPad cockpit app at NBAA, Las Vegas in October.

The free app, which features on the Apple iTunes web store, gives pilots access to their flight plans, weather, NOTAMS and charts on their ARINC account. It had been in beta testing for the last few months with several large corporate and pilot-owner operators.

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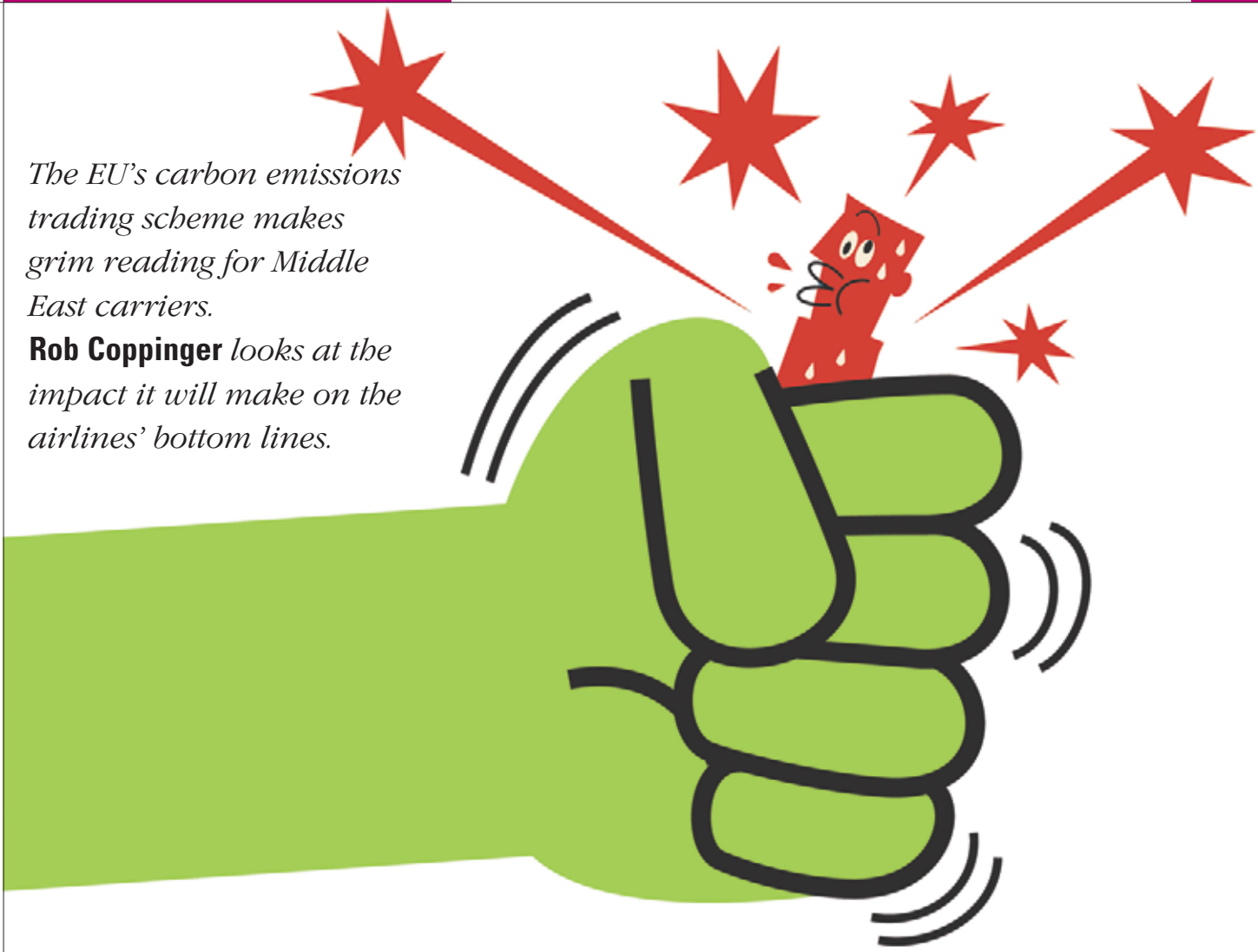

The EU's carbon emissions trading scheme makes grim reading for Middle East carriers.
Rob Coppinger *looks at the impact it will make on the airlines' bottom lines.*

New green law that makes airlines see red

The European Union's carbon emissions trading scheme is supposed to tackle climate change by giving pollution a price but Middle East airlines see only pain and no gain with a mechanism that is designed to tackle a worldwide problem caused by the West.

While some Middle Eastern airlines will not discuss the pain, Emirates is estimating the scheme will cost it up to $1 billion until 2020 and Etihad Airways is expecting to pay €500 million over the same period.

The emissions trading scheme (ETS) will require airlines flying to or from 31 European countries to buy permits from the start of 2012 for emissions produced during the entire flight. Those countries include the European Union's 27 members plus Iceland, Liechtenstein and Norway and, from January 2014, Croatia, because it will become an EU state on July 1 2013.

IATA is deeply opposed to the ETS. IATA's now former head, Giovanni Bisignani, said in June before his departure: "This year we have a special place of dishonour on the IATA wall of shame for the European Union. They are ignoring international law with plans to include international aviation in Europe's emissions trading scheme."

For the EU's European Commission, the need for an ETS is because of the growth of air travel and its related pollution. The EC states on its ETS webpages: "As air travel becomes cheaper, EU emissions from aviation are increasing fast. Someone flying from London to New York and back generates roughly the same level of emissions as the average person in the EU does by heating their home for a whole year… the EU Emissions Trading System (EU ETS) would be the most cost-efficient and environmentally effective option for controlling aviation emissions."

So disliked is this scheme in the USA that in 2009 the US Air Transport Association of America took the EU to its own court, the European

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Court of Justice (ECJ), and its complaint was heard in July. At that one-day hearing the ATA called for the ETS to be dismissed and declared illegal.

Explaining why it is opposed to the ETS, ATA uses an example flight from San Francisco to London Heathrow. According to ATA: "As a percentage of total emissions, 29% take place in US airspace, 37% take place in Canadian airspace, a further 25% over the high seas, and only nine% of emissions take place in EU airspace." ATA estimates that the cost to the US airline industry will be $3.1 billion from 2012 to 2020.

In its testimony to the ECJ the airlines trade body said: "If the EU ETS regime implemented an international agreement agreed by third countries, as well as by the EU, we would not be here today. ATA challenges EU ETS because it is a unilateral measure which has not been agreed by countries outside the EU yet, nevertheless, applies EU law to third-country carriers in third-country airspace."

The ATA now expects the ECJ's advocate-general to come back with an opinion whether the case against the ETS is valid. The ECJ does not have to accept the opinion and so the case could drag on for years.

Political action

However, there is also political action being taken in the USA. In July the US House of Representatives' Transportation Committee introduced a bill opposing ETS. The bill prohibits US airlines from participating in the scheme. The bill describes the ETS as an "extra-territorial action…inconsistent with long-established international law and practice".

On 27 July the US House of Representatives' Transportation and Infrastructure Committee heard testimony about ETS. The committee chairman, Republican Congressman for Florida, John Mica, said: "This appropriately named EU scheme is an arbitrary and unjust violation of international law that disadvantages US air carriers and kills US aviation jobs. The message from Congress and the US government is loud and clear; the United States will not participate in this ill-advised and illegal EU programme."

The EC rejects this claim. It told *Arabian Aerospace*: "The inclusion of aviation in the EU's emissions trading system is fully consistent with international law.

The purpose of any flight is to take off from one place and land at another. The ETS only applies to flights that either take off in or land in the EU. We do not seek to require aircraft operators to account for their emissions relating to their other flights."

ATA is concerned that this situation could spiral and it told *Arabian Aerospace* that "it is possible" a trade war could result from trans-Atlantic tit-for-tat measures. According to Pricewaterhouse Coopers International non-complying aircraft operators may be banned from operating in the EU or face a penalty of €100 per missing allowance.

How will aviation emissions trading work?

From January 2012 airlines will be included in the European Union's Emissions Trading System (ETS) that started on January 1 2005.

When it started it covered energy-intensive industrial installations that are responsible for nearly half of the EU's total CO2 emissions.

The ETS is described by the EC as a "cap and trade system". It is designed to keep emissions – in this case CO2 emissions – covered by the scheme within a pre-defined limit.

The mechanism it uses to try to achieve this limit on emissions is an allowance scheme. For the expected CO2 emissions in a given year an airline will get so many allowances, 85% of which they get for free. The remaining 15% are purchased.

At the end of each year operators surrender the allowances equal to their actual emissions in that year.

They can either use the allowances they were given for free or buy allowances on the market and submit those too.

If they emitted less than the allowances they were given, they can sell those surplus allowances or bank them to cover future emissions.

Businesses that emitted more CO2 than their free and paid-for allowances represent can buy other companies' surplus allowances. Airlines don't have to buy from other airlines; allowances from other industries can be purchased.

Operators can also buy emission credits from clean energy projects carried out in third countries under the Kyoto Protocol mechanisms.

The idea, explains the EC, is to allow the market to decide where reductions of greenhouse gas emissions can be achieved in the most economically efficient way possible.

For airlines that exceed their allowances the EC's view is that they can invest in more efficient technologies or change their operational practices to reduce their CO2 output.

Middle Eastern airlines are planning to comply. Emirates, Etihad and Qatar Airways will all comply with the scheme. Emirates said: "From an EU perspective, Emirates will be complying with all aspects of Europe's forthcoming emissions trading scheme."

However, it doesn't like the ETS. In Emirates' June newsletter it states: "The long-standing IATA position and one which Emirates has always supported, is that the optimal solution lies in a global scheme to manage and reduce emissions through ICAO – not in an overlapping patchwork of multiple taxes, charges and schemes like the EU ETS."

The ATA also wants a scheme that operates on a global sector basis.

Last year Qatar Airways chief executive officer Akbar Al-Baker was criticising the EU scheme. He described the ETS as a scheme "to fund governments" adding that the funding would not necessarily find its way back into the industry and that consumers would be forced to pay charges to the detriment of the industry as a whole.

Emirates told *Arabian Aerospace* there would be "a cost of between $500 million and $1 billion through 2020" from ETS. In its most recent environmental report Emirates states: "Unfortunately, this cost will almost certainly have to be passed on to customers."

Qatar Airways declined to give a figure for how much its participation in ETS would cost.

Etihad Airways head of environment, Linden Coppell, said: "Like all airlines the cost is significant. The amount of free allowance is significantly less than the emissions we are experiencing by total flights within and in and out of Europe. So, even in the year that we start paying, we only at this stage anticipate about 60-70% of our emissions are covered. In terms of cost the number of allowances we will get will not be confirmed until later this year. We have estimated costs over the next eight years rising as high as €500 million based on our forecast growth rate of traffic into Europe and the cost of carbon."

Affect European airlines

Aviation analysts do not agree on what the cost is going to be to buy the allowances the airlines will have to purchase. Pricewaterhouse Coopers International is estimating a cost of €3.5 billion for the entire sector per year while Standard & Poor gave a figure of €1.125 billion in its analysis "Airline Carbon Costs Take Off As EU Emissions Regulations Reach For The Skies" published in February. London-based aviation economics analyst Keith McMullan said: "It's impossible to tell; it all depends on routes, airlines' historical performance and their aircraft. It will affect European airlines a lot more than Middle Eastern airlines."

Participating airlines, the EC points out, can use biofuels to avoid paying for allowances. The emission factor for biofuel is deemed zero by the EC. An aircraft using 100% biofuel is deemed non-polluting.

The US airline Continental and Finnish operator Finnair are two examples of airlines that have experimented with 50% biofuel, 50% Avgas mixes for their fuel. But biofuel is expensive and so 100% operational use is not expected for some time. According to IATA, biofuels will not start to make significant contributions to decreases in CO2 until the 2030s.

With just months to go before January 2012 and the start of ETS, airlines might be complying with it but the future appears to be a troubled one. Middle Eastern airlines face costs of hundreds of millions of dollars and US airlines will be caught between domestic law prohibiting their participation and EU law requiring it. Whatever 2012 brings, the political and legal struggle over aviation emissions trading could become a very long haul.

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Abu Dhabi relishes "golden opportunity"

The announcement that 2012 World Routes Development Forum would be taking place in Abu Dhabi was made at this year's event in Berlin. Alan Peaford was there.

It was truly fitting that the Abu Dhabi Airport Company (ADAC) scooped the top prize for airport marketing during the Berlin event because organisers were able to confirm that the emirate would host to the next world forum.

The 2012 event is expected to attract more than 3,500 senior aviation professionals from around the world to Abu Dhabi and ADAC chief executive Jim Bennett described it as a "golden opportunity" for the emirate.

Bennett told a Berlin press conference: "This will give us the chance to showcase Abu Dhabi as a business and leisure destination, as well as demonstrate the award-winning services that Abu Dhabi International Airport is offering to its airlines partners."

Chief operations officer Ahmad Al Haddabi promised delegates of Routes 2012 a unique voyage into the Emirate to experience its cosmopolitan mix and the harmony offered between heritage, culture and modernity.

Bennett added: "Hosting the next Routes demonstrates the Emirate's position as a leading driver in the aviation industry. We look forward to welcoming aviation professionals to see our dynamic city and discuss the growth opportunities of air services to Abu Dhabi."

Routes 2012 takes place from September 30-October 3.

Iraq's plea to build tourism for normality

The Iraq tourism industry made an impassioned appeal to the world's airlines to ignore negative media and press coverage and "come back" to Iraq.

Fadhil Al Saaegh, chief executive of Najaf-based travel company Al-Rafidain, has been representing the Iraq tourism ministry at travel events around the world during the past year.

"Most people have a negative image of Iraq, which they have seen from their televisions. They think of kidnappings and killings. This is not the case. The media never covers the many positive things that are happening," he said in a presentation at the Routes Talks Tourism Theatre at the Berlin event.

"We are in the rehabilitation and reconstruction stage but we have four and five-star hotels and new airports being developed across the country," he added.

Iraq has 12,000 recognised archaeological sites and Al Saaegh said there are probably another 6,000 awaiting recognition. "There is no other country on earth that can match this," he said.

He told the audience that airlines such as Gulf Air, Turkish Airlines, Etihad and Lufthansa are already flying into the country, but he called for more support from both business and leisure sectors. "There are many opportunities and we welcome visitors to help bring normality back to our country," he said.

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FLIGHT FEVER

Pilot and actor John Travolta made worldwide headlines this September when he joined Bombardier's team as a business aircraft brand ambassador for its Learjet, Challenger and Global jets. Here, he tells **Liz Moscrop** *why he signed up.*

Business aviation has always "made sense to me in that it offers flexibility, privacy, security and, most importantly, timesaving – meaning I have the ability to keep up with my busy schedule and have more time for my family, which is very important to me," explained actor John Travolta.

"On top of that, I'm a pilot – I love to fly. Bombardier designs aircraft as much for the person flying them as for the passenger. I'm proud to represent their aircraft."

The Canadian airframer reckons it asked the star because he is a licensed jet pilot and an advocate for corporate aviation. With a busy schedule of filming, publicity and charity work, he is a truly international business traveller. He has also received two aviation awards – the American Institute of Aeronautics Foundation Award for Excellence in 2003, and the Living Legends Ambassador of Aviation award in 2007.

Steve Ridolfi, president, Bombardier Business Aircraft said: "John Travolta is both a film icon and knowledgeable aviator. He recently added the Challenger aircraft to the impressive list of 11 different jets he is qualified to fly."

Given that 'adding the Challenger' took the best part of a month, it was a huge commitment for someone with such a busy diary. Travolta said: "It took 21 days non-stop getting my type rating on this, and it will be four or five days every year for this particular plane. But I don't mind. I like it. I enjoy it. It keeps me safe."

The well-travelled actor is in a prime position, too, to see the growth of business aviation around the world, and explained why regions like the Middle East are such hotbeds. He said: "More than ever everyone is involved globally. They see there's a possibility there. Business aviation creates jobs for everybody."

Like many regions, the Gulf is suffering from a shortage of pilots and technicians. Travolta pointed to the next generation of pilots and how he is trying to attract young people to the aviation industry. He said: "I'm hoping with all my brand endorsements like with Breitling, Qantas and Bombardier that it will make it kind of exciting for people to be interested again, but you never know what the trick is to get them sparked again because they're so insular with their computers that you may have to actually demonstrate the fun."

With an acting career spanning some 30 years, Travolta has starred in 60 films and has been honoured with a number of film awards and award nominations. He is involved in three upcoming movie projects: Savages, the story of a drugs cartel in Laguna Beach, along with Salma Hayek and Benicio Del Toro; Gotti, the story of John Gotti, the infamous crime boss of the Gambino mob family; and Shrapnel, which is about two veterans of the Bosnian War, one American, one Serbian, who clash in the remote Rocky Mountain wilderness.

Electrical failure

In terms of the definitive aviation film, Travolta believes an adaptation of the Frederick Forsyth novella *The Shepherd* could be it. The tale is of a De Havilland Vampire pilot, going home on Christmas Eve 1957, whose aircraft suffers a complete electrical failure en route from RAF Celle in northern Germany to RAF Lakenheath in Suffolk. Lost in fog and low on fuel, he is shepherded to a disused RAF dispersal field by the pilot of a World War II De Havilland Mosquito fighter-bomber, who has apparently been sent up to guide him in. Travolta said: "It is one of my favourites because it personalises the two planes involved. I guess because I owned a British Vampire it is a little more real to me."

The star suffered a huge loss in 2009 with the death of his son Jett, who suffered from Kawasaki Disease, a rare illness, which can cause seizures. As part of the healing process the Travolta family established the Jett Travolta Foundation, which supports a wide range of charities, particularly those involving helping children. A key area of interest is research into convulsions. Travolta said: "We are looking at putting quite a bit of money into seizure investigation, because seizures have still not been solved. Oddly enough you can cure cancer but you can't cure seizures."

He said that he is speaking with a company that believes it may have found a breakthrough and will talk about that more when he is ready to publicise its work.

Woman with a licence to thrill…

Not content with just being the first licensed female glider pilot in the Middle East, Bassmah Bani Ahmad has now earned the title of the first licensed female aerobatic pilot, too. **Kelly Green** *talked to her.*

Bassmah Bani Ahmad is a member of the Arabian section of the Ninety-Nines female pilot organisation and she thinks deeply about her role.

She told me: "When I was training to become a commercial pilot I met a captain on an A320 who told me, 'Flying is an art'. At the time, I didn't understand the depth and meaning to that simple statement."

After completing her pilot training, Ahmad was hired as a flight instructor at Ayla Aviation Academy, Jordan. "Little did I know at the time that joining Ayla would open new and unexpected doors for me that would change me as a pilot," Ahmad said.

While working as a flight instructor, Ahmad used the opportunity to expand her flying skills in other areas at the Ayla Aviation-managed Royal Aero Sports Club of Jordan. "I did everything from jump pilot work with sky-divers, tourist flights over exhilarating locations like Petra and Wadi Rum in Jordan and working with photographers and cinematographers, to ferrying aircraft throughout Europe," she explained.

"The exposure gave me the ability to really mould and tune my flying. Diversity was the new theme in my aviation career. I had flown more than ten different types of aircraft and changed my flying profile from one flight to another. It was very exciting and made me appreciate how important it was to think safety first."

Finding herself on a mission to increase her safety margin in the aircraft, Ahmad decided to increase her flying skills by going to UK-based flight training organisation Ultimate High to learn aerobatics.

"Aerobatic flying is blood pumping, exciting, thrilling, challenging and, in my opinion, unmatched by any other sport in terms of adrenaline and skill," she enthused. "It pushes skills to the ultimate limit and completely changes your perception of time. Every detail counts in aerobatics; movements are small and complex. I discovered that in order to move and think simultaneously you have to become more aware, which means that you need to somehow slow down time.

"In addition to the joy of flying aerobatics, I opened my eyes to the full potential of the aircraft and myself. Ayla Aviation Academy helped pave the way to my aviation career and I hope to continue the momentum and to grow as a pilot, wherever I go and whatever I fly."

Alia Twal, governor of the Arabian section of the Ninety-Nines, added: "I feel so proud of the Arabian section women pilots. They all have very interesting stories and every one of them has achieved something very special and made a mark in the history of female pilots."

The Arabian section now includes 30 female pilots and is looking forward to recruiting more licensed pilots. Contact aliatwal@hotmail.com.

Oman Air chooses deputy chief officer

Oman Air has appointed Captain Ali Hassan Sulaiman as deputy chief officer, flight operations.

Captain Sulaiman assumes the role following 30 years' professional experience in civil aviation, including a range of managerial positions at Oman Air and Gulf Air, as well as chief operations officer at the Gulf Aviation Academy in Bahrain.

Etihad sales boss for North England

Etihad Airways has appointed Melanie Quinn as the new sales manager for the North of England.

Quinn will be responsible for raising the profile of Etihad throughout the region, cultivating and managing relationships with key stakeholders including agents, airports, suppliers, guests and government organisations.

The appointment reflects the airline's on-going expansion and multiple significant developments in Manchester, England.

Highlights of Etihad's commitment to the area include the signing of a 10-year sponsorship deal with Manchester City Football Club, the launch of a new aircraft maintenance centre, the doubling of daily flights from the city and the construction of a new contact centre at Manchester airport for 2012.

ARINC to open Dubai base

ARINC Direct is to expand its Middle East operations with the opening of an office in Dubai.

Stefan Nicolov, a sales manager with ARINC Direct since 2007, will open the new office.

QATAR AIRWAYS CEO ELECTED TO AACO EXECUTIVE

Qatar Airways CEO Akbar Al Baker has been elected to the executive committee of the Arab Air Carriers Organisation (AACO). Al Baker joins the organisation's executive body for a three-year term.

A delighted Al Baker said being appointed to the AACO committee was a great honour and that he looked forward to continued working with member airlines in his new capacity.

"With the formidable rise of air passenger traffic and new regional players to this ever-exciting industry, a regional framework where partners gather, collaborate and raise the profile of the many exceptional airlines in the Middle East only brings benefits to all concerned within the AACO membership," he said.

"It is my aim to continue the good work of AACO and help raise the bar for member airlines in this highly competitive industry."

Mehoke steps up as vice president

Etihad Airways has appointed Ms Robbie Mehoke as vice president eastern USA, based in the airline's New York office.

Mehoke joins Etihad from Cars.com, having started her career with United Airlines as an account manager in San Francisco and Philadelphia before being promoted to global account manager in Chicago.

Death of former Etihad CEO Strodel

Robert Strodel, the first chief executive of Etihad Airways, died suddenly in Sharjah in August, just days short of his 56th birthday. Strodel was working for Rus Aviation.

Tributes from across the aviation world have been pouring in for the likeable Austrian, who was credited for having set Etihad Crystal Cargo on the path to the success it is enjoying today.

His time as country head for Lufthansa in India and his long affection with the Gulf, where he worked in consulting, made him a well-known character.

Saleh Al Aroud, chairman Rus Aviation, said: "Robert was our respected friend and colleague, who we all knew as a nice, generous and frank man, gifted with a great heart and good sense of humour.

AL NAQBI APPOINTED TO BOARD OF COMLUX

Ali Al Naqbi, founding chairman of the Middle East Business Aviation Association (MEBAA), has been appointed to the board of Comlux, the Swiss-headquartered VIP charter with a major base in Bahrain.

Al Naqbi has developed his strong experience in business aviation from working more than 20 years with Abu Dhabi Presidential Flight as vice president finance and administration, and contributing to Royal Jet as founder and managing director.

Al Naqbi will continue to act as the chairman of MEBAA and as an IBAC board member.

Mercator makes changes at the top

Dubai-headquartered Mercator, the commercial arm of Emirates Group IT, has announced a number of key management changes.

Rolf Eichenberger will replace Roland Heller as CEO of Mercator Asia.

Heller, who founded the company before it was acquired by Mercator, will transition out of the day-to-day operations of the business and will focus on product development and technology strategy as head of development.

Together, Heller, Eichenberger and newly appointed head of product management, Thomas Jaeger, will form the executive management team of Mercator Asia; assuming responsibility for the strategic and operational aspects of the business.

Chief operating officer Patrick l'Anson will leave the Mercator Asia team and resume his previous position as technical operations manager of the Emirates Group's IT division based in Dubai.

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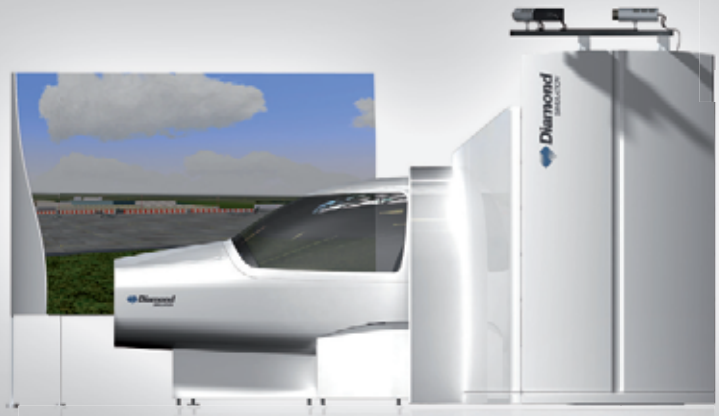

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Adrian Hickey

L-3 to open regional office in Abu Dhabi

UK-based defence manufacturer L-3 is opening a new international office in Abu Dhabi to expand its presence in the Middle East and provide increased, localised support for its customers and partners in the region.

L-3 TRL's expansion into the UAE comes as a result of increasing demand for its electronics products and services in the Middle East.

Adrian Hickey has been named as MEA regional manager and will be heading up the new office, bringing with him over 20 years of experience in working with clients in the region.

EMIRATES MAKES REGIONAL APPOINTMENTS

Emirates has announced several new appointments within the Middle East, further strengthening its commercial operations team.

The new appointments will see five former graduates of Emirates' dedicated UAE national commercial management programme take on new challenges across the region. "These moves reflect our commitment to offering our staff the opportunity to grow and experience new challenges. Market dynamics vary in every one of our destinations creating a unique and challenging working environment," said Ahmed Khoory, Emirates senior vice president commercial operations, Gulf, Middle East and Iran.

■ Reema Al Marzooqi (pictured right), was named as the new Country Manager Bahrain. Reema has been with Emirates since 2003, she moves to Bahrain as Country Manager after spending the last eight months as sales manager Jordan and West Bank.

■ Haitham Al Battawy, is the new Country Manager Iraq having joined Emirates in 2006 as part of the UAE National Trainee Management Programme. He has most recently held country manager roles in Libya and Oman.

■ Khalid Al Serkal, takes over in Qatar. In his 11 years at Emirates he has previously held country manager roles in Uganda, Tanzania and most recently Egypt, where he has spent the last four years.

■ Asma Al Rahma, is the new country manager in Oman. Asma was most recently posted as sales manager Kuwait.

■ Khalid Al Haddad, becomes the new district manager for Sharjah and Northern Emirates. Khalid started his career with Emirates in 2003 as part of the airline's High Potential Programme at Cranfield University in the UK. He has held several roles within the group most recently working as Country Manager for Morocco.

Etihad appoints Nepal country manager

Etihad Airways has announced the appointment of Pawana Shrestha as its country manager in Nepal.

Based in Kathmandu, Shrestha will take over from outgoing acting country manager, John Rees Evans.

Peter Baumgartner, Etihad Airways' chief commercial officer, said: "I am delighted to welcome Ms Shrestha, who brings extensive experience and expertise in the travel and distribution industry. She will build on the work of John Rees Evans who, in a short time, has played a major role in strengthening our commercial organisation and office in Nepal, further developing our operations to Kathmandu."

Pawana Shrestha.

Etihad enjoys graduate success

Emiratisation continues apace at UAE national carrier Etihad with the Abu Dhabi-based airline celebrating another group of national graduates completing their studies to join the airline.

A total of 31 UAE national cadet pilots, 10 graduate managers, one engineer graduate and 77 contact centre staff from the UAE – and an additional 11 graduating cadet pilots of other nationalities – were recognised in a ceremony at the Al Raha Beach Hotel in Abu Dhabi.

Fields ploughs new furrow as director

Gulfstream Aerospace Corp has named Jamie Fields as director, repair and overhaul services, in a newly-created position that covers the Middle East.

In his new role, Fields is responsible for expanding and enhancing Gulfstream's repair and overhaul capabilities worldwide. He began his career at Gulfstream as a member of the GIII production line. He has also been an avionics installer systems test technician, service centre maintenance planner, and a customer program manager.

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Captain Donald David Douglas

Marcelle Nethersole *speaks to Captain Donald David Douglas of helidubai.*

1 What is the background of helidubai?

In line with the vision of the Dubai government to establish a centre of excellence for this unique branch of aviation, helidubai has seen remarkable growth since inception. Established in 2005 to provide aerial support to the customers of the Burj Al Arab, helidubai has expanded into inter-emirates transfers to (and not limited to) the Emirates Palace in Abu Dhabi, and also into the ever growing cinema industry.

2 What does a general working day involve for you?

I currently wear two hats in the company – chief pilot and crew training. As a training manager I ensure that all training activities can be carried out in accordance with civil aviation best practice.

As the chief pilot, that is where things start to get different.

Not one day is the same and with every new day comes a new challenge. We are a small company with eight pilots, all experienced and professional. When presented with extraordinary situations, I would ask my colleagues for their opinions.

Usually more than one solution comes to the surface and that's when the fun part comes in; the best plan. I think that synergy is very important in any company, especially small ones.

3 What is your training background?

It all started with a dream. Wanting to become a pilot, after high school, I joined the Canadian Armed Forces, where I received a diploma in administration from the College Military Royale in Saint-Jean, Quebec. I then flew helicopters for the next 20 years. Throughout my military career, I was fortunate to attend and graduate from many flying courses, including instructional and evaluations.

4 How is the company fleet made up?

Helidubai operates a fleet of five helicopters. We have two Agusta VIP standards A109e for public transport and three Eurocopter AS350 B3 helicopters in support of tourism flights and also filming and photography.

5 Who are your customers?

Jumeirah Group has appointed helidubai as its primary helicopter service provider for all its hotels. The guest at the iconic Burj Al Arab hotel can book directly through the concierge. Working in conjunction with travel industry partners, our customer base includes the many visitors to the UAE as well as dignitaries, government officials, members of royalty, international celebrities and VIPs. We also provide tourism flights over the city of Dubai from the Atlantis at The Palm, located on the crescent of the Palm Jumeirah.

6 What are the future plans of helidubai?

Tourism being one of Dubai's economic pillars, we are looking at expanding our scenic flights capability. There is an increase in the number of cruise liners visiting Dubai. We are in the process of establishing a heliport at Port Rashid to capitalise on this niche. In our other area of expertise, helidubai was involved in an aerial shoot for the latest instalment of *Mission Impossible 4* with Tom Cruise. More and more film producers are choosing Dubai as a prime location, further enhancing the city's growing reputation as the number one location for movie making. Surely, helidubai will be there for the challenge.

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- Administration ☐
- Department Manager ☐
- Dispatcher ☐
- Pilot ☐
- First Officer ☐
- Flight Crew ☐
- Government ☐
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- Mechanic ☐
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- Corporate aircraft owner/user ☐
- Design ☐
- Embassy/consulate ☐
- Engine manufacturer ☐

FBO

- Finance, leasing and insurance ☐
- Flight support services ☐
- General aviation ☐
- Government - Civil ☐
- Government - Defence ☐
- Helicopters ☐
- Interiors and completions ☐
- IT ☐
- Maintenance/MRO ☐
- Media ☐
- Navy ☐
- OEM ☐
- Private operator/owner ☐
- Recruitment ☐
- Replacement parts ☐
- Safety and security ☐
- Space ☐
- Training and simulation ☐
- Other ☐

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ARABIAN AEROSPACE

Rubber Removal

UNITED HYDROCLEAN, is the GCC's most reputable and active specialist in Rubber Removal, Friction Testing, Paint Removal and Re-painting; with over 30 years experience in these fields for both Military and Commercial airports.

A long time partner of the reputable *Strate WHDtechnik e.K - Germany,* **UNITED HYDROCLEAN** has maintained international service standards with access to customised and environmentally friendly methods and high tech equipment, along with personnel with a collective experience of over 60 years.

We are distinguished with our ability to provide the most impartial advice and reliable guidance to our customers with packages tailored to their airports needs and requirements.

Our clients are considered partners and long term affiliates, and thus our priority is their runway safety, and we pride ourselves with the ability to provide our clients with the safest solutions taking into consideration the speed, cost and reliability of service.

UNITED HYDROCLEAN successfully operates throughout the GCC & Mena Region, including Iraq and Afghanistan, in both commercial and military airports.

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RUNWAY RUBBER REMOVAL

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