



ARABIAN AEROSPACE

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

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POWER POINT

THE WORLD'S ENGINE
MAKERS DESCEND ON DUBAI

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Published by



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All eyes on Dubai as Middle East leads the way out of recession

The eyes of the aerospace world will focus on the Middle East region in November as the 11th edition of the Dubai Airshow takes place in the emirate.

The show has come a long way in the 22 years since it first started and its growth into the third largest industry event in the world reinforces the importance that the region plays in today's aerospace industry.

As we come through the worst global recession the world has seen in modern days, the Middle East is leading the way from the downturn.

Airlines in the region continue to grow.

The Honeywell Business Aviation forecast issued in October shows the Middle East region has the highest purchase prospects for business jets in the world.

The Defence Chiefs meeting in Dubai in November takes place against a back-drop of fleet

modernisation and utilisation of the latest available technologies.

The future for personal space missions now depends heavily on Middle Eastern involvement.

One major change over the 22-year history of the Dubai Airshow is the amount of involvement Arab companies have.

No longer do Arabian aerospace businesses just come to the show to admire and buy, they come to sell and to share. The region is slowly developing an indigenous industry,

This issue of Arabian Aerospace is our biggest yet and showcases so much of what is going on. We join in the welcome being offered as the aerospace world comes to Dubai and look forward to welcoming you back both to the region and to our magazine.

Alan Peaford
Editor-in-chief

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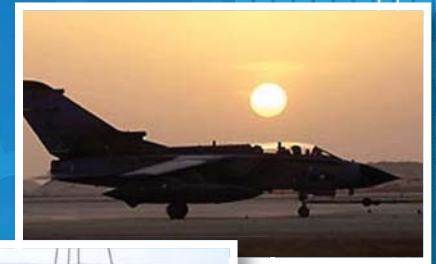
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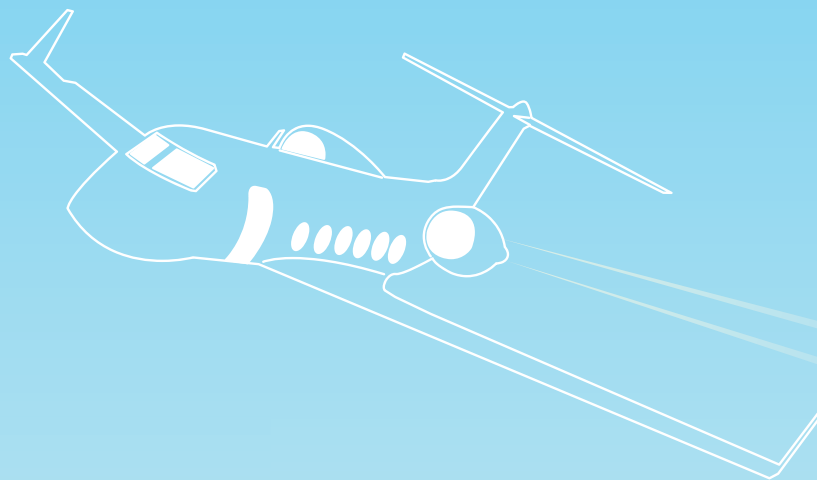
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Qatar flight history with 'natural gas'

A Qatar Airways aircraft has completed the world's first commercial passenger flight powered by a fuel made from natural gas.

The historic journey from London Gatwick to Doha on October 12 took just over six hours and was operated with an Airbus A340-600 aircraft using Rolls-Royce Trent 556 engines.

Shell developed and produced the 50-50 blend of synthetic gas to liquids (GTL) kerosene and conventional oil-based kerosene fuel. The State of Qatar is set to become the world's leading producer of GTL kerosene when it is put into commercial production from 2012.

The fuel, as an alternative to conventional oil-based kerosene, will contribute to diversification of aviation fuel supply. It also burns with lower sulphur dioxide and particulate emissions than pure conventional oil-based kerosene, making it attractive for improving local air quality at busy airports.

The blend of conventional kerosene and GTL kerosene will be known as GTL jet fuel.

The flight was the latest step in more than two years of scientific work carried out by a consortium consisting of Airbus, Qatar Airways, Qatar Petroleum, Qatar Science & Technology Park, Rolls-



Abu Dhabi connects for free

Abu Dhabi airport now offers free wi-fi and internet access with 50 new walk-up kiosks fully operational in the newly-opened Terminal 3, following the success of 15 similar kiosks launched in Terminal 1 last year.

The expansion of free internet access across the entire airport is part of ADAC's policy to create a technologically-advanced gateway to the world with world-class facilities for all passengers.

The 65 touch-screen kiosks offer 20 minutes of free internet access per session. The wi-fi provides one hour of access per session, with users able to reconnect for subsequent sessions. Approximately 25% of airport visitors are logging on to the service, either through laptops, phones or the kiosks.

Royce, Shell and WOQOD into the benefits of using GTL jet fuel to power commercial aircraft. Much of this work is being undertaken at the Qatar Science & Technology Park in Doha.

LCCs now work across Gulf states

Dubai low-cost carrier flydubai has rocked the

regional airline market by introducing low-cost flights between Gulf states

The airline – a subsidiary of Emirates Airlines group – began operating routes on the highly lucrative intra-Gulf Cooperation Council (GCC) market with the launch of twice-daily flights between Dubai and Qatar on October 18. This is the first direct service to be operated within the GCC by a low-cost airline.

His Highness Sheikh Ahmed Bin Saeed Al Maktoum, chairman of flydubai, said: "The company was established by the Government of Dubai in March 2008 in order to provide a quality service at a reasonable price and thereby make safe, efficient and comfortable flights available to many more people in this region. The importance of low-cost

intra-GCC flights cannot be underestimated. Our communities are close in many ways and these new flights will help to bring us closer in terms of both business and leisure.

"We have worked closely with the Qatari authorities to bring about this announcement and I would like to thank them – and especially His Excellency Abdul Aziz Mohd. Al-Noaimi, chairman of the Civil Aviation Authority – for their hard work and support. I look forward to continuing the long and successful relationship between our two nations with the advent of flydubai's twice-daily service between Dubai and Doha."

Al-Noaimi warmly welcomed the new service: "flydubai will be a great addition to the existing flight schedule between Doha and Dubai as it will give so many more people another option when travelling."

Now you CeBe now you don't

CeBeNetwork, which had its cabin systems featured in the last *Arabian Aerospace* magazine, became Voith Industrial Services on October 1, 2009. Voith has founded a new division – Voith Engineering Services – for tailor-made engineering combining CeBeNetwork, with Hörmann Engineering and Voith Industrial Services Engineering.

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Iraq gets T6 trainers

Hawker Beechcraft Corporation (HBC) has been awarded a contract to provide eight T-6A trainer aircraft to the Iraqi Air Force.

The contract is from the United States Government and represents a government-to-government agreement between Iraq and the US.

“This contract marks the beginning of what will be a beneficial relationship with the Iraqi Air Force,” said Jim Maslowski, president, US and international government business.

“The T-6A is the most successful primary trainer in the world. Its training and flying capabilities are characteristic of HB’s world-class military training programmes and operations, and it will make an excellent addition to the Iraqi Air Force fleet.”

The contract also includes ground-based training systems, spares, contract logistics support, maintenance, post-production support and technical publications, as well as options for follow-on aircraft and support.

The T-6 is proving popular across the region. In September Hawker was awarded a contract for 24 T6-C trainer aircraft, spares, program support, operational flight trainers, ground support, on-site support and technical publications by the Moroccan government.



Oman Air unveils three-class service

Oman’s flagship carrier, Oman Air, has launched a First Class Mini Suite, together with new business and economy class seats, menus and uniforms, on its new three-class Airbus A330-300.

The three-class service will be introduced to a range of routes across Europe and Asia, including non-stop direct flights between Muscat and London Heathrow.

The First Class Mini Suite features an 82-inch long, fully-flat bed within a pitch of 85.5 inches, a seat width of 25.5 inches, electrically-operated backrest, leg rest and seat depth controls, and an eight-point massage system. There are just six seats in the first class cabin to maximize privacy. In addition, each seat offers a 23-inch in-flight entertainment (IFE) monitor, a wireless IFE handset, a back-up IFE handset, two USB ports, an ethernet socket (RJ45), an audio and video assumption (RCA) plug and a PC power outlet.

The airline also offers 20 business class seats. The 77.5-inch long, lie-flat seats have a pitch of 82 inches, are 22 inches wide and offer electrically-controlled backrest, leg rest and seat depth. Each seat, fitted in a four-abreast, 1:2:1 configuration, also features a 17-inch Gen. III IFE monitor, two USB ports, an ethernet socket (RJ45), audio and video assumption (RCA) plug and PC power outlet. There is also a cocktail table, a one-piece meal table, a buddy seat and ample stowage.

The new economy class seat has a spacious 34-inch pitch and offers adjustable head and foot rests, a bi-fold, sliding food table and upholstery that has been constructed for enhanced comfort, all located within a one-piece composite seatback structure. It has a 10.6-inch seatback-mounted IFE screen and handset, USB and RCA video multi-plug for every passenger, and an ethernet socket (RJ45) and PC power port for every double seat.

For all three classes of travel, IFE is provided via the Thales i5000 in-seat Audio Video on Demand (AVOD) system, with its broad range of media content, which is integrated with Rockwell Collins Tailwind Live Satellite TV, broadcasting across eight channels. The system also provides a platform for forthcoming full wi-fi and GSM connectivity.

The new menus draw on both Omani and international culinary influences, while Oman Air’s staff have been fitted out with new elegant uniforms.

accommodation with plenty of stand-up head room.

With only one stop, the Falcon 900DX from Dubai can reach destinations such as New York via Shannon or Rio de Janeiro via Lagos. “Also of great interest to our clients from Saudi Arabia will be the aircraft range from Jeddah, for example, all the way up to Moscow, Singapore, Bangkok, Cape Town or even Sierra Leone non-stop,” said Balkar.

Emirates breaks new financing ground

Emirates Airline has brokered a new means of finance for three Boeing 777-300ER aircraft following the successful pricing of its inaugural US bond offering guaranteed by the Export Import Bank of the United States.

The transaction is in the amount of US\$413.7m with a fixed-rate coupon of 3.465 % per annum. The secured notes are due on August 21 2021 and are payable in instalments of principal and interest on a quarterly basis.

Brian Jeffery, senior vice president, corporate treasury at Emirates, said: “This transaction is very important for the industry as it represents the first offering of its kind directly into the global public capital markets. We believe bond markets represent an important source of capital for the airline industry in general and for Emirates in particular.

“We are very pleased to be the first airline to complete this innovative product. It could not have come at a better time for the airline industry.”

Goldman Sachs & Co and Cylon Securities acted as joint bookrunners and joint structuring agents. Clifford Chance represented Emirates as issuer’s counsel and Milbank, Tweed, Hadley & McCloy LLP acted as underwriters’ counsel.

New Falcon joins the Elite fleet

Dubai-based private jet operator Elite Jets has added a Dassault Falcon 900DX to its managed fleet.

The wide-body business jet has intercontinental range, acclaimed cabin comfort and remarkable

versatility – with unique safety and performance features.

“I am extremely pleased with our Falcon 900DX aircraft. In November 2008 Elite Jets received its first Falcon Jet, the 900B – and our clients truly enjoyed their travel experience on board,” said Ammar Balkar, Elite Jets

president and CEO.

The 900DX is approved to land or depart at London City airport and it performs well, especially in hot weather zones. It handles short runways and high altitudes virtually anywhere with ease, such as St Moritz in Switzerland or St Tropez in France and has access to

many smaller airports, which is especially valuable on remote multi-sector trips. Also, the three-engine configuration offers additional safety assurance.

According to the *Pocket Guide to Business Aircraft*, the Dassault Falcon 900DX comfortably seats 13 passengers in spacious

Parade tragedy of Iran's Simorgh

Iran's sole Simorgh AWACS aircraft was lost during a military parade on September 22 – one of two Iranian military aircraft that crashed in Tehran while participating in a display to mark the anniversary of the start of the 1980-88 Iran-Iraq War.

The Islamic Republic of Iran Air Force operated a single Simorgh, a former Iraqi Air Force Adnan. The Adnan AWACS was, in turn, a modification of a Soviet-built Ilyushin Il-76 transport.

The Simorgh collided with one of the Air Force's Northrop F-5E Tiger II fighters over the area of the Imam Khomeini Shrine, southern Tehran. According to eyewitnesses, the crash occurred immediately after the parade. Apparently, no mayday call was issued.

Both aircraft crashed in flames. Seven crew members were killed in the crash.

In total, Iraq built three AWACS aircraft, one Baghdad, and two Baghdad-2s, the latter later renamed Adnans. One Adnan and the Baghdad were evacuated to Iran during the 1991 Gulf War, while the second Adnan was destroyed on the ground by a coalition air strike in January 1991.

The exact status of the Iranian Simorgh and its onboard systems was long



EgyptAir ups its Boeing order

EgyptAir has converted a previous order for two Boeing 777s into one for an additional eight Next-Generation 737-800s.

The airline currently has seven 737-800s in operation and it is taking delivery of an additional five this year. It has five 777s in its fleet and is scheduled to receive six 777-300ERs at the beginning of next year.

"As a Star Alliance member, operating from a newly-opened ultra-modern, international terminal at Cairo International Airport, we are pursuing a fleet plan that allows us to expand our regional markets and offer those passengers extensive international routing options," said EgyptAir chairman Captain Tawfik Assy.

"We've found the 737 performs exceptionally well in maintaining our scheduled flights to and from Cairo and that the 777 is unmatched in efficiency on our long-haul flights to our international destinations."

uncertain. However, photographs suggest that the aircraft was equipped with a newly-fitted functioning radar suite.

Libyan fighter crash

A Libyan Air Force MiG-23 fighter jet crashed during a demonstration flight at Lavex, the third Libyan aviation exhibition. The aircraft crashed about two kilometres from observation platforms at the Libyan Aviation Conference & Exhibition,

which ran from October 4-8. According to reports from the Libyan press high ranking pilots died in the crash. It is understood that the MiG 23 was displaying as part of the 40th anniversary celebration of President Gaddafi.

The injured reportedly included three residents of the house where the crash occurred.

The house, located in the suburban Soug-Ejemaa district, was heavily damaged. Production of the "third-generation" MiG-23 started in 1970 and ended in 1985

with more than 5,000 aircraft built.

Etihad's new Emirati trainees

Etihad Airways' latest group of Emirati trainee managers have started their programme at the airline's headquarters in Abu Dhabi.

The seven men and four women, who come from across the United Arab Emirates, will spend the next 21 months training on the graduate management development programme.

This involves a nine-month work experience in key Etihad departments, followed by a placement with a specified team. The Etihad Airways scheme now boasts 134 cadet pilots, 42 graduate managers and 29 technical engineers.

Tornado's 40 years fly by

The aircraft that forms the backbone of the Saudi Arabian Air Force was the star at a special anniversary fly-past. The Tornado was 40 years old on September 15 and Panavia, the European Tornado Aircraft Consortium, and Turbo-Union, its sister aero-engine company, celebrated 40 successful years of the tri-national Tornado programme together with NATO agency NETMA. As well as Saudi, the aircraft is still a vital part of the operational capabilities of the UK, Italian and German Air Forces.

Gulfstream on schedule with G650.

Gulfstream is on schedule for the first flight of its new flagship aircraft – the G650 – following the first appearance of the ultra-large-cabin, ultra-long-range business jet at a special roll-out ceremony at the company's HQ in Georgia, USA. The aircraft rolled out under its own power.

First announced in March 2008, the G650 remains on schedule for customer deliveries in 2012.

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Masdar launches bio fuels research

The Masdar Institute of Science and Technology in Abu Dhabi is to work with Boeing and Honeywell to study the sustainability of a leading family of saltwater-based plant candidates for renewable jet fuel

The study is being commissioned as part of the Sustainable Aviation Fuel Users Group consortium. The Masdar Institute will lead the study, which will examine the overall potential for sustainable, large-scale production of biofuels made from *salicornia bigelovii* and saltwater mangroves – plants known as halophytes. Yale University's School of Forestry & Environmental Studies and UOP will also participate in the analysis, which will include an assessment of the total carbon lifecycle of biofuels

Halophytes can be highly productive sources of biomass energy. They thrive in arid land and can be irrigated with sea water, making them suitable for biofuel development with Abu Dhabi as a viable location for conducting a lifecycle-analysis study. With improved plant science and agronomy, early testing results indicate that halophytes have the potential to deliver very high yields per unit of land.

Livery paints a whole new picture

A military aircraft painted in the colours of a Gulf airline has begun operations in the region.

Boeing handed over the Qatar Emiri Air Force's second C-17 Globemaster III at the company's final assembly facility in Long Beach and the new livery created quite a stir.

The aircraft, designated



Airbus A320 is a first for Saudia

Saudi Arabian Airlines has taken delivery of its first Airbus A320, becoming the newest operator of the aircraft. It was acquired under a long-term lease agreement with ALAFCO.

The A320 will be deployed on regional routes from Riyadh, which could include Europe and the Indian subcontinent. Depending on configuration, the A320-200s, will seat between 120 and 132 passengers in two-classes. The aircraft are powered by CFM56 engines.

Saudia's A320 is the first to be equipped with a high-bandwidth in-flight entertainment system, making it an option on all Airbus aircraft for the first time. This means that passengers have access to high-speed interactive services such as full audio and video-on-demand.

Ahmad Alzabin, ALAFCO chairman and CEO said: "ALAFCO is proud to provide the first of 13 A320 aircraft entering into Saudia service on operating lease. ALAFCO has taken delivery of 10 A320-200 from Airbus so far in 2009."

Saudia, placed an order directly with Airbus for 22 A320 aircraft at the Dubai International Airshow in November 2007. Significantly, the agreement marked the first time in more than two decades that the airline had placed an order with Airbus. Previously, Saudi Arabian Airlines was the launch customer for the Airbus A300-600, which was delivered in 1984.

Qatar 02, is registered as a military aircraft yet bears the same grey, maroon and white livery seen on government-owned Qatar Airways commercial jetliners. This unique C-17 paint scheme – the first of its kind – is intended to build awareness of Qatar's participation in operations around the world, according to Brigadier General Ahmed Al-Malki, head of Qatar's airlift selection committee.

Al-Malki said: "The C-17s will help us extend our reach when supporting

humanitarian aid, disaster relief and peacekeeping missions."

Qatar is the first Middle East nation to order the C-17. "As a tactical and strategic airlifter, the C-17 is a perfect fit for the requirements of the Qatar Emiri Air Force," explained Tommy Dunchew, Boeing Global Mobility Systems vice president of business development. "In addition to being able to land and take off on short, unimproved runways, it has the highest mission capability rate of any

airlifter, which means it is ready to fly roughly 90 % of the time."

The United Arab Emirates announced earlier this year that it also will acquire four C-17s.

Marlborough extends portfolio

Aviation executive search firm Marlborough is now extending its reach into the tourism, leisure and hospitality sectors as well as creating two new divisions – Marlborough Interim and

Marlborough Consultancy. Marlborough Interim is a response to the growing demand to bring specialists on board quickly, for a short period of time, while a more thorough search is being conducted.

Marlborough has been advising clients for some time on issues well beyond executive search, including leadership development, executive coaching and management assessment, and has now put these extra services into a separate consulting division.


Alliance to deliver safety

Arabian Jets has signed a business alliance agreement with global airworthiness and safety consultancy AVISA, on aviation services in the MENA region.

The aircraft engineering consultancy has offices in Jeddah, Riyadh, Amman and Beirut and provides aircraft technical management, engineering and maintenance services, pilot training management and human capital building for airlines right through to single aircraft owners.

The alliance was signed in the AVISA UK offices by company MD Justin Goatcher and Anas Rayes, president of Arabian Jets. Both parties agreed to work together to deliver market-leading safety services to a growing and maturing industry throughout the MENA region.

Rayes, said: "AVISA was Arabian Jets' first and best choice to ally with in the MENA region. Service models that we developed during our intensive meetings and workshops target the support and empowerment of both commercial and private operators. Knowledge and skills transfer to local engineers are one of the very major advantages we both target in our strategic alliance."

An aerial photograph of a rugged, arid landscape. A dirt road winds through the terrain, with a white truck driving on it. In the background, there are several buildings, some appearing to be in ruins or under construction. The terrain is a mix of brown earth and sparse green vegetation.

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Why the UAE is right in protecting its shores and airspace

CASE FOR THE DEFENCE

*The Dubai International Air Chiefs Conference (DIAC), held on the sidelines of the Dubai Airshow, takes place on November 14. Organised by the Institute for Near East and Gulf Military Analysis (INEGMA), the event brings together leaders of the air force and air defence community from around the GCC and beyond. **Riad Kahwaji**, chief executive of INEGMA looks at one of the key talking points.*

The noticeable hike in defence expenditure in a few Gulf countries, specifically the United Arab Emirates (UAE), is very much related to continued concerns of a possible regional war between Iran on the one side and the United States and Israel on the other that might swirl out of control and drag in Arab Gulf countries.

While some countries in the Gulf littoral opted to deal with the threat of war through downplaying its possibilities and betting more on the success of diplomacy, others appear to have decided not to take any chances and to prepare for the worst.

Besides, the Gulf region has already witnessed three major wars in the past three decades, and hence the chances of another one in light of the current tension should not be

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ignored and ought to be anticipated and well prepared for.

Recent studies and surveys on global defence spending by international think tanks have placed the UAE high up on their lists. But little was done by these studies to indicate why that much was being spent now. Many media outlets and press reports have dealt with the issue in a superficial manner without addressing the subject in a logical and scientific way.

Strategic measures

National defence policies that dictate what procurement programmes would be needed for the country are based on several factors, like the national resources, population size, topography of the country, nature and size of borders, and identifying internal and external threats and ways of dealing with them.

Small Arab Gulf States have many commonalities:

- They lack strategic depth;
- They have a sizable shoreline on the western bank of Gulf waters facing Iran;
- They are rich in oil on shore and off shore;
- They have small populations;
- They have mostly flat desert landscape with clear skies and high temperature most days of the year;
- They house major Western business and some American military assets.

Lacking geographical depth and sizable manpower with the need to protect strategic assets scattered around the country – as in the UAE's case – requires the country to seek high-tech and top quality defence systems to make up for the existing disadvantages and extend an effective defence umbrella to all of the state's strategic assets and critical infrastructure. So it is qualitative edge that would make up for quantitative shortages in manpower, especially when facing a far bigger adversary.

It is imperative for the UAE to keep the Strait of Hormuz open, not just for the export of its oil and gas but also for the sustainability of import-export activities now it has become a major regional trade and business hub linking the Western world with Asia.

Being host to many huge multinational companies and some Western military assets (French and US) the UAE – and other Arab Gulf States – could find itself on the receiving end of Iranian ballistic or cruise missiles and could be the target of terrorist attacks by extremists sneaking in from the vast land or sea borders. Therefore, the UAE needs a robust border control system made up of cameras and sensors integrated together with a command and control centre and backed by fleets of reconnaissance airplanes and coastal patrol boats. In 2008, the UAE embarked

on a multi-million-dollar high-tech project to consolidate the security of its borders.

The UAE also needs a robust integrated missile defence system capable of achieving the following objectives:

- Track and intercept incoming ballistic missiles on all tiers – high, medium and low altitudes;
- Provide strong early warning from the minute the incoming missile is launched to allow maximum time to achieve interception;
- Provide a counter-force that allows the armed forces to go after missile launchers and other military targets of the adversary.

After at least ten years of studies and going over

All of the above systems would be suitable to give a small-size army a considerable deterrent posture, and a superior defence capability against air-borne and sea-borne threats plus terrorism.

The oil boom, prior to last year's economic crisis, has enabled the UAE to save enough monies to purchase the required systems. Even with the economic crisis, the UAE seems to have felt the pressing need to keep its military preparations, just in case of the worst, because getting caught off guard in a regional war would have more devastating consequences on the country than spending to be ready in advance.

Worldwide historical experiences have often proven that foreseeing possible threats and



“The UAE's decision to spend more on defence matches its heightened threat perceptions and appears to be directed towards meeting the threats it could be facing in the future.”

tenders offered by several international defence companies, the UAE opted, at the start of 2009, to select a full multi-tier system with a good early warning as well as counter-force capabilities.

It became the first foreign country to purchase the Theatre High Altitude Air Defence (THAAD) system for high-altitude (above atmosphere) interceptions, with the advanced Patriot PAC-3 missiles for low-to-medium altitude interceptions and advanced radars – airborne and land-based – for early warning.

Moreover, the UAE has just completed taking delivery of 80 F-16 Block-60 jetfighters that are operating alongside 60 Mirage 2000-9 warplanes, making the UAE Air Forces a formidable power with the capability to deliver a strong punch to any adversary using an array of highly-lethal and accurate stand-off weapons. The UAE is also procuring six multi-role Baynunah-class corvettes, built by Abu Dhabi Ship Building Company (ADSB), that will play a role in protecting the shoreline and the country's economic zone.

preparing well for them is always wiser, because it does not only provide a better protection in times of war, it also increases the confidence of foreign investors in the country.

Therefore, the UAE's decision to spend more on defence matches its heightened threat perceptions and appears to be directed towards meeting the kinds of threats it could be facing in the future.

Besides, the size of economic growth in the country – which was slowed by the international financial crisis but did not stop – also proves that defence spending has not been done at the expense of socio-economic development.

■ INEGMA is a globally-respected think tank based out of Beirut and Dubai. It was set up to provide governments, militaries, NGOs and commercial companies with a range of services in defence and security. Further details are available on www.inegma.com

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With decision time looming in a number of important fighter competitions, and with the aircraft appearing to be well placed in several of these, 2009 could yet be 'the year of the Rafale'.

Jon Lake reports.

D-DAYS FOR RAFALE

Quite apart from being the subject of real interest from potential export customers, Dassault's Rafale fighter bomber is making great progress in French air force (Armée de l'Air) and navy (Aéronavale) service.

When France left a collaborative European fighter programme to develop the Rafale, it did so because it wanted a smaller, lighter, cheaper aircraft than its former partners, more optimized to the air-to-ground role, and better sized for carrier operations and for export. As a result, today's Rafale is a smaller, lighter aircraft than the rival Eurofighter Typhoon, somewhat cheaper, and with greater emphasis having been placed on getting fighter-bomber capabilities into service early. As a direct result of this approach, the Rafale enjoys considerably greater maturity in the vital air-to-ground role than its closest rivals – the multinational Typhoon and Sweden's Gripen, whose air-to-surface capabilities still remain relatively modest.

The Rafale 'entered service' with the Aéronavale on December 4 2000 and became operational in

2004. The first Armée de l'Air Rafale squadron formed in the summer of 2006. The type has now made a succession of deployments to support operations in Afghanistan, with the Navy using the type on board a carrier for extended evaluation from 2002. This saw it flying limited escort and tanker missions in support of Operation Enduring Freedom during 2003.

Missions over Afghanistan

The first fully operational Rafale deployment was undertaken by three two-seat Armée de l'Air Rafale B aircraft, which were based at Dushanbe in Tajikistan from March until mid-2007, flying missions over Afghanistan. An Aéronavale Rafale M deployment was undertaken aboard the carrier Charles de Gaulle at the same time.

Since then there have been two deployments by single-seat Armée de l'Air Rafale Cs to Kandahar airfield in Afghanistan itself. The Rafale still has no autonomous self-designation capability and relies on laser designators on the ground, or

carried by accompanying Mirage 2000s. The primary weapon used in Afghanistan has been the 500lb GBU-12 Paveway II laser-guided bomb, four of which are usually carried with a pair of under-wing fuel tanks.

The first air force Rafale C deployment to Kandahar saw the initial operational firing of the new armement air-sol modulaire (AASM) bomb, an INS/GPS guided rocket-boosted missile. On April 19 2008, a Rafale operating from Kandahar fired two 250kg weapons at a Taliban bunker from a 10km stand-off range. A Canadian FAC on the ground transmitted the GPS coordinates of the target directly to the aircraft.

Back in Metropolitan France, March 2009 saw the inauguration of the Armée de l'Air's second Rafale squadron, EC 1/91 'Gascogne', which joined EC 1/7 'Provence' at St Dizier. The squadron will eventually operate in the nuclear strike role, using the ASMP-A missile, and will become operational next summer.

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With the French Defence Ministry eager to slow down deliveries of its own Dassault Rafales, in order to spread its spending on the aircraft over a longer period, the need to find export customers for this impressive and capable swing role fighter-bomber has become more and more pressing for the manufacturer. Rafale production has already been reduced from 14 aircraft annually to just 11 and, though French requirements remain at 294 aircraft (234 for the Armée de l'Air and 60 for the Aéronavale), only 120 have actually been ordered, and 82 of these will have been delivered by the end of the year. A further 60 aircraft order is expected, but unless it is placed soon, there could be a production gap.

Dassault hopes to win export orders to gain vital revenue, to maintain the most economically efficient production rate – which some analysts estimate at 18 aircraft per annum – and also to fund planned improvements to the aircraft.

After the disappointment of being rejected in South Korea, Norway, the Netherlands and Singapore, Rafale's export prospects now look very much brighter. The aircraft still looks well-placed to win an order in Brazil, though there was some frantic

back-tracking after a comment in September by president Luiz da Silva that Brazil would “enter final negotiations” to buy at least 36 Rafale F3 fighters. The Brazilian Defence Minister, Nelson Jobim, immediately issued a statement saying the air force would continue negotiating terms for the FX-2 contract with all three competitors, effectively denying that Rafale had already won, which had been the original impression.

Strong contention

The aircraft also remains in strong contention in Switzerland and India (where reports in April 2009 that the Rafale had been disqualified from the competition for not meeting minimum performance requirements were explicitly denied by the Indian MoD), and in Greece.

In the Middle East, an order from the UAE seems to be becoming increasingly likely. French president Nicholas Sarkozy claimed that the UAE Government was in discussions to buy the aircraft in June 2008. This June, Abu Dhabi's state news agency confirmed that: “The Government of France has received the technical and operational specifications required in the French Rafale jet fighter from the UAE Armed Forces in the

framework of the ongoing negotiations between the governments of the UAE and France.” Though no formal announcement is expected imminently, talks are understood to have reached an advanced stage, even including discussions as to the possible buy-back or onward sale of the UAE's existing Dassault Mirage 2000-9s, according to Dassault chief executive Charles Edelstenne. Military co-operation between France and the UAE has also intensified, and Armée de l'Air Rafales have already undertaken exercises in the UAE, operating from Base Aérienne 104 – the newly-opened permanent French military enclave at Al Dhafra air base.

The UAE is being assiduously courted by Dassault and the French government. UAE VIPs attended the first public air display by an Armée de l'Air Rafale earlier this summer and a model of Rafale was prominently displayed at the Paris Airshow carrying unique-to-the-UAE weapons configurations, including the Al Hakim rocket-powered precision stand-off bomb.

One problem facing Dassault is that the UAE requires capabilities that have long been planned for Rafale, but which are not yet available on Armée de

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l'Air aircraft, thanks to development delays and funding constraints.

The UAE wants an operational active electronically scanned array (AESA) radar, a helmet-mounted sight and display system, an advanced forward sector infrared search and track system, a laser designation/targeting pod, an advanced defensive aids system (DAS), and a full spectrum of air-to-air and air-to-ground weapons, including the MBDA Meteor beyond-visual-range air-air missile, and Scalp and Al Hakim ASMs.

Most of these improvements and enhancements are planned for French Rafales and work is already under way on the AESA version of the RBE2 radar, and on integrating the Damocles targeting pod. But integration of the Gerfaut helmet sight and enhanced OSF remain unfunded, and Rafale's Systeme de Protection et d'Evitement des Conduites de Tir du Rafale (SPECTRA) DAS remains some way short of its originally planned capabilities.

Integration of Meteor on the Rafale is currently scheduled to begin in 2013-14 for service entry in 2017-18, and though it has been suggested that this date could be brought forward if necessary, this could be too late for the UAE.

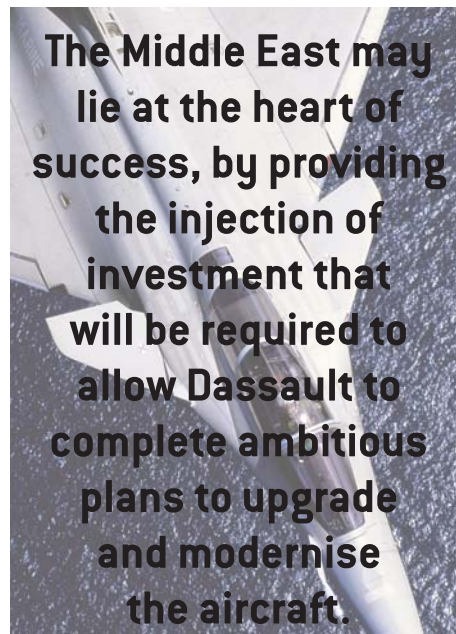
Missing feature

But the key 'missing feature' for the UAE is a more powerful engine. The UAE's requirement emphasizes long-range interdiction, and the air force is interested in operating the aircraft in some heavy configurations.

The Rafale has been criticized in some quarters for being under-powered, and the existing 75 kN SNECMA M88-2 engine may not be ideally suited for such configurations in the hot-and-high conditions that may be experienced in the Middle East.

The focus of engine development for the French military has been on improving costs of ownership and extending the time between overhauls under the M88-TCO programme, with blisks, single crystal turbine blades, ceramic coatings and a range of other advanced technologies. There is also an M88-X project, which does aim to increase thrust to about 88-kN, aimed at export customers. A test programme for this new powerplant, with a new high-pressure core, is already under way. SNECMA says that a production M88-X could be available within three years of a contract being signed.

But while an increased thrust engine is possible, the French government has made it clear that it has no requirement for such a higher-thrust powerplant and, therefore, will not fund the development programme, which has been estimated to cost €250-€300 million. This would mean that the UAE (and/or Brazil and/or India) would need to fund development of the new engine. This could be enough to scupper the deal, and it could make an alternative aircraft a better option, off-the-shelf, for the UAE.



The UAE might also be a customer for conformal fuel tanks – already flown in mock-up form – since these would allow extended range without using external stores stations to carry drop tanks.

A first delivery of the Rafale to the UAE would not be made before 2012, according to Edelstenne, and he estimated that the UAE Air Force would probably need about three years to train pilots to operate its new aircraft.

The UAE's interest in Rafale follows failed campaigns in Saudi Arabia, Morocco and Libya. In 2005 French newspapers reported that Saudi Arabia had agreed in principle to acquire up to 96 Rafales for a reported price of some €6bn following discussions between then-French president Jacques Chirac and Saudi Arabia's Crown Prince Abdullah, though Saudi Arabia subsequently confirmed its order for 72 Eurofighter Typhoons, and Dassault subsequently denied that there had been any offer or negotiations.

In June 2006, French press agencies reported that Morocco was expected to become the first export customer for the Dassault Rafale, with Saudi Arabia funding a €2.3bn (\$3.22bn) 12-18 aircraft package for the Kingdom. After initial optimism, it was acknowledged that the Rafale was 'out of the race' in late 2007, amid reports of poor co-ordination and contradictory pricing from the DGA and Dassault, with the French State Arms Agency trying to tie the Rafale deal to frigate and helicopter orders. Though it was reported that Morocco came "within an inch" of signing for Rafale, the Kingdom eventually bought 36 F-16s instead, at a reported price of \$2.3bn.

The next opportunity in the Middle East reportedly came in December 2007, when Colonel Muammar Gaddafi, Libya's head of state, visited Paris. The French newspaper *Le Figaro* jumped the gun and reported that Libya

had actually agreed to purchase 14 Rafales, but soon withdrew the story. Other papers reported that Gaddafi had merely signed an agreement to start negotiations for a €2.5bn (\$3.24bn) deal for 15-18 F3 standard Rafales.

This was a bilateral government-to-government negotiation and a Dassault spokesman denied that the company was in any negotiations with the Libyan government.

In March 2008 it was announced that commercial and technical negotiations had been "largely completed", but then it all went quiet. More recently, and perhaps coincidentally, on August 28 this year, three single-seat Armée de l'Air Rafales from St Dizier flew to Tripoli to participate in an Airshow commemorating the 40th Anniversary of the First of September Great Revolution of the Socialist People's Libyan Arab Jamahiriya – the coup in which Gaddafi seized power. The visit was described as demonstrating France's wish to reinforce its defence co-operation with Libya, but may also have been a barely concealed sales demonstration.

Dassault also claims interest in the Rafale from Qatar, Kuwait, and even Oman. Qatar, already an operator of the Mirage 2000, is probably the best prospect among these three Arab nations. The Rafale was reportedly offered to Qatar during high-level talks between Sheikh Hamad and French president Sarkozy, though the Lockheed Martin F-16 and Eurofighter Typhoon also remain in contention.

Serious consideration

In February 2009, Sarkozy announced that Kuwait was close to buying 14-28 Rafales to replace its Boeing F/A-18 Hornets – for delivery before the end of the year. Though Kuwait has operated French equipment in the past (including Mirage F1 fighters), and though Kuwaiti defence minister Sheikh Jaber al-Hamad al-Sabah suggested that Rafale was worth "serious consideration", due to its "high quality and advanced technology" nothing further has been heard, and Kuwaiti interest is believed to have turned elsewhere.

During the same visit to the region, Sarkozy also offered Rafales to Oman to replace its ageing fleet of SEPECAT Jaguars. This was an optimistic pitch, as Oman has for many years aligned its air arm with the Royal Air Force, and was already known to be working on a plan to buy Eurofighter Typhoons to meet the Jaguar replacement requirement.

Though Dassault has so far failed to find an export customer for the Rafale, all of that could change within the next few months, with decisions looming in Brazil, Switzerland and India. We could still see the type repeating the formidable export success of the company's Mirage fighter family. If so, the Middle East may lie at the heart of that success, by providing the injection of investment that will be required to allow Dassault to complete its ambitious plans to upgrade and modernize the aircraft, finally allowing it to fulfil its very considerable potential.

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TRANSF

BUSINESS AIRCRAFT SHOW ANOTHER FACE AS THEY LINE UP FOR SPECIAL MISSIONS



REPORT IAN GOOLD

The possible appearance of Lockheed Martin's Gulfstream III Airborne Multi-intelligence Laboratory (AML) at this month's Dubai Airshow follows the modified business jet's first military exercise supporting the US Army.

Planned as a sensor and data-processing testbed, the aircraft has already taken the eye of several possible customers, according to Lockheed Martin information systems & global services strategic programmes programme manager Charles Gullede.

Another of Gulfstream's business-jets, the G550, is seen as an alternative 'platform' for the technology.

The GIII, which has US Federal Aviation Administration airworthiness approval in the experimental category, carries an under-belly 'canoe' fairing, which houses a synthetic-aperture

radar and electro-optical/infrared sensor, while on-board systems provide communications, electronic, and signals-intelligence capability. Should the aircraft appear at Dubai, Lockheed Martin hopes to demonstrate it to one or more unspecified European governments.

The machine provides a graphic illustration of the different markets available for aircraft that had been originally conceived for business, corporate, and executive use.

Another example of such alternative application is Britain's ASTOR airborne stand-off radar ground-surveillance system, first seen at the 2006 Farnborough Airshow. This employs a Bombardier Sentinel R1, which is based on a Global Express corporate-jet 'platform'. The machine completed capabilities-assurance mission testing ahead of operational deployment this year. The Canadian airframe manufacturer,

ORMMAIRS



which claims to have produced more than 300 special-missions aircraft of all kinds, integrated all the new systems down to the level of electronics line-replaceable units.

The generic title special missions (SM) may cover a multitude of government, military, quasi-military, or utility duties, of which electronics-systems 'platform' is just one.

The perceived market has led business-aircraft manufacturers Bombardier and Gulfstream to establish dedicated business units, dubbed Specialized Aircraft Solutions (SAS) – formerly Government and Special Mission Aircraft Department (G&SMAD) and Special Missions Program Office, respectively, to promote military variants.

With the prospect of good money to be made from both provision of the original airframe and possible related maintenance and logistics support contracts, many other aerospace

companies, including Cessna, Dassault, and Embraer, have entered the market.

It is much less expensive to adapt an established airframe than to originate a design for possibly a relatively modest production run. Such commercial off-the-shelf arrangements typically cover aircraft already certificated to a high standard of reliability with normal systems that may be maintained by engineering personnel the world over without special training.

Of course, the resulting aircraft, after modification, may bear little resemblance to the original model, when all manner of drag-worthy protuberances have been added, along with multiple antennae and various humps and bumps. And that is without considering possible major internal changes to accommodate more sophisticated instruments and equipment.

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A key requirement for an effective military SM aircraft is the integration of command, control, communications, and computers (C4) and intelligence, surveillance, and reconnaissance (ISR) airborne capabilities.

Their roots as established jet or turboprop business-aircraft programmes means SM variants offer military end-users a combination of modern equipment, advanced systems redundancy, and low down-time levels, according to one manufacturer.

Nevertheless, such programmes involve serious airframe changes to accommodate all the avionics equipment to support related radar and sensing systems.

Special missions require special equipment, says Bombardier. The Canadian manufacturer claims it has the expertise to integrate and install complex systems, including forward-looking infrared (FLIR) and other radars, counter-measures and secure communication systems.

With eyes very firmly on military requirements, a broad-ranging February 2009 Teal Group special-missions report divided the market into six segments: air surveillance, bombers, electronic warfare, ground-surveillance/command, maritime patrol/antisubmarine warfare (ASW), and tankers. Teal Group analysts point out the over-arching budgetary realities that influence the sector. "These diffuse segments suffer one unifying problem – special-mission planes are often among the last to receive funding."

Low-cost alternatives

They cite, for example, the 1990s' airborne early warning/airborne warning and control system (AEW/AWACS) market. "Just four 'high-end' planes were sold (to Japan). Everybody else either deferred their requirement, or opted for low-cost alternatives."

Another challenge for manufacturers hoping to convert turbine-engined business aircraft for alternative military special-mission roles can be inter-service rivalry. "The recent fracas over the US Army's Aerial Common Sensor program was complicated by the question of whether the Army was getting into Air Force turf."

Business aircraft have been used for non-VIP flying since the earliest days of the genre. Indeed, the longest-serving aircraft in Britain's Royal Air Force (RAF) are British Aerospace 125-based Dominie T1s used to train navigators, air-electronics operators, and air engineers since the mid-1960s.

The Cessna Citation, the world's most-popular business jet, has found its way into the special-missions market as, likewise, has the Hawker Beechcraft King Air; by far the most popular business aircraft – jet or turboprop.

Learjets have been used in military service since 1965, when the US Air Force (USAF) began to fly Series 23 aircraft. Dassault Falcon 20s have provided airways calibration services for the French, Indonesian, Iranian, and Spanish governments.

TRANS How aircraft

■ BOMBARDIER

Bombardier claims its SAS business unit meets aircraft and mission systems' requirements, whether needed to gather information over battlefields, patrol oceans, or monitor navigational systems. In 1996, it set up the original G&SMAD unit. In SAS guise, inaugural deliveries comprised the first of five Global Express-based Sentinel aircraft for the RAF under the UK ASTOR programme and a CL-604 Challenger to the Korean National Maritime Police Agency (KNMPPA).

Bombardier has also provided the Royal Danish Air Force with a CL-604 Challenger, ordered to replace earlier Gulfstream SMA-3s employed on exclusive economic zone and fishery-protection duties. Available SM modifications include air-operable door, observation windows, drop hatch, launch tubes and emergency equipment. Overall, more than 300 aircraft have been delivered to more than 35 governments for SM duties.

■ CESSNA

Cessna says its ubiquitous Citation series is perfectly suited to test and evaluate navigational aids. The manufacturer also promotes it for other utility or SM roles such as aerial imagery, airline crew training, medevac, and surveillance and patrol. Cessna sees the Citation XLS as "an excellent platform" for flight-inspection work, continuing an application previously performed by the Citation V. Such markets have included China and Turkey.

■ DASSAULT

French manufacturer Dassault supplied the US Coast Guard (USCG) with 41 Falcon 20-based HU-25 Guardian aircraft, which entered service in 1982 and have only this year begun to be replaced by EADS/Casa HC-144A turboprops. The HU-25s provided maritime patrol, SAR, contraband interception, and (occasional) executive transport service. The aircraft sported large port and starboard observer windows and employed crews of five, comprising pilot, co-pilot, two observers, and avionics operator (to work radar and radios).

Other military operators included the French Navy, which accepted the first of four Falcon 50M maritime-surveillance aircraft in 2000. As an SAR platform, it can drop eight 30-passenger rescue buoys in a single operation. Falcon multi-role SM aircraft also are used for maritime surveillance, target towing, medevac, and navigation-aid

calibration. Around 200 various Falcons have been produced for multi-role special-mission operations.

■ GULFSTREAM

US manufacturer Gulfstream Aerospace's Special Missions Program Office works with governments and defence contractors to meet specific national requirements, co-ordinating aircraft modifications and integration of mission equipment.

A subsidiary of General Dynamics, Gulfstream provided Gulfstream V (GV)-based special electronic mission aircraft (SEMA) for use in the Middle East in 2005. It was awarded the SEMA contract in November 2001 and development was undertaken with partners that included Lockheed Martin (selected to perform necessary aircraft structural modifications) and Garrett Aviation (aircraft interior design).

More than 30 countries operate SM Gulfstream corporate jets, including the Japanese Air Self Defense Force (JASDF), which flies multi-purpose Gulfstream IV-MPA aircraft (designated U-4s) to perform three different mission roles: medevac, high-priority cargo, and passenger. Domestically, Gulfstream has delivered five GVs to the US government (as C-37s) and other similar machines to Middle East customers, such as the government of Kuwait and the Kingdom of Saudi

Arabia – the latter a dedicated medevac aircraft. One USAF C-37A is assigned to disaster-relief operations and another to quick-reaction missions.

Other customers outside business aviation include the US National Science Foundation, which operates a GV, and the US National Oceanic and Atmospheric Administration (GIV).

■ HAWKER BEECHCRAFT

By far the most active in the SM market among current business aircraft manufacturers has been Hawker Beechcraft – in its earlier Beech and Raytheon iterations. The company reports having delivered almost 3,000 SM aircraft since the 1960s.

The Beech King Air 90 series made its debut in 1964 and was wearing US military uniform within two years, followed in 1975 by the King Air 200. Hawker Beechcraft has supplied King Airls for maritime surveillance/search-and-rescue, flight inspection/airways calibration, photo-graphic/survey, and reconnaissance/intelligence missions.

The King Air 350 entered service with Japan's Ground



The Global Express is the platform for Raytheon's ASTOR programme.

FORMAIRS

manufacturers adapt



Gulfstreams are used for special missions around the world.

Self Defence Force in 1999, equipped for reconnaissance and communications; the Royal Australian Air Force is using King Air 350s for navigator training, while the Australian Army has such aircraft for command and control, communications support, and surveillance.

■ PIAGGIO

Italian manufacturer Piaggio Aero claims versatility, reliability and advanced technology make its P180 Avanti II the "ideal aircraft for delicate, crucial missions". In special-mission mode it is used for patrol, photo-detection and civil and military flight inspection. The configuration is used by military and government agencies for air-ambulance, surveillance, and coastal defence and patrol duties.

Continued
on Page 32

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CONTINUED FROM PAGE 31

■PILATUS

Swiss manufacturer Pilatus offers its PC-12 Spectre for multi-mission surveillance by military or government agencies. More than 900 PC-12s have been delivered and the Finnish Air Force has been the most recent of more than 30 military customers to select the aircraft.

Soon after its launch, the special-mission aircraft was promoted at the 2003 Dubai Airshow. Offered roles include medevac, cargo services and search-and-rescue. Operators range from the Royal Canadian Mounted Police Air Services to Australia's Royal Flying Doctor Service.

■TBM INTERNATIONAL

French manufacturer Daher-Socata unveiled a multi-mission aircraft (MMA) version of the TBM 700 and 850 business turboprops at this year's Paris Airshow. It is equipped with a retractable Thales Agile 2 gyro-stabilised turret, holding up to four sensors (such as infrared and electro-optical systems or laser rangefinder and/or designator to mark targets) for reconnaissance, surveillance, and intelligence operations.

Sample non-VIP roles played by business aircraft

■MEDICAL EVACUATION

Gulfstream says that its widebody corporate jets can be configured for medevac operations with the cabin laid out for several litters for mass-casualty evacuation. A medevac Gulfstream G400 can hold 12-14 patients in standard NATO litters, plus three medical attendants and supplies. Alternatively, there is an intensive-care configuration. Further, full surgical facilities are available for critically ill patients. The manufacturer has developed an air-transportable patient-loading system in co-operation with medical equipment suppliers.

The JASDF GIV-MPA was fitted with a 5ft X 6ft cargo door to meet Japanese Defense Agency medevac requirements. Saudi Arabia also operates a special-mission Gulfstream IV-SP equipped for medical evacuation.

Bombardier customers for medevac-convertible aircraft include: Quebec Government (CL-601 Challenger), Rega Air Swiss Ambulance (three CL-604 Challengers), Irish Air Corps (Lear 45XR), Canadian Global Air Ambulance (Lear 35A), and Saudi Armed Forces Medical Services (Lear 35).

By the end of this year, Egypt's Smart Aviation will have received two Cessna Citation Sovereigns configured for medevac work with Cairo-based Smart Aviation. The aircraft are being equipped to carry LifePort single or dual-patient systems under a supplemental type certificate.

Dassault delivered its first Falcon 20 air-ambulance in 1967 to Europe Assistance, which is said to fly hundreds of medevac flights every year.

The extraordinary section of the Avanti II cabin, the largest in its segment, provides large space for the health operations and boarding of patients. The perfect pressurization is able to maintain sea level up to a flight altitude of 24,000 feet, away from turbulence.

■HOMELAND SECURITY

Terrorism attacks against the USA in 2001 led to an additional role for USCG HU-25s. Homeland security operations have included infrastructure inspection of, say, bridges, as well as



Medical evacuation or flying hospital duties are a common conversion for business jets - this one is in service with Saudi Arabia.

checking ports and watching arriving ships more closely in so-called 'maritime domain awareness missions'.

The introduction of FLIR in 2002, to create the HU-25C+ variant, gave the USCG the ability to identify vessels from longer range. Also, flying at greater altitude and more stable power settings improved fuel efficiency and extended flight duration.

■FLIGHT TEST AND R&D

Turboprop and jet business aircraft have been pressed into service as flight-test platforms for R&D. For example, one RAF Dominie was operated for many years in trials such as wind-shear investigation and sound attenuation. A pair of Dassault Falcon 20s were supplied to the French Air Force for use as test beds for weapons and radar system research.

■MARITIME PATROL AND FISHERIES PROTECTION LAW ENFORCEMENT

The Piaggio Aero P180 Avanti II is designed for maritime surveillance activities for government agencies protecting the land-use, illegal immigration, smuggling and illegal traffics. The monitoring of territory is effected by means of a FLIR/TV Camera (Forward Looking Infra Red) installed on the lower part of the fuselage.

Arizona's Phoenix Police Department Air Support Unit expects to introduce a Pilatus PC-12 Spectre next year. It will be used for surveillance, transport, and extradition. The UK has also used its long-serving BAe Dominies for short-range maritime patrol, while the Japan Coast Guard has flown FLIR-equipped Gulfstream Vs to counter incursions by North Korean craft into Japanese waters.

Similarly, USCG HU-25 Guardians have been used to enforce local fisheries laws throughout the US 200-mile

economic exclusion zone. Radar-equipped HU-25Cs performed drug interdiction operations.

■AIRCREW TRAINING

Customers currently using Bombardier aircraft as flight-training platforms include USAF, with Lear 35s, and Singapore Airlines, which has a small fleet of Lear 45s.

In 1965, Air France introduced Dassault Falcon 20s for intensified flight training. With as many as five landings an hour, these represented particularly high-cycle operations. Similar use was made by Japan Airlines and French airworthiness regulator DGAC.

■TARGET TOWING

Since 1992, Learns have been used in Germany to tow targets for the armed forces, replacing jet fighters. The service is provided by EADS subsidiary GFD, which operates nine Lear 35As and two 36As that fly about 500hr/year and also are used for target simulation, electronic-warfare (EW), fighter-guidance training and other special missions. The French Air Force has used a Dassault Falcon 20 as a target tug and also contracts services from GFD. A Falcon 20 was supplied to the French Air Force for similar target-towing duties.

■ELECTRONIC WARFARE

Seven of the GFD Learns have been equipped for EW training with provision for under-wing jamming pods and a third crew member. Dassault supplied EW-equipped Falcon 20s to Morocco, Norway and other countries.

■ENVIRONMENTAL PROTECTION

Use of business and utility designs in environmental-protection duties has included USCG operations with HU-25B Guardians to detect pollution. Crews look for evidence of

SPECIAL MISSIONS

oil and hazardous chemical spills, their natural-resource protection responsibilities including enforcement of marine environmental laws and the protection of marine mammals and other endangered species.

In Germany, GFD also uses one Lear 35A on behalf of universities, other research agencies, and Enviscope, which produces environmental measuring equipment used to investigate the ozone layer. The aircraft has been modified to permit the taking of samples and other environmental measurements.

A Falcon 20 has been equipped with special measuring equipment such as visible-light, ultraviolet, and radar cameras for resource exploration.

■ CALIBRATION AND FLIGHT INSPECTION

Testing of navigational aids and landing systems is another essential role provided by aircraft initially developed for business use.

Bombardier examples include: US Federal Aviation Administration (Lear 60, and CL-601 and CL-604 Challengers); Japan Civil Aviation Bureau (Global Express); government of Malaysia (Lear 60) and Nav Canada (CL-601 Challenge).

Ordered for delivery this year, two Turkish government Cessna Citation XLS aircraft will be used by the country's General Directorate of State Airports Authority (DHMI) to inspect airport navigation aids. The aircraft, which replace two Citation Vs acquired for special-mission purposes in 1993, are modified to include flight-inspection calibration equipment produced by Norwegian Special Missions.

■ METEOROLOGICAL MISSIONS

Dassault has supplied Falcon 20 equipment for use as a West German government special weather-research aircraft. Four years ago, Gulfstream delivered a special-mission GV to the University Corporation for Atmospheric Research (UCAR), while a GIV-SP is used by the US National Oceanic and Atmospheric Administration to track hurricanes.

■ SEARCH-AND-RESCUE

Among business-jet operators conducting search-and-rescue duties has been the Japan Coast Guard, which introduced a pair of Dassault Falcon 900s in 1979 for flights up to 1,200nm offshore. In such operations, the US Coast Guard flew its Falcon 20-based Guardian aircraft at 500ft, descending to 200ft and slowing to 130kt if needing to drop safety or other equipment to ships or people in distress.

■ PHOTOGRAPHIC SURVEY

France, Canada, and several other nations have used Falcon 20s for high-altitude photographic survey operations.

■ INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE (ISR)

In March 2007, the Iraq Government ordered five King Air 350ERs for ISR against a total requirement for 24 aircraft. Last November, the US Air Force ordered 23 King Air 350ERs and took options on six more.

Other special-mission non-VIP duties performed by business-jets include border control, disaster relief, and navigation and military training.

Why Rohde & Schwarz stands the test of time

Rohde & Schwarz, the huge Munich-based electronics group celebrating 75 years in the business, is one of the world's largest developers and manufacturers in civilian and military arenas.

It has a considerable presence in the Middle East and Africa, with both sales and service locations throughout the region.

The group provides test and measurement (T&M) equipment for mobile radio, general-purpose electronics, and microwave systems; transmission and T&M equipment for TV and sound broadcasting; secure communications for armed forces, government authorities, and industry; and frequency management and radiolocation equipment for internal and external security.

Wherever signals need to be generated or analysed, high-quality audio equipment measured, or the spectrum analysed, Rohde & Schwarz has the necessary equipment.

Worldwide, more than a billion mobile phones are sold each year – and around half of them are developed and produced using T&M equipment from Rohde & Schwarz.

Rohde & Schwarz maintains development centres in the USA, Korea, China, Singapore, Denmark, France, and the UK, while its main production and manufacturing sites are in Germany, with an additional factory in the Czech Republic.

“Our worldwide success is possible only because people with top training and a lot of commitment like to work for us,” said company chairman Michael Vohrer. “At Rohde & Schwarz they can apply their creativity and skills each day on the job, and develop



Rohde & Schwarz is adding the new DVB-T2 standard to its portfolio of T&M and transmitter systems. The global market leader in terrestrial transmitters can now provide the critical support that network operators and manufacturers of broadcasting equipment need to enable the successful transition from the DVB-T standard.

them further.”

Security organisations and the military need to exchange information efficiently and securely so the company supplies interoperable and powerful communications systems to help ensure the prompt co-ordination of civil, government, and military forces.

More than 200 international and national airports use the company's radios for air traffic control, while its Professional Mobile Radio subsidiary has supplied terrestrial trunked radio (TETRA) networks to more than 30 countries, including those used in the Moscow metro, the Panama Canal and at large sporting events such as the Asian Games in Qatar.

In the field of crypto products and systems for industry and governments, the company has supplied both the German armed forces, and NATO.

Qatar closes in on turboprop deal

Indonesian Aerospace (IAE) is in negotiations to sell its CN-235 military twin-turboprop to the Qatar Emiri Air Force. An Indonesian special envoy is expected in Doha around the time *Arabian Aerospace* goes to print to conclude the deal, according to the Indonesian ambassador to Qatar.

IAE manufactures both tactical transport and maritime patrol versions of the CN-235 and it remains to be seen which variant the Qataris are buying.

The emirate's air arm is in the middle of an initiative to give itself a substantial transport capability, with Boeing having handed over two C-17 Globemaster strategic transports in August and a deal for four Lockheed Martin C-130J Hercules under negotiation. The tactical transport version of the CN-235 would slot in below the C-130J, providing a light transport capability for regional sorties.

On the other hand, buying the maritime variant would be a logical step that follows the example of the UAE Air Force, which announced earlier this year it is converting two Bombardier Dash 8-300s maritime patrol configuration to cover the busy Arabian Gulf sea lanes.

Qatar has a major export trade in liquefied natural gas and Iran's regional naval ambitions – particularly its use of modern Russian Kilo-class submarines – is known to be a concern to other Gulf states.

IAE could not be contacted for details of the proposed deal.

Airbus Military has two major products in the pipeline, and the Middle East could play a significant role in their fortunes. Mike Martin looks at progress on the A400M military transport as it closes in on first flight and, in the next article, the Multi Role Tanker Transport (MRTT) once more doing battle for a \$40 billion contract.

LIFT-OFF?

A400M GETS MIDDLE EAST BOOST

An unnamed Middle East country is ready to “enter into contract negotiations” for the purchase of the Airbus A400M military transport as soon as it is a few months into its Flight Test Programme (FTP).

It’s one of several items of good news in a programme that has been hit by development problems resulting in serious delays. Other welcome news for the Airbus Military teams in Spain are the expectation of a renegotiated contract with the body representing the European launch customers, and the first flight of the A400M now expected by the end of the year.

Despite the travails in delivering the programme, the “airlifter of the 21st century” has already excited the market, according to Peter Scoffham, Airbus Military head of defence capability marketing.

“There is terrific interest. To date some 36 nations have had a look at it and a large number have said they are seriously interested as soon as it has got some way into the FTP,” he said.

“One particular nation in that area (the Middle East) has said that once we have got four to six months into the FTP they want to start contract negotiations.”

With the Middle East becoming something of a

hub for humanitarian relief operations, he added that the A400M’s capability in that area was one of its strongest selling points in the region.

The vigorous marketing campaign conducted over the past two years has been hampered by the delays to the programme, which has created uncertainty over delivery slots.

Marketing activity

“For the last two years, marketing activity has raised the visibility of the aircraft around the world,” said Scoffham. “However, there was a limit to how far we could take the conversations. While we were sorting out the technical challenges, we could not guarantee times or dates. Nor did we know how much money was involved in resolving the problems.

“From the customer point of view, if you don’t know the costs and the timing of availability, there is only so much you can talk about. Now, we are in negotiations with the launch nations and, hopefully, they will be concluded by the end of the year. Only when that is concluded and the new delivery dates for the launch nations is decided will we know what delivery slots are available for additional customers.”

The European launch customers – Germany with 60 orders, France (50), Spain (27), UK (25), Turkey (10), Belgium (7) and Luxembourg (1) are represented by the joint cooperation organisation for armament (OCCAR) currently renegotiating the original contract, which is expected before the end of the year, said Rafael Tentor, head of the A400M programme. In addition, South Africa has ordered eight aircraft and Malaysia four.

“In July, all European joint launch nations renewed their commitment to the programme,” he said. “They established a prominent team in Toulouse (the Airbus headquarters). We are in permanent dialogue and we are down to the details. We expect to have a new contract. We are really positive and optimistic that the negotiations are going well.”

He declined to go into details because of a non-disclosure agreement with OCCAR, nor would he comment on reports that the cost of the aircraft had risen from €110 million to €145 million.

The technical issues that have dogged the aircraft development had now been resolved, he said. The Full Authority Digital Engine Control (FADEC) system had been a problem, he said, but it had been resolved.



“We expect the final software release this week. We are confident that we will have software in line with our target for a first flight by the end of the year,” he said.

Final steps towards first flight include an audit on the FADEC system, and low and high-speed taxi trials.

“Our target is to have the aircraft in the air before the end of the year. At the moment we are on target and our confidence is increasing every day.”

He added that the second (MSN2) and third (MSN3) aircraft for the FTP are scheduled for first flight in the first quarter of next year and the summer respectively.

He said: “We are not only working for tomorrow: we are developing a standard for the next decades. This aircraft uses the most advanced technologies, deriving benefits from programmes like the (Airbus) A380.”

The engine, built by Europrop International (EPI), a consortium of Rolls-Royce, SNECMA, MTU and ITP, has now undergone more than 3,150 hours of testing.

The engine is the most powerful turboprop built in the West and will enable the A400M to

achieve speeds of .72 mach, close to that of a jet-powered aircraft. It’s just one of the features of the aircraft that give it huge flexibility, said Tentor.

“This aircraft does the job of three aircraft,” he said. “It is a logistical airlifter, a tactical transport and an aerial refueller.”

Launched in 2000, the A400M is designed to carry out both tactical and strategic/logistic missions and is able to fly fast or slow and at high or low altitude.

Humanitarian relief role

Its useable fuselage (18 metres long x four metres x four metres) enables it to carry an NH90 or CH-470 Chinook helicopter, or two Stryker infantry-carrying vehicles in its military role. Operating in its humanitarian relief role, it can carry a semi-articulated truck with a 20-foot container, or a rescue boat, or large items of plant such as excavators or mobile cranes.

Airbus said that it is the only airlifter that can deliver its cargo straight into the action thanks to its “unique” landing characteristics. Its 12-wheel main landing gear is designed for operations from stone, gravel or sand strips.

On the ground, the aircraft is designed for very

rapid and autonomous unloading or loading, without specialised ground support equipment. With on-board winches and crane, the cargo hold is optimised for single loadmaster operation based around a computerised workstation.

Its speed characteristics also enable it to drop supplies from low altitude on to a very limited surface.

The A400M has a range of 4,700nm (8,700km) at a cruising altitude of 37,000 feet. Able to be refuelled in flight, the range can be extended.

Operating when configured as a refueller, the A400M can refuel military fast jets at 25,000 feet and 300kt or helicopters at 110kt at 5000ft. Refuelling is via two wing pod hoses or through centreline hose and drum unit.

Its operational versatility means the aircraft can also serve for paratroop operations at both high or low altitude. Special forces drops from as high as 40,000 feet can be carried out, or 116 fully-equipped paratroopers can be dropped two at a time, either from the rear ramp or through special side doors.

Little wonder that the aircraft’s first flight is eagerly awaited.

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The Airbus MRTT could have a role in the Gulf forces.

Airbus Military confident on \$40bn tanker contest re-run

When the United States government slaps a 35 % import duty on Chinese-made tyres, what chance does the European contender have for a high-tech, high-profile programme like the US Air Force (USAF) KC-X tanker one now being re-run?

An excellent competition, according to off-the-record comments from the Airbus Military team behind the A330 MRTT (Multi Role Tanker Transport) contender.

The A330 MRTT won the \$40 billion competition for 179 refuelling aircraft the first time around. However, rival Boeing, offering a product based on its 767 aircraft, protested and the result was annulled on a number of technicalities.

The competition has now been re-launched and Airbus Military, which is teamed with Northrop Grumman, is quietly confident that its offer will prevail once again.

“We know that our competitor will lobby hard at a political level to promote its own product and it will play the economic nationalism card,” said one insider. “We will point out the US economic content of the A330 MRTT and, above all, that this was the aircraft that the US Air Force wanted and, we believe, still does.”

Meanwhile, Airbus Military is progressing on work for the firm orders that it has for the A330 MRTT, including two from the Middle East. The Kingdom of Saudi Arabia has ordered six aircraft and the UAE three and may be interested in taking more, according to Peter Scoffham, head of defence capability marketing for Airbus Military.

“The UAE has ordered three aircraft and there might be more,” he said. “Discussions are under way.”

The USAF competition aside, Scoffham believes there is a world market of some 40 – 50 tankers in this category. Airbus Military also has orders for 14 aircraft from the UK and five from Australia.

Miguel Morell Fuentes, head of military derivatives programmes, said: “We are going to get all of this market. If we don’t have any competition, then we will get all of the orders. Today, we do not have any competition.”

The Airbus Military team revealed that the UAE is alone in choosing to have all its (current) three aircraft converted at the Airbus Military base at Madrid. Other purchasers will have

their initial aircraft converted at Madrid before completing conversions of subsequent aircraft on their home soil.

Both the Royal Saudi Air Force (RSAF) and the UAE Air Force are scheduled to take delivery of their first A330 MRTT in 2011. In the case of the RSAF, the first aircraft was due to arrive in Madrid for conversion this month. The next five aircraft will be converted in Saudi Arabia. The first aircraft for the UAE Air Force will arrive in Madrid for conversion in January 2010, with the other two also scheduled for conversion in Madrid.

While Airbus Military is confident of securing more orders for the A330 MRTT – it is in discussions with France, among other potential buyers – the big prize is the re-run USAF KC-X competition.

Since the original competition was run, the world has gone through economic turmoil and the siren voice of economic nationalism has been heard in some quarters in the United States.

On the eve of the re-launched KC-X competition, US president Obama slapped 35 % import duties on Chinese-made tyres in what was seen as an unwarranted protectionist move.

Despite that, the Airbus Military team remains confident at the prospects for the A330 MRTT the second time around. “Which car are you going to buy?” asked Fuentes. “The model that is no longer in production or the one that is in production and which has the latest technologies and which is cheaper?”

The A330 MRTT is based on the best-selling commercial A330 aircraft, which has logged more than 1,000 orders to nearly 100 customers. Airbus Military said that this network ensures “easy and swift” technical support for the military variant.

It offers a 36,700 US gallon fuel capacity, compared to 23,000 gallons in the VC-10 and 24,000 gallons in the KC-767A and can refuel any receiver either via wing pods or its in-house-designed Aerial Refuelling Boom System (ARBS) fuselage refuelling unit.

The ARBS was developed by Airbus Military and offers a fuel transfer rate of 1,200 gallons per minute. The boom operator is co-located with the flight crew in the cockpit and uses a three-dimensional viewing system during refuelling operations.

“We will point out that this was the aircraft that the US Air Force wanted and, we believe, still does.”



The T129 took to the skies for the first time in Vergiate, Italy.

T129 goes on the ATAK

Turkey has moved a step closer to fielding its next-generation attack helicopter with the first flight of the T129 prototype.

The P1 prototype helicopter made its maiden flight at AgustaWestland's Vergiate facility in northern Italy on September 28. The aircraft was piloted by AgustaWestland and Turkish Aerospace Industries (TAI) test pilots, marking the culmination of months of preparations by the joint industry team.

Under the banner of the 'ATAK team', TAI is operating as prime contractor and is working alongside two key sub-contractors – fellow Turkish company Aselsan and AgustaWestland – to deliver a contract for 50 T129s under the Attack/Tactical Reconnaissance Helicopter requirement of the Turkish Land Forces Command (TLF).

The firm orders for 50 T129s is worth in excess of €1 billion to AgustaWestland and this could increase further if Ankara exercises an option for a further 41 aircraft as part of the agreement.

Project gathers pace

AgustaWestland says the programme is on time and budget. As the project gathers pace, a dedicated T129 facility was opened at AgustaWestland's Cascina Costa base on the outskirts of Milan recently. The facility will act as a focal point for development activities on the T129 and is already staffed by 70 Turkish and AgustaWestland integrated team technicians. A similar team is working in the TAI facility near Ankara.

As part of the T129 programme, Turkish industry will be responsible for the integration of high-tech avionic equipment, hardware and software, which will be developed locally. A proportion of design, development and production work will also involve Turkish aerospace companies. For example, Aselsan will develop and produce the mission computer and targeting, navigation, communication and electronic warfare systems.

Speaking at the first flight ceremony, Muharrem Dortkasli, general manager of TAI, said: "It is a great privilege to be here today to witness the first flight of the T129. This will become the most advanced helicopter in its category, so satisfying the requirements of the land forces, as well as making it very appealing to the international market – an international market in which the Turkish industry will play a primary role.

"It has been a long journey for us to come to this point. We

Result of TUHP duel due by 2010

Turkey is expected to announce the winner of its long-running Turkish Utility Helicopter Programme (TUHP) competition by the end of the year.

The 100-plus aircraft order is being contested by Sikorsky, with a T-70 variant of its UH-60 Black Hawk and AgustaWestland, which is offering the TUHP 149; a Turkish dedicated customised variant of the latest addition to its product range, the AW149.

AgustaWestland announced in May at IDEF in Istanbul that it was to offer the TUHP 149 and that it would seek to replicate and even further expand the partnership with Turkish industry that already exists on the T129 ATAK programme. If selected, the partners would include TAI, as well as Aselsan, Tusas Engine Industries, Roketsan and Havelsan. The 8.1t TUHP 149 would be capable of transporting up to 18 fully-equipped troops.

If selected, the move would be significant for AgustaWestland, as it would then have a major export customer in place for the AW149, which was announced at the Farnborough Airshow in 2006.

The TUHP competition was launched in 2005 and a decision on the acquisition of 54 helicopters was expected in late 2007. The requirement was raised to 84 helicopters and later to the current 109 aircraft.

are proud of the success the ATAK team has generated; a success which I am sure will be followed by many others."

AgustaWestland chief executive Giuseppe Orsi underlined the importance of the industrial partnership behind the programme: "It gives us great pleasure to celebrate today the first flight of the most modern combat helicopter in the world," he said.

"This event sets a major milestone in our long-standing partnership with Turkish industry and provides clear evidence of how effective this collaboration has been in jointly developing a state-of-the-art all customer-focused solution designed and brought to life in an extraordinary timely manner.

"Today the Turkish aviation industry enters a new era at the forefront of rotorcraft technology. We are committed to further expanding such a successful co-operation in the future."

Further prototype deliveries are next on the agenda for the ATAK team, with P2 and P3 due to be delivered in 2010. P4, the first TAI aircraft, is scheduled to be delivered to TAI early in 2010 for final assembly in Turkey. This aircraft will be used to achieve military certification for the full T129 configuration.

First production helicopter

Aircraft P4 will then be delivered to the Turkish Army as the first production helicopter. The programme also includes a second TAI assembled prototype, P5, which will fly in 2011.

The AgustaWestland AW129 International was selected as the platform for the ATAK requirement in March 2007. Contract signature and contract effectiveness took place in September 2007 and June 2008 respectively.

AgustaWestland has been strengthening its presence in Turkey in recent years, with the opening of a regional office in Ankara in May 2008.

The company has forged a long-standing collaboration with Turkey that dates back to the early 1960s. Supply contracts have since been agreed with the Turkish Land Forces, the Turkish Air Force, the Turkish Navy as well as the Turkish Gendarmerie. Almost 230 helicopters have been delivered to date.

TAI is already closely involved in one of AgustaWestland's key product lines, the AW139, for which it delivers fuselages at the rate of approximately three a month. TAI has delivered more than 80 fuselages so far.

Experience & Innovation



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Time and Place

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Registration

From 10:00, 15 November, until 09:30,
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Conference on the Web:

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< Sharjah boosts its M171 fleet with new deal

Russian Helicopters is to deliver 20 Mi-171 helicopters to Sharjah-based Airfreight Aviation Ltd next year. The move follows a contract signing between the Ulan-Ude Aviation Plant – the manufacturer of the helicopter – and Airfreight Aviation, which is creating a regional service centre for Russian-made helicopters operated in the Middle East, Iraq, and Afghanistan.

The Middle East is a booming market for the Russian Helicopters joint venture. Manufacturing enterprises within its framework have signed contracts with the Sharjah operator for a total of 70 Mi-171s over the past two years. A new joint venture between Russian Helicopters and Airfreight Aviation Ltd will handle service and maintenance.

“This contract has greatly boosted our presence in the region,” said Andrei Shbitov, Russian Helicopters chief executive. “Our next step is to establish a joint service and maintenance venture for Russian-made helicopters. Russian Helicopters is aiming at moving from selling its products proper to selling the entire lifecycle of its products.”

The Mi-171 has a proven track record in countries with difficult operational environments. It is reliable and easy to maintain. This makes it particularly attractive for operators in the areas like the Middle East, where more than 100 Mi-171s are already successfully employed.

Russian Helicopters is an affiliated company of UIC Oboronprom and is the managing body of helicopter manufacturers such as Mil Moscow Helicopter Plant, Kamov, Ulan-Ude Aviation Plant, Kazan Helicopters, Rostvertol, Progress Arsenyev Aviation Company, Kumertau Aviation Production Enterprise, Vpered Moscow Machine-Building Plant, Stupino Machine Production Plant, Reductor-PM and Helicopter Service Company (VSK).

Russian copter wins EASA approval

The European Aviation Safety Association (EASA) has certified the all-weather multi-role Ka-32A11BC helicopter for operation in EU countries – a move that could see increased operations in MENA activities too

EASA has issued type certificate EASA.IM.R.133 for the Ka-32A11BC that will allow any EU operator to commercially fly the Russian helicopter.

The Ka-32A11BC is designed by Kamov, a company integrated into the Russian helicopter industry holding managed by Russian Helicopters, and is built by the Kumertau Aviation Production Enterprise, also part of the holding.

The helicopter boasts trademark Kamov coaxial rotors and is fit for a variety of tasks, including transportation of people and loads, high-rise construction, patrolling, and search and rescue operations.

Before type certification by EASA, several Ka-32A11BCs were operated by EU countries for fire-fighting and mountain electric lines assembly pursuant to a Specific Airworthiness Specification.

The EASA.IM.R.133 type certificate has opened the skies of EU states for the Ka-32A11BC, lifting limitations for commercial operation by private European companies. Until now the Ka-32A11BC had been at the disposal of state institutions only.



^ Eurocopter signs Kazakhstan deal

Eurocopter has signed a cooperation agreement with Kazakhstan's sovereign wealth fund SAMRUK-KAZYNA to create a public-private joint venture in the country to develop helicopter activities

The deal was signed during the official visit of French president Nicolas Sarkozy to Kazakhstan in October.

The project, which includes both European and Kazakh partners, was launched as part of the strategic agreement signed between France and Kazakhstan. The purpose of the joint venture is to transfer skills and knowledge to local partners in order to develop a fully integrated and

independent helicopter service industry in Kazakhstan.

Parent company EADS said the new agreement demonstrates Eurocopter's long-term commitment to the Kazakh government and its people, and also reflects the strategic position of the country in Central Asia and its potential for economic growth.

Nearly every product in the Eurocopter range is already present in Kazakhstan in the public and private sectors and in the oil and gas industry. An agreement was also signed with a local operator to open the first maintenance centre in the Almaty region.



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Not your normal boardroom scene: senior Arab airline executives participated in a traditional dance ceremony at the official opening of the AGM in Jeddah. Right: Top trio at AACO, secretary-general Abdul Wahab Tefaha, director-general of Saudi Arabian Airlines and outgoing AACO chairman Khalid AIMolhem and incoming chairman Hussein Massoud, chairman and CEO of Egypt Air Holding Company, face the media following the conclusion of the AGM.

'The worst year in the history of air transport'

There is light at the end of the economic tunnel but more work is needed to remove obstacles that are preventing the Middle East airline industry from moving forward, CEOs and senior officials from more than 20 Middle East airlines heard at AACO's annual meeting.

While AACO members had weathered the crisis better than airlines elsewhere around the world, said the organisation's secretary-general Abdul Wahab Tefaha, he called for governments to let go of the reins of political and economic control and allow consolidation between carriers.

And delegates were warned that continuing improvements in passenger numbers would be worthless if continuing price competition meant that yields suffered.

In his annual report to representatives of the 24-member organisation, Tefaha said 2009 would go down as the worst year in the history of air transport. Having endured six troubled years from 2000 due to factors including earlier economic downturns, the 9/11 terrorist attacks, the SARS epidemic and the Iraq war, the global industry had enjoyed just one year of positive results (with even those compromised by skyrocketing fuel prices) before the global recession had struck, he said.

This had allowed it insufficient time to build up financial reserves to ward off the current economic crisis. This had "thumped the air transport industry into an unprecedented decline". And, although there was light at the end of the tunnel, carriers had still to emerge from the darkness.

The effects of the global recession and the thorny problem of climate change unsurprisingly featured high on the agenda of the 42nd AGM of the Arab Air Carriers Organisation (AACO), held this year in Jeddah, Saudi Arabia from October 17-18. Alan Dron reports.

Concern over Amman terminal

Both Tefaha and Bisignani expressed concern at the situation in Amman, where the Jordanian government had signed an agreement with concessionaire AIG to build a new terminal at Queen Alia International Airport.

Once operational, the terminal's charges could be increased by AIG without reference to the airlines using it and 54% of the gross revenue would go to the Jordanian government, thus making the country's airline regulator a business partner of the concessionaire.

Speaking on the sidelines of the AGM, Tefaha said he would rather have the government owning and operating the airport, or acting purely in the regulatory role with AIG running the airport. "The mixed solution agreed in Jordan really confuses people. Where does the regulator's role stop and the operator's role begin?"

Work was continuing, he added, on measures to allow mutual approval of engineers, mechanics' licences and maintenance centres throughout the region, with talks having been held with the Arab Civil Aviation Commission. Progress on the issue was not as swift as one would hope.

Turning to the Arab world, he said the industry suffered from major structural problems. Despite the advent of the Damascus Convention on the liberalisation of air transport in the region, its measures were rarely applied. There had been no real fundamental changes in easing barriers to cross-border mergers and acquisitions. The Arab Economic Summit in Kuwait had emphasised the importance of implementing agreements such as the convention and AACO hoped that this would be the first step on the path to a unified transport market.

On the problem of global warming, Tefaha emphasised that AACO members had to present a united front, together with their national governments, when attending December's UN Copenhagen conference on climate change. Moves were under way to comply with the European Union's planned emissions trading scheme, although AACO objected to it; he emphasised that the preferred way forward was through a global environmental scheme through the International Civil Aviation Organisation (ICAO).

That point was taken up by

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The Jeddah years: How the AACO members have grown

This year's AGM was the fourth to be held in Jeddah since AACO's inception in the 1960s.

The growth of the region's air transport sector can be measured by the size of the organisation members' fleets and number of passengers carried in the years in which the AGM visited Saudi Arabia's main commercial hub.

In 1972, Arab airlines transported 10 million passengers on a combined fleet of 88 aircraft. By the second Jeddah AGM in 1982, figures had more than doubled, to 23 million passengers on 217 airliners. In 1999 they had risen to 45 million and 452 aircraft while, this year, AACO members are en route to roughly 105 million passengers on board 730 aircraft.

Protest planned over Yemenia crash

Secretary-General Teffaha announced that AACO intended to protest to the European Commission at the "ill-treatment, bordering on prejudice" shown against Yemenia following the crash of one of its Airbus A310s off the Comores Islands on June 30 that killed 152 people.

Officials of one EU nation, which he declined to name but which is known to be France, had started to issue statements critical of the carrier within hours of the tragedy, he said. A series of statements and comments had been made attacking Yemenia, despite the fact that it was the first fatal accident involving the carrier in its almost 50-year history and that the airline had passed its IATA Operational Safety Audit, an internationally accepted evaluation system that assesses a carrier's operational management and control systems.

AACO had generally good relations with the EU but such negative allegations could harm the close aviation relations that existed between the Arab world and Europe, said Teffaha.

Following the accident, the European Commission also asked Yemenia for an update on its pre-existing safety improvement programmes.

Yemenia had AACO's full support, he added.

According to news agency AFP, Yemenia has threatened to cancel a \$2 billion order for 10 Airbus A350s if France's "harsh" position remains unchanged.

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International Air Transport Association (IATA) director-general Giovanni Bisignani in his overview of the global and regional airline sector. The stakes at Copenhagen for the airline industry were very high, he commented. "Failure to address aviation effectively could cost us tens of billions of dollars in uncoordinated economic measures, taxes and charges."

Like Teffaha, he argued the way forward was through ICAO. It had already shown it was competent to handle major environmental issues through its "tough but fair" measures to reduce aircraft noise. There were a few weeks before the Copenhagen summit. In that time, airlines had to deliver a united message to their national governments: "Give us a global sectoral approach under ICAO and we will deliver on even tougher targets than those set by our regulators," he promised.

IATA's members had also shown they were capable of rising to the challenge, he added. The organisation's environmental strategy had already saved nearly 70 million tonnes of carbon emissions and reduced members' fuel bills by \$13 billion.

So far this year IATA's 'Green Teams' had helped 73 airlines implement best practice in fuel efficiency, with six Middle East airlines having saved \$80 million. And, by working with governments and air navigation service providers

AACO leads the way in emissions software

Twelve AACO members will be the first to deploy the world's only emissions monitoring software. The equipment, developed by air transport IT specialists SITA to monitor the amount of global-warming carbon dioxide, will become operational next month.

It will come after extensive testing of the Aircraft Emissions Manager, a piece of software designed to measure both carbon emissions and fuel burn in tonne-kilometres to comply with the EU's forthcoming carbon emissions trading scheme.

The initial stage of the scheme calls for airlines to submit a baseline measurement of the amount of carbon dioxide. From this will be calculated the amount of carbon dioxide allowances which are allocated to each airline and how many credits it will have to buy from the EU to cover the excess.

worldwide, 244 air routes had been shortened, seven of them in the Middle East.

A good example of this progress involved Jeddah. Co-operation between Saudi Arabia and Jordan had led to the opening of T559, which shortened travel between Amman and Jeddah, and on to Sana'a and Aden, by up to 10 minutes, saving 9million kg of CO2 in a year.

Describing the Middle East as "an oasis of good news for the industry" amid the current economic turmoil, he noted that in the first eight months of 2009 passenger demand in the region had risen by eight % while capacity had expanded by 13 %. However, he warned that this growth had still not translated into profitability and some airlines in the region were still in the red.

While total losses for carriers in the region this year were likely to halve compared to 2008, they would still amount to around \$500 million. "Growth is good but if it does not generate profits, the business is not sustainable in the long term," he said.

There were encouraging signs: the region's wide-bodied fleet would grow by eight % this year, in line with demand growth, while aircraft utilisation in the region was improving when carriers elsewhere were adjusting capacity by using their fleets less efficiently.



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TREBLE CHANCE

The three selling points that hold the key to Saudi airline nas's survival in the low-cost carrier market. Alan Dron reports.

Budget airlines have come only recently to the Arabian Gulf but the marketplace is rapidly filling up. Air Arabia, Jazeera Airways, flydubai and Sama are among those fighting it out for market share in the region.

Whether all survive remains to be seen. A year ago, however, it seemed likely that one early casualty would be nas air. The first Saudi budget carrier's future seemed doubtful after a poor start following its February 2007 launch.

Fleet utilisation was low, load factors were worse. And astonishingly, the airline published schedules only a month in advance, making it difficult for passengers to book ahead.

Things began to change after a new top management team came on board last autumn; statistics have started to move in the right direction, aggressive expansion plans have been drawn up and passenger feedback has improved markedly since spring 2009.

While there is still work to do, there is a new optimism at the Riyadh-based airline.

A senior member of the new management team, chief commercial officer Dr Maria-Angelika Hanne, puts many of the problems of the past down to many of her predecessors coming from legacy or state-owned carriers that did not face the same pressure to be profitable as budget airlines.

An indication of the problems facing nas air before the owners changed the management team

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Like many Middle East airlines, nas air recruits cabin crew from a wide variety of nationalities. It has had success in attracting Saudi men to the positions.



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comes from the fact that fleet utilisation was just 6.2 hours daily, services between city pairs operated at different times from day to day and, in 2008, it flew just 500,000 passengers.

Today, utilisation is over nine hours (with 11 hours targeted for next year), schedules are not only published for a year ahead but have been expanded to give more frequent (often daily) services between city pairs and Hanne anticipates carrying 1.4 million passengers in 2009.

The airline has three main selling points, she explains: a brand-new fleet (its eight Airbus A320s and four Embraer 190s have an average age of just 10 months); on-time performance; and low prices.

She makes the point that nas air is not a 'full-on' low-cost carrier (LCC) like Southwest or Ryanair. Rather, it sits somewhere between the LCC model and full-service airlines.

She prefers to describe the airline as a 'budget carrier' that has some LCC attributes, such as one-



Initial plans for nas air were that the fleet would grow to 18 aircraft by the end of 2010. A new strategic plan for the period out to 2014 was due to be finalised as *Arabian Aerospace* was going to press and this figure may change, said Hanne, but she described the figure of 18 aircraft as "still realistic". Similarly, the airline's initial projection of carrying its 10 millionth passenger by the end of 2010 is still feasible, she believed.

Expansion will require more pilots and cabin crews. Like many airlines in the region, nas air draws its personnel from many nations. "The Saudi Arabian government would like to encourage Saudi nationals to join the workforce and we're very eager to get nationals who fulfil our requirements.

"We have a lot of Saudi pilots, while our cabin crews come from several Arabic-speaking countries such as Egypt and Tunisia." Staff from nations as far afield as Brazil, India and Bulgaria are also employed. The Kingdom's social conservatism means Saudi women are not



Nas air's chief commercial officer, Dr Maria-Angelika Hanne, has a history of helping to turn around faltering airlines.

class seating, while avoiding many of the charges now commonly imposed by LCCs for services such as carrying baggage in the hold or priority boarding. The only additional charge made by nas air is for food and drink served on board.

Indeed, the airline operates an unusually generous baggage policy, with international passengers allowed to check in 30kg. This is to take account of local travellers' habits – particularly for those departing from Jeddah following the Haj or Omra pilgrimages, who tend to carry a lot of gifts for family and friends.

Another difference with LCCs is that while the Saudi carrier accepts it is a point-to-point airline, passengers buying two tickets can connect through its network of routes.

That network has been extensively strengthened in the past year. Most destinations now have daily or double-daily services. The airline's busiest sector, Riyadh – Jeddah, has four daily return flights.

The network has also been expanded with new domestic and international destinations. Seven new points have been added this year so far – Dammam, Damascus, Latakia, Assiut, Sharm-el-Sheikh, Sana'a and Kuwait.

The next new destination will be Khartoum at the end of this year or the start of 2010, followed by flights to as yet undisclosed destinations in India and Pakistan. Other Middle East destinations are also pencilled in, with the airline looking at Iran and Iraq in the longer term.

"We're growing aggressively," said Hanne. "We're also turning round our image and the perceptions of our customers. We're getting a lot of very positive comments – they weren't so good six months ago." Load factors are also increasing and are now around the 66 % mark, with routes to the airline's three Egyptian destinations – Assiut, Sharm-el-Sheikh and Alexandria – among its busiest. Beirut and Damascus are also popular.

Among the domestic sectors flown are several Public Service Obligation routes (PSOs) that the Saudi government transferred from flag-carrier Saudi Arabian Airlines in October 2007.

These are not subsidised by the government but, in operating them, nas air at least now has access to the same preferential fuel rates granted to the national carrier for domestic routes. Discussions are continuing for government financial support for the PSOs.

employed in these roles, but Saudi men have been joining the ranks of the cabin crew.

Social attitudes in The Kingdom change slowly, but the younger generation are more willing to take on roles that previous generations might have dismissed, she explained. "We have some very good young Saudis who are quite promising. Especially in ground operations, we have a lot of Saudis and I think their attitude in general has become more 'international'."

Differences in culture mean that "you can't apply 100% European or US management methods, because the ways of communication are different. They're not quite so direct and everything is handled on a more personal level. You need to discuss issues from several points of view and several times. Communication is a challenge and a very important task here."

Hanne accepts, however, that just as the new management team have had a steep learning curve to turn the airline around, existing staff have also had to cope with changes. It is still relatively unusual to find a senior female manager in an Arab airline: "The learning curve has also been on their side, but I think everyone has adapted very well to having me as a boss!

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Mahan proves that charity begins at home

It's not often that a charitable organisation starts an airline. It is even less often that such an airline becomes an international carrier spanning two continents. That, however, is precisely the story behind Mahan Air, currently the third largest airline of the Islamic Republic of Iran.

In the early 1990s, the businessmen behind credit co-operative Mol Al Movahedin became increasingly frustrated at the lack of air services between Tehran and their home province of Kerman by national carrier Iran Air.

They felt strongly that Kerman's economic development would be hindered unless more flights were provided. They decided to take the matter into their own hands. The carrier that emerged from their efforts, Mahan Air, was Iran's first private airline. It is now number three in Iran and anticipates taking over the number two slot from Iran Aseman Airlines in the near future as it continues to grow, according to director of marketing and route development Hossein Hosseini.

From its first flight between Tehran and Kerman in 1993, Mahan Air has grown steadily. Its first international route, to Damascus, opened in 1994; it carried its millionth passenger in 1996 and began flights to Dubai, one of its busiest sectors, two years later. Passenger numbers on the Dubai and Bangkok sectors became so great that the airline served them with Boeing 747-400s.

Hossein Hosseini:
Expanding very rapidly in the domestic market.



- Mahan comes from the Farsi word meaning 'great'
- Mahan Air flew 2.7m passengers in 2008, 60% of them international.
- The bulk of its fleet comprises various models of Airbus A300s and A310s. Two Boeing 747-300 Combs and three -400s handle the busiest routes, while two BAE146-300s are used for short-haul domestic sectors.
- Its HQ is at Tehran.

The airline's initial equipment consisted of two Tupolev Tu-154s, but its expansion really began to accelerate with the arrival of Airbus A300s in 1999 and it carried its 10 millionth passenger in 2006.

In recent years it has expanded both west and east. Flights to Duesseldorf cater largely for business traffic in winter with more VFR (visiting friends and relatives) trade in summer, while Bangkok is a popular destination for German tourists.

Flights between the UK and Iran have never been the heaviest-travelled of sectors, but Hosseini said Mahan Air has found a market among the large Indian population from the English Midlands, who fly out from Birmingham and transit Tehran en route to one of Mahan Air's main Asian destinations, Amritsar. And, like their German counterparts, UK tourists have started to use the Iranian airline for onward flights to the Thai capital.

Haj flights to Saudi Arabia are another major source of passengers.

The Iranian domestic market is a

major one (13m passengers in 2008) and Mahan has tapped further into this in recent months by adding three new domestic destinations – Awaz, Bandar Abbas and Zahedan – to its internal network, taking the total to 12.

Hosseini said the company is gaining a reputation within Iran as a modern, attractive airline with a good safety record (it has never had a crash) and is expanding "very rapidly" in the domestic market.

Despite its good safety record, however, it found itself banned from the UK in summer 2007 after two incidents of abnormally low approaches to Birmingham airport. It was then banned from European Union airspace in September that year for not meeting EU safety standards. Hosseini accepts that these had to be brought up to modern levels, but notes that EU inspectors have confirmed that the necessary corrections have been made and the airline was given a clean bill of health in July 2008. Flights have since resumed to Germany and the UK.

Plans to expand

Internationally, Mahan Air has major plans to expand. Over the next six months it intends to start flying to Shanghai, Almaty, Kabul and Erbil.

Over the years, said Hosseini, the usual pattern of expansion has seen Mahan Air prepared to take on a new route, even if it is not initially completely viable. It will start the service, then work hard at improving load factors and yields. Typically, a year of expansion will be followed by a year of consolidation. It has been a controlled, disciplined process, he explained.

One thing that concerns him about the regional marketplace is the rapid growth of airlines in some other Gulf nations, such as Qatar and Abu Dhabi. "We think they are just buying aircraft, then trying to find destinations. That will really disturb the market in a very bad way, because there is so much capacity," he said.

Mahan Air is not exposed to the full force of what he described as this "uncontrolled expansion" because to some extent it operates in markets that are niche, or appeal particularly to Iranian customers who are prepared to pay for the benefit of direct flights to destinations, rather than transiting some of the better-known airports in the Gulf. For these reasons Mahan Air does not have yield problems, said Hosseini.

Expansion is also underway on the ground: in 2008, Mahan Air opened a new catering facility employing 600 people capable of producing up to 24,000 meals a day for both itself and other airlines. And a new maintenance centre is currently being fitted out at Tehran's Imam Khomeini Airport that will be capable of handling five wide-bodied aircraft simultaneously when fully operational.

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CIVIL AVIATION AFFAIRS

Alan Peaford reports from Beijing where planners from airports, airlines and tourism authorities come head to head.

Conference en route from Beijing to Abu Dhabi

Middle East airports and airlines were the newsmakers at September's 17th World Route Development Forum – the event that brings carriers together with tourism authorities and the airports that serve them.

One big announcement revealed that Abu Dhabi Airports Company (ADAC) has been named as the host organisation for the 18th World Forum in 2012.

This is excellent news for ADAC. World Routes is one of the most significant networking and development events on the aviation calendar, with over 200 airlines and more than a thousand delegates from airports and tourism authorities from all over the world attending. The event was held in Dubai three years ago and was seen as an ideal way for Dubai Airports to showcase the country and the airport infrastructure to the people who matter.

For ADAC it will be the same. HE Khalifa Al Mazrouei, the ADAC chairman, said: "World Routes is a key event for us and an important part of our overall strategy to deliver Abu Dhabi suitable airline connectivity. Abu Dhabi is the perfect location to host such an important industry event. It has strong aviation and tourism sectors that are benefiting from further investment and are significant contributors to the local economy.

"World Routes Abu Dhabi is expected to attract more than 3,000 delegates from around the world and will provide the ideal opportunity to showcase the extraordinary economic transformation under way as well as the progress on the iconic Midfield Terminal Complex at Abu Dhabi International Airport, which will increase airport capacity to 40 million passengers per year."

The airlines were at Beijing in force and a senior Etihad official used the occasion to urge governments not to pull up the shutters to counter the financial crisis and to press ahead with liberalisation of airline markets.

Speaking at the Global Strategy Summit, which was part of the World Route Development Forum, Etihad vice president of international affairs Vijay Poonoosamy said he feared the global recession was prompting some governments to put air liberalisation on hold, or in some cases, move backwards.

"The case of liberalisation for our industry is compelling to me, to most, but sadly not to all," he said. "Some countries are putting up the barriers, not just in air transport, but in other sectors as well.

"We need to encourage governments to look at the bigger picture, at the long-term national interests," he said, urging them to think beyond protecting national carriers who may be struggling during the tough economic slump. "Protecting them from competition will not guarantee they will improve, it might put them on life support for a bit, but the country might actually be cut off in the long-term."

Poonoosamy also urged governments to use tourism and travel as a driver to help stimulate economies. "The world needs aviation. It remains a catalyst for social economic growth," he said. "These are exceptionally challenging times. We must do all we can to boost national economies by boosting travel and tourism. Let's scrap national policies that put taxes and charges on travel. Let's unleash the power of travel and tourism."

The role of the tourism authorities was also raised and Bahrain's key delegate at the World Tourism and Air

Services Summit, on the sidelines of the World Route Development conference, was keen to insist that they should be even more involved.

Airport and tourism authorities around the world have no choice but to work hand-in-hand to develop their cities as major destinations, said Sayed Mohammed Mehdi, director of marketing and promotion at Bahrain International Airport.

"We cannot operate independently; we must work together and cooperate to develop the business," he said.

Mehdi said success also hinged on fully understanding three "whats" related to airport proposals and the route development process. "We must know what and where the destination is, what drives traffic to that destination, and what are the economics of flying to the destinations," he said. Only by fully understanding this can they attract airlines and increase passenger traffic, he added.

Tourism authorities must also spend more time collecting data on



Vijay Poonoosamy: "The case of liberalisation for our industry is compelling to me, to most, but sadly not to all. Some countries are putting up the barriers, not just in air transport, but in other sectors as well.

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tourism, meet local airports, airlines and aviation stakeholders, and actively participate in proposals to airlines to help develop destinations and routes.

"People ask what came first – tourism or air services. Different people say different things when you ask them, but there is no correct answer. They ultimately go hand-in-hand," he added.

This year's event proved to be the largest in the Routes Forum history. Hosted by Capital Airports Holding Company, more than 200 airlines were among the 2,500 registered delegates. There were also up to 1,000 airport representatives, including those from Queen Alia in Jordan, Kuwait Airport, Abu Dhabi, Dubai, Bahrain, Ras al Khaimah and Cairo.

Visitors also included a large Chinese contingent, with more than 800 delegates. After a difficult time, there were clear signals from both the Chinese airlines and the government that the regional carriers are now ready to expand again with several new routes between China and the Middle East coming on to the agenda.

The attendance from tourism authorities was also stepped up, with 75 represented. Mike Howarth, chairman of Routes said: "Tourism authorities are becoming more involved in the route development process, increasingly providing financial support for key services which will underpin important tourism revenues. In short: they are now moving up the supply chain and following the same path as airports a decade ago."



Air Arabia sets the date for new Sharjah hotel

Air Arabia, the first and largest low-cost carrier in the Middle East and North Africa, has announced that construction of its 300-room three-star Centro Hotel at Sharjah Airport will be complete by April.

The property will be managed jointly by Air Arabia and Rotana Hotels under the innovative Centro by Rotana brand. It includes both standard rooms and suites, offering comfort and convenience for business and tourist travellers passing through one of the region's fastest-growing airports.

"The hotel is a key element of Air Arabia's expansion strategy," said Group CEO Adel Ali. "It will offer a superior-class accommodation and genuine Arabian hospitality and we are pleased that, despite challenging economic conditions, the project is on track and will be ready to welcome guests next year. In addition to enhancing the services offered by Air Arabia, the

hotel will also strengthen ancillary revenues. We are confident that Centro will further improve the hospitality and experience at Sharjah Airport." Features will include a full casual-style dining area, in-room wireless internet connectivity and entertainment, and a range of personal amenities, gymnasiums and swimming pools. There will also be business facilities, such as private meeting rooms and business centres.

In the first five months of 2009, passenger traffic at Sharjah Airport reached 2.33 million – up by 11% compared to the same period last year. According to the 2008 World Airport Traffic Report released by Airports Council International, Sharjah International Airport saw annual traffic growth of 22.1% in 2008, and was ranked third among the world's 25 fastest-growing airports.

"These statistics indicate how popular the hotel will be in the emirate and further boost its economy," added Ali.

RAK Airport Your Gateway to Possibilities

Ras Al Khaimah Airport is gearing up as a **cargo and logistics hub** for the **Northern Emirates**. Each day free and special economic trade zones within Ras Al Khaimah generate approximately **70 tons of inbound and 110 tons of outbound airfreight**. This airfreight is currently handled through other ports, however with RAK Airport's investment in a new cargo terminal and favorable relationship with RAK Customs to support the exports from RAK Airport, this trend is slowly changing. Airport management is aggressively working with customers to design solutions including **sea-air and road feeder services**, that best use currently underutilized resources at the airport and ensure local industry and manufactures are support by a world-class service just kilometers from their front doors.

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LOADING UP

In the past few months the worldwide freight market has taken a nosedive with many areas reporting huge drops in demand. However, the Middle East is moving in the opposite direction, reporting growth.

Terry Spruce reports

The Middle East region airports and airlines are reporting increases in the freight market. Airports like Ras al Khaimah, cargo divisions like Emirates SkyCargo and airlines like MNG Airlines are bucking the downward spiral and reporting rises in demand.

The differences in demand are striking with year-on-year figures in August 2009 for the Middle East region up three per cent while Europe is down 14.5% and North America down 12%.

Middle East airlines are ordering new freighters while European carriers are putting newly-delivered freighters into storage. What is it about the Middle East and North Africa that is having this effect?

Michelle Soliman is the first female CEO at Ras al Khaimah (RAK) airport and is overseeing a large development there, with all areas of air transportation growing – from business jet operations to passengers and air cargo.

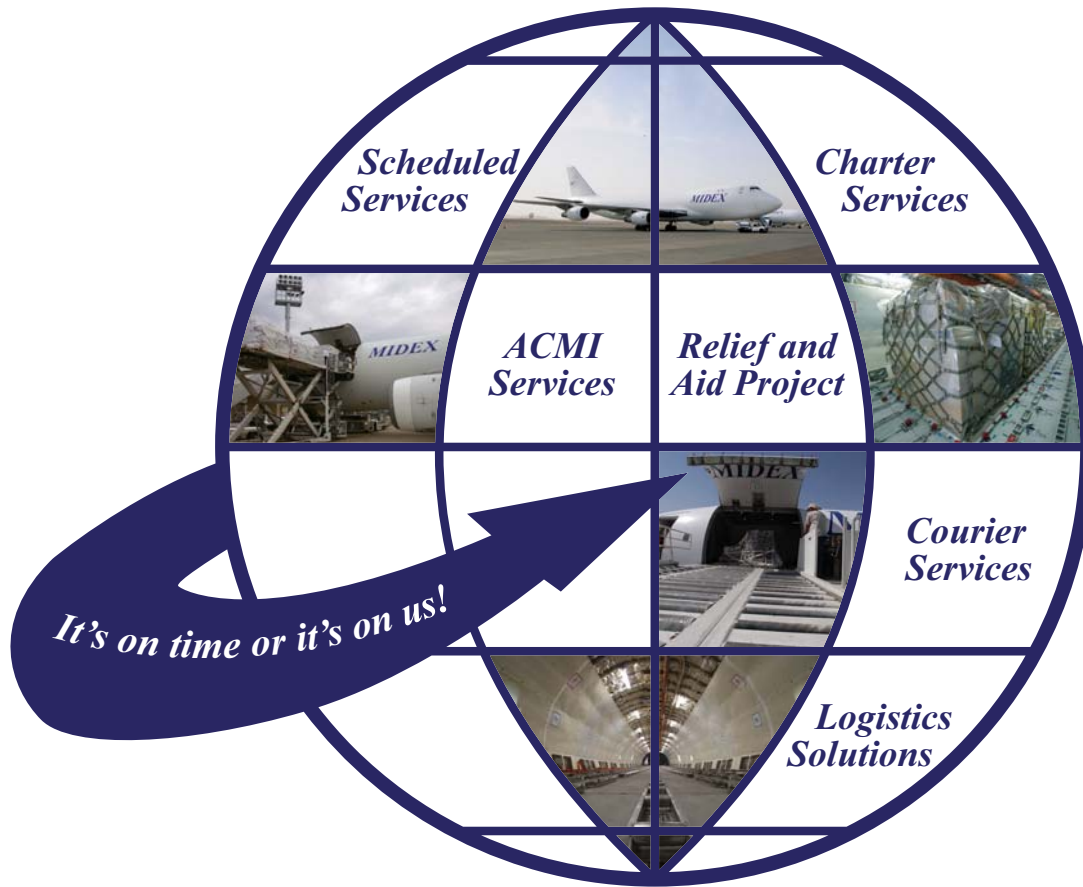
She knows the reasons why airlines are using RAK as opposed to other airports in the region?

“RAK Airport has the advantage of being less congested than many others, geographically positioned closer to many key markets and nearest to the sea port of Khorfakkan,” she said.

Continued
on Page 54



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CONTINUED FROM PAGE 53

"We have in-house expertise to help develop logistics solutions for our customers with special emphasis on sea-air products. We provide a professional and customized service to our airlines and are committed to ensuring their success. Development of air freight is foremost in the mind of our development team and airport service providers, such as RAK Customs, which has streamlined its processes and committed additional resources to ensure the success of the airport."

The airport has two cargo terminals which, together, can handle around 30,000 tons of freight per annum. It also has additional staging and handling areas available.

"According to research conducted by RAK Airport, the air freight generated through the Ras Al Khaimah Free and Special Economic Zones is primarily destined for Europe (72%) followed by Far East (12) and Middle East (16)," said Soliman.

"We are pursuing an aggressive strategy to ensure that this freight is exported from the airport as opposed to the other ports in the UAE. Today a large percentage of the air freight exported through RAK goes to Afghanistan due to our favourable geographical proximity to the market."

This success is also promoting jobs in the region. "The logistics industry is growing as a whole and the synergies between the modes of shipping are such that professionals are able to move between the various areas and strengthen the industry by applying expertise and experience from one field to another," said Soliman. "One area that we are focusing on is development of sea-air products, which relies on individuals who are able to link together all areas of shipping including air, sea and road in order to create the best possible logistics solutions for their clients."

State-of-the-art handling equipment

Soliman believes things will get even better in the next few years.

"The airport is functioning at around half the capacity of our current facilities. However, the recent completion of our second cargo terminal, investments in state-of-the-art handling equipment and a well-considered expansion plan for the growth of logistics at the airport including cargo terminals, warehousing and dedicated cargo aprons, will help ensure RAK emerges as a cargo hub for northern emirates."

Dubai International airport is one of the busiest airports in the world for freight activity with steady growth since the 90s. The region has freight links to all corners of the world. Currently the most important links are North America and the Indian sub continent but over the next 20 years, if growth in China continues, then that country will become more important to the Middle East region.

In August the airport saw a 6.2% increase in cargo and a 12% increase in aircraft movements. This is due the strength of the Abu Dhabi economy and the commercial business sense of the Abu Dhabi marketplace. The airport was also helped by Etihad Airways – the Abu Dhabi national carrier –



Michelle Soliman: "We are pursuing an aggressive strategy."

opening new routes and with other airlines beginning services into Abu Dhabi.

While many airlines are reducing frequencies or cutting services to some parts of the world, Emirates SkyCargo is continuing to increase services and has recently added Durban to its growing list of cargo destinations. Emirates launched the new Durban service on October 1 using an Airbus A330-200.

Durban is the airline's 17th African destination and is one of the cities that will host matches in the FIFA 2010 World Cup being held in South Africa. This extra service is welcome as the South African freight market from the Emirates has gone up four-fold in the 12 months to July 2009. The growth can be directly attributed to the addition of a third daily service to Johannesburg and a Cape Town service started in March 2008. Further growth is expected with a 100 tonnes of additional capacity out of Durban every week.

Even cargo shipped by sea is being switched to air-based transportation. The main reason is that lower transport costs and the global consumer downturn are encouraging more of the region's traders to move from shipping by sea to flying freight, according to Hussein Hachem, CEO for the Gulf Region of Aramex. He said: "While the volume of shipments has reduced, the frequency has increased. As a result, a lot of the volume earlier transported on ships is being diverted to air cargo."

There are increases in orders, especially for new freighters.

At Airbus, the A330 freighter is nearing completion and, according to Alan Pardoe, director product marketing for the A330, A340 and A350: "The A330 is having a revival in orders, some of which are for the new A330 freighter."

The new A330 freighter variant should fly in the next few weeks. The certification programme is on

time, with deliveries to customers beginning in 2010.

John Leahy, Airbus chief operating officer – customers said: "The A330-200F is the right aircraft at the right time. We are on the eve of a market recovery and now is the time for airlines to prepare for future freight growth."

In the 2009 Airbus Global Market Forecast, the manufacturer says that in the next 20 years the Middle East will grow even more. With the uniquely geographical location it has, the Middle East has an advantage over the other regions of the world to reach Europe, Asia or Africa very easily. In the past ten years or so the region has had economic growth linked to oil and, to a lesser degree, other industrial developments such as tourism. The Middle East countries are now developing other industries as and when the oil revenues diminish. Infrastructure has also improved over the period allowing more capacity without some of the challenges that airports in Europe and North America have had to endure.

However, Boeing is experiencing challenges with the 747-8 programme and is having to set aside a \$1 billion pre-tax charge for this year – \$640 million of which relates to late maturity of engineering that has meant redesigns on the programme. The remaining \$360 charge is to maintain the 747 production rate at 1.5 aircraft per month for two years longer than previously planned, deferring an increase of two aircraft per month. The company now expects the first flight in the early part of 2010 with first delivery to customer in the fourth quarter of 2010.

Doubled the order

MNG Airlines of Turkey has now four A330-200 freighters on order, the airline originally ordered two examples in 2007 and then doubled the order.

Mehmet Nazif Gunal, founder and chairman of MNG Companies Group said: "We are pleased to add to our previous order so we can start implementing our growth strategy when the worldwide freighter market recovers from the recession. We are fully convinced that the A330-200 freighter aircraft, the newest member of the A330/A340 family, is the right aircraft to contribute to achieving our goals and allow us to operate the most modern and efficient fleet of cargo aircraft in Turkey."

The feeling of confidence does not exist with other airlines around the world. Cathay Pacific has placed five Boeing 747 freighters in storage and leased out a single example. At the same time the airline has taken delivery of six new Boeing 747-400ERFs.

Air France/KLM is also taking difficult decisions regarding freighters, leasing four Boeing 747-400ERFs to Martinair of the Netherlands, while Martinair has grounded four 747-400 converted freighters itself. Air France has also grounded two 747-400ERFs as well as the 777 freighters it had just received from Boeing as the launch customer.

Other airlines have been placing ex-passenger recently converted freighters in storage to reduce capacity while the demand is low.

Waiting for take-off...

The Middle East's aviation sector will need to address a number of problems before it can reach its full potential according to Booz & Company principal Alessandro Borgogna and senior associate Tansel Kilicarslan.

The aviation market in the Middle East has enormous potential because a number of factors drive demand for air travel. The region has been less affected by the global financial crisis than the US and Europe, so business travel has remained strong. Also, a large population of expatriates generates traffic from visiting friends and relatives, while religious travel around Hajj and Umrah brings visitors from around the region and the world.

Labour traffic within the Middle East, as well as back and forth to Asia, is another source of demand. The regional sector also benefits from relatively new fleets, which keep operating costs down, as well as modern airport infrastructure that encourages hub traffic.

At present, however, the sector is not reaching its potential. The system's overall costs are too high and it is not yet effectively serving the region's economic needs. Market penetration is lower than in most other regions (see exhibit 1). Seat load factors are, on average, seven per cent lower than for European and Asian carriers. Furthermore, the sector is lagging in its adoption of new business models, such as low-cost carriers.

The rapid development of tourism in the region should have led to greater traffic.

Several factors are inhibiting the development of a high-quality, highly efficient, sustainable aviation system.

A heavily regulated system imposes restrictions on traffic rights along with price restrictions. These mandates restrict airlines' growth as well as their profitability.

Airports and airlines are still fully owned by the government. In Europe and Asia, by contrast, about half of the airlines are privately owned. The lack of private options in the Middle East market hampers competition and keeps prices high, discouraging travel.

Air routes are restricted by designated no-fly zones, which are mostly driven by military considerations. These restrictions prevent airlines from optimizing route plans, leading to substantial carbon emissions and significant cost increases.

The sector is constrained by a lack of legal instruments

that would allow cross-border equity participation and cooperation. As a result, regional airlines are missing out on the benefits of the global industry alliances and consolidation.

Various visa and custom limitations limit the free movement of people and goods between regional countries.

Ultimately, regional transport ministries and civil aviation authorities must initiate a coordinated effort to set up a regulatory framework that nurtures the Middle East aviation sector. The reform necessary for the sector's sustained growth can begin with a few concrete measures.

■ **Liberalize routes:** Middle Eastern countries have already agreed to take this step as part of the Damascus Convention, a multi-bilateral agreement between countries in the region. However, progress to date has been slow. If a few countries were to liberalize their own routes, it would generate a sense of momentum and lead others to follow suit. The benefits of such a step have already been proven; for instance, the initial Open Skies agreement between the European Union and the US led to a significant increase in the number of aviation passengers (see Exhibit 2).

■ **Facilitate cross-border cooperation:** The sector must develop legal instruments – whether on the country, regional, or even bilateral level – that permit cross-border equity stake-holding or closer cooperation between airlines that could pave the way for consolidation. At the same time, regulators must be careful to preserve the national identity of the relevant airlines, as Air France and KLM have done.

■ **Develop an Arab Sky Control:** This body, similar to EuroControl, would harmonize and integrate air navigation services in the Middle East. The purpose would be to create a uniform system of air traffic management for civil and military users. Creating such a body would engender safe, secure and effective travel throughout the region and minimal environmental emissions.

■ **Reduce no-fly zones to a minimum:** Regulators and transportation ministers would need to work with national security and the military in taking this measure. It would allow airlines to optimize air routes, cutting down costs and limiting carbon emissions.

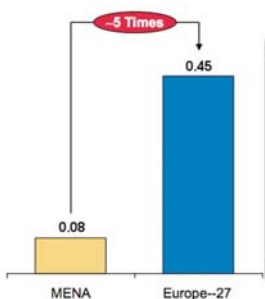
■ **Reduce travel-related charges:** Regulators should review airport, passenger, and fuel taxes and charges – among others – to drive growth in tourism.

■ **Allow more people to travel more easily:** The sector could increase demand for air travel by investing in technology and processes to support cross-regional security screening.

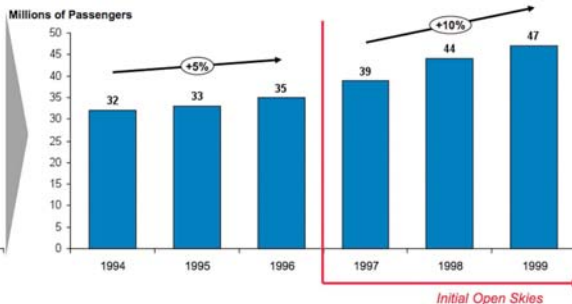
■ **Invest in human resources:** The industry needs aviation staff to support its growth, including crew members (pilots and other flight crew), aircraft technicians, ground technicians, and air traffic controllers. Leading airlines and national development agencies have started to set up flight training centres; however key gaps remain in training and educational institutions for air traffic controllers.

The Damascus Convention was a strong statement of intent but it requires more dedicated follow-through.

Annual Intra-Region Air Passengers / Total Population (2007)



Effect of EU-US Deregulation





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EAG's Hawker 4000 a first for the GCC

Dubai's Empire Aviation Group (EAG) has become the first aircraft operator in the Gulf Cooperation Council (GCC) to take delivery of the latest Hawker Beechcraft Corporation business jet – the Hawker 4000

The super-midsize Hawker 4000 is the first business jet made from advanced, sophisticated composite materials and offers significantly lower operating costs to owners.

The new eight-seater, twin-engine H4000 was acquired from the manufacturer following the sale by EAG to an owner in the region and will be managed by EAG, as well as offered for charter. A further two H4000 aircraft sales have already been completed by EAG for delivery to the region in 2009-2010.

The Hawker 4000 was originally known as the Hawker Horizon and took years to certificate because of its ambitious development of using a fuselage constructed from advanced composite materials. This reduces the weight of the aircraft, increases performance and significantly reduces the operating costs. The composite material does not corrode or fatigue, and is stronger and lighter than aircraft fabricated from metals, resulting in lower costs and higher performance.

It cruises at 514mph at an altitude of 45,000 feet, with a range of 3,280 nautical miles, which puts it within direct reach from Dubai, for example, of destinations such as Paris, Singapore, Geneva, and Mauritius; with London accessible direct from Jeddah and Riyadh.

The aircraft offers one of the quietest cabins in the super-midsize sector with all the amenities of far bigger aircraft and six feet of headroom for the full length of the cabin. Luxuries include finishes such as handcrafted galley cabinetry.

Due to the strength of the composites, the cabin pressurization system can maintain a very low cabin pressure when cruising at the 45,000 feet ceiling, which reduces fatigue and dehydration for passengers and crew.

“Composite materials have been used for many years in the manufacture of military aircraft and this technology is now being applied for the first time in the business jet sector by Hawker Beechcraft,” said EAG executive director Steve Hartley.

“Civil aviation is following this lead with the new Boeing 787 Dreamliner built on the same composite technology acquired from Hawker Beechcraft.

“EAG is very proud and excited to be the first in the region to take a delivery of this aircraft, which is probably 10 years ahead of other manufacturers. The owner – and our charter clients – will benefit from this new technology and the cost/performance that it delivers. In fact, Hawker Beechcraft Corporation is so confident about the new aircraft that it is guaranteeing the aircraft's maintenance, charging a fixed fee per flying hour to cover all aircraft maintenance, and even tyre wear, over the first five years of operation.”

The new aircraft joins EAG's mixed fleet of business jets, one of the largest managed fleets in the region comprising 13 aircraft (10 of which are available for charter), with another two to three aircraft expected to be added before the end of 2009, subject to delivery.

EAG is a GCC regional distributor (with exclusivity in some countries, including the UAE) for Hawker Beechcraft Corporation.

Alan Peaford reports from the National Business Aviation Association (NBAA) convention in Orlando, Florida

Middle East leads the fightback

Business aviation is on the way back – and that recovery is being led firmly by the Middle East.

The industry met in Orlando, Florida during October for the annual National Business Aviation Association convention. Although the NBAA is geared for the US market, by its sheer size it acts as the global centre for the industry and delegates from the MENA region were given a warm welcome.

And not surprising. The show started off with the traditional unveiling of the *Honeywell Business Aviation Outlook*, which headlined the Middle East, Africa and Asian regions as the areas with the highest purchase expectations in the sector over the next decade.

As part of the forecast, in which Honeywell confirmed the boom of 2003-2008 is officially over, the company said that purchase expectations of 55% recorded in Africa/Middle East were up more than 10 points from 2008, setting a new record high.

All the increase in purchase plans came from the fleet replacement category. Fleet expansion demand fell by about three points compared to last year. Middle East and selected African economies continue to benefit from improved oil prices and burgeoning trade with China and Asia, the report said.

Economic growth

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

Overall, Honeywell forecasts delivery of approximately 11,000 new business jets from 2009 through 2019, generating estimated industry sales of \$200 billion.

For 2009, Honeywell Aerospace forecasts deliveries of 750-800 new business jets, down from 1,139 in 2008. Deliveries in 2010 are expected to drop below 700.

Based on operator survey responses, long-term buyer interest has increased, however new purchase plans are currently timed later in the five-year planning window, which strongly suggests that by 2011-2012 there will be

significant pent-up demand that will improve the outlook for order intake and new jet deliveries.

After peaking in 2008, new jet deliveries are projected to decline roughly 30% in 2009 followed by a 10-15% decline in 2010 before starting a recovery in 2011.

Based on new jet models mentioned by survey respondents, the *2009 Business Aviation Outlook* projects a fairly balanced demand profile across most business jet segments over the next five years.

Medium and medium-large aircraft combined

account for about 23% of the projected demand through 2014. Light and light-medium aircraft make up about 24 per cent of projected five-year demand. The next largest groupings are in long-range and ultra-long-range aircraft at 18% and in large class models, also at 18%.

Sustained interest in the long and ultra-long-range segment has been present for several years and reflects increased need for aircraft capable of trans-Pacific flights, as well as the growth in demand in other areas such as the MENA region, requiring more long-range operations as trade and economic growth is still anticipated.



The new Legacy is put through its paces.

Large Legacy boost for Embraer

Embraer revealed at NBAA that it has successfully flown the first Legacy 650 large-cabin business jet, an upgraded version of its super-midsize Legacy 600.

The launch brings to seven the total number of executive jets in the Brazilian airframer's portfolio. "One thing our Legacy customers kept telling us is that the aircraft should have more range," said Claudio Camelier, Embraer's vice-president of market intelligence for executive jets. "The 650 is a response to that demand."

Embraer began delivering the Legacy 600, a derivative of the ERJ-135 regional jet, in 2002 and

has produced more than 170 to date. The new 650 will bridge the gap in product offering between the super-midsize Legacy 600 and the Lineage 1000.

The flight test programme is scheduled for completion by mid-2010, with certification and service entry expected in the second half of 2010. The company launched the programme internally during the first half of 2008, said Camelier.

The 650 has a distinctive underbelly ventral fuel tank to increase range which, combined with airframe modifications and new Rolls-Royce AE3007-A2 turbofan engines, will deliver 3,900nm (7,220km) range.

You Need To Fly
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< G3000 system unveiled

Garmin unveiled a next generation integrated flight deck for Part 23 turbine aircraft – the touchscreen-controlled G3000, which will feature on the new PiperJet and the HondaJet.

A version of the new suite could also be the choice for Cirrus Vision customers. Along with three 36cm diagonal WXGA high-resolution wide-aspect ratio displays across the flight deck, the G3000 will include a new central panel vehicle management system operated by pilots via infrared-sensitive touchscreens that control radios, audio, flight management, weather systems, synoptics, and other vehicle systems. It will be available in 2011.

Mystery of the VIP Airbus buyer

An undisclosed head of state from the Middle East has bought two VIP A340-500s from Airbus and awarded the cabin completions contract to Gore Design Completions.

The first of the new-build long-range wide-bodies will be handed over to San Antonio, Texas-based GDC in the second half of 2010, followed by the second in early 2011. The completions are expected to take around 18 months.

GDC chief executive Jerry Gore says the market for VIP wide-bodies remains buoyant despite the global economic downturn. "The market is better than I've seen in 25 years," confirmed Gore.

GDC has selected B/E Aerospace to provide seating for the A340-500s, including VIP single seats, majlis divans, executive pods and guest seating. Custom Control Concepts will provide cabin management and entertainment systems for the two aircraft.

Under separate contracts, GDC is preparing to hand over another VIP A340-500 to a Middle East customer this month, and will begin work on an A340-200 later this year.

Josh Stewart and Ali Al Naqbi at the NBAA unveiling of the X Jet plans



2010 start date for Al Bateen luxury FBO

The building of a VVIP luxury FBO at Abu Dhabi's Al Bateen airport by exclusive business aviation services provider X Jet, will begin early in 2010.

The company is also breaking ground on a luxury FBO facility at Paris Le Bourget, according to MEBA's founding chairman Ali Al Naqbi, who is a major investor in the X Jet company.

The facilities will mirror the company's members-only facility in Denver, Colorado – which is also being expanded – where 13 aircraft owners pay a one-off fee for dedicated hangarage, handling and lounge access.

"This business model has been a huge success,"

said X Jet founder and president Josh Stewart at NBAA.

"We opened the Denver facility two years ago to cater to aircraft owners rather than pilots and to remove the dependence on fuel sales for profit. With our seven-star facility, we have successfully revolutionised private aviation and turned the traditional FBO model upside-down."

The Le Bourget and Al Bateen "aviation campuses" should take 12 months to complete and will give X Jet a foothold in the European and Middle Eastern markets. "The whole concept is very different," Al Naqbi said.



New look Piaggio

Piaggio Aero – in which Abu Dhabi's Mubadala is a major investor – unveiled a new look for the twin pusher turboprop. The Italian manufacturer is pushing to increase sales in the Middle East and Africa saying it has huge potential in the medevac market, according to John Bingham, executive vice-president marketing and sales.

The company, which sells almost exclusively in Europe and North America, wants 30% of its sales to come from the rest of the world in five years.

"Our new image is more contemporary. Our message is that we are a different company today," Bingham said.



CJ4 sees improved test results

Cessna announced significantly improved performance numbers for its CJ4 light jet, which made a one-day flying visit to Orlando. Set for certification by the end of this year, with first deliveries early in 2010, test results and technical adjustments have yielded better speed, payload, range and time-to-climb results for the \$8.75 million twinjet, which takes seven to ten passengers.

Most significant is a speed increase of 17kts, boosting maximum cruise speed to 452kts at 31,000ft (9,500m) and up to 430kt at its certificated maximum altitude of 45,000ft.



Winglets for Citation X

Cessna's top-of-the-range Citation X has a new look and improved range following the addition of elliptical winglets. The company is teamed with Wichita-based Winglet Technology for the installation of the graphite epoxy devices, which Winglet says will provide 15kt (28km/h) additional cruise speed, 1,200lb (545kg) more payload at hot and high airports and a 150nm (280km) boost in range.



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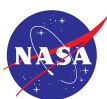
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STARSHIP ENTERPRISE

Could Virgin deal help turn Abu Dhabi into the Middle East centre of space excellence? Steve Nichols reports.

Abu Dhabi could become the Middle East equivalent of the USA's Florida space coast, thanks to the recently-announced deal between Aabar investments and Virgin Galactic.

Abu Dhabi's Aabar Investments announced in July that it is to invest \$280m and take a 32 per cent equity stake in Virgin Galactic, billed as the world's first commercial spaceline venture. The company was previously wholly-owned by Sir Richard Branson's Virgin Group, which has invested more than \$100m in Virgin Galactic since its formation in late 2004.

Additionally, Aabar will "potentially commit" a further \$110m to fund a small satellite launch capability. Virgin has said it will launch small satellites at "unprecedented levels of cost, reliability and flexibility".

Abu Dhabi is also to gain exclusive regional rights, subject to regulatory clearances, to host Virgin Galactic tourism and scientific research space flights. Other plans for the future include spaceport facilities in the emirate.

Continued
on Page 66

An artist's impression of SpaceShipTwo feathering its wing before re-entry.



Mohamed Badawy Al-Husseiny, CEO of Aabar, and Richard Branson sign the Aabar agreement at Oshkosh.

CONTINUED FROM PAGE 65

Virgin Galactic's president, Will Whitehorn, said: "We always said that when our system was ready we would bring in a second-round investor. What marked Aabar out as a potential investor was that they were extremely committed to the conceptual use of the system; well beyond the use of space tourism. They understood our business plans for astronaut training and human space science.

"Beyond that we had plans for a satellite launcher – an unmanned vehicle – that could launch a 200kg satellite into orbit. Aabar showed a great willingness to back that plan as well; hence the additional commitment of \$110m."

Whitehorn added that if Abu Dhabi decided to build a space port it would have exclusive use of Virgin Galactic's system in the region.

"Abu Dhabi has indicated that it is very keen to develop a space port with some sort of science park facility around it and that would be a resource for all the emirates to take advantage of; but that is a decision that has not yet been taken," Whitehorn said.

Mohamed Badawy Al-Husseiny, CEO of Aabar, said: "This transaction carries multiple potential for the creation of an exceptional platform for space infrastructure, such as research labs, space centre for commercial travel and much more."

Aabar Investments PJSC is listed on the Abu Dhabi Securities Exchange and directly invests in various sectors, including energy, infrastructure, real estate, automotive and financial services companies. Its largest shareholder is the International Petroleum Investment Company which, in turn, is wholly owned by the Government of the Emirate of Abu Dhabi.

Aabar likes high-tech investments and, in March, became Daimler's biggest shareholder after investing \$2.7 billion. In July it bought 40 per cent of Daimler's stake in the Tesla electric car company, with a view to developing lithium ion battery technology.

If the proposed Abu Dhabi spaceport comes to fruition it could follow the model currently being worked on by Virgin Galactic in New Mexico, USA.

There, would-be astronauts are queuing to pay \$200,000 each for the privilege of being one of the first carried aboard Virgin Galactic's SpaceShipTwo. Slung underneath the mothership launch vehicle, the craft promises to take them to an altitude of more than 50,000ft before they are released.

Once dropped, SpaceShipTwo will ignite its hybrid nitrous oxide rocket motor, which will propel it into sub-orbital space at speeds of more than 2,500 mph (4,000kmh), to heights over 65 miles (110km) above the Earth's surface.

So far, more than 300 people from around the world have paid approaching \$40m in deposits, representing \$60m worth of ticket sales, to guarantee one of the early seats on SpaceShipTwo.

Six minutes of weightlessness

Passengers are promised they will achieve up to six minutes of weightlessness before their descent back through the atmosphere using the space ship's feathered wing re-entry system.

Will Whitehorn said the company will not put a definite timeline on when the commercial flights will begin but it is on track with its development plans. The first flight of the Virgin Galactic space ship will be by the end of the year, with the first flight into space about 12-14 months after that.

Whitehorn added: "Once all our testing is done – and this is a far bigger test programme than even the Concorde project had – we will apply for our final licence from the Federal Aviation Administration. We expect to start commercial flights in late 2011 or early 2012, but it could be on the early side of that curve if the test programme goes well.

"Let's be clear, Virgin Galactic is the only company in the private sector to be developing a human-carrying space launch system. None of

the other projects you may have read about in the newspapers have ever produced a vehicle – not even a working prototype.

"Our prototype flew to space twice in 2004 and is now in the Smithsonian Museum. Now we have built a full commercial system with a much bigger payload capacity to allow this system to complete a whole variety of roles in space."

The Aabar deal was signed at the EAA AirVenture Airshow in Oshkosh, Wisconsin, where Virgin Galactic was debuting its new space carrier space launch vehicle, called Mothership VMS Eve.

The space launch mothership is a twin-hull all-carbon composite vehicle designed to launch SpaceShipTwo above heights of 50,000ft. The development of the new vehicles is being carried out by Scaled Composites, the Mojave, California-based aeronautical company owned by Northrop Grumman and led by Burt Rutan.

VMS Eve has already logged more than 50 hours of flying time and achieved an altitude of 52,400ft. It will carry six trainee astronauts in its starboard hull and give each of them a full range of G force experiences, including a zero G flying capability.

Its port hull is pressurised and has the capability of carrying science instruments and other experimental payloads.

It is expected that VMS Eve will make its first 'captive carry' flight with SpaceShipTwo attached by the end of 2009.

The first tests of the hybrid nitrous oxide rocket motor took place in southern California in May by Scaled Composites and its subcontractor SNC (Sierra Nevada Corporation).

Virgin Galactic 'broke ground' on its purpose-built space port in southern New Mexico in June.

Speaking at the ground-breaking ceremony, Will Whitehorn said: "This is an enormous milestone for Virgin Galactic, which is investing more than \$300 million in developing a new space launch system to operate at Spaceport America after it opens."

SPACE IS A GROWING MARKET IN THE MIDDLE EAST...

Abu Dhabi forum attracts the world's best

The UAE's premier space event, the Global Space Technology Forum, takes place in Abu Dhabi in early December.

The two-day conference (7th and 8th) and three-day exhibition (7-9) is being held at the Abu Dhabi National Exhibition Centre and promises to be the region's only event dedicated to space research and commercial space applications.

Organiser Streamline Marketing says GSTF will "outline global policy relating to private ventures and future projects in space, new technology and research efforts, making space access easy and affordable".

Experts from leading organisations such as NASA, the European Space Agency and others representing emerging national space programmes, are booked to speak. The programme has been set up to allow plenty of interaction and knowledge sharing in a relaxed setting.

Topics will include forecasts for the global space industry, international cooperation and collaboration in the space sector, the environment, energy and climate, plus space technology transfer.

Already booked to speak are Michael O'Brien, NASA's assistant administrator for external relations, Dr Mohammed Argoun, director of the Egyptian space programme, Ahmed Al Mansoori, director general of the Emirates Institution for Advanced Science and Technology (EIAST), and others.

EIAST hit the headlines recently after DubaiSat-1 was successfully launched into space on July 29 from Baikonour in Kazakhstan.

Organiser Rick Theobald of Streamline Marketing says that globally the space industry is expected to be worth one trillion dollars by 2020.

"Space is very much a growing market for the UAE and regionally we have an investment of \$1.7bn," said Rick. "A lot of companies are investing in space regionally and the ancillary industries will also benefit."

"I expect several space companies to be based at the large aerospace business park being built at Al Ain. The big composites factory that Mubadala is building in Abu Dhabi will, no doubt, have applications in the space industry as well."

There are now 20 emerging national space projects in the Middle East and North Africa region and the recent announcement by Abu Dhabi-based 4C GEOC for a \$1bn Earth Observation Space Centre is further evidence that the UAE is showing the way forward for the region.

Last year Yahsat signed an agreement with the UAE Armed Forces to provide secure satellite communications in the UAE. Arianespace is set to launch the Yahsat 1A satellite in the fourth quarter of 2010. Another agreement has been signed with International Launch Services (ILS) to launch Yahsat 1B in the first half of 2011.

The conference will also look at space commerce, space ports, tourism, defence and military communications as well as what it takes to set up a national space administration, where NASA's experience is expected to form part of Michael O'Brien's speech.

Space tourism is also a hot topic in the UAE. Abu Dhabi's Aabar Investments and Virgin Group recently announced that Aabar is to take a 32per cent equity stake in Virgin Galactic, billed as the "world's first commercial spaceline".

US-based Space Adventures also announced in 2006 that it is to build a \$265m global Spaceport development project at Ras Al-Khaimah in the UAE, but almost no progress has been made since.

The company, which has organised the orbital flights for all of the world's private space explorers, also announced that His Highness Sheikh Saud Bin Saqr Al Qasimi of Ras Al-Khaimah, along with the UAE Department of Civilian Aviation, had granted clearance to operate sub-orbital spaceflights in their air space.

The Middle East and North African region is now home to more than 20 emerging national space projects and is rapidly evolving as one of the key growth markets for the global space industry.

GSTF2009 organisers are also planning a series of special 'closed door' meetings for heads of space missions/projects from the Middle East, Africa and other emerging space markets with selected space suppliers.

At these, decision-makers representing

leading MENA space programmes and other emerging space markets will discuss their requirements and projects.

Other events arranged for GSTF include:

- An exhibition of MENA space projects;
- A networking dinner;
- Awards programme;
- Space technology seminars and workshops;
- Overview of space activities in 2009;
- An advanced sat-com conference (December 9).

The sat-com conference will look at next-generation trends in satellite communication, new markets, integrated satellite-terrestrial wireless networks and new opportunities for future development. Co-located with the Global Space Technology Forum, this will be a high-level event bringing together the world's top leaders representing satellite operators, regulators, investors, researchers and top consumers for sat-com services and solutions.

GSTF 2008 was the first in the region and was deemed a resounding success. Around 1,000 attendees from 18 countries attended with more than 80per cent of the visitors stemming from the UAE and the Middle East region. The organisers of GSTF 2009 have now confirmed that 70per cent of the exhibitors from last year will be returning to the show.

There are now
20 emerging
national
space
projects in
the Middle
East

The design for the 110,000-plus square foot facility was created by a team of American and British architects, selected after an international competition.

Whitehorn added that a space port in the Middle East would be ideal for Virgin Galactic.

"The desert environment is very good for our type of technology," he said. "You also have the chance to build long runways, which would suit us as we upgrade the system in the future to a bigger all-composite carrier vehicle, such as WhiteKnightThree."

"You also don't get some of the problems found in other areas, such as icing on the vehicles, and you have a nice clear area of airspace."

"So UAE definitely has a future for space flight now that the industry has moved away from just having ground-launched rockets."

■ In February 2006 Space Adventures announced that it was to build a \$265m global spaceport development project at Ras Al-Khaimah in the UAE.

The company, which has organised the orbital flights for all of the world's private space explorers, also announced that His Highness Sheikh Saud Bin Saqr Al Qasimi of Ras Al-Khaimah, along with the UAE Department of Civilian Aviation, had granted clearance to operate sub-orbital spaceflights in its air space.

Space Adventures president and CEO Eric Anderson said at the time that the UAE spaceport, planned to be located less than an hour drive from Dubai, would offer flights aboard its system consisting of a flight-operational carrier aircraft, the M-55X, and a rocket spacecraft.

The US company has sold seats on Russian rockets to the International Space Station worth an estimated £175m.

Sub-orbital flights such as those from the Ras Al-Khaimah spaceport might typically cost around \$100,000 apiece.

At the time of writing, there have been no further developments on the proposed Ras Al-Khaimah spaceport.

FOCUS ON

jordan





ON THE KITEPATH

Why young Yassan and his pals are flying high



Yassan Jamal is just seven years old but he has already mastered the skills to get his home-made kite, linked to the ground by hundreds of metres or fraying nylon, to soar high above the hot concrete rooftops of Amman.

A few miles away at training academies at Marka Airport or at Queen Alia International, young men and women with backgrounds like Yassan's, from among the tightly-packed buildings that pepper the seven hills that surround the Jordanian capital, put their early dreams of flight into practice.

The fascination and the love affair that Jordanians have with aviation is something now embedded in their culture, thanks to the support for the industry fostered by the late King Hussein and carried on by his son, King Abdullah II.

Pictures of the late king and the present ruler adorn the walls of every hotel or office, but in none of them are the smiles of father and son greater than when they are pictured wearing their

wings or having just completed a freefall parachute drop.

King Hussein's legacy, one that has been adopted by his son, is that education is vital for both the young men and women of Jordan. Education removes poverty and aviation broadens knowledge.

Throughout this tour of the highlights of Jordan's aerospace industry, from the capital, through military bases, to the furthest corner on the Red Sea coastal port of Aqaba, the message is the same. Jordan's greatest resource is its people. Education and commitment to work has given the aviation industry in the country a maturity which its competitors in the Gulf states can only envy.

The welcome that visitors get, whether as tourists or on business, is a testimony to the culture in the country, and is embedded no more clearly than in Jordan's aerospace champions.



Nayef H Al-Fayez: "Jordan has always maintained good relations with its neighbours."



‘We are an oasis of stability and tranquillity’

Dive in the Red Sea and see its beautiful underwater life; float in the Dead Sea and cleanse your body in its natural minerals. Take in breathtaking valleys and mountains, stand in the footsteps of Moses at Mount Nebo, see the site of the baptism of Jesus, visit the world’s oldest Islamic and Christian sites. This is just a taster of some of the things to do in this fascinating country.

Nestling between Israel, Iraq, Saudi Arabia and Syria, Jordan certainly lies in a region known for its political turmoil and religious conflicts. But, as the Jordanians themselves will tell you, this is “a safe country”, “a quiet land”, and travellers have already started to put it on their list of ‘must go to’ destinations.

“We are an oasis of stability and tranquillity; Jordan is a very safe country,” said Nayef H Al-Fayez, managing director of the Jordan Tourism Board.

“Because we’re in a turbulent region tourists have been put off the area so we try to fix the misconception of the security and stability issue. If you look at the history, Jordan has always maintained good relations with its neighbours and all countries throughout the world.”

And, certainly, Jordan is starting to see tourists arrive in droves.

“Today tourism is one of the main pillars of the Jordanian economy,” said Al-Fayez. “It is the second largest contributor to our GDP – around 14.7 per cent of the total for 2008. Last year we were almost at three billion dollars from the tourism industry.

With a history spanning more than two millennia, Jordan is an explorers’ delight.

Marcelle Nethersole met
Nayef H Al-Fayez, from the Jordan Tourism Board, to look at the country’s diversity and explain how tourists and business travellers can enjoy this jewel in the Middle East that is often, mistakenly, thought of as a danger zone.

“It is a sector which has been growing in the last ten years. I would say 50 per cent of tourists are from the Arab region and the rest are mainly from Europe and North America. Jordan is starting to see an influx of all nationalities, though, and of all ages too.”

This is not surprising. The country can be traversed from top to bottom in six hours and certainly packs in a lot. Al-Fayez said: “We have a diverse product. A tourist needs at least two weeks to discover Jordan as there is so much to do.”

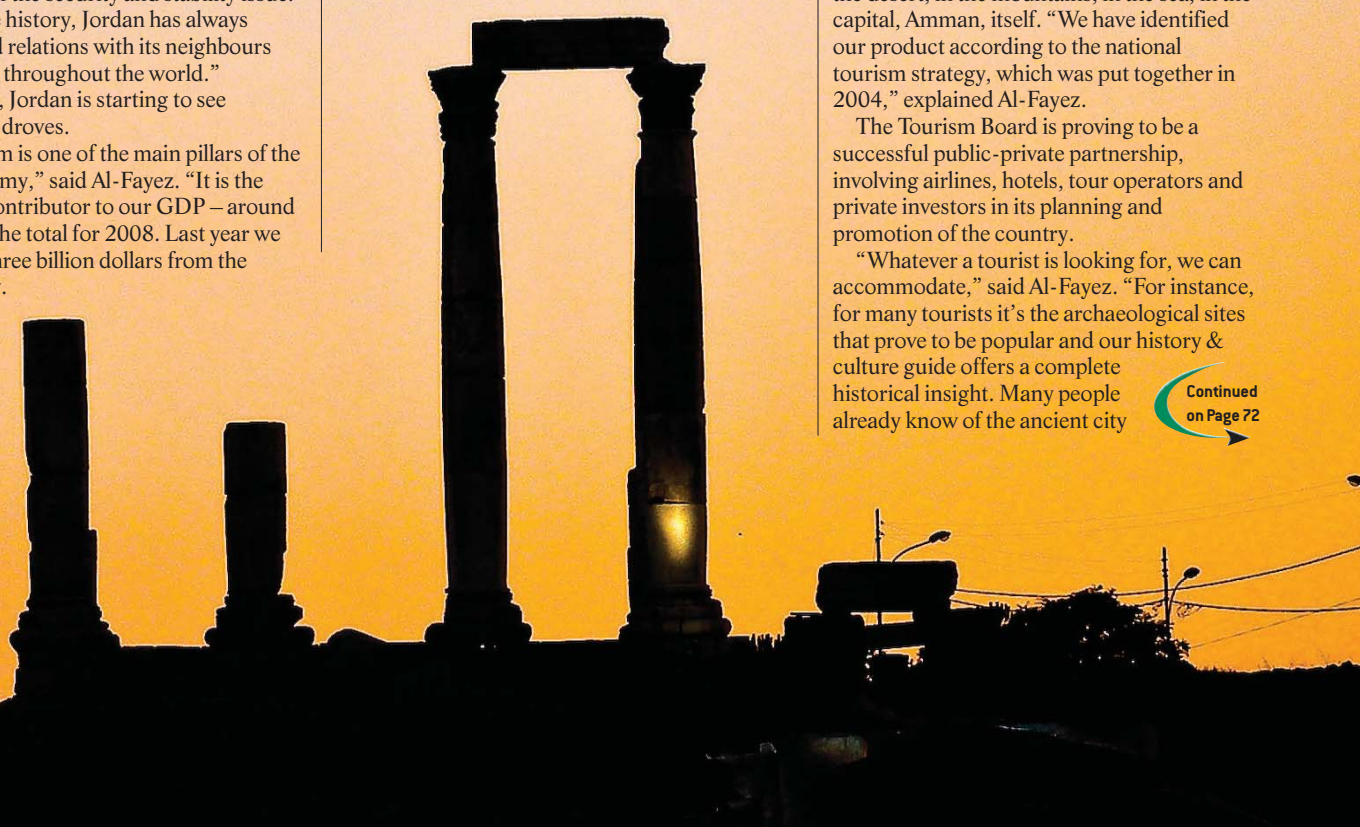
The Jordan Tourism Board has broken down tours into sections to suit everyone. These include: history & culture, religion & faith, fun & adventure, eco & nature and leisure and wellness. All of these things can, of course, be combined but it’s a great guide to plan your trip in the time you have.

Jordan is an open-air museum, a country that wherever you go you will find history and culture, from north to south to east to west, in the desert, in the mountains, in the sea, in the capital, Amman, itself. “We have identified our product according to the national tourism strategy, which was put together in 2004,” explained Al-Fayez.

The Tourism Board is proving to be a successful public-private partnership, involving airlines, hotels, tour operators and private investors in its planning and promotion of the country.

“Whatever a tourist is looking for, we can accommodate,” said Al-Fayez. “For instance, for many tourists it’s the archaeological sites that prove to be popular and our history & culture guide offers a complete historical insight. Many people already know of the ancient city

Continued
on Page 72





Ayla Aviation Academy (Aqaba, Jordan) has obtained JAA approval for its Ground School – making it the only Ground School in the Middle East to be JAA approved.

You can now obtain a fully approved JAA license through Ayla Aviation Academy and Atlantic Flight Training (AFT).

For more information, please contact info@aylaaviation.com
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CONTINUED FROM PAGE 70

of Petra, which is one of our national treasures and one of the world's seven wonders, and for many years we have had visitors to Petra. But, for us, it is just a gateway.

"Jordan played a major role in the Roman, Biblical and early Islamic and Crusader periods and the ancient city of Jerash is proving to be of great interest to travellers. It is the best-preserved Roman city outside of Rome and also has the only enactment of real gladiator life.

"Another place of interest is the ancient town of Madaba, which was resettled by Christian Arab tribes from the Karak region in the 19th century. Today it is referred to as 'the City of Mosaics' and is home to the huge sixth century Byzantine mosaic map in the Greek Orthodox church of St George, where two million brightly coloured stones depict Jerusalem and other holy sights."

Religion plays a big part in Jordan's history. Earlier this year Pope Benedict XVI visited the reputed site of the baptism of Jesus Christ at Bethany-beyond-the-Jordan and looked over the Holy Land toward Jerusalem from the top of Mount Nebo, a permanent memorial to Moses, who is believed to have ended his days in one of the valleys below.

Part of the Holy Land

Al-Fayez said: "People think only the old city of Jerusalem and surrounding areas represent the holy sites but, actually, Jordan is part of the Holy Land and, through the words of Abraham, Job and Moses, the Bible's Old Testament records show that it is in the Hashemite Kingdom of Jordan that God first manifested himself to man. Jesus travelled, taught and healed the sick throughout the area before he started towards Jerusalem."

Jordan is home to some of the world's earliest churches, including the remains of what is believed to be the oldest purpose-built church in the world, located in Aqaba.

The Red Sea town of Aqaba has some of the best sandy beaches in the region. "The Red Sea is renowned for excellent diving and snorkelling as its waters are pristine and you will find beautiful coral reefs and vast marine life," said Al-Fayez.

Another place for thrill seekers is Wadi Rum. "This is a breathtaking location and has Jordan's largest and most stunning desert landscapes. Jordanians refer to it as 'The Valley of the Moon' and it's very popular to camp here and take part in a lot of outdoor activities like trekking and hiking. It's a serious challenge for mountaineers," said Al-Fayez. It is also the setting for the 1962 film epic *Lawrence of Arabia*.

Then there is the world-famous Dead Sea, the largest natural spa on earth, where you will be amazed you can't sink. No marine life is able to live in such salty water; it is actually six times saltier than the ocean and, at more than 400 metres (1,312 ft.) below sea level, it is the lowest point on the face of the earth. The Dead Sea is also believed to be the site of five Biblical cities – Sodom, Zoar, Zeboiim, Gomorrah and Admah.



AERO SPORTS – BY ROYAL APPOINTMENT

Unlike many parts of the Middle East, the concept of aero sports and leisure flying is welcomed in Jordan. His Majesty, King Abdullah, is a proficient and enthusiastic freefall parachutist and founded the Royal Aero Sports Club after discovering the thrill of flying and seeing the beauty of the Kingdom from the air. He felt that this was something that should be made available to all.

The club maintains its royal patronage with HRH Prince Hamzah bin Al Hussein the president. He has become a qualified skydiver himself.

The club is based at Aqaba and is managed by the Ayla Aviation Academy. It provides hot air ballooning, land sailing, skydiving and training for microlight and ultralight flying.

The club is non-profit making and all activities are funded from income generated within. It has two two-seater ultralight aircraft, A Remos G3 and a Savannah.

Today, however, it's just peaceful water and a top holiday destination for the locals; not surprising as it enjoys dramatic and stunning landscape with mountains to the east and the rolling hills of Jerusalem to the west. Try cleansing your skin with the natural minerals of the Dead Sea mud; it feels gooey and doesn't smell great but you'll feel fabulous after you scrub it off.

If you travel to the city of Ma'an, it has a new Sixth Senses hotel and spa, which is one of the world's best, due to its thermal waters.

Jordan is also deeply involved with the Royal Society for the Conservation of Nature and has many ecological treasures. "We have set up several large nature reserves that are professionally run in order to minimize negative impacts on the natural habitats and rare species of Jordan's flora and fauna," explained Al-Fayez. "These include Wadi Rum, Dana, Mujib Nature Reserve and Shawmari Wildlife Reserve."

With so much to do and see, is there any time



From the World Heritage city of Petra, to the historic and splendid shores of the Dead Sea Jordan is packaging its USP for the travel market offering beaches, business and biblical attraction.

to feel in competition with neighbouring Egypt, a popular tourist spot?

“Not at all,” said Al-Fayez. “We have our own product. We’re a diverse country and a unique one. We are a very hospitable friendly nation too, with great food – both Jordanian and international. And we’re also an easy country to reach. We have two airports in Amman; Queen Alia International and Marka, as well as King Hussein International Airport in Aqaba.

“Queen Alia Airport’s expansion means we can expect up to nine million people. We hope to attract more carriers as that will, in turn, attract more tourists. We have a lot of VIP travellers at the airports, too, particularly at Aqaba due to its location by the Red Sea. It’s also close to Petra, which makes it attractive.”

Jordan is a very popular spot for business travellers and the tourist board has made sure they leave with a smile. Al-Fayez explained: “We have always had lot of business visitors to Jordan

with most business being between Amman and the Dead Sea. We have a large conference centre called The King Hussein Bin Talal Convention Centre, which sits on the shore of the Dead Sea, 45 kilometres from Amman. We have hosted the World Economy Forum at this centre five times now. It caters for major conferences and events and has state-of-the-art high-tech equipment. For the World Economy Forum to be hosted here for the fifth time is testimony to the calibre of the facility and that of the Jordanian people. Also, what other country can offer high quality facilities then, after a hard day, you can go and float in the Dead Sea and de-stress?”

The capital, Amman, is also a wonderful place to visit, whether as a tourist or while on business. It is one of the oldest cities in the world, with a history that dates back to 8,000BC.

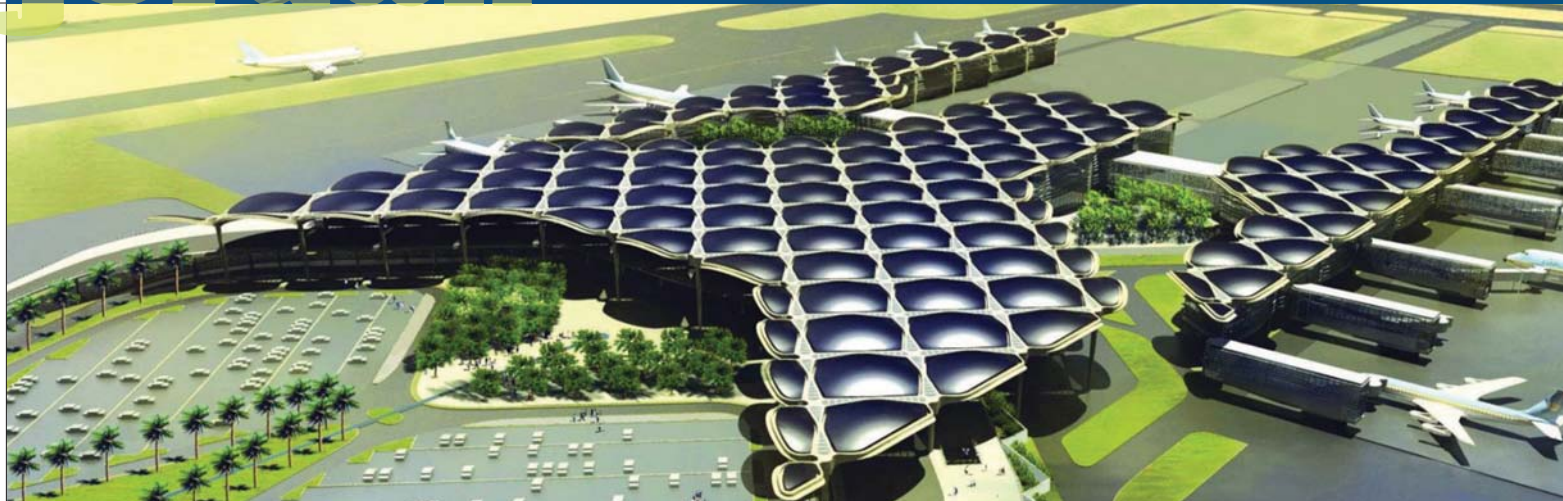
“Amman has the best weather during summer as it’s on high mountains so there is a fresh, cool breeze. It’s very much a family location, great for

shopping, enjoying festivals, parks, and there are wonderful restaurants of all cuisines,” said Al-Fayez.

There are also some world-class hotels used for both tourists and business travellers with first-class conference and leisure facilities. Typical is the five-star Marriott Amman, which currently receives 65 per cent of business guests, with the remainder being tourists. There are two other Marriott hotels in Jordan based in Petra and by the Dead Sea and there are plans for a Marriott in Aqaba.

Jordan certainly is a land of surprises. For example, it has vineyards where wine has been made for more than 2,000 years. Wine in a Moslem country? But that’s Jordan and its inordinate sense of liberal opportunity.

“Jordan does surprise many visitors,” laughed Al-Fayez. “I often say it ‘takes you beyond’ but people ask ‘beyond what’? We leave it for the people to decide from their experience. Jordan certainly provides you with an experience beyond your expectations, that, I promise you.”



The vision of the near-future for QAIA in Amman.

Getting a car into Queen Alia International Airport takes you through checkpoints where your luggage and passports are examined while you still have a kilometre to travel to the terminal buildings, which sit in the shadow of giant cranes.

Curtis Grad, chief executive of the consortium that has the 25-year contract to operate Amman's main airport, will not be apologising for either the highly visible security or the construction work.

"The whole approach to security is very different here to what you might see in Europe or the United States. Here it is very visible and in your face. As a result, Jordan is a very safe place," he said.

And the cranes? Grad's face breaks into a smile. "That is the future."

The future will come in February 2012 when the new terminals open for business. The \$700 million project is six months behind schedule due to additional ideas being added. "Its like when you are building your house and you add an extra room, it takes longer," Grad explained.

Need for expansion

Grad says there will be a gradual introduction of the facilities to meet the growth at Amman. "We are up 16% year-on-year," he said. The need for expansion is long overdue. Originally opened in the mid-1980s, the airport was designed for a capacity of around 3.5 million. "We did 4.5 million last year, but we have been able to manage it well. We had great cooperation from Royal Jordanian and other airlines to spread the load while we got our plans in place."

Phase one, with 14 loading bridges, will see capacity increase to seven million passengers; the second phase will add a further four bridges and another two million capacity.

The AIG Consortium made up of Abu Dhabi Investment Corporation, Noor Finance from Kuwait, EDGO from Jordan, J&P of Cyprus and its partner J&P of Greece, and the Airports de Paris, took over the operation in November 2007. Its first move was to bring in Grad with his first-class record of success in Jamaica and

Facing up to security

No apologies on offer for checkpoints – or cranes



Curtis Grad: "The whole approach to security is very different here to what you might see in Europe or the United States. Here it is very visible and in your face."

Cyprus to head the airport management team. He has just been joined by Kholoud Abdulkheir as head of airport marketing route development, who was formerly with IATA.

Grad and Abdulkheir will work together to not just attract airlines from outside the region but also persuade other airlines in the Middle East to work with them.

"Our message is work with us, don't compete!" Grad said. "We can help feed the other hubs. We have no aspirations to be a Frankfurt or a Dubai, but we can provide the link to other airports throughout the region."

"We are a 24-hour airport and that allows us to feed the A380s at the other hubs because we can help airlines meet their connections."

While currently 35% of the airport's business is with national carrier Royal Jordanian, Grad believes that, with the additional capacity, other airlines will bring that figure closer to 25% when the new terminals open.

Already the impact of a new marketing approach, along with the steadily increasing numbers from RJ, has seen Queen Alia enjoy a record-breaking summer.

AIG reported that it enjoyed record-breaking volumes in both QAIA passengers and aircraft movements (ACMs) for July 2009, recording an increase of 14.14% with 5,673 ACMs compared to 4,970 in July 2008.

Monthly passenger volumes topped half-a-million for the first time, with 524,626 passengers in July 2009 compared to 478,102 for the same month of last year, registering a year-over-year increase by 9.73%.

These dramatic increases are "an important signal of economic recovery" Grad said, adding that the terminal expansion will make QAIA "the gateway of choice in the region".

The development at the airport is also allowing for greater competition among the airport services.

As Grad pointed out: "Things are really moving here. Amman is an exciting place to be. The airport plans are good and we are getting the support to make this really work."



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Flight training academy that's so well grounded...

When entrepreneur Marwan Atalla decided to learn to fly he visited flying schools near his home in Amman but felt they didn't have the quality or the right approach to develop top-level pilots.

Instead, he learned his skills in the USA and, as an investor in the world's most popular general aviation aircraft company, Cirrus Design, he began to appreciate more and more about first-class training facilities and what was needed to change the perception of careers in aviation.

"Aviation has been seen as a secondary career in the Arab world," Atalla said. "Yet it is something that is needed to meet the future demands in our region. I felt that piloting is about a lot more than just flying the airplane. It is about leadership, about working in teams, about loyalty and responsibility."

So Atalla decided to create his own training academy. The result is Ayla.

Based at King Hussein International airport in Aqaba, Ayla Aviation Academy has been training pilots from Royal Jordanian Airlines, Gulf Air, Kuwait Airways, Bahrain Air and Oman Air and is providing aspiring self-funded pilots with training using state-of-the-art aircraft, simulators and training techniques.

From the moment you enter the glass doors of the flight-centre at the airport, the sense of style and command is apparent.

Crisp uniforms

Instructors are dressed in crisp uniforms, as are the students. This is a centre that means business.

While most of the classrooms are at the ground school in the centre of Aqaba, there are also immaculate lecture rooms. In the dispatch centre all of the charts, the weather reports, NOTAMS and other data is available for students to check before lessons. Here you live and breathe aviation.

The quality of the students is high. For Atalla, it is not about numbers. "We have a limit on our student intake. We have a comprehensive selection testing process, and stay innovative and progressive in our training," he said. "We stick to our basic principle of providing quality over quantity. It is of no use to us taking on a student who is not going to make it."

Atalla is like a father-figure, or a favourite uncle, to the students and there is a strong sense of togetherness.



"I like to get the groups away from the training school and into the desert," he said. "We do team-building exercises and learn to work together. On the flight deck you need to work together and respect each other. I want to develop leaders as well as good pilots."

Before launching Ayla, Atalla hired global consulting firm SH&E to study the flight academy needs and existing market. Jordan, with its liberal and progressive attitude to business and aviation in particular, was seen as an ideal location from which to operate. Any training should be based on the JAA syllabus and any training aircraft should have the glass cockpit – now essential for any modern airliner.

Atalla visited training schools in Europe and

worked closely with Oxford, Cabair and Atlantic Flight Training (AFT) before creating the Near East Group, which became the owner of Ayla and then AFT in Coventry.

"I was very impressed by what I saw at Atlantic," Atalla said. "By working together we were able to provide a world class facility and capability."

The hard work for the JAA syllabus paid off earlier this year when Ayla became the first in the Middle East to receive JAA approval to conduct APTL theoretical knowledge training.

Ayla was already offering an ICAO Jordanian CPL/IR, issued by the Civil Aviation Regulatory Commission (CARC) with a Frozen ATPL, an ICAO CPL/IR with fully-approved JAA ATPL



Marwan Atalla: "We stick to our basic principle of providing quality over quantity. It is of no use to us taking on a student who is not going to make it."

theoretical knowledge with Frozen ATPL, and a joint program with AFT in which cadets can obtain a fully-approved JAA license by completing a majority of their training at Ayla in Aqaba, Jordan and the remainder at AFT in Coventry, UK.

Atalla said: "Using both schools, Ayla and AFT, we are able to provide cadets with a fully-approved JAA license, making them more marketable and competitive in the global market."

The long-term vision is for the multi crew pilot licence (MPL). "That is the way ahead," said Atalla. "I really believe in that programme."

The MPL training programme uses





CONTINUED FROM PAGE 77

a competency-based approach in lieu of the “required hours” utilised in traditional training methodologies. In addition to training a candidate in basic flying skills, MPL maximises the use of two-pilot airplanes, simulators, and flight training devices to train candidates for airline entry proficiency on turbine-powered aircraft, and establish a foundation in crew concepts such as Crew Resource Management (CRM) and Threat and Error Management (TEM).

The minimum experience that an MPL holder will be required to have is 240 hours total time, which may be obtained in either an aircraft or a simulator.

Ayla has the aircraft that would be ideal for the basic skills. The Academy offers new Cessna 172 Skyhawks with the Garmin 1000 glass cockpits for the basic PPL stage of its current training. Students then progress to the Diamond DA40 TDI twin engines for their multi-engine ratings. The school also uses Alsim AL200-DA42 simulators that give a true representation of the DA42, which allows the students to get familiar with the complexity and the systems of the aircraft before taking to the air.

The instructors reflect the diversity of the aviation community with a mix of experienced ground school training captains and young enthusiastic flying instructors.

The academy is also progressive in its approach with a number of women instructors and female cadets.

Committed to learning

Capt Natasha Sultan is one of the female instructors. Born in Pakistan and trained at a flying school in Lahore, she is finding the experience at Ayla priceless. “It is a fantastic place, with everybody committed to learning and doing it properly,” she said.

Sultan admitted that there had been some cultural issues, with some students having reservations about taking instruction from a woman, but these were quickly resolved.

Ayla is so committed to the issue that, in 2010, it will be hosting the first ever conference on the role of women in aviation in the Middle East.

Students are helped with accommodation and at the ground school there are modern classrooms with the latest teaching aids. There are also areas for relaxation and gyms.

The flying conditions are ideal. The airport has a 10,000 foot runway and operates 24/7 with full Air Traffic Control and facilities for full instrument training. Although the immediate airspace is tightly controlled due to close proximity to Egypt, Saudi Arabia and Israel, there is a large nearby training area with multiple visual references.

For Atalla the job doesn’t stop on graduation. “We keep in touch with our former cadets. We have an alumni and we are there to help. We are not building pilots, we are building careers. As a training academy we are what we produce.”

ACADEMY LAYS THE FOUNDATIONS FOR THE FUTURE



Khaled Al Oran: “We think we will be able to help 500 student pilots get funding over the next five years.”

King’s foresight leaves a right royal legacy

When the late King Hussein discovered his passion for aviation he had the foresight and the commitment to recognise that this could be shared by many of his countrymen.

As a result, in 1966, he founded the Royal Jordanian Air Academy (RJAA) with a clear aim to help Jordanians develop the flying skills needed to sustain the demands of the country’s airline.

He went one step further and extended the reach of the academy to include technicians and engineers – vital knowledge that would keep the fleets in the air in the worst of times.

King Hussein’s legacy continues today. Now in private hands, the RJAA continues to welcome more student engineers and pilot cadets than any other training establishment in the Middle East.

Following recent changes in structure, RJAA has come together with the Queen Noor Civil Aviation College, which has responsibility for training air traffic controllers and other skilled professionals, to create a new aviation university.

RJAA’s public relations and student affairs manager, Khaled Al Oran, said the academy was continuing to offer a full service and currently has 1,000 technicians and engineers with 600 pilots attending.

The academy has been working with a Bahrain bank to provide funding to help pilots coming through the system as airlines are cutting back on recruitment and sponsored cadetships.

“We think we will be able to help 500 student pilots get funding over the next five years,” Al Oran said.

The academy has students from across the Middle East airlines, including from Algeria, Syria, Bahrain and Kuwait. The majority are from Jordan.

The relationship with sister company Arab Wings could see a

development in training for business aviation – an initiative that will be warmly applauded by MEBA, the Middle Eastern business aviation association.

RJAA offers a 24-month commercial pilot licence with instrument rating starting each April and October; it provides 28-month courses in avionics maintenance and electronic maintenance engineering, also both in April and October. It also offers aircraft dispatcher courses, which last 10 weeks.

The RJAA has invested in simulators and workshops for practical training and with a large fleet of aircraft the training engineers have plenty of opportunities to get hands-on experience.

“We have more than 3,500 graduates now working with major airlines,” Al Oran said.

Cadets get to fly Piper Warriors with glass cockpits as well as more complex piston aircraft. They use the Marka airbase, which has regular commercial, military and business aircraft movements going on, giving the pilots valuable experience of busy airspace.



The RJAA continues to welcome more student engineers and pilot cadets than any other training establishment in the Middle East.

Aircraft Capabilities

- **Airbus**
A300-600, A310-200/300, A320 Family, A330 and A340
- **Boeing**
727-100/200, 737-200,
Classic and NG series
- **Embraer**
170,175,190 and 195
- **Tri-Star**
L1011-series



Base Maintenance Services

- Periodic & Scheduled Maintenance up to D check, 6- and 12-year inspections
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- Major Minor Airframe Repairs
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**Bashir Abdul Hadi -
Jordan's MRO business
has a lot to offer.**

Why JorAMCo is so happy to have competition



Bashir Abdul Hadi, CEO of Jordan's leading maintenance, repair and overhaul (MRO) operator JorAMCo, has never been nervous of competition.

With a distinguished career as a pilot behind him – several years of which was as King Hussein's pilot on Jordan's head-of-state Tristar – Bashir looks at the growth of competitive MRO facilities that are springing up around the Middle East, particularly the Gulf, and believes it is "good news".

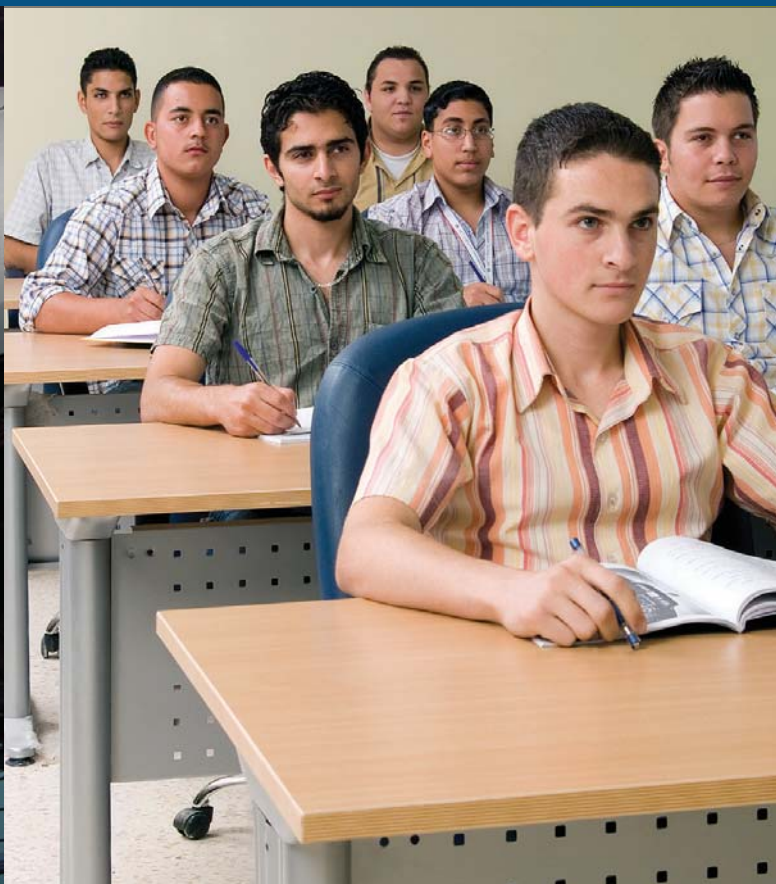
Bashir's view is simple. All of the MRO operations will benefit as the region's reputation for quality increases and any doubts about sending valuable assets to the Middle East for maintenance or repairs are eradicated.

"We are not in collaboration with any other MRO, but we have good relations. It is good to have strong players and I believe in regional strength as it brings up the market."

Pre-privatisation

Like many of the aviation businesses in Jordan, JorAMCo came out of the pre-privatisation break-up of Royal Jordanian. As Jordan Aircraft Maintenance Company, to give it its full name, was separated, more than 90% of its business was Royal Jordanian. Now, nine years later, third-party work has a clear majority.

Owned by UAE investment house Abraaj (80%) and Royal Jordanian (20%) since 2005,



the company has both invested and expanded. A new hangar was built adding 13,000sqm of capacity to the 16,000sqm of award-winning hangar that already existed. Improvements were made to the hangar and the aprons.

"Abraaj is about more than capital," said Bashir. "They also bring strategy. We sat down with them and agreed that JorAMCo needed to look outside the borders of the region and become a world-class organisation."

"We can take 13 narrowbodies in the hangar at any one time, so we began looking at a potential market five or six hours from Amman. Jordan is already well known for its excellent labour force and its cost base. With our experience, particularly with Airbus 310 and 320 and our commitment to a continuous improvement process, a number of new customers have come to us and we have trebled our revenues."

JorAMCo's position with free zone status at the heart of Queen Alia International Airport has led to customers coming from Turkey, Kuwait, Saudi Arabia, Spain, USA, Austria, Russia and, most of all, India.

"We now have virtually all of the Indian airlines among our customers," Bashir said. "Our offer of quality, price, turn-round time and flexibility means we can meet changing requirements."

"Our approach is one of transparency."

Customers can go to the aircraft any time they want and if they need meetings at any time we are available at all levels. Our view is that once the aircraft is here, the contract negotiation is over and then we work together as partners with the objective to get it out of here as soon as possible and back in the hands of a happy customer."

The success with the Indian airlines has been so great that JorAMCo is studying the prospects of opening a maintenance shop in India to meet the demand. "We look at opportunities. The economy is tough. It is tough for everyone. We are taking steps now with restructuring. We know things will recover and we will be ready," Bashir said.

Great engineers

JorAMCo has taken one step and created its own maintenance academy.

Chief operating officer Nick White joined the MRO from Air Deccan earlier this year. "The academy is a great idea," he said. "We need 100 trainees at any one time. They get to learn on the job; they learn technical English and we get some great engineers."

The engineers study for the UK CAA's Part 66 licence. The first class will graduate in 2011.

"This is a strategic requirement for us. We have mostly Jordanian nationals and they are a committed group with a high standard of work."

"We will be ready for the upturn when it comes."

JorAMCo will be at the Dubai Airshow and Bashir hopes that his simple message will be picked up by the many official airline delegations attending.

"We want people to go away knowing that we are a serious company that is large enough to deal with the needs of an airline and yet small enough to be focused on the smaller details."

"We are not after becoming a mega-company. We know the first obstacle is getting the first aircraft but we genuinely believe that if people try us with one aircraft, others will follow."

Having tripled revenue, there is no question that JorAMCo is a sound investment for Abraaj and RJ and the investment continues. A new 13,000sqm hangar has opened and a 16,000sqm new hangar has followed, giving the MRO the capacity to receive 13 aircraft at any one time.

JorAMCo is gearing up for the new families of widebodies that will hit the market in the next few years. "We are ready for the A350 and the B787," Bashir said. "We are a realistic opportunistic company. Of course we have been affected by the downturn in the economy and we have had to deal with it and take actions – but I am optimistic about the future."

■ **Overleaf: The competition**



‘Retro’ rockets Airmotive to world-class status

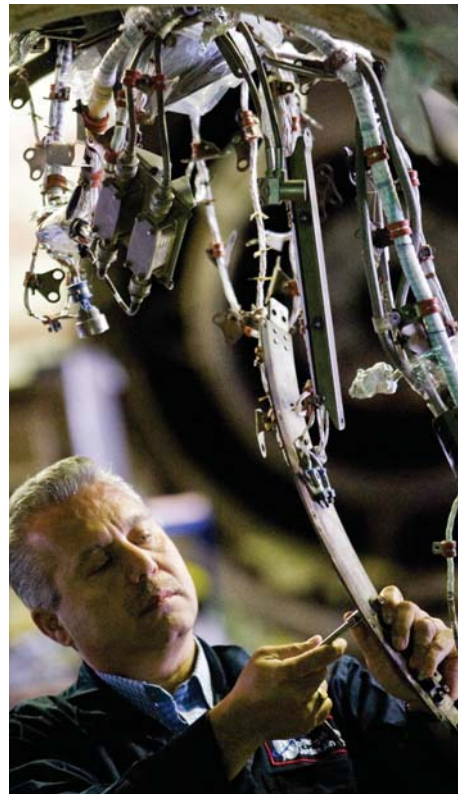
While much of the aviation world is looking forward to the new airframes and engines that will be gracing the skies during the next decade, one Jordanian company is focused very closely at the stars of yesteryear.

Jordan Airmotive, a specialised MRO provider based at Amman international airport, has discovered a niche in which it has developed a world-class reputation.

Throughout the world – and particularly the developing nations – there are many airlines and cargo operators that are not in the position of the Gulf carriers to order 787s and A350s and, instead, are plying routes with classic legacy aircraft that may still have years left on the airframe.

The problem is often the powerplants. Engines that are no longer manufactured can create difficulties for spare parts or even knowledge for maintenance – and this where Jordan Airmotive comes in.

“The company was established in 1985 in collaboration with Rolls-Royce as an offset offer for the Royal Jordanian purchase of the Lockheed TriStar fleet with the RB211-424B engines,” said general manager Waheed Al-Rousan. The company became part of the Royal Jordanian group and was owned by the Government. In 2006, as part of the divestment of business by the airline, Jordan Airmotive moved into private hands through a local investment group.



Top: Waheed Al Rousan, and above, skilled labour gives Jordan Airmotive a great reputation.

But the heritage moved with the 27,000sqm facility and the company realised that there were fewer and fewer shops able to deal with the RB211 engines.

“There are still aircraft out there and our position between Europe, Asia and Africa makes us ideally located for engine repairs and overhaul,” Al-Rousan said.

Supporting the original RJ fleet of Boeing 707, 727 and 747 aircraft, as well as the TriStar, meant that Airmotive gained the necessary experience with engines such as the JT3D, JT8D and the CF6-50.

More recently, as part of the overall growth strategy, the company is looking at other mature programmes and has begun working with the CFM56-3 engine.

“In the longer term we will be looking at the dash five model,” Al-Rousan said.

The company is predicting 10% growth and will be looking to expand hangar space. “We have plenty of land and will be able to do it,” Al-Rousan said.

More investment has gone into the firm’s testbed facilities with \$25million being spent on a new testbed for engines up to 1,000lbs of thrust. “This is world class,” Al-Rousan said.

The investment will allow Jordan Airmotive to look at other models, such as IAE’s V2500 and the T56. “With our new capabilities, we believe we can reach about 68% of the engine populations worldwide,” Al-Rousan said.



الاردنية لصيانة محركات الطائرات
jordan airmotive

Capability

(Current) Full Overhaul & Testing

JT3D Series
JT8D Series
RB211-524 Series (B4/C2/D4)
CF6-80C2

Partial Repair (Line Maintenance Level)

CFM56-5 Series
V2500-A5

(Future) Full Overhaul & Testing

CFM56-3
CFM56-5B
CFM56-7B
JT8D-200

Certificates

FAA	E31Y372Y
EASA	EASA.145.0090
CARC	CARC.AMO.02

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Life-long partnership commitment

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www.jordanairmotive.com

Arabic superstar is the fresh face of RayaJet

RayaJet, Jordan's fast growing business jet operator, may talk about making aviation more accessible to the average business person – but over the next year many in the region will be watching each of its aircraft landing in the hope there is one special passenger on board.

Lebanese singer Ragheb Alama has become the face of the operator for the coming year.

"Ragheb is truly an Arabic superstar. He is loved all over the region and people both young and old recognize and like him," said Noor Abu-Mater, the Amman-based operator's head of marketing.

Alama flew into Amman to launch his Summer Backstage Live Tour '09 on board RayaJet's Challenger 601 and told the media how impressed he had been by the excellent service he had received.

For RayaJet, the increased awareness and the perception of being a young, fit company is worth every penny.

The company is in the midst of a merger with aviation academy Ayla, and is also investing in fleet development.

Earlier this year RayaJet and Ayla agreed to purchase the first Beechcraft Premier II for the Middle East – a move that RayaJet CEO Nader Dajani says will create new markets for business and leisure travellers across the Levant.

Operating cost

With a range from Amman to Dubai, Dajani says the operating cost of the Hawker Beechcraft entry-level jet is so much less than other aircraft with the impressive cabin size of the Premier, that RayaJet will be able to offer charters at significantly lower costs.

"We already have a lower cost base than Gulf operators," he said.

"Whereas in the USA the Premier is used primarily for business, I think we will see a lot of people wanting to use it for personal and leisure flights in this region."

Dajani is excited about the proposed merger with Ayla.

"We are at the second stage of due diligence. Both sides will see advantages. We see us being involved with more simulators there – at the moment our pilots have to go for recurrence training in the USA – also they have a great maintenance team. It is a win-win situation."

RayaJet has performed beyond expectations and forecasts for 2009, Dajani reports. But does that make him happy? "One should never be



Arabic superstar Ragheb Alama announces his commitment to RayaJet at a launch event in Amman.

happy in business," he said. "If everyone is happy no-one does good business."

Certainly RayaJet has done good business in the three years since Dajani and his business partners decided that they were spending too much money chartering aircraft and thought it would make more sense to create their own charter company.

"My business is cement and shipping," said Dajani. "Aviation is a lot more exciting. We use about 15% of the availability ourselves and the rest is there for charter."

Further expansion

The demand is great enough that Dajani sees further expansion beyond the Premier. "We are looking at a new Challenger," he said.

RayaJet is offering a premium service. "Because we are new we are able to look at doing things differently," said Abu-Mater.

"We are passionate about our business and that goes right the way through the company. It is not about just transport, it is about service. We want people to try us once. When they do we are confident they will come back again. We build

relationships and we make sure the service is the highest level."

Suddenly, marketing assistant Anoud el Khatib takes a call. There is a request for a medical assistance flight.

"This is a growing element of our business," Khatib confirmed. "We are moving people around the world." Mostly the flights are from Baghdad. "We have carried patients to as far away as Fiji," she said.

RayaJet has close relationships with medical specialists in Amman who give the go-ahead for the flight after checking the report from doctors on the ground. A doctor and a nurse will accompany the RayaJet crew for the flight.

It takes just two hours to convert RayaJet's Citation VII or Challenger 601 into an air ambulance; the flight clearances often take longer.

"We are luckier than many," said Abu-Mater. "We have our own flight planning team at Marka and get clearances quickly."

Dajani agrees. "Service is better in Jordan than many of the surrounding countries. The main thing is our human resource. The commitment to service makes us stand out."



Nader Najani sees new market opportunities ahead for RayaJet.

Why Arab Wings is the name to remember

Jordanian aircraft management specialist Arab Wings has a special place in the history of business aviation in the Middle East.

The company was the first to offer VIP charters in the region on a commercial basis, having been created from the royal flight team serving the late King Hussein, which was then operated as part of the Royal Jordanian airline.

Today the company is recognised as one of the leaders for quality across the whole of the MENA region and is expanding its reach.

Earlier this year the company said it was on the hunt for a European acquisition as its owner embarks on an expansion strategy that includes new offshoots in Sharjah and Bahrain, as well as an aviation university.

The holding company that owns Arab Wings also owns the Royal Jordanian Air Academy and the Queen Noor Civil Aviation Technical College in Amman. Both training operations were merged into a new university in September, offering degrees and other courses in every aspect of aviation. (see separate story).

Arab Wings, with a dozen aircraft under its management, has established Gulf Wings in Sharjah and is preparing to launch Luxury Wings in Bahrain. Both of these ventures are planned to operate with local air operator's certificates. Chief executive Ahmad Abu Ghazaleh said even with the financial downturn he expects Gulf Wings to have up to 20 aircraft under management by the end of the year.

The company has an impressively diverse fleet on its managed books, including a Gulfstream G450, several Challenger 604 and 605, two Hawker 800 XPs, Cessna Citation Sovereigns and a CJ1+, as well as Beech 1900D and a King Air B200.

Chairman Mohammed Abu Ghazaleh said the goal is for the Arab Wings name to lay claim to the top-of-the mind recall among VIPs and business executives across the region. "We expect to acquire a more diverse fleet that will meet our increasing demand for both business and leisure travel."

According to marketing head, Dima Elayyan, awareness of the Royal Wings brand is already working. "As the first to provide executive aviation in the Middle East, people know us. When they try us they find the service standards are so much higher. We are applying those service standards to smaller aircraft as well."

The company will be the first in the Middle East to receive the Embraer Phenom 300. It will also be at the other end of the scale with the new luxury large-cabin Embraer 1000, as well as gaining several Global Express ultra-long-range aircraft. Through its links with the training academies, it will also have the entry-level Phenom 100.

"There are so many different requirements here," said Elayyan. "We are close to Beirut, Syria, Iraq and to Europe. With our Bahrain AOC we will work closer with Saudi Arabia. We have an ideal fleet."

Arab Wings has been working closely with banks to support financing deals for people wanting to buy aircraft and put them through the company's managed fleet.

"By working closer with the owners we can make sure they get the best deals and they can see that we are the right people to manage their aircraft."

The company's commitment to its customers doesn't end with the red carpet treatment at the Marka Airport FBO. It has signed an agreement with Al-Markazia, the Jordanian Lexus dealer, to provide a chauffeur-driven limousine for all Arab Wings' clients.

Silent eye in the

Manufacturing and assembling aircraft is still a rarity in the Middle East.

Alan Peaford *meets one company that is breaking the mould.*

During a routine operational mission on July 11, an Iraqi Air Force pilot spotted a situation on the ground along a well-known oil pipeline west of Rumaylah, Iraq.

From thousands of meters above, the crew of the Iraqi aircraft saw three oil trucks and long black streaks of oil-soaked earth.

"From the minute I saw the trucks I knew they were there to steal the oil," said Iraqi Air Force Colonel Karim. The smugglers were using an unofficial but well-travelled trail to get to the site, where an unknown device was used to rupture the pipeline. The oil seeped to the surface, creating pools on the ground.

Hoses extending from the trucks were in the pools, siphoning the natural resource from the ground into the trucks' tanks, said Karim.

He told his left-seat pilot to descend so they could better assess the situation. Upon visual confirmation of the activity, Karim radioed back to the unit he commands in Basrah – Iraqi Reconnaissance Squadron 70 – and reported the theft. "We told them what we saw and to inform the Southern Oil Company by phone," he said.

The squadron alerted the Ministry of Oil, which sent Iraqi security forces to the scene. Karim's crew, although already inbound to their home base, averted their planned landing and continued real-time surveillance for another 30 minutes. From the air, they coordinated a follow-on surveillance aircraft to maintain oversight until police forces arrived on the scene.

This is everyday work for the surveillance squadrons working in Iraq. But what surprises many is that the aircraft being utilised to make these missions is one built in Jordan by a company owned by an Iraqi expatriate, and one that is pressing to be taken seriously by the aerospace world.

The aircraft is the Sama CH2000; the company is Jordan Aerospace Industries (JAI) and the owner is Muayad S Al-Samarrae. Al-Samarrae



Muayad S Al-Samarrae.

left Iraq in 1987 and, as a direct descendent of the Hashemite family, was welcomed to his new home as a Jordanian. His late grandfather, First Lieutenant Dawood Bin Salman Al-Samarrae, was famous in military history for establishing the factory building both light and heavy weapons for the Arab Hijaz army, and went on to head the operations from 1917 through 1919.

He was a decorated hero in the Great Arab Revolt and the Twentieth Revolution in Iraq, a reputation which left a great impression on the young Muayad and steered the path for future accomplishments.

An enthusiastic aviator, Muayad had been with the Baghdad flying club in its pre-wars heyday and had a burning ambition to build certified light aircraft in the Levant region. Having created his plans in Iraq, he brought his ideas across the border with him and began designing and building aircraft. In 2001 he established JAI, which remains the only private certified light aircraft manufacturer in the Middle East.

The original CH2000 has been in production since early 1996, with already more than 175 aircraft flying. Manufactured out of aluminium, the aircraft is tough and easy to maintain. Depending on users' requirement the aircraft are powered by Lycoming engines ranging from 116hp and up to 180hp with the option of a diesel



sky above Iraq

engine. The utility trainer/surveillance aircraft has been in service since 2004 in the Iraqi Air Force through a direct purchase by the US Army.

The hardiness of the Sama is remarkable and it is ideal for the harsh desert environment in which it operates. It has a crosswind ability of an amazing 25 knots, thus similar to rotary wing aircraft.

With low maintenance and low operating costs, the Sama cruise speeds range from 100 up to 160 knots. The aircraft has exceptional low-speed handling and manoeuvring capabilities at around 50-70 knots, allowing for continuous tight turns during low-level observation, inspection and photography. At this low speed it has an endurance exceeding eight hours, assisted by an extended fuselage and larger wings developed for improved fuel capacity.

The plant is based at Amman's Queen Alia International Airport. The production line, although small, is perfectly formed with FAA and European JAR quality approved processes and the hand-crafted skills of the Jordanian workers.

"Everything for the aircraft is done here," Muayad said. "We don't pass out to sub-contractors like Cessna or Piper would do. Even the command-control software for the surveillance equipment is designed by us.

"We would love to see more training establishments using our aircraft as they are ideal for the Middle Eastern environments and can handle the strong winds. There is little happening in the world of general aviation in the region and there is no profit in the civil side but, as a platform for the forces, it is doing well."

The aircraft is in use in Libya and Yemen but Muayad believes the emerging African nations will be good candidates for the Sama.

The company has 10 technicians and is investing in R&D.

"We are currently in the middle of the R&D phase of transforming the Sama to be totally unmanned, including the autopilot system and ground stations. To this end, and as part of our customer service policy, we offer our Sama CH2000 & CH2000A customers upgrade packages at cost," said Muayad.



Adel-Gary:
engine maker

Turning an engine dream into a reality

In a workshop close to the runway at Queen Alia Airport, an American-trained aeronautical engineer is working hard on making a dream come true.

Abdalla Aref Adel-Gary studied engineering with the Royal Jordanian Air Force and won a scholarship to the Northwest University in the USA. Now he is back in Jordan working with JAI but, with the support of the company's owner, Muayad Al-Samaraee, he has been quietly getting on with his own project – a new engine.

The result of years of hard work is the Paddling Blades Engine (PBE), an internal combustion engine that has a high power to weight ratio similar to the gas turbine engine. Basically it works like a piston engine but with results that should match a turbine.

"It will give better fuel efficiency than a gas turbine, it starts at a lower rotational speed and delivers a higher torque than a gas engine," Adel-Gary said. "It can be built from cheaper materials and it deals with a high quantity of air and doesn't require the sealing component to minimize the air leaks, such as the ones used in piston and rotary engines."

Adel-Gary has patented the invention but is now on the search for investors. "The amounts of money needed are quite small in development terms," he said. "I need \$200,000 to take us to the next stage. But this is an engine that can replace both jet and piston engines."

"The Sama 2020G2 is the product that meets all challenges. We produced a technically and operationally advanced model that easily beat all its American and European rivals. The current version of the Sama 2020G2 performs better at low operating and maintenance costs."

The move towards unmanned aircraft is well established by JAI with Muayad arguing that the technology is the future for military and homeland security operations.

As a result, JAI created Jordan Advanced Remote Systems in association with the King Abdullah Design and Development Bureau and already has three products well along the production route. These are The Jordan Falcon, an effective, easy-to-use and affordable compact tactical UAV capable of performing a wide range of aerial robotic applications. It performs real-time day and night reconnaissance, remote sensing, surveillance and target accusation up to a range of 50 km.

Then there is The Silent Eye, a back-packable UAV for aerial surveillance, scouting missions, area and perimeter aerial control, and highway monitoring and traffic control. It is also suited for search and rescue mission support, patrol and convoy missions, locate and verify area parameter missions, aerial survey, etc.

Finally there is the Jordan Arrow, an aerial target system intended for air defence weapon training to evaluate and test the various close-in and short-range air defence weapon systems. This threat simulation system can be used for land and sea training, and is used by the RJAF for training on combating surface-to-air missiles (including man-portable) and anti-aircraft artillery.

But Muayad S Al-Samaraee needs investment if he is to take the company to the level he believes it should be as a world-class manufacturer. "It has been said if I moved the business to Abu Dhabi, or elsewhere in the Gulf, then the funding would come. I am not doing that," he said. "I may look towards developing a manufacturing base in Iraq. There is a future there and a need – but I am very proud of what we have achieved here."





The impressive Royal Jordanian Air Force Air Lift squadrons have their HQ at Marka. from Left, regular training takes place, centre: Brigadier General Nabil Ababneh and right the Medevac team ready for action.

RJAF – a small force with a huge

Though smaller and less lavishly funded than the air arms of some of its neighbours, the Royal Jordanian Air Force (RJAF) has an enviable reputation for professionalism, esprit de corps and effectiveness.

Founded by King Abdullah in 1948 as the Arab Legion Air Force (ALAF), the RJAF initially consisted of a training element and an observation squadron, with the RAF providing assistance and support, and maintaining a fighter squadron at Amman.

ALAF was renamed RJAF by royal decree on September 25 1955, and King Hussein (himself an enthusiastic and gifted RAF-trained pilot) energetically steered an expansion and re-equipment programme, and reduced the air

arm's dependence on RAF support, though links remained close.

Jordan purchased a pair of Vampire T.Mk 11s, four Chipmunks and three Harvards for training, and Britain presented ten single-seat Vampire FB.Mk 9 fighter-bombers to form the basis of the RJAF's first fighter squadron. The Vampires soon gave way to Hawker Hunters, which equipped two squadrons and the nine-aircraft 'Hashemite Diamond' aerobatic team.

The RJAF performed with distinction in the 1967 war, its Hunter pilots claiming four enemy aircraft destroyed for one loss in air combat, before the Hunter fleet was virtually wiped out on the ground.

Post-war, No.s 1 and 6 Squadrons re-

equipped with replacement Hunters, while No.9 received F-104 Starfighters. The Hunters were replaced by F-5A Freedom Fighters and F-5E Tiger IIs from late 1974, and Mirage F1s entered service in 1981.

The RJAF has re-established links with foreign air arms since the 1991 Gulf War (including Israel, following the October 1994 peace treaty), and has begun a major modernization and re-equipment programme. Jordan's national command, control, communications, computer and intelligence networks are being upgraded and modernised by Northrop Grumman under a five-year programme, while the air force's S711 and S511 radar systems are being upgraded by AMS UK under an arrangement that began in 2005.

Royal Jordanian Air Force

1 Squadron	Mirage F1BJ/CJ/EJ	AD/A-G	Al Azraq / As Shaheed Muwaffaq al Salti AB
2 Squadron	F-16A/B	AD	Al Azraq / As Shaheed Muwaffaq al Salti AB
3 Squadron	C-130H, C295	Transport	King Abdullah AB, Amman
4 Squadron	T-67M 260	Elementary training	King Hussein Air College, Mafraq
5 Squadron	MD500D, AS350B3	Training and crop spraying	King Hussein Air College, Mafraq
6 Squadron	F-16A/B	AD/recce	Al Azraq / As Shaheed Muwaffaq al Salti AB
7 Squadron	AS332M-1/AS532	Transport/Special Forces	King Abdullah AB, Amman
8 Squadron	UH-1H	Transport/SF/Border security	King Abdullah AB, Amman
9 Squadron	F-5E/F	AD/A-G	King Feisal bin Abdul Aziz / Al Jafr
10 Squadron	AH-1F	Attack	King Abdulla II AB
11 Squadron	Casa C-101	Basic training	King Hussein Air College, Mafraq
12 Squadron	AH-1F	Attack	King Abdulla II AB
14 Squadron	EC635T1, AS350B3, Schweizer SA 2-37	SF support	King Abdullah AB, Amman
17 Squadron	F-5E/F	OCU	H5/Prince Hassan AB
Royal Squadron	A340-211/ -642, G-IV, G450, CL-604, S-70A-11, UH-60	VIP	King Abdullah AB, Amman



AIR-LIFT TEAM THAT PROVIDES FULL REGIONAL SUPPORT

reputation

The ageing F-5Es have been relegated to a lead-in fighter training role, and the Mirage F1s will soon be retired, thanks to the influx of F-16 Fighting Falcons. Jordan acquired an initial batch of 33 ex-USAF F-16 Fighting Falcons from the USA, and these have been augmented by 17 further F-16As and 8 F-16Bs from Belgium and the Netherlands (all upgraded to NATO MLU standards).

It is expected that the ex-NATO F-16s will undergo the same TAI upgrade as the ex-USAF F-16s, which incorporates Falcon-up, Falcon-Star and mid-life upgrade (MLU) and brings the aircraft to Block 40 standards.

The F-16s have given the RJAF a much-improved air defence capability, not least after the November 2004 deal that saw Jordan receiving 'up to 50' AIM-120C missiles.

The RJAF has also revitalised its transport and helicopter fleets, taking delivery of two Casa 295 tactical transport aircraft, ten AS532M Cougars and nine Eurocopter EC635T1 armed scout helicopters.

The RJAF headquarters at King Abdullah Air Base in Amman oversees six main air bases, 15 squadrons and two specialised flying schools.

The RJAF has been heavily involved in humanitarian missions, with its C-130s supporting the Jordanian Army contingent serving with UNPROFOR in the former Yugoslavia, and delivering relief in Armenia, Bangladesh, Chechnya, Indonesia, Iran, Japan, the Maldives, Pakistan, Sudan, Turkey, and the Yemen. Today, the RJAF is supporting the fledgling Iraqi Air Force with aircraft and training, continuing to add to its enviable reputation.

The professionals ever-ready for missions of mercy

When Beirut Airport was bombed by Israeli forces, the first humanitarian mission to bring vital medical supplies to the city was a C-130 from the Royal Jordanian Air Force (RJAF).

When the atrocities in Gaza occurred earlier this year, tens of thousands of Palestinians needed medical attention or evacuation to hospitals – the first support came from Super Puma helicopters from the RJAF.

When a Jordanian driver was involved in a head-on car smash in Saudi Arabia, the patient was airlifted back to Jordan for treatment with the RJAF, and when a group of tourists went missing in the vast Jordanian deserts it was an RJAF Bell 212 from the Air Lift Wing that brought them back safely.

Brigadier General Nabil Ababneh commands the Air Lift Wing from its headquarters at the King Abdullah Air Base at Marka in Amman. "We are able to provide a full regional support from here," he said.

In the 2006 Israeli attack on Beirut, the C130s of Number 3 squadron carried out more than 100 missions to the badly damaged airfield. "We were the first in and were able to assess how much of the runways could be used," Ababneh said.

"Jordan is a small country, but King Abdullah believes strongly in providing support when it is needed. Our role is not about aggression, it is about peace and prosperity. We pride ourselves in being able to respond to His Majesty's wishes and bring help when it is needed."

The Air Lift Wing has responded. It has taken humanitarian aid to China after the earthquake – a repeat of the help given to Turkey, Armenia, Japan, Iran and Pakistan in recent years. When tsunamis hit the Pacific rim countries, Jordan was at the front of the line taking aid to the victims.

Closer to home, the Number 7 helicopter squadron operates the Super Puma and carries out light and

medium airlift, search and rescue, medivac, border security and anti-terrorism operations.

Across the apron from General Ababneh's office a medical team is on full-alert waiting for the scramble signal.

"When that order is given, the paramedic team moves quickly and can be airborne in minutes," Ababneh said.

The Jordan Government is committed to providing medivac and airlift support to any of its nationals that may be injured or killed elsewhere in the world. The Wing was utilised bringing back Jordanians from Bosnia in the war there, but more often is involved in repatriating injured nationals from hospitals after road accidents following the Haj or long drives from the lower Gulf states over Eid or summer holidays.

The Air Wing is also looking at providing fire fighting capability and has been training with specialists.

"We don't have the wealth of the oil-based economies," Ababneh said, "but we have first class training and commitment and can be on a par with those wealthier nations. Training is important and it is continuous. If you look outside you will see teams training and being mission-ready."

One mission that General Ababneh is always prepared for is a parachute drop. King Abdullah is an experienced freefall parachutist and occasionally likes to make a drop. "When His Majesty calls we want to be ready – and make sure everything goes well," Ababneh said.

The RJAF takes its C130s to the UK every year to the Royal Air Tattoo and other air forces pay tribute to the country's fine ambassadors. "We do our job – but we do it well," Ababneh said.



Making connections in the Middle East



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BACK SEAT DRIVER

When it comes to in-flight entertainment (IFE), Middle Eastern carriers are among the most ambitious in the world.

Emirates' Panasonic-based Information Communications Entertainment (ICE) service, offering hundreds of on-demand films and music tracks, is regarded as one of the best of its kind. Etihad gives its first-class passengers huge 23-inch screens to watch content served up by Thales TopSeries hardware.

Panasonic and Thales dominate the market for top-of-the-range in-seat IFE. But they do it with system architectures that have stayed practically the same for a couple of decades. While the two manufacturers continue to evolve their products to enhance performance and cut weight, volume and power requirements, they still believe in centralisation. Hundreds of gigabytes of movies and other content are held on powerful "head end" servers and dished out on demand to "dumb terminal" screens in the seat.

French aircraft seat manufacturer Sicma believes there's a better way – one that halves weight, cost and power demands compared with the traditional approach, and offers enough processing power to support brand-new entertainment options such as 3D games. As a newcomer to the IFE market, Sicma needed a launch customer with the confidence to challenge the established order. Earlier this year it found one in Royal Jordanian Airlines.

By ordering Sicma's new Seat Integrated Technology (SiT) system for

Though the airlines want in-flight entertainment systems that are lighter and cheaper than ever before, they take no risks in choosing their suppliers.

Brendan Gallagher reports on a Middle Eastern carrier that is about to break the mould.

Sicma's new Seat Integrated Technology (SiT)



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installation in its quartet of Airbus A340-200s the Amman-based carrier is going where few airlines anywhere in the world have dared to tread for many years. Conscious that quality of IFE service can lose as well as win customers, the airlines are very conservative in their choice of audio/video-on-demand (AVOD) suppliers, playing safe by sticking to the big two of Panasonic and Thales.

Among the exceptions are carriers that have turned to hand-held IFE as a way of offering entertainment quickly, flexibly and at reasonable cost. One of the prime attractions of this solution is the fact that it demands no complex work in the cabin and can be withdrawn at a moment's notice by simply wheeling the cartload of hand-held players off the aircraft. There's more to installing SiT than that, but Sicma says it's still much more straightforward than putting in the conventional systems, with their big head ends and multiple boxes.

The secret of SiT is the way it puts all of the available content into every seat, storing it right under the passenger's fingertips in the Seat Display Unit (SDU). Capable of being mounted in the seatback or on a fold-out arm, the SDU is essentially a standalone PC with a high-resolution 10-inch screen, a 1GHz processor, 1 Gb of RAM and a 250Gb hard drive – enough for 85 typical films.

Sicma says that decentralising in this way eliminates the possibility of the multi-seat failures that can plague conventional systems, as well as speeding up response when the passenger selects new content. It also means that the IFE hardware can be built into the seat right from the start, eliminating some of the integration and retrofit issues that currently add cost and complexity.

By existing standards, the rest of SiT is lightness and simplicity itself: a small (1kg) SiT Interface Box (SIB) and a gigabit-rated optical ethernet network for the delivery every few weeks of new content loads to the SDUs; one power box for every four seats, one passenger control unit per seat, a crew control unit, and a 1kg Aircraft Interface Box (AIB) to integrate other functions such as air-to-ground connectivity and a moving-map display.

Sicma's claims to superior installability are founded on being able to deliver the seats with



their IFE provision already in place. Then it's just a matter of securing the seats on their tracks, installing the power supplies and other small boxes, running the content-delivery ethernet cable along the existing raceways in the floor, plugging in power and switching on.

"We estimate that the complete installation will weigh around 2.9kg per passenger across 30 seats in business class and 229 in economy aboard Royal Jordanian's A340s," said Loic Bouet, SiT product manager at Sicma. "This compares with a figure of at least 4.5kg for a typical conventional system. Our cost, depending on aircraft type, is \$4-6,000 per passenger, half as much as for the competition, and power consumption is 35W/passenger against 66W."

Work on the first A340 should now be under way at Royal Jordanian's base in Amman. The aim

is to complete all four aircraft by September of next year and to have the installation certificated by EASA and Jordan's Civil Aviation Regulatory Commission. SiT will then be used to deliver in full commercial service a range of IFE offerings that is now being finalised. The airline is also considering installations for its Airbus A310s, with the final decision depending on how much longer the twinjets are likely to stay in the fleet.

The Airbuses are due to be replaced with Boeing 787s some time after 2012, opening up the possibility that in due course a satisfied Royal Jordanian may be pushing to have SiT approved for installation in the new twinjet. If that happens, a Middle East carrier will have played a central role in ushering a new player and a new way of doing things into an IFE systems market currently dominated by two heavyweight incumbents.



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Are you sitting comfortably? UAE flagship carrier Etihad is making sure its premium customers will be as the carrier unveils its new Diamond zone first class suite.

Marcelle Nethersole reports.

Etihad's new Diamond in the sky

Since its launch in November 2003 with flights from Abu Dhabi to Beirut, Etihad has steadily progressed its operations adding another 50 destinations to its list.

While other carriers have been feeling the pinch of the current economic crisis and have been forced to scale down their operations, the UAE national carrier has this year launched new services to Istanbul, Athens, Chicago and Melbourne and is now upgrading its premium cabin offering.

But it is not just its growing global routing and aircraft acquisition that is making Etihad so successful. It is continuing to invest in its on-board products and services, too, and its latest product offering of the award-winning Diamond (first) class zone certainly marks a new era in luxury air travel.

First class passengers on board Etihad's latest Airbus A340-600, operating between Abu Dhabi and London Heathrow, can now enjoy the comfort and privacy of their own state-of-the-art suite.

"The entry into service of our new first class product is a major milestone for us," said James Hogan, Etihad Airways' chief executive. "It is the first time we have offered our customers their own private suite within the first class cabin.

"It is state-of-the-art and offers innovative enhancements, such as a personal illuminated wardrobe with mirror and refreshment cabinet. It demonstrates our continued commitment to provide a world-class experience for our premium passengers."

The new Diamond Cabin contains 12 individual suites, which have been supplied by B/E Aerospace. They provide first class customers with an extra-large

leather seat, upholstered by Poltrona Frau (providers of interiors for Ferrari cars), which extends to a full flat-bed, 80.5in long and has a built-in massage, lumbar support and adjustable headrest.

There are power sockets for an i-pod, laptop, and other devices, and there is ample stowage compartments around the seat.

Each suite is accessed by its own sliding door and has its own wardrobe and mini bar, as well as a 23in-wide LCD screen with the AVOD IFE, which holds more than 600 hours of entertainment.

Dining is also a luxury as meals are served on a large wood-finished table, with an ottoman providing a seat for a guest, as well as the capability to lower a seat divider to provide dining space for four people.

To further improve customers' dining experience, Etihad has introduced a new dining position of food and beverage manager on board to ensure top quality food and service.

The décor and style of the suites reflects Etihad's Arabic cultural background. "The suite takes its inspiration from traditional Arab design motifs and the subtle hues reflect the natural colours found in the region's landscape," said B/E's Doug Rasmussen.

Within the first class cabin there is also a large luxury changing room with a full-length mirror, wash basin and leather fold-down seat, allowing customers to freshen up at any time during the flight.

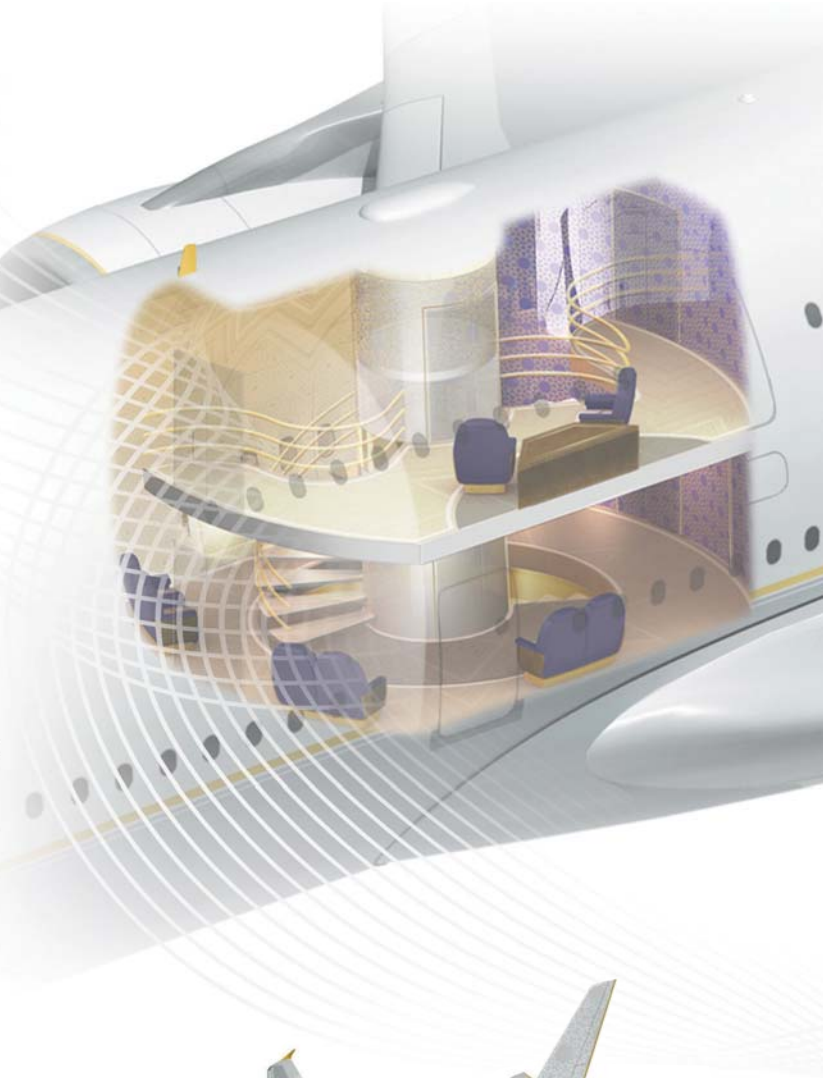
Etihad will take delivery of a further five Airbus A330-300 aircraft configured with the new first class suites during the next two years. The airline will also upgrade its business and economy-class cabins with improvements on its seats and the AVOD IFE system.



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The jewel in the Masterjet crown

Patrick Mauboussin is known the world over for his fine jewellery designs but is now working on a different kind of gem – his signature aircraft design for Masterjet Business Aviation. Marcelle Nethersole talks to Mauboussin and Masterjet's Edward Queffelec, about their collaboration and the interest it is sure to generate in the Middle East.

According to Patrick Mauboussin, air travel is also a question of art, which is why he has been working on a new concept called “Flying is Art” and creating a new aviation interior and exterior design company – Patrick Mauboussin Aircraft Design.

His first project is ‘Nile Spirit’, the painting of the 26-passenger Airbus A320 Corporate operated by Masterjet.

But just how did a jewellery designer get to launch his own aircraft design company and work with a business aviation specialist? “Masterjet’s expertise is in three areas of business aviation; aircraft trading, aircraft charter and operation and consulting,” explained Edward Queffelec, Masterjet marketing manager.

“We operate a range of Dassault Falcon, Cessna Citation and Airbus jets. Our main operation facility is based at Paris Le Bourget airport with other facilities in Geneva, London, Jeddah, New Delhi and Malta. We are always looking at new ways to keep our global customers happy.

“Over the years, Masterjet has analysed the customer demand regarding cabin size and found out that more and more customers are attracted to the new wide cabin solutions, ACJ and BBJ, but were stopped by the heavy acquisition price. This is why Masterjet came back with a new solution product proposing the acquisition of a recent second-hand airliner and offering a VIP conversion.

“This provides a tailor-made aircraft for a customer with a sensibly reduced price. But to make us different we needed a brilliant designer with a fresh view of aviation.”

The answer was close to home. Edward’s father, Philip Queffelec, is the Masterjet Group president and he had been friends with Patrick Mauboussin for decades.

For the famous jeweller it was an offer he could not refuse. “My family was in the aviation industry a long time ago so I found it natural to join my friend Philip in this new venture,” Mauboussin said.

The move allowed Mauboussin to start with a clean sheet of paper and bring fresh ideas to the industry.

“I hope to not only bring decoration but also well-being, using some other technologies, in order to let the passenger feel better after his journey. I have the chance as a jeweller to

realise specific and ultra-personalised orders for customers,” Mauboussin said.

An A320 was the first project for him.

“Masterjet was providing an A320 project for a customer and we wanted to make a gift for him. At the same time, Patrick Mauboussin Aircraft Design was being created and we thought it would be a wonderful idea to offer to our customer a unique aircraft paint mixed between his country culture and Patrick’s incredible inspiration,” explained Queffelec. “We have to say that the customer was very pleased to get such a signature on his aircraft and to transform his corporate travel tool into a piece of art.”

The project was called ‘Nile Spirit’ which, Queffelec said, “raises a very new skin, underlying a fuselage composed with several shades of blue”.

Mauboussin explained the creative idea behind the design of ‘Nile Spirit’: “My first priority was to understand the background and the culture of the customer. This is very important. I told the customer a number of different stories and let him choose which one applied to him.”

This approach is generating significant interest within the VIP market as it reinforces the point to customers that they have their own unique aircraft with their own personalities at the heart. Queffelec added: “The Patrick Mauboussin Aircraft Design signature is aimed at customers who are passionate about their aircraft and who want to make it something unique; to make their flight an ‘art’. The good thing is you do not have to make it super-expensive for it to be unique. Just create it around you, which means that the Mauboussin signature is not limited to a single-area customer or a single aircraft type and can be adapted for any customer.

“The Middle East market is definitely the one that is the most used to the aircraft personalisation and, furthermore, Middle East customers are definitely the most open to new designs and different schemes. They have always had a passion for aviation, which clearly makes them potential customers for Patrick’s concept. Not being a decorator, but a jeweller, and an artist, Patrick definitely brings a breath of fresh air in the aircraft design industry.”





Chic and Mac

*UK aircraft interior refurbishment and manufacturing company MAC Interiors was selected by Egypt Air to refurbish three of the airline's Falcon 20 VIP jets. **Marcelle Nethersole** met up with MAC MD Stephen Whittaker to find out why the company is proving to be so successful.*

MAC Aircraft specialists provide a full package of aircraft interior services, from concept design through to certification and installation.

"We have a team of exceptionally skilled professionals and gifted designers using the finest materials sourced from all over the world," said Stephen Whittaker, the company's managing director.

"Whether you require a single piece of bespoke furnishing for an executive jet, or complete multiple assemblies for an aircraft interior refurbishment, MAC Interiors will offer the right solution."

As well as Egypt Air, MAC Interiors customers include Qatar Airways, Airbus, BAE Systems, Cathay Pacific, Lufthansa, British Airways, Boeing and Virgin Atlantic. Like everyone in the industry the 20per cent reduction of spend by commercial airlines has had an impact, but MAC has balance in its work for the corporate sector too.

"The VIP side of the business is still brisk; commercial airlines appear to be taking stock in the wake of the reduced revenues and looking to provide refurbishment options on existing aircraft. But through this we are also seeing changes in design," said Whittaker.

"Customers are looking towards more contemporary interiors with a chic stylish feel to them, which we are able to provide. But we do not design for re-sale value; it is always personal taste. Our customer is priority; whatever they want we will provide but we are careful to guide them and apply all sensible options with wider appeal where it is appropriate to do so."

MAC carries out a lot of business in the Middle East and is able to meet design demands within this region.

Whittaker explained: "We cover a wide area in the Middle East, including Kuwait, Qatar, Dubai, Saudi Arabia and Bahrain. We are popular here because we can adapt very quickly to the various subtle differences in the area's culture and requirements. Customers here have a lot more creative

ideas, which we can meet. We can provide the complete service from concept to completion and beyond. Plus, we provide considerable on-site assistance and guidance in many areas of interior support. And, for all customers, private hangar facilities are available and annual maintenance can also be provided to ensure the bespoke interiors have an exceptionally long life span to ensure peace of mind."

MAC designs everything from galley units, seats and in-flight baby cradles to cabin dividers and oxygen storage systems. It is currently working closely with raw material manufacturers to approve lightweight versions of materials from the super yacht industry, including 3D metallic base decorative surfacing.

"We pride ourselves on technical innovation and pushing the boundaries of materials, design and manufacture. We're skilled at interpreting the personal tastes of customers from all over the world, engaging with their individual or brand identities and creating interiors that are exclusive, while maintaining the utmost elegance, style and practicality," said Whittaker.



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POWER PLAYS

The decade to define the next 50 years

The world of commercial aircraft engines has always been mighty competitive – but it has seldom been so polarised as now.

And it's not the usual trans-Atlantic battle either as – in different guises – the USA's major OEMs duke it out between themselves, sometimes pausing for breath to tackle their European competitors.

Alliances and joint ventures notwithstanding, the major players are GE, Rolls-Royce and Pratt & Whitney – with companies like France's Snecma, Germany's MTU, Italy's Avio, Sweden's Volvo and Japan's Aero Engines Corporation linking up with the 'big three' in various combinations to produce power-plant components and modules for today's, and the next generation, of engines.

Since the introduction of the high-by-pass ratio turbo fan engine – GE led the way with the CF6 – all the major players have travelled along a similar route, increasing by-pass ratios and enhancing power outputs through hugely sophisticated, but not dissimilar, technologies. Until now that is.

It's the scramble – if a situation evolving over several years can be so termed – to power the next generation of single-aisle airliners (replacing Boeing's 737 and the Airbus A320 families) that has proved to be the catalyst for the evolution of significant changes in emphasis.

High – and unstable – oil prices, international

environmental pressures and pressure from airlines to reduce maintenance costs even further, have all contributed towards the growing polarisation of the major companies.

Competing philosophies are vying one with another to emerge as the overall victor in a multi-billion dollar competition – the rules for which have yet to be published. That's down to when the airframers decide which way to jump in terms of aircraft structure and size.

And don't be too surprised, either, if the 'airframer club' includes some new members rising to challenge the current supremacy of Boeing and Airbus...

Make no mistake, whichever company, or alliance, or joint venture wins the lion's share of orders to power the new generation of regional airliners, it will do very nicely, thank you.

Aviation journalists *Martin Johnson, Ian Sheppard and Geoff Thomas* take an in-depth look at what's emerging in the world of the major engine original equipment manufacturers (OEMs), as ever higher-by-pass ratio turbofans take on geared turbofans and maybe open rotors. What will emerge is anyone's guess.

But the next decade looks certain to define what will happen over the next 40 or 50 years, at least in the world of the regional, probably single-aisle, airliner.

Trent keeps flowing into the Middle East

When Gulf Air announced at this year's Paris Airshow that it was again opting for the Rolls-Royce Trent 700 to power a fleet of 20 additional Airbus A330s, the decision served to highlight the engine's remarkable record in the region.

Eight out of the nine A330 operators in the Middle East and North Africa have taken the Rolls-Royce option on an aircraft that, unusually among modern passenger jets, offers customers a choice of all the "big three" engine manufacturers – Rolls-Royce, General Electric and Pratt & Whitney.

Claiming a 70per cent market share over the last three years, the Trent 700 has used its 72,000lb thrust – the highest rating on the A330 – to demonstrate impressive capability, particularly on higher weight versions of the twinjet, in the harshest 'hot and high' environments.

More than a third of the fleet's 11 million hours of operational experience has been in the Middle East, where temperatures regularly topping 50C provide one of the world's stiffest tests of equipment.

Meanwhile, to meet the specific challenges of operating at high elevation destinations such as Lhasa, Tibet – 3,600 metres above sea level – some Chinese airlines are now flying the newly designated Trent 772C, which delivers an additional three per cent take-off thrust and eight per cent more climb thrust by reprogramming the electronic engine control (EEC).

The Trent 772B is certified to produce its full-rated thrust up to ISA+22C, equivalent at sea level to an ambient temperature of 37C or 99F, some 7C higher than the general standard for civil turbofans and the competing A330 engines.

As an illustration of how that translates into customer benefits, Rolls-Royce maintains a Trent-powered A330-300, flying a 3,000 nautical mile route at 8,000ft elevation on an ISA+20C day, can carry 244 passengers – 65 more than the same aircraft fitted with the lowest rated competing engine.

Higher available thrust is seen by Rolls not only as a

differentiator in aircraft capability, but as a direct link to the engine's impressive time-on-wing record. The company points to independent industry data showing an average of 18,000 hours before first shop visit, with second, third and fourth shop visits consistently spaced at intervals of 15,500 hours.

Richard Keen, head of marketing for Airbus programmes at Rolls-Royce, says the 700 has been a calling card for the rest of the Trent series. "It's such a great cornerstone for us, opening up markets and, in many cases, establishing the brand in airlines which go on to become multiple Trent operators."

It may have been the first of the Trent family to enter service back in 1995, but its performance on the A330 continues to prove a winning formula, resulting in Trent 700 production rates rising consistently year-on-year since 2004. In fact, its heritage as the initial member of the now six-strong Trent series made it a prime candidate for the type of improvement programmes that have raised performance levels.

Where operators can expect clear benefits, Rolls-Royce has consistently taken opportunities to feed latest technologies back into earlier generation engines. Indeed, some years ago the Trent 700 itself took on the donor's role when its core was successfully offered to retrofit the hot section of the RB211-524G/H.

Continuous improvement

"This philosophy of continuous improvement has certainly worked well for the 700," said Keen. "In 1999 we inserted the 04 module from the Trent 800 (the high-pressure compressor, combustor and HP turbine) and came up with the Trent 772B, giving customers extra capability, greater reliability and improved performance. Although our maximum operational thrust of 72,000lb is the highest available on the A330, in effect the changes gave us a 75K-capable core."

Rolls-Royce subsequently introduced a second major technology enhancement in the form of the enhanced performance (EP) package, consisting primarily of improved blading in the intermediate and high-pressure compressors. This is said to deliver an engine fuel-burn improvement of up to 1.3per cent, equivalent to a typical annual saving of \$100,000 per engine in fuel costs.

The upgrades are now incorporated in new production engines, the first batch of the new standard Trent 700s having been delivered to Singapore Airlines in March.

Meanwhile, the launch customer for the EP kit is to be Cathay Pacific, which is retrofitting 24 engines over the next two years, reducing CO2 emissions by an estimated 720 tonnes per year.

Rolls-Royce says it is talking with other interested customers about potentially fitting kits during scheduled shop visits, and reveals that some Middle East operators are among those in discussions.

Whatever the merits of the respective products from the major engine makers, there is no doubt that the Trent 700 has become the dominant force on the A330 in recent years. And that trend looks set to continue, with 68per cent of the total A330 backlog currently set to be Rolls-Royce-powered.

Etihad and Emirates are among the airlines whose selection of the Trent 700 has made the Rolls-Royce product the engine of choice for the region's A330s





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ENGINES

THE

FACTOR

The Middle East, North Africa and Gulf regions are hugely important markets for both airframers and engine makers as airlines fight for share in an arena of growing significance – witness the huge growth in air transport within and around the UAE over the past 20 years.

CFM International, which is about to celebrate its 35th anniversary and delivery of its 20,000th engine, is gearing-up for the future by creating an entirely new powerplant. Called LEAP-X, it is designed to power the next generation of short to medium-range jet airliners likely to enter service within the decade.

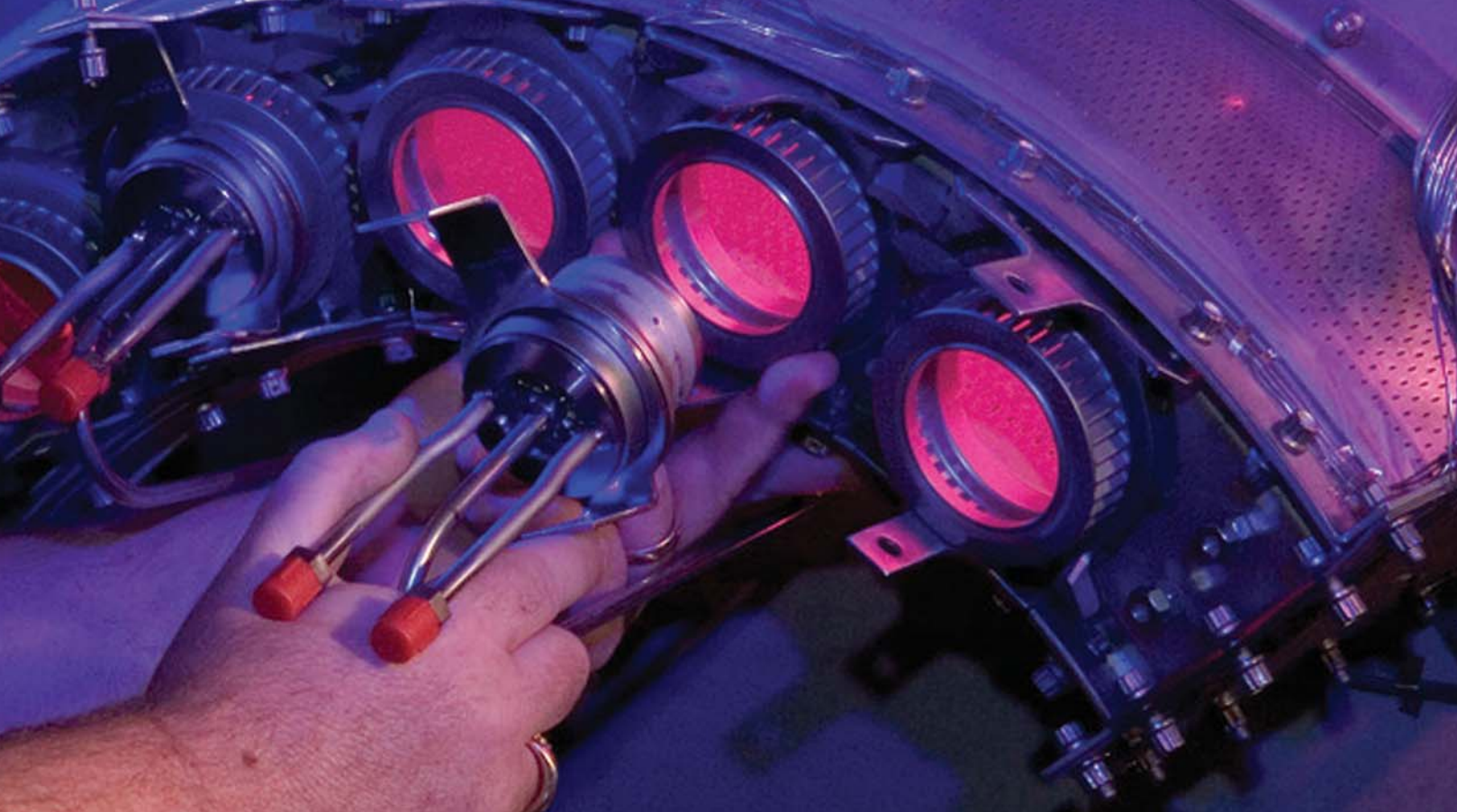
CFM is a 50/50 joint company between France's Snecma (SAFRAN Group) and America's GE – a relationship that has now been extended until 2040. With the LEAP-X, it is introducing revolutionary technology aiming to achieve up to a 16per cent reduction in fuel burn by 2016.

CFM is the world's leading aircraft engine supplier with its CFM56-7B and CFM56-5B engines powering all Boeing's 737NGs and also being available for selection by airlines flying Airbus' A320 airliner family.

In the ever-tougher international market where fuel-burn, operational costs and environmental efficiency dominate, the CFM56 has proved to be a star performer offering, with each new development, higher thrust, improved efficiency, and lower maintenance costs.

Indeed, CFM now claims that its engines are so reliable that, statistically, a pilot with CFM56s on-wing would experience an in-flight shutdown only once every 165 years based on one in-flight shutdown every 500,000 flight hours.

Once every two to three seconds, a CFM-powered aircraft takes off somewhere in the world with remarkable operational reliability records



equating to an average first engine on-wing life of 18,000 hours – or 14,000 cycles.

The first core of the advanced LEAP-X development programme began its ground test programme in early June 2009 in a special altitude test chamber at GE Aviation facilities in Evendale, Ohio, as the full-scale LEAP RTM (Resin Transfer Moulding) composite fan completed extensive cross-wind and acoustics tests at GE's unique outdoor test facility in Peebles, Ohio.

The first full demonstrator engine is scheduled to run in 2012, and the full LEAP-X engine could be certified by 2016. The same core technology may also be utilised in an 'open rotor' engine, if this is the direction in which the airframers decide to head.

The goals for LEAP-X include reducing the engine contribution to aircraft fuel burn by up to 16per cent compared to current CFM56 Tech Insertion engines.

Additional fuel burn improvements will be achieved once this engine is paired with new aircraft technology, bringing a comparable improvement in CO₂ emissions. LEAP-X is also being designed to reduce NO_x emissions by 50 to 60per cent compared to the current International Civil Aviation Organisation (ICAO) CAEP 6 limits. The incorporation of advanced composite materials and alloys that reduce engine weight will also contribute to the lower fuel burn.

Technology highlights of the revolutionary LEAP-X engine include:

■ **Advanced 3-D Woven Resin Transfer (RTM) composite fan and case:**

This Snecma proprietary technology has been under development for several years and will dramatically reduce engine weight while

providing a more durable blade. In January 2009, CFM initiated ground test of a full-scale RTM fan installed on a CFM56-5C engine. The programme, dubbed Moteur à Aubes de Soufflante en Composite Taille (MASCOT), is validating this revolutionary technology in a CFM-sized fan.

CFM says results to date are positive and are in line with pre-test expectation. It will continue to refine and test various blade designs to identify the optimum configuration for the first LEAP-X demo engine test in 2012. The LEAP-X fan will feature 18 blades, a 50per cent reduction versus the CFM56-5C and 25per cent fewer blades than the CFM56-7B.

■ **Advanced core:**

The LEAP core currently undergoing ground testing features an eight-stage compressor, advanced Twin-Annular Pre-Swirling mixer (TAPS II) combustor, and a single-stage high-pressure turbine. This is the first application of CFM parent company GE Aviation's engine core development programme known as 'eCore'.

The test programme is focusing on aerodynamic performance parameters; the aeromechanical properties of the blades and how they respond to vibration and natural frequencies; and operability to ensure the engine maintains CFM's reputation for stall-free operation.

CFM successfully completed a full-annular rig test of the combustor earlier this year; now it can map the response to an actual compressor flow field and the temperature profile exiting the combustor into the turbine.

Programme manager Ron Klapproth said there are a number of ways to minimise the fuel-burn, some of which are directly within the remit of the airframers and engine builders and some of which

– like air traffic management and to a certain extent bio-fuels – aren't.

"Propulsive efficiency comes at the top of the list, giving an improvement of 7.5per cent," he said. "This is followed by enhanced thermal efficiency creating another 7per cent benefit and the weight/drag of the overall propulsion system – including the nacelle – offering a further 1.5per cent improvement."

By utilising highly sophisticated materials and 3D aerodynamics within the compressor and turbine modules, operating temperatures can be enhanced, while the overall pressure ratio can also be increased, giving additional fuel burn improvements.

Reducing the 'hot-spots' within the combustors (thanks to CFM's TAPS II technology that reduces the 'residence time' creating a leaner mixture) gives more efficient and even combustion without generating additional NO_x and this also enables benefits in terms of the fuel-air ratio. The new technology should cut NO_x emissions by around 60per cent.

At the same time, technologies such as a variable area fan nozzles will help reduce the engine's noise by between 10 and 15 EPNdB (effective perceived noise in decibels) compared to today's current Stage 4 noise regulations. This equates to making a jackhammer operate as quietly as an alarm clock.

Other noise reducing measures include a higher bypass ratio being achieved with the 70-inch 3-D woven RTM 18-blade fan. With fewer blades and a composite case, this results in a lighter module (around 1,000-lbs per aircraft) and higher efficiency.

Additional fuel burn improvements will be achieved once this new engine technology is paired with new aircraft technology, incorporating low weight composites and even more enhanced aerodynamics.

ENGINE MRO

A Strategic Alliance

Aerostar Asset Management, Sharjah, UAE and Air India Engine Overhaul Division, Mumbai, India have created an Engine MRO brand called 'The A Team'. Directed initially for the Middle East Market, this strategic alliance shall provide engine repair and management solutions to all operators of the region.

The facility based in Mumbai will initially cover the GE CF6-50 & 80 series, PW 4000 series, GE 90 series and CFM56-7 series, and will also cover the CFM56-5 series in the near future.

An Exclusive marketing agreement was recently executed between the two companies and the brand is to be launched at the Dubai Airshow to be held from the 15th to the 19th November 2009.

Aerostar Asset Management is a company promoted by the ETA Star Group which has a strong presence in the Middle East. Aerostar has been involved in jet engine management for various customers since 2005.

Air India Engine Overhaul Division has been catering to third party MRO services since 1999.

The above alliance will provide practical and economic solutions to engine repairs which will benefit operators in these crucial times.



Aerostar's capabilities in material management, sourcing and procurement coupled with Air India's technical expertise and facilities shall be the ideal combination for providing optimal and economically attractive engine repair management solutions to the operators in the region.



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PowerJet defies its critics with Super performance

The PowerJet SaM146 axial-flow, twin-shaft turbofan was selected to power the Superjet 100 in 2003, when it was still on the drawing board.

The programme has proved its critics wrong so far, entering flight test in July at Komsomolsk in Russia and flying at the Paris Airshow in mid-2009. Powerjet is a 50:50 joint venture between Snecma and NPO Saturn of Russia.

Snecma is responsible for the core, control system, transmissions, overall engine integration and flight testing, while NPO Saturn looks after LP section components and engine installation, as well as ground testing.

The core was developed by Snecma, drawing on its M88 'hot section' military engine experience and the DEM21 core demonstrator project – with its six-stage compressor and single-stage, high-pressure turbine with active blade-tip clearance control – and various other modern design features (such as single-piece bladed disks).

The engine's thrust range is 13,500-17,500lb with a design point at around 90 passengers and a range of approximately 70 to 120 passengers. First ground test was in July 2006 and first flight test took place in December 2007 on an Ilyushin Il-76 testbed aircraft. Six months later a pair of SaM146 engines powered the Superjet 100 on its first flight.

Jean-Paul Ebanga, who has been chairman and CEO of PowerJet since 2007, said: "Based on all the assumptions of the business

plan we are on track and aiming to certify the engine by the end of the year. The third flight test aircraft is now flying and they have done more than 4,000 test hours with what are effectively production-standard engines, with no problems.

"We started the engine from a blank piece of paper, which gave us the flexibility to optimise the design point. We got the feeling that customers were looking for a quick solution, not a 2016-2020-type solution, so we decided to mix advanced technology and a proven solution to get the same level of reliability as the CFM56."

Ebanga says the approach makes the engine a generation beyond the CF34 – for example "it is using a six-stage compressor when the CF34 uses a nine-stage compressor to produce the same pressure ratio".

Another difference is the long nacelle used on the SaM146 – which should make it quieter than the CF34, Ebanga

suggests – while it is also designed with generous temperature margins for reliability in hot climates. "We took the CF34 as the benchmark and ensured that we were better on everything," he said.

With its other main competitor, the P&W PW1000G (selected to power Mitsubishi's MRJ), Ebanga said: "I will be very interested to see the real performance in our market segment. The geared fan is a 20-year old concept which P&W has developed for larger engines but when you reduce the fan diameter you increase the penalties of the gearbox

versus the benefit gained."

He added that the gearbox is a "potentially weak link" because it operates very hot and at high pressure. It also adds weight and increases part-count, when the sensible thing is to reduce it.

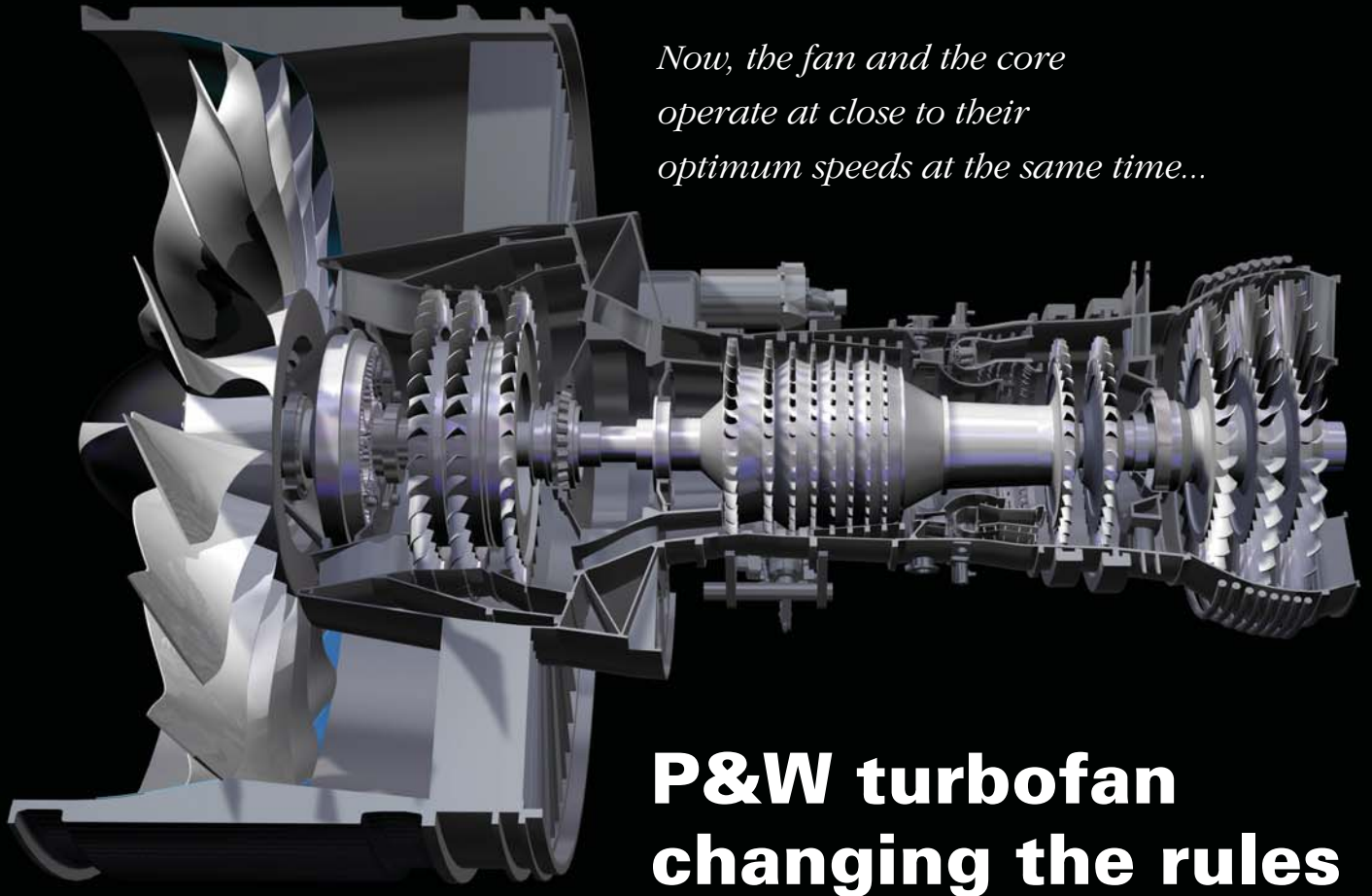
As to whether the engine is a contender for Embraer's next regional jet, Ebanga said: "We are 100% focused on the Superjet 100 entry-into-service but further down the road the engines can be used on a different platform." For now the SJ100 is in direct competition with the Embraer 190.

The PowerJet chairman added: "From a customer standpoint we are already in discussions with some potential customers in the Middle East... regional flights there have a huge potential. During the last Dubai Airshow we were showing the range on a map – this aircraft can reach all the regional market and has a longer range than the competition – it can even go from Dubai to India."

SaM146 Suppliers

Techspace Aero	Lubrication system
Microturbo	Air starter
Hispano-Suiza	Electrical equipment
	Hydromechanical equipment
	FADEC (via Fadedec International)
	Engine control system components
Tecnofan	Fans
Sagem	Engine overspeed controller
Aircelle	Thrust reversers
	Nacelles
SO France	Engine injection upstream filter
	Main fuel filter
Snecma Propulsion Solide	Mixed flow nozzle (MFN)





*Now, the fan and the core
operate at close to their
optimum speeds at the same time...*

P&W turbofan changing the rules

The advance offered by Pratt & Whitney's 'game changing' geared turbofan engine is to allow both the fan and the core to operate at close to their optimum speeds at the same time – which has previously not been possible.

The fan will operate at around one-third the speed of the turbine. Although there is a weight penalty having a gearbox, this is offset overall due to fewer parts. P&W says that it has calculated a fuel-burn improvement of 12-15% over current engines when it enters service in 2013.

P&W vice president environment and technology Alan Epstein said: "With the engine's geared technology, we expect it to then improve 1-1.5% annually."

He added that the GTF is "approximately ten per cent shorter in length and five per cent lighter than a conventional design with the same level of technology. There are approximately 1,500 fewer airfoils".

P&W proved the concept using a PW600 engine with a GTF drive to the fan, undertaking a 400-hour technology demonstration programme – including 120 flight hours on the company's 747 testbed and Airbus's A340 testbed (as Airbus was also

interested in evaluating the technology).

The company told *Arabian Aerospace*: "Our analysis shows that the PW1000G is 12% better than a CF34-8 on an Embraer 170, and more than 15% better than a CFM56-5B/7B with tech insertion."

As to concerns over the gearbox, Epstein responded: "We've run the equivalent of 40,000 take-offs on a gear set and you still could see the machining marks from the production process on the gear tooth surface." He added that the gear system does not use any life-limited parts.

The US engine manufacturer has moved into 12-15 months of detailed design, which will involve making some more key decisions – such as whether to have composite or metallic fan blades. It is on a high after the PW1000G, with a thrust range of 14,000-17,000lb, was selected as the powerplant for the Mitsubishi Regional Jet (MRJ) – it will be designated PW1217G – and then, somewhat more spectacularly, for Bombardier's new 'game changing' CSeries.

Bombardier needed the step-change in engine efficiency promised by P&W to make the CSeries viable in a market niche sandwiched between the Embraer 190 from

below and the 737s and A320 family from above.

P&W was able to oblige by offering a version with a larger, 73-inch fan (increased from 56in) and extra low-pressure compressor stage to bump the engine up into the right thrust range (17,000-23,000), as the PW1524G.

Initial run of a PW1000G is scheduled for mid-2010, with certification expected by the end of 2011 and entry into service in 2013 on the CSeries – if it remains on time. The MRJ, which was also due to enter service in 2013, slipped slightly in September and will now enter service in early 2014.

The MRJ is the competitor for CF34 and SaM146-powered regional jets. It has been selected by All Nippon Airways (ANA), which became launch customer in March 2008, but has so far failed to attract another order.

P&W is leveraging the PW1000G's geared fan architecture to develop an engine for the next generation narrowbodies of Airbus and Boeing. It has launched a technology programme and is "targeting an additional 8-10 per cent fuel burn benefit through advancements in a higher-ratio fan drive gear system".

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Step by step to a step change

GE continues to develop the CF34 – but is looking much further ahead

GE Aviation's CF34 engine has been developed over the years in a way that, although it has kept the original designation, the later models are very different from the early examples.

Andre Robert, manager CF34 marketing, said the engine started out for business aviation applications and there are now more than 1,500 in service powering Challenger 601, 604 and 605 aircraft.

The original model was the CF34-1 and it was developed from a military engine (the TF34), entering service in 1983. It is as a regional aircraft engine that it really took off, however, following entry into service on the Bombardier CRJ-100 as the CF34-3A1, the CRJ-100 being a development of the business jet for the airline market. Then the CF34-3B1 helped the CRJ-200 become "the mainstay of the market", said Robert, with more than 1,000 CRJ aircraft delivered.

By 2001 Bombardier had developed the CRJ-700 and Embraer entered the market

segment with the ERJ-170/175, aircraft for which GE developed the CF34-8. The first delivery of the Embraer 170 (as this 'E Jet' is now known) was in March 2004, and in the same month Embraer flew its new 190 model powered by two of GE's new CF34-10E engines.

Between the CF34-3 and -8, GE refined the design for more power with fewer moving parts, going from 14-stage compressor to a ten-stage compressor while achieving an increase in rated thrust from around 9,000lb to some 14,000lb. For the -10 engine there are nine compressor stages plus a three-stage booster after the fan, but GE went from a two-stage to a single-stage high-pressure turbine, keeping to four stages for the low-pressure turbine. It thus borrowed features from the larger CFM56 engine, developed by GE/Snecma joint venture CFM International for Boeing 737s and Airbus A320 family aircraft.

However, various other refinements bumped the

Continued
on Page 110



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CONTINUED FROM PAGE 108

overall pressure ratio to 29:1 (slightly higher than the -8 but significantly higher than the 21:1 of the -3) and the engine has a top rating of 20,000lb, significantly higher than the -8. Turbine entry temperature was increased from 900C to 970-990C for the later engines, allowing for better exhaust gas temperature (EGT) margins and longer life.

Another major change, explained Robert, was to synchronise the life-limited part (LLP) deck at 25,000 cycles for the -8 and -10. With the -3, LLP lives varied between 18,000 and 30,000 cycles.

The next step for GE is the NG34, its next generation engine, said Robert. "It is important

for us to look to the future so that we're prepared to support new applications in 2015 and beyond. Our objective with the NG34 technology programme is a 10-15per cent reduction in operating cost with high reliability – so we will rely on simple, robust designs."

A key feature is the 'eCore', which will take technologies that GE has developed for the GENx (powering the Boeing 787) a step further. It is aimed at engines in the 10-30,000 thrust range so that they can have a common core architecture, said Robert. "It boils down to taking all the capabilities – aerodynamics, twin annular premixing swirler (TAPS) combustor (which will be eTAPS) etc – to the next level," he explained. "The fan and low pressure turbine (LPT) will scale well from the GENx into the NF34 programme but the core will be a generation ahead. We have just completed the first core test and the team is evaluating the results. We plan on testing 'Core 2' in the second quarter of 2011, and we aim to bring the engine to test in 2012."

Meanwhile, the CF34-10A will be the next market application, following the planned entry-into-service of the CRJ-1000 with the CF34-8C5A1 engine at the end 2009. The -10A will power the Chinese ARJ21 – the main difference being that the engine will be rear-mounted. Two aircraft were scheduled to be in flight test as *Arabian Aerospace* was going to press, with a third due to join them soon and a fourth in 2010, before certification and entry-into-service in late 2010.

The application on the stretched CRJ has seen GE improve the HPT "for durability purposes – because it is a higher base thrust rating", said Robert. This meant changing the geometry of

certain airfoils, software changes and better cooling features. "The most significant change is probably improved nozzles in the turbine, allowing it to go from 48 to 34 vane while holding the same flow function."

GE believes operators will see up to a 10per cent reduction in maintenance costs through these various enhancements, which "will become common for the whole -8 programme", believed Robert.

CF34 engines will not have greater thrust ratings than 20,000lb in the future due to GE's agreement with Snecma to avoid CFM56 territory – although the eCore will be applied to other engines.

The CF34 engine family is now the dominant engine powering regional aircraft by a huge margin, although the success of P&W in having its geared turbofan selected for Bombardier's new CSeries was significant. However, that is larger than the traditional regional jets and Bombardier would have been interested in thrust ratings beyond 20,000lb – whereas the CF34 is at the top of its effective design reach there. That Mitsubishi has also selected the GTF is interesting in that P&W will have a version with a smaller fan diameter and two, rather than three, booster stages behind the geared fan – thus covering the 14-17,000lb thrust range as well as 17-23,000.

Robert said GE looked at geared fan architecture and from all the work it had done felt content with the traditional two-spool design.

Developing the CF34 has proved a great success but, admitted Robert: "We find that with a given generation of product you can improve

up to a certain point but then it is a case of diminishing returns and you have to consider a suite of technologies that will work well together and deliver the improvements expected from the market place."

He added that the CF34-10 will be further improved in 2010 with a new fan blade and new oil cooler, so it will have improved specific fuel consumption. "It is a another tweak but ultimately we will need the step change," he said.

The main prize for GE will, perhaps, be the next generation Embraer regional jet. There will be fierce competition between GE and PowerJet, which is yet to prove itself in service and cannot come close to matching the GE support network at present.

"It is important for us to look to the future so that we're prepared to support new applications in 2015 and beyond. Our objective with the NG34 technology programme is a 10-15per cent reduction in operating cost with high reliability – so we will rely on simple, robust designs."

Andre Robert



General Electric and Abu Dhabi's Mubadala Development Company have lost no time in moving to implement the initial steps of the comprehensive maintenance, repair and overhaul agreement signed at the Paris Airshow.

Muhammad Al-Lamadani, GE's vice president regional sales for the Middle East, Central Asia and Eastern Europe, said progress on matters involving the in-service fleet is already evident. "Many airshow announcements seem to be made simply for the benefit of short-term publicity but in this case meetings between us began immediately post-Paris and we are already hard at work implementing the MRO arrangements involving CFM56, CF6 and GE90 engines. We're very encouraged by the levels of co-operation with both Mubadala and its affiliates."

The Paris announcement addressed one of the remaining components of a broader strategic partnership forged between the parties last year, which encompassed a range of activities including commercial finance and research into clean energy projects.

Under the latest initiative, GE Aviation will provide technical support and services to Mubadala's affiliate MRO companies, SR Technics and Abu Dhabi Aerospace Technologies (ADAT) including materials support, technical



Mubadala MRO deal moving on apace

training and the granting of licenses to service certain GE engine types.

Mubadala Aerospace associate director Homaid Al Shemmari reiterated at Paris that part of their ambition was to build a global MRO network – a point which resonates with GE's Al-Lamadani. "Our agreement includes terms to cover potential expansion and I think they are willing to make some sizeable investments in areas such as technology capability and tooling to fulfil their aims beyond the Gulf," he said. "The future is an open question, but they already have a European foothold through their affiliation with SR Technics and I think, eventually, they may want to create other facilities in the Far East and America."

Key components of the latest development include the naming of ADAT as the world's first MRO network provider for GENx engines, covering GENx-1B and -2B powerplants operated in the Middle East and North Africa. The shop will be fully operational in 2013, supporting an expanding regional presence,

including Etihad Airways, which has confirmed the choice of the GENx engine to power its future fleet of 35 Boeing 787s.

GE will also support ADAT in obtaining capability to carry out modular assembly and disassembly of Etihad's fleet of 36 GE90-115Bs (current and on order) as well as designating ADAT as a member of its global network of on-wing support providers for the model. The Middle East has the highest global concentration of GE90s.

GE and CFM International will provide ADAT with technical and overhaul support for CFM56-5A/B/C and CF6-50/80C engines while, in the case of SR Technics, the same input will apply to CFM56-5B/C variants.

Both organisations will benefit from the sharing of best practice through GE Six Sigma initiatives; while GE and Mubadala also confirmed a 10-year OnPoint Solutions agreement to provide the respective MRO companies with new and used serviceable parts,

Abu Dhabi Aircraft Technologies (ADAT) is to acquire GE90 modular and on-wing support capability as part of the latest set of agreements between Mubadala and General Electric.

and component and accessory repair for all the previously named engine types.

The Paris revelations followed hard on the heels of confirmation that GE and Mubadala were to establish an \$8 billion finance company and to create the Abu Dhabi Leadership and Development Centre, which will form part of GE's global learning network.

It seems unlikely that this will mark the limit of the co-operation. Muhammad Al-Lamadani describes Mubadala's outlook as dynamic and ambitious. "They are determined to be successful in this sector and their management team has a visionary and futuristic outlook. I can't predict what direction we may take, but a global agreement is already in place with GE corporate and when we identify potential opportunities they will be evaluated."

Mubadala brings together and manages a multi-billion dollar portfolio of local, regional and international investments, projects and initiatives across a wide range of sectors, including energy and industry, healthcare, real estate and information communications. Its sole shareholder is the government of Abu Dhabi.

Fan blade designs enjoy wind of change

General Electric and NASA have embarked on a programme of wind tunnel tests to evaluate new and exotic fan blade designs for potential use in open rotor engines.

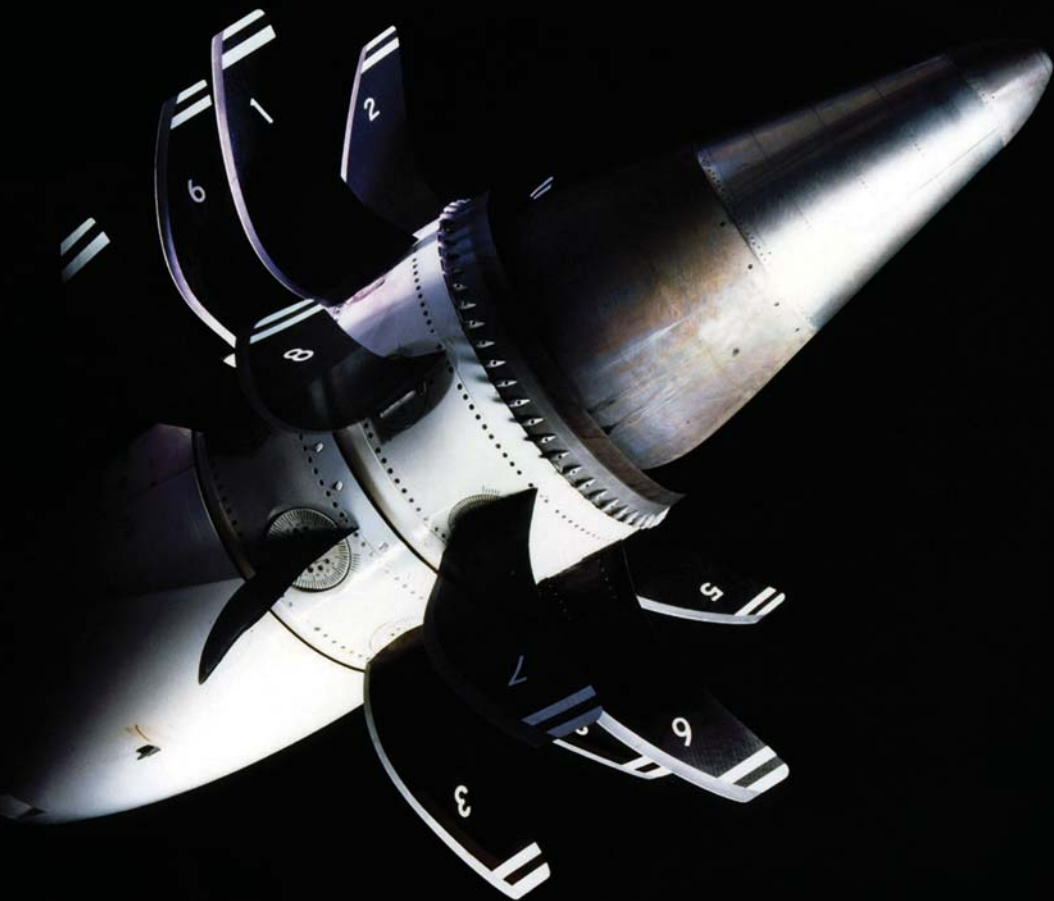
"The tests mark a new journey for GE and NASA in the world of open rotor technology," said David Joyce, president of GE Aviation. "They will help to tell us how confident we are in meeting the technical challenges of open rotor architecture. It's a journey driven by a need to sharply reduce fuel consumption in future aircraft."

The tests will involve seven different sets of composite blades, scaled to one-fifth size, designed and manufactured by GE at its Cincinnati facilities.

The programme is jointly funded by GE and NASA's research directorate, with design input from CFM International partner Snecma. Open rotor concepts are among the longer-term technologies being considered for LEAP-X – CFM International's programme focusing on future advances for next-generation CFM56 engines.

The facilities at NASA's Glenn Research Centre in Cleveland, Ohio – used in the 1980s when NASA and GE first tested counter-rotating fans as part of the development of the GE36 open rotor engine – have been refurbished for this latest initiative.

The evaluation programme, which will last throughout the rest of this year and into early 2010, is based around a series of component rig tests featuring a standard configuration of counter-rotating blades; 12 in the front row and 10 in the back. These will be tested in Glenn's low-speed wind tunnel to simulate low-altitude aircraft speeds for acoustic evaluation (engine noise is accepted as being among the major operational challenges facing open rotor engines), and in a high-speed wind tunnel, which will create high-altitude cruise conditions to measure blade efficiency and performance.



GE and MTU are combining to come up with new, advanced engine repair schemes. MTU's expertise already includes ground-breaking processes like blisk patch welding, being carried out here in a pure, inert gas atmosphere. (Picture: MTU)



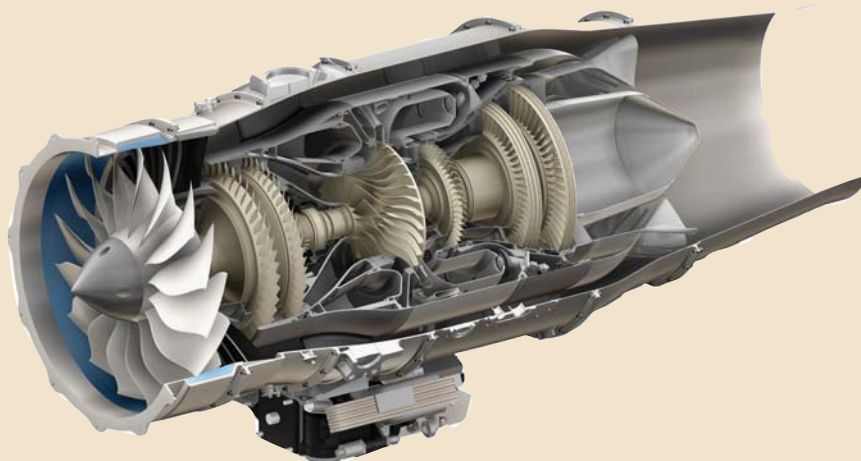
< MTU and GE in ground-breaking link

Germany's MTU, whose customers in the region include Saudi Arabian Airlines, Saudi Aramco, Qatar Airways, Royal Jordanian and Abu Dhabi Aircraft Technologies (ADAT), is to team with GE Aviation in what it views as a ground-breaking development to jointly develop innovative component repair processes.

"This is the first agreement of its type that we have signed with one of the OEMs," said Dr Stefan Weingartner, MTU Aero Engines president and CEO, Commercial Maintenance.

The transatlantic cooperation is not restricted to specific GE engine types or assemblies. "We can bring our experience, our technologies and our know-how to the table to benefit both commercial and military programmes," added Weingartner.

The agreement covers a 10-year term, with jointly developed repair procedures being approved as OEM repairs and marketed by GE.



< Two new GE options set for Gulf

Operators of business and utility aircraft in the Gulf will shortly enjoy additional powerplant options thanks to two new engine programmes involving GE Aviation initiatives in Asia and Europe, which are moving into their certification phases.

The first GE Honda Aero Engines' HF120 has been assembled to certification configuration at GE's manufacturing facilities in Lynn, Massachusetts. The engine was launched in 2006 and selected to power Honda Aircraft's advanced light jet, the HondaJet, and the Spectrum Aeronautical Freedom business jet.

"With the experience gained through our demonstrator testing, we're confident the HF120's configuration is mature and we're anticipating a smooth FAA certification programme, which will be completed in 2010," said GE Honda president Bill Dwyer.

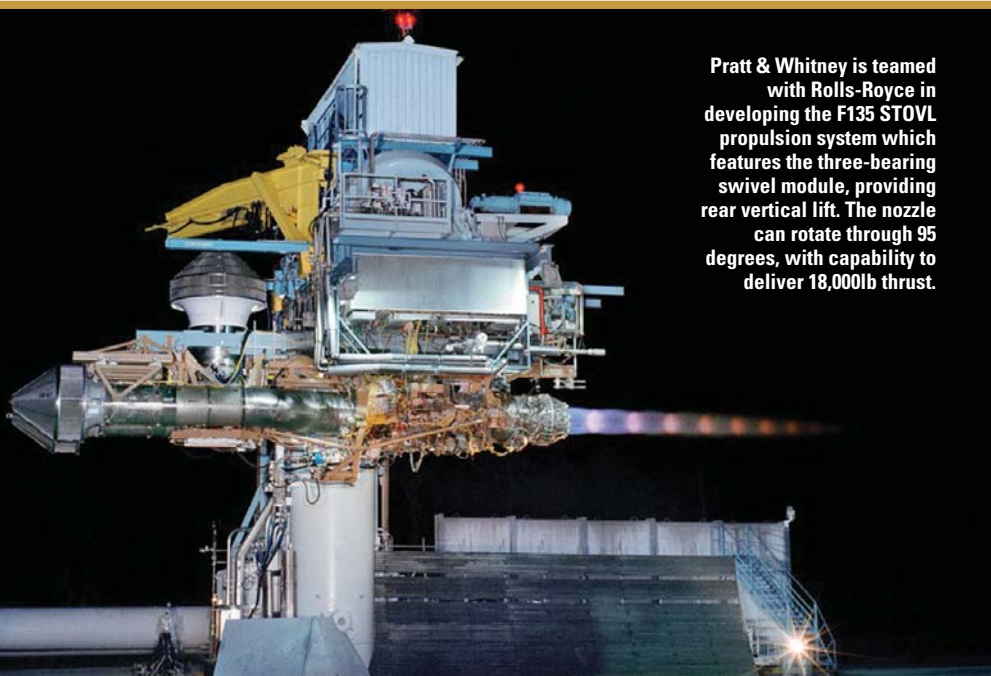
Prior to the start of official certification testing, GE Honda had already run eight HF120 cores and 11 full engine demonstrators, exceeding the engine's design goal of 2,095lb thrust.

Thirteen development engines will be involved in certification testing at seven locations in the United States and Japan, with flying testbed trials scheduled ahead of flights on the customer certification aircraft. By entry into service, the HF120 will have accumulated more than 15,000 cycles of ground and flight testing.

HF120 technologies include a swept, wide-chord fan and two-stage booster, along with composite outlet guide vanes and a high-temperature titanium impeller in the compressor for maximum engine pressure ratio and stall-free performance. Turbines feature advanced materials, with a counter-rotating HP and LP spool shaft system.

Meanwhile, in the same timescale, GE is preparing to certificate its new turboprop derivative, the H80, which is based on the proven M601 series produced in the Czech Republic by the former Walter Engine company. Producing up to 800 shaft horsepower, the H80 is aimed at the utility, agriculture and business and general aviation market.

The programme is a collaborative effort involving GE engineering teams in Evendale, Lynn and the Czech Republic.



Pratt & Whitney is teamed with Rolls-Royce in developing the F135 STOVL propulsion system which features the three-bearing swivel module, providing rear vertical lift. The nozzle can rotate through 95 degrees, with capability to deliver 18,000lb thrust.

^ Lightning II flashes past another milestone

Pratt & Whitney says development of its next-generation F135 fighter engine remains on track in support of the F-35 Lightning II flight test programme, having passed the milestone of 12,000 engine test hours.

This achievement, as part of the system development and demonstration (SDD) phase, is in addition to 3,600 test hours accumulated during F-35 concept demonstration, taking total F135 engine test hours to more than 15,600.

At this point, the F135 conventional take-off and landing (CTOL) engine, and the short take-off and vertical landing (STOVL) propulsion system, had powered 113 flights (134 flight test hours).

Programme vice president Warren Boley said: "We're proud of the F135's performance in successful ground and flight tests. It demonstrates its dependability and reliability, as well as the maturity that comes with the first production engines that we will deliver later this year."

Meanwhile, the US Department of Defence (DoD) has awarded P&W a \$571 million "low-rate initial production" (LRIP) contract covering production, spare parts and engineering support for the third tranche of F135 engines, including 10 CTOL and 11 STOVL variants. Additionally the company has been granted a \$113 million contract by the DoD for long-lead material procurement to produce 32 engines in the fourth batch of F135s.

Rolls-Royce lands the Eagle

Rolls-Royce has been selected to power the RotorWay Eagle 300T turbine twin-seat helicopter with RR300B1 engines. As part of the agreement RR300s will be delivered to RotorWay through 2017.

The RR300B1 is the second new model in the RR300 programme and one of six new civil engine programmes Rolls-Royce has launched in the last three years. The engine's development programme has progressed quickly since its 2007 launch, with production and deliveries commencing in 2008.

Ken Roberts, president of Rolls-Royce's helicopter engine business, said: "This new partnership with RotorWay will enable them to expand on the range of popular piston-powered helicopters in their portfolio. The selection of a gas turbine engine for RotorWay's new, civil-certified Eagle 300T is an excellent opportunity for us to demonstrate the power and versatility of the RR300 engine."



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Mike Martin *reveals how an act of aviation necessity developed into ...*

The Harvard of flying schools

The impact of the 9/11 terror attacks in New York was felt around the world, but not every outcome was bad news. The creation of the Horizon International Flight Academy in the UAE in the aftermath of the attacks began as an act of necessity and has grown to become the premier training facility in the region.

The perception after 9/11 was that it would become difficult, if not impossible, for citizens from Middle East countries to get permission to get flight training in the United States.

"I can see it as if it was yesterday," said Mohammed Humaidan Al Zaabi, general manager of Horizon, who was a leading member of the founding team. "It was the idea of His Highness Sheikh Mohammed Bin Zayed Al Nahyan (Crown Prince of Abu Dhabi and deputy supreme commander of the UAE Armed Forces).

"We are talking about the time after September 11 and everything was closed. If we did not make arrangements for our own training, then training would stop. So, in order to continue, we planned our first course for September 2003."

Looking at the current fleet of nearly 30 aircraft, both fixed wing and rotor, the graduation of some 300 pilots and flying instructors, it is tempting to say that the rest is history. In fact, according to Al Zaabi, it was unremitting hard work that delivered the success, and Horizon's ambitions have a long way to run yet.

"You cannot stand still and we have never done that," he said. "We want to be the Harvard of flying schools and we have made progress towards that end. We would also like to expand elsewhere, possibly in Europe. Why not?"

Horizon was established at Al Ain International Airport by the Mubadala Development Company, the investment arm of the Abu Dhabi government. After receiving approval from the UAE General Civil Aviation Authority, Horizon opened its doors.

The pioneering "class of 2003" were on a helicopter flying course – the first civilian training body for helicopter pilots in the Gulf Cooperation Council (GCC). From the outset, Horizon aimed to meet the needs of the military, civil and corporate flying sectors.

The academy was the first in the region to introduce the European Joint Aviation (JAA) curriculum and the only one to offer both helicopter and fixed wing programmes. Training includes the Private Pilot Licence (PPL), the

Commercial Pilot Licence (CPL), the Air Transport Pilot Licence (ATPL) Instrument Rating (IR) and Certified Flight Instructor (CFI).

Al Ain International Airport was first choice because of the availability of air space and the fact that Abu Dhabi's second city was already home to the UAE's leading universities. A bonus is the annual Al Ain aerobatic display, which draws crowds in their thousands.

With the blueprint for Horizon drawn up, Al Zaabi and his team outlined the project at the Dubai Airshow. "The response we got was very favourable and we sensed, even then, that this venture would be successful," he said.

Now, with 100-plus staff, Horizon undertakes flying training for students from throughout the GCC region and further afield, including from Europe, Africa and India. A major boost came with the launch of Etihad, when Horizon won the contract to run the new airline's pilot cadet programme.

The academy has achieved accreditation under international aviation bodies and, most recently, won the right from the UAE Ministry of Education Committee of Academic Accreditation to offer High Diplomas on selected flight training courses.

The Horizon fleet includes the Bell 206 Jet Ranger, the Robinson R44, the Kingair 350 and the Diamond DA 42.

Horizon has expanded its reach, establishing a centre at Umm Al Quwain in the UAE. As well as the range of flying courses, the new Horizon centre offers something from the lighter side of life – skydiving.

"In skydiving you have the same attention to detail and emphasis on safety as you have in flying," said Al Zaabi. "Umm Al Quwain has the airspace for this activity and it fits perfectly within the UAE's strategy of developing tourism."

Al Zaabi said he is actively looking to expand the Horizon name into other countries. A deal was close for a centre in another GCC country but was put on hold at the last moment.

While the recession has hit areas of the Arabian Gulf hard, Abu Dhabi has been able to withstand it far better than some states. Horizon has been pretty unscathed, said Al Zaabi.

"Training and education will never be hit too hard, whatever the global situation," he said. "You will not stop your kids from going to school. There is an effect for sure, but it is not bad."

As if to make the point, Horizon had just taken delivery of its latest simulator – a CRJ 200 jet transition facility.

Al Zaabi is particularly proud that the educational and administration side of Horizon is now fully electronic, thanks to an initiative designed by the academy. The Horizon Management System is used by both students, staff and anybody else authorised to check the curriculum, monitor progress or to access 1.5 million books and texts relating to aviation.



Mohammed Humaidan Al Zaabi: "Horizon's ambitions have a long way to run yet."





Air Cost Control

Electrical Parts Purchasing Office

Air Cost Control is a leading stocking distributor specializing in electrical parts for the aerospace industry.



"Where is an electrical expert when I need one? I could really use such a partner to handle part of this contract." said Laure Parelle, Sales Director & Co-Owner of Air Cost Control, while working within the Airbus contractual purchasing department. Off she went in July 2000 on a quest to consolidate 300 electrical component manufacturers into a single source. With determination and will, she and her husband, Laurent Parelle (CFO & Technical Director), began a 9-year adventure to create what would become the only purchasing office specializing in electrical parts. The couple spent 10 years at Airbus, from the LPPIA (now Lycée Professionnel Privé Lycée des Métiers de l'Aéronautique Airbus), an in-house technical school created in the early days of Airbus, through the Toulouse assembly lines. "We wanted to redefine service. We believed customers had more expectations from a business transaction than just trading a product for money." advised Laurent Parelle.

Although the activity developed rapidly, it was not until the company implemented an ERP system in 2003 that it began to experience double-digit growth.

The young team expanded to 15 specialists in 2006. The same year, the company opened a representative office in Madrid, and a second in Beijing. Later, the State of Florida welcomed Air Cost Control USA, LLC and a new American division with a second stocking warehouse dedicated to American customers.

While the development was fast and steep, the red line was never broken. "Flexibility, Proximity, Problem Solving and Technical Knowledge are our core values." said Laure Parelle. Those promises were kept. And a new company, EWIS Training, a training and technical consultancy subsidiary, was created in 2007. The goal was to offer a new level of expertise to Air Cost Control customers and others. MROs, IFE & Completions Centers, electrical wiring companies and any aerospace related company could now take advantage of Electrical Wiring Interconnection Systems courses provided and taught by an in-house certified Airbus instructor. Specialized tool kits, such as the EWIS and Quadrax toolkit were developed by A2C and certified by Airbus.

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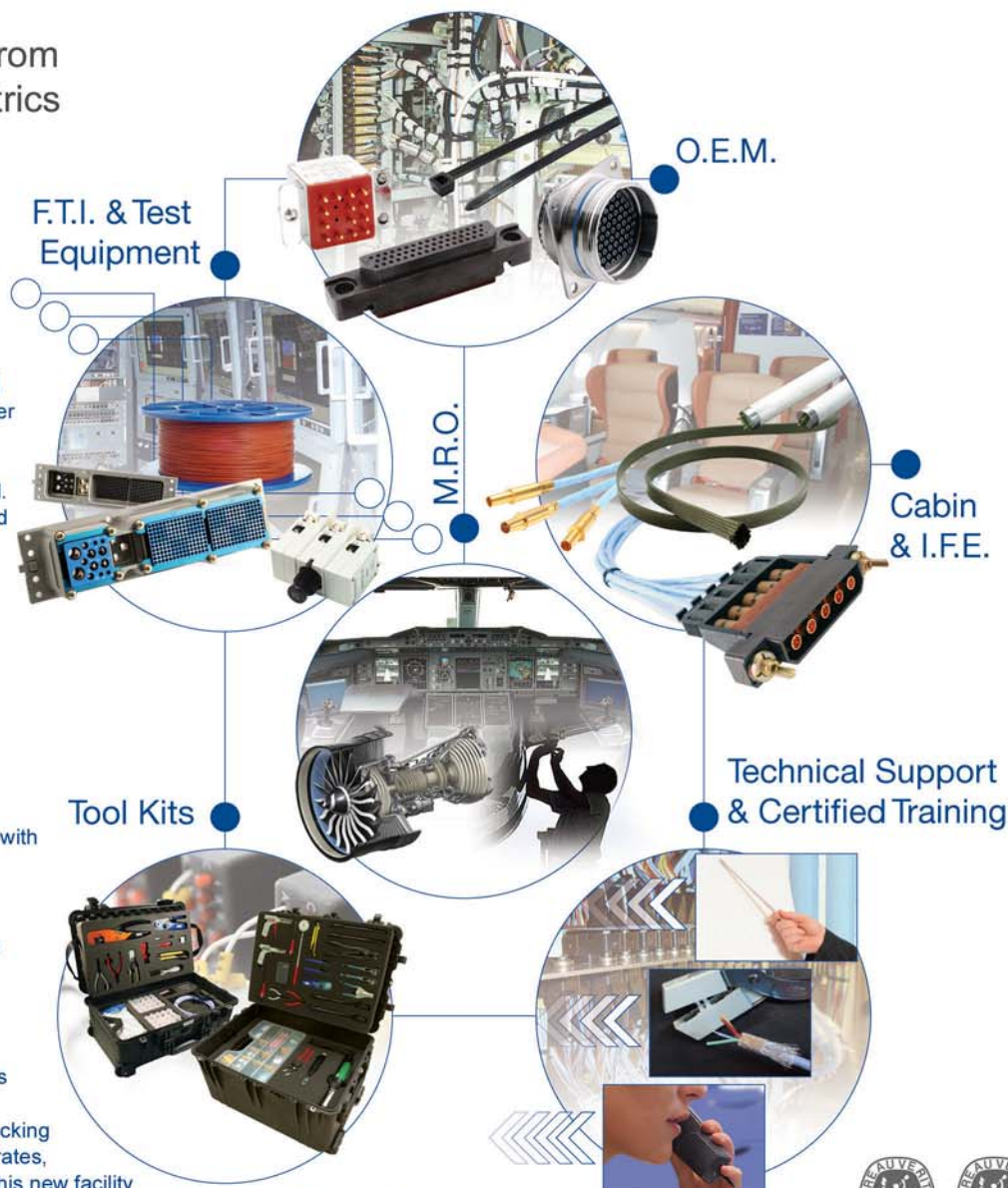
received recognition from Airbus Center of Electrics in the form of an award for its outstanding commitment

On January 8th 2008, Air Cost Control received recognition from Airbus Center of Electrics in the form of an award for its outstanding commitment. "We are honored to receive this award. We see it as the result of the combined efforts of everyone here at Air Cost Control. Over the years, our emphasis on the importance of continually increasing our level of service has paid off. Today, the progress we have made readily benefits all of our customers, large and small." commented A2C owners Mr./Ms. Parelle.

Air Cost Control secured new capital during the same year in order to cope with unprecedented growth. The French headquarters added a new logistics building and new automatic stocking equipment, allowing the logistics team to receive, stock and dispatch parts more efficiently.

Since the Middle East is now the number one customer of aircraft OEMs like Airbus, Dassault and Eurocopter, Air Cost Control launched the third stocking warehouse in Dubai, United Arab Emirates, Air Cost Control Middle East FZCO. This new facility handles customer requests & technical support for Middle Eastern and Asian customers. Stock is scheduled to be put in place in 2010.

Today, Air Cost Control employs 50 passionate and customer oriented professionals, with over 10 different nationalities. The group of companies generates a turnover of 26M\$. The product line is composed of connectors, wires, sleeving, circuit breakers, accessories, tooling & more, representing over 8000 product standards. Two VAD assembly lines offer 3-day delivery of EN3646/E0052/53/54/8525 connectors and EN2997/8533 engine connectors. Its main customers are aircraft manufacturers and subcontractors, IFE integrators, cabin completions centers, wiring facilities, MROs and airlines. A2C holds EN/AS9120 and ISO9001 certifications from BVQI & ASD EASE.



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MAINTAINING MOMENTUM

Ian Goold *considers industry experience with the Airbus A380 as Singapore Airlines conducts the first two-year maintenance check, Emirates follows and Qantas marks 12 months of service with the quad-aisle quad-jet.*

Since Singapore Airlines (SIA) launched Airbus A380 commercial services in October two years ago, more than two million travellers have sampled the very-large aircraft (VLA). By mid-2009, the 17 machines being flown by SIA, Dubai-based Emirates Airline and Australia's Qantas Airways, had logged almost 60,000 flight-hours (FH) during 6,000 flights.

A380s have been averaging slightly more than one flight a day; Airbus having reported average daily utilisation of 13.2FH/day earlier this year. The aircraft is currently being used on flights between and among 12 airports: Auckland, Bangkok, Dubai, Hong Kong, London, Los Angeles, Melbourne, Paris, Singapore, Sydney, Tokyo, and Toronto.

According to the manufacturer, the A380 was given "the highest maintenance inspection intervals ever for a new aircraft" when it entered service.

A380 maintenance intervals have been promulgated using the most appropriate operations parameter (FH, flight cycles, or calendar age), with no prescribed package of conventional 'letter' checks.

Assuming standard commercial operations involving block-check maintenance, the A380 interval for typical 'C-check' equivalent inspections is two years (or 6,000FH), with structural checks performed every six years. More-frequent 'A-check' tasks are conducted at 1,000FH intervals.

The value of this philosophy and the industry Maintenance Review Board (MRB) report procedure, according to Airbus, is to reduce to two the number of maintenance shop visits before the first airframe structural check. This compares with three such visits before the first intermediate layover on many other types. Following operators' reports, the manufacturer has identified improvements to the maintenance-planning document (MPD).

To date, more than 35 A-checks have been carried out on SIA's fleet by SIA Engineering Company (SIAEC). In the early days of A380 operations, SIAEC had to change "a significant number of big and heavy components", which led it to improve ways of using special hoists and tools for such operations.

Continued
on Page 120

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SIAEC's maintenance facility in Singapore, one of the largest in the world, offers world-class standards of MRO services to its large client base of more than 80 international airlines and aerospace equipment manufacturers. The company also has 24 joint ventures (JVs) and fully owned subsidiaries in nine countries. It was the first MRO provider in the world to maintain the A380. Through its global cluster of line maintenance stations, SIAEC has supported the A380 entry into service at airports like Narita, Sydney, Hong Kong, Paris, London and soon, Melbourne. This includes troubleshooting and conducting component changes at the airports.

The first A380 'C' check took place in Singapore from September 7-20 with the next due from November 2-15. Another is planned for 2010.

For the 'C' checks, access has been a challenge considering the height of most parts and areas. The company overcame this by investing in new equipments to provide the reach to access the aircraft during maintenance. Keeping the aircraft in a cool condition posed a challenge, too, as the electronic items in the aircraft are very sensitive to heat. Throughout the check, coordination was a critical factor given that the company has many maintenance teams working on the aircraft at the same time. Now, though, with more than two years' experience and enjoying a close collaboration with Airbus, SIAEC feels it is well placed to offer A380 maintenance to all airlines and operators around the world.

Like the current operators, Air France-KLM and Germany's Lufthansa – the next two airlines to receive the A380 – will use in-house engineering and maintenance departments: Air France Industries (AFI) and Lufthansa Technik (LHT), respectively.

The A380 MPD offers "significant savings" in labour time and costs "compared to aircraft with similar operations", according to Airbus. Just two years into service with a limited number of aircraft, SIA believes it is "still too early to determine" such performance, but experience is growing quickly among the three operators as more aircraft are delivered.

Qantas operations group executive Lyell Strambi said A380 'A' checks had been completed successfully with no significant issues. The airline has been working with Airbus to streamline its maintenance procedures, techniques, and tooling requirements.

SIA and Qantas both base their maintenance schedule on Airbus and regulator recommendations. Meanwhile, AFI has chosen to set up its programme based upon MPD recommendations, MRB requirements, and its own experience. LHT said it would also apply experience to "round off" MPD requirements.

Local Arab carrier Emirates has been very diplomatic in its public comments regarding early reliability issues with the VLA. A year ago, it experienced an electrical "glitch", said to have

been caused by a "foreign object", in an avionics-bay. The problem grounded its first A380 for a week after it had otherwise been achieving a high despatch reliability.

Emirates praised the manufacturer for quickly overcoming its problem, calling Airbus's response efforts "outstanding, with no expense or resource spared". The airline compiled a comprehensive report of its introductory experience with the A380, detailing for the manufacturer heat-damaged wiring, engine problems, and various other occurrences. Publicly, it was more euphemistic: "Technical issues are expected with new aircraft, particularly one that uses many new technologies. Our confidence in the A380 remains unchanged – it is an excellent aircraft."

Viewing all three operators, Airbus programmes executive vice-president Tom Williams has acknowledged the aircraft's teething problems as: "normal for an aircraft of this complexity and sophistication".

According to SIA, each operator cites different experiences but technical problems have been ironed out quickly. For Qantas, Airbus is recognised for having worked hard to deliver a mature product.

Fuel-level indication

Qantas experienced problems with fuel-level indication on two A380s, as well as nose-wheel steering trouble on one aircraft. Each situation was resolved quickly. It rates its A380 operational experience as "exceptional", equating it with that of the Boeing 747-400's entry into service 20 years ago. "Expectations have been more than met. A small number of technical issues impacted operations for a short period, but generally we have been happy with reliability."

Across the three operators, the manufacturer is keen to accentuate the positive, highlighting its long-haul performance particularly: "Qantas is operating the 6,000+nm Melbourne-Los Angeles route with the full 450-passenger capacity and cargo without any range problems," said A380 product-marketing manager Julien Manhes.

A380 systems, including avionics, engines, and in-flight entertainment, function "generally well, with no major anomalies", according to Airbus. The system that has provided the greatest concern is the VLA's body wheel steering. This has frequently required resets by the crew and, most troubling for its propensity to trigger a negative technical despatch reliability score, has led to aircraft having to return to the gate for deactivation.

For SIA, the A380's Rolls-Royce Trent 900 engines have met specification, although again the airline said it was too early to comment on fuel-burn relative to performance guarantees. Ahead of Air France deliveries, AFI has been meeting regularly with the airframe and engine manufacturers to discuss performance and behaviour of the A380 and GP7200 powerplant.

The GE/P&W partnership has appointed Air

France-KLM subsidiary and engine-parts repair specialist CRMA to be the primary repair agency for the engine's combustion chambers and turbine centre frames. AFI is to establish GP7200 module expertise, with the aim to set up an initial capacity of 20 engines/year.

The GP7200 engine partnership has won a \$3 billion order to provide fleet management covering maintenance, repair, and overhaul of the 250 GP7200s Emirates has ordered.

For SIA, A380 cabin systems have been reliable, with initial teething problems resolved with Airbus and suppliers. Qantas reports a "very positive" experience in A380 cabin-systems capability, reliability, and quality; it specifically cites the Panasonic IFE system. Air France will fit the Thales TopSeries I5000 IFE system.

SIA A380s are said to have performed "extremely well", with service-entry having been "one of the smoothest of any new aircraft type". SIAEC said it has provided A380 aircraft certification, maintenance release, and technical ramp handling services at Singapore Changi Airport with high despatch reliability.

After SIA had taken the first customer aircraft in 2007, last year saw 12 A380 deliveries, with Emirates beginning operations in August 2008 and Qantas two months later. Five further A380s had been handed over by the end of August this year.

Earlier in 2009, Emirates disclosed it would reduce the rate of deliveries around the end of 2010. "We're looking at slowing things from late 2010/early 2011," president Tim Clark reported at the Paris Airshow in June.

Subsequently, the airline has said it will receive six A380s next year and another five in 2011. Seven are slated for delivery during the current April 2009-March 2010 business year. In 2012, 12 A380s are scheduled to join the fleet, followed by 11 in the following year. The remainder of the 58-strong order is programmed for 2014-16 delivery.

The three current operators and at least the next three customer airlines are involved in revised production plans announced by Airbus earlier this year: 14 examples (rather than 18 previously slated) would be delivered this year and "more than 20" in 2010. In August, Qantas took its fourth aircraft and was expecting two more as *Arabian Aerospace* was going to press. Delivery of aircraft Nos 7-10, from a total order for 20, has been deferred by Qantas for up to 12 months because of the current recession. Remaining 2009 deliveries are understood to include the tenth for SIA, Emirates' sixth and seventh A380s, and the first two (or possibly three) for Air France.

The schedule for next year appears to cover more aircraft for these operators and initial machines for further A380 customers: SIA four, Emirates six, Qantas two, Air France three, and Lufthansa five. Korean Air could get its first example and the flight-test A380 earmarked to be the first for private operation is expected to be delivered to a completion centre.



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A brush with something different for the A380

Needless to say, painting an A380 is a big job. Each Airbus double-decker has more than 3,000 square metres of skin to be sealed, primed and covered with up to a tonne of coatings. What's more, the process will have to be reversed and then repeated several times in the life of the aircraft to facilitate structural inspections and undo the effects of weathering and wear and tear.

It's expensive in materials, facilities, man-hours and downtime, and anything that can cut the amount of work to be done offers the potential for millions of dollars of savings. Fortunately for the growing band of A380 operators, US-headquartered aerospace coatings specialist PPG Aerospace has developed the very thing.

At this year's Dubai Airshow, the company will feature its Selectively Strippable System (SSS). In this three-stage process, a special intermediate coating goes on top of the primer before the polyurethane topcoat is applied. When, years later, the aircraft goes into the shop for a deep inspection and repaint, the topcoat and intermediate layer can be removed with a relatively mild chemical stripper, leaving the primer intact.

According to the supplier, SSS can cut up to two days off the 10 days typically taken to strip a wide-body back to the bare metal and repaint it from scratch. It is available for specification by A380 operators and is in service with launch carrier Singapore Airlines and on Emirates' first five aircraft.

Another PPG product, the PR-1782 sealant, is designed to take weight out of the A380 airframe. Developed specifically for Airbus and described as the first lightweight multipurpose sealant for both fuel tanks and fuselage fasteners, it is a third lighter than earlier offerings.

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Goodrich rolls out new plans for support

Goodrich, which recently announced the addition of electronic engine controls (EEC) repair capability to the range of services at its Dubai MRO centre, says it eventually plans to expand provision from early variants of the Rolls-Royce Trent to cover the entire engine series.

Customers are currently offered a repair service on EECs fitted to the Trent 700 (A330), Trent 800 (Boeing 777) and Trent 500 (growth versions of the A340). But the three latest members of the Trent family are already being eyed by Goodrich for future expansion of its Dubai business.

Joel Haldemann, vice president Europe, Middle East and Africa MRO for Goodrich customer services, said: "It's definitely our intent to support these new programmes as they come into service. We're working closely with our customers and our links with Rolls-Royce are well known."

Of the three additional variants, only one – the Trent 900 on the A380 – is yet in service. The longer-term targets are the Trent 1000 (Boeing 787) and the Trent XWB, which remains the sole engine offered on the A350 XWB.

"Obviously, each customer has a choice of MRO centre. Our commitment is to provide the best locally available service. We have a good level of activity and long-term commitment with Emirates on the Rolls fleet," added Haldemann, who also identified Qatar Airways as a significant customer.

Advances in diagnostics are one of the key reasons for the latest shifts towards EEC repair. "The new generation of test rigs offers more sophisticated methods of defining the cause of failures," said Haldemann.

Opened in 2007, the 115,000sq ft Goodrich MRO campus is located alongside the Jebel Ali International Airport development.

It already offers a full range of MRO services for components and systems for both commercial and military aerospace customers across the region.

Products covered include engine accessories, nacelle systems, cargo handling equipment, sensors, inlet and fan cowl, thrust reversers, de-icing systems, evacuation slides, hoists and winches. In addition to its MRO capabilities, the facility also delivers asset stocking and management services, which support aircraft on ground (AOG) and other critical requirements.

These latest developments further strengthen the existing ties between Goodrich and Rolls-Royce, which include the formation of a joint venture, announced last December, to develop and supply engine controls for Rolls powerplants.

The 50/50 joint venture, officially titled Rolls-Royce Goodrich Engine Control Systems Ltd, is operating under the title of Aero Engine Controls. It combines Goodrich's existing UK-based engine controls design and manufacturing business with Rolls' expertise in the integration of controls into the engine. Goodrich will retain the aftermarket and services business associated with the joint venture's products.

Aero Engine Controls is already involved as an industrial partner in the Rolls-led Environmentally Friendly Engine (EFE) demonstrator programme funded by a combination of UK public and private sector finance.

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Abdul Wahab Teffaha:
 "The penalties for
 non-compliance are
 very heavy."



Like it or not, emissions trading schemes will soon be a fact of air transport life. The Middle East's airlines are as well placed as any to take the pain out of compliance.

Brendan Gallagher reports.

Much hot air has been expended on the subject of the airlines' contribution to global warming and the introduction of emissions trading schemes (ETS) as a potential solution. But the facts are starkly simple: several national or regional schemes are in development, and the airlines of the Middle East will find themselves having to comply with at least one of them just three years from now.

Despite some recent slips in the timetable, the European Union remains set on requiring all airlines operating into its airspace to accept a cap on their CO2 emissions from 2012 and, if they break their limits, to buy offsetting credits from better-performing carriers or other sources.

The countdown was to have begun at the end of this August, when each airline was due to submit a plan for monitoring, verifying and reporting its emissions to the authorities of its allocated "administering country". But, as the summer drew to a close, the European Commission had still to announce a final list of which nations would be responsible for which carriers. As a result, Britain's Environment Agency has pushed the deadline back to this month, while the German Federal Environment Authority plans to give the airlines six weeks to make their submissions once the list of responsible countries has been published.

The airlines' breathing space will be brief, however, because the next deadline is already looming. From the beginning of January the airlines must start monitoring and recording their emissions in accordance with plans that they have still to file and that the responsible authorities have still to approve. But all the indications are that the Europeans will stick to that timetable despite US pressure to extend it in proportion to the initial delays.

These developments have added to the demands of a schedule that Abdul Wahab Teffaha, secretary-general of the Arab Air Carriers Organisation (AACO), describes as

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EMISSION CONTROL

“Aircraft Emissions Manager will reduce both the cost of verification and also the chances of litigation between airlines and regulators.”

Frederic Falise.



CONTINUED FROM PAGE 125

both very aggressive and fraught with financial hazards for airlines that fail to prepare properly. “The air transport industry has little experience in this domain,” he said. “And the penalties for non-compliance are very heavy.”

Even if they do master the process, the airlines can expect some hefty bills once the European ETS scheme gets under way. “On average carriers will have to pay for carbon credits to cover 26% of their emissions,” Teffaha estimated. “But the figure for the Arab airlines is likely to be double that to begin with, and can be expected to grow in the short term. In its first year, the scheme will cost the AACO airlines around €200 million.”

Fortunately for their bottom lines, the AACO carriers had been working to ready themselves for a full year by the time the outline requirements of the scheme were published in November 2008. “At AACO we started planning in October 2007 to prepare the Arab airlines for an emissions trading regime,” Teffaha recalled. “The first step was to make the membership aware of the issue. Even now awareness among airlines worldwide isn’t as high as it should be.”

AACO is being supported in its efforts by international airline IT and communications provider SITA. “Because mistakes could prove to be very expensive, we decided to find a partner who had already begun to address the problem,” explained Teffaha. “Six companies responded to our request for proposals and SITA stood out as the most knowledgeable about the intricacies of ETS in aviation, and the best able to produce a solution minimising the possibility of costly errors in reporting emissions.”

Geneva-based SITA built its expertise with the help of a 24-airline working group formed last year. Called the Working Group for Environmental Regulations Implementation, it aims to help the industry drive down the cost of ETS compliance and to ensure that operational efficiency is not compromised.

This summer the company unveiled the first

results of its efforts – the Aircraft Emissions Manager monitoring, reporting and verification software tool. Described as the first of its kind in the world and featuring powerful data processing and data mining capabilities, it has been tested by a total of four airlines from the Middle East, the United States and Europe. SITA verified against external records the accuracy of the data it extracted from the airlines’ flight records, and has now perfected ways of gathering the required information and making it available to governments and other regulatory authorities.

Conscious of the commercial burden that emissions trading will impose on the airlines, SITA has striven for an economically effective solution. “One of the drivers behind the working group was the need to understand how we could help airlines to control their data and demonstrate compliance without suffering undue financial consequences,” said SITA environment programme head Frederic Falise. “Aircraft Emissions Manager will reduce both the cost of verification and also the chances of litigation between airlines and regulators.”

Adopt the system

AACO is the first airline representative body to recommend that its members adopt the system, which has just been released to the market. “Following extensive consultations and successful testing, we’re pleased to report that a large number of our members have adopted Aircraft Emissions Manager,” said Teffaha. “We’re satisfied that it will allow our member airlines to provide 100% accurate data so that we get a fair deal under the European ETS.”

SITA is already supporting the 12 carriers that are working to the European timetable – Afriqiyah Airways, Air Cairo, the EgyptAir group, Jordan Aviation, Kuwait Airways, Libyan Airlines, Middle East Airlines, Oman Air, Royal Jordanian, Saudi Arabian Airlines, Syrian Arab Airways and Yemen Airways. Under a joint consultancy agreement the organisation has helped the airlines to prepare their plans and will guide them through the coming months until the required

monitoring and reporting routines have been fully implemented. SITA is also advising a number of carriers in other regions.

“The parameters required by the Europeans are well defined,” said Teffaha. “SITA is working with our members to identify where the relevant data – quantity of fuel burned, how much CO₂ is emitted, passenger load per flight – resides in their information systems. The information is then checked for accuracy and integrated in preparation for the day when we have to start submitting formal reports.”

Together, SITA and the Arab carriers are currently marching to the beat of the European drum. But both make no secret of their enthusiasm for a single global scheme.

Australia, New Zealand and Japan are developing schemes for introduction in the next two or three years. The USA is expected to move soon under the impetus of a presidential goal of an economy-wide scheme intended to cut total greenhouse emissions by 80% by the middle of the century. “We want a global arrangement, not a patchwork, and we still hope that one will emerge under the principles already established by ICAO and IATA,” said Teffaha. “Accordingly, we are talking to SITA about what we might need to do to fit in with an eventual global scheme.”

SITA is confident that its solution is flexible enough to go global if necessary. “We’re all in favour of a global scheme,” chief executive Francesco Violante said earlier this year. “Our present solution is suitable for deployment in any region and we are sure that it could also be readily adapted to a global arrangement.”

Emissions trading for air transport is still a highly contentious topic. No less a figure than Qatar Airways chief executive Akbar Al Baker described it as a “hot potato” at this year’s IATA annual general meeting and declared that the European scheme should have been challenged more vigorously when it was first proposed. But it’s now a fact of life, and the Arab airlines are as well placed as any operator in the world to manage its effects on their business.



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*The Middle Eastern nations have spent billions on building some the most modern and well-equipped airport terminals in the world. But the operators face some uniquely challenging conditions out on the airfield, writes **Brendan Gallagher**.*

During the summer the ground temperature can exceed 50 degrees C and there's dust, sand and stones to contend with. Those were the words of George Cooper, chief executive of Kuwait-based premium carrier Wataniya Airways, as he explained some of the major hurdles facing the region's operators.

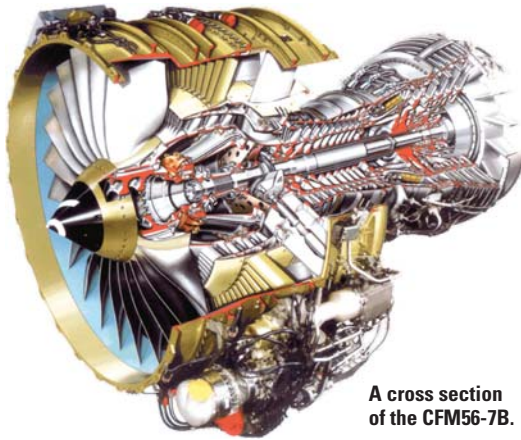
"These conditions are not normal elsewhere. Europe has pristine grassy runway verges – we have desert just about everywhere we fly," added Cooper. "The dust and sand affect engines and other systems, and stones blown on the taxiways and runways are bad for aircraft tyres and wheels."

Wataniya keeps its small but hard-working fleet of Airbus A320s rolling by the simple expedient of stocking more wheels and tyres than would be needed in a less demanding environment. The effects of fine wind-blown sand and dust are mitigated by more frequent changes of the filters for the engine oil and the air intakes of the air-conditioning system, just as they are in cars. But the region's blistering summer heat, never encountered in more temperate climates, calls for more drastic measures.

"We had to specify brake cooling fans, which the standard A320 doesn't have," said Cooper. "Our turn-rounds average an hour in Kuwait and can be even less elsewhere on our route network. In very high ambient temperatures that's not long enough for the brakes to naturally cool down below the 300 degrees C limit for taxiing and take-off."

Pre-departure brake temperature is limited for at least two reasons. Braking performance falls off with brake temperature, with the result that beyond a certain figure it would be unequal to the most extreme test, a maximum-weight rejected take-off. Then there is the risk of fire. The Skydrol hydraulic fluid in the pipes inside the landing-gear bays auto-ignites at around 400 degrees C – the airworthiness authorities were keen not to have hot brakes anywhere near this potential fire hazard.

The fans have another, non-safety, function. The wear rate of the carbon brakes now common on airliners tends to peak at temperatures between 70 and 200 degrees C, depending on the manufacturer. Judicious use of the fans can help to maximise brake life by keeping brake temperatures in the desired range.



A cross section of the CFM56-7B.

They can also contribute to help operational efficiency and reduced fuel burn. Relatively cool brakes can even begin to reach the limiting temperature as a result of a long taxi-out, particularly when there is a slower aircraft in front and the brakes have to be applied repeatedly. Airbus pilots can solve the problem with the fans, retract the gear and high-lift devices

promptly and carry out an efficient climb. In other types, the gear must be left down for longer than optimum so that the brakes cool in the airflow.

Airbus and rival Boeing differ on the need to offer brake cooling fans as an option. The European manufacturer believes that an active onboard cooling capability makes it possible to optimise the size of the brakes and achieve an overall weight saving. But the US company says its thermal testing has proved there's no need for built-in fan cooling of the carbon brakes on the Boeing 737NGs, and declares that it saves weight as a result.

The Boeing philosophy is evidently to leave the fans on the ground, as emerged earlier this year when it admitted that a modification of the 787's brake temperature sensors would be required.

The company expects the twinjet's quick turn-round performance to be constrained until the change is made, and says that in the meantime ground-based fans could be used at the gate to help with brake cooling.

Suppliers of this kind of equipment include France's Samif Babcock. Specialising in mobile air-conditioning for air transport, the company exhibited a new mobile cooling unit at the Airport Build and Supply Exhibition in Dubai earlier this year.

Though Boeing has set its face against built-in brake fans, it has acknowledged that another extreme condition – blowing sand – can call for extra measures. "We are always ready to respond to customer suggestions," said Seattle-based spokeswoman Beverly Holland. "In 2006 we sent a service bulletin to BBJ operators noting that environmental conditions such as blowing sand could sometimes cause air-conditioning systems to become less efficient. Our suggested remedy is a centrifugal cleaner to filter the air going to the air-conditioning packs from the auxiliary power unit or engine bleed systems."

If brake fans and air-conditioning modifications can be treated as optional extras, that's far from true of the upgrades offered by CFM International, supplier of engines to both Airbus and Boeing. "The fan and compressor sections are affected by ground debris," said strategic communications director Jamie Jewell. "Sand can erode the compressor aerofoils. And airborne sand, dust and other small particles can affect the hot section."

The Snecma/General Electric joint venture designs its engines to tolerate these conditions, and

HEAT AND DUST



FLYING CONDITIONS

also offers modifications to operators who are particularly affected. "The fan inlet area and fan blades can be designed to reduce the intake of foreign objects into the core of the engine," Jewell explained. "Coatings on the compressor blades can be effective against erosion. And in the hot section, cooling passages and circuits can be sized to reduce the potential for blockage."

Some of these features are standard on all CFM powerplants, others are offered as spares: "We don't produce engines with a different bill of materials for each customer. If the operator wants certain modifications, they are installed after delivery or during a scheduled shop visit. There is strong demand from affected airlines for these product improvements because they extend on-wing time and reduce operational costs."

The package of modifications, and its cost, varies from region to region, depending on specific conditions. "Factors such as the composition and average size of sand grains and other particulates vary from region to region, producing different effects on the engine," Jewell explained.

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A RIGHT ROYAL SHOW

The family backing that has helped make Dubai a truly regal event



Sheikh Ahmed bin Saeed al Maktoum was a guest of honour with his nephew, now ruler of Dubai, His Highness Sheikh Mohammed bin Rashid al Maktoum, when the first Dubai Airshow opened to the world in October 1988.

At that time Dubai's aerospace industry was virtually non-existent. Emirates Airlines was in its infancy, having been started to bring flights from Dubai as an alternative to Gulf Air's Sharjah and Abu Dhabi routings.

The first show took place in a marquee beside the Dubai Creek and a small number of exhibitors took part. There was no flying display, no static park and the only aircraft of any type to see was a helicopter.

Dubai Airport was still in its infancy and the city virtually ended at the World Trade Centre, which

itself was a bit of a trek into the desert.

Today, the Dubai Airshow is proudly the third largest aerospace industry show in the world and the largest outside of Europe. Having overtaken Singapore two years ago, the organiser, Fairs & Exhibitions (F&E) – a part of the Tarsus Group – believes it could move further up the table in years to come.

Hopes had been pinned on the show moving to its new permanent site at the Maktoum International Airport at Dubai World Central in Jebel Ali for this year.

Earlier this year it was announced that the new site would not have the infrastructure in place to allow the event to take place to the standard that both the organiser and the Dubai Government would expect.

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on Page 132



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"Of course it was a blow to us all," said Alison Weller F&E's director of aerospace. "We were all very excited about the move but it is more important that the show is right. We, our exhibitors and Dubai are all in this for the long game. We will be there in 2011 and it will be right. The challenge we had was getting back to the site at Airport Expo and making sure we had the capacity and capability of dealing with the demand for the show."

And it was Sheikh Ahmed, now the chairman of Emirates Group and the head of Dubai's civil aviation authority and the Dubai Airports group, that took up the challenge.

"You can see throughout history just how much HH Sheikh Ahmed and HH Sheikh Mohammed have done to make sure the show develops and to demonstrate the whole commitment that the Dubai Government has for the event," said Weller.

Indeed, it was Sheikh Mohammed who identified the need to bring defence exhibitors to the event. In his then capacity of Minister of Defence and head of the UAE's armed forces he began a programme of inviting official delegations and hosted them in a large purpose-built majlis alongside the showground.

That practice continues today with the event firmly on the calendar of military forces throughout the MENA region and beyond. European delegations welcome the opportunity for bilateral discussions and, in recent years, the defence chiefs' conference held on the eve of the show has given it an extra special appeal to leaders of the armed forces.

Key decision makers

"The delegations programme delivers key decision-makers to exhibitors, ensuring high-level interaction between them. This initiative has been one of the cornerstones of Dubai Airshow's continuing success and is instrumental in reinforcing its position as one of the world's top aerospace events," Weller said.

On the civil side too there was help.

As Emirates began its meteoric rise from a small airline to one of the world's top carriers, Sheikh Ahmed always made a point of using the show to meet key suppliers and make the major announcements that have clearly made it a 'must-go' for the engine makers, the cockpit and cabin technologists and all parts of the manufacturing supply chain.

As the clear show for the Middle East, other Arab carriers have also supported the event in spectacular fashion.

Dubai has a very 'can-do' attitude. So when it was decided that the new airport would not be ready in time to allow the move, Sheikh Ahmed's office moved in with new ideas.

"Our biggest concern was space," Weller said. "We appeared to have limitations along the chalet line where the airport had needed room to park aircraft while the new terminals were being



Alison Weller: "You can see throughout history just how much HH Sheikh Ahmed and HH Sheikh Mohammed have done to make sure the show develops and to demonstrate the whole commitment that the Dubai Government has for the event."

built. Also we had growth from new companies coming to the show for the first time and we had had a sell-out two years ago."

The answer came from the top. Build a new hall!

The result is a new 'Emirates Hall' – the home to the Emirates Airline booth, along with other key exhibitors. It covers 7,025sqm, with 5,000sqm for exhibition stands, which brings the total airshow area to 325,513sqm, including the static park.

The temporary structure, which will have its own entrance and a reception for registration to facilitate smooth and speedy access for exhibitors and visitors, has the full support of the Dubai carrier.

Maurice Flanagan, executive vice chairman, Emirates Airline and Group said: "The Dubai Airshow is not only a major event in the UAE's calendar, it is also growing in prominence as one of the world's foremost events for doing business and networking in the air transport industry."

Extend the commitment

"Emirates is proud to have supported the Dubai Airshow since its inception and to extend that commitment further this year with the inauguration of the new Emirates Hall, which we know will be a resounding success."

The location of the Emirates Hall will enhance visitor way-finding, in addition to improving traffic navigating the car parks and road system.

Additional space was also found outside with 13 extra double-storey hospitality chalets being added. The floor space of all double-storey chalets has also increased by 40sqm – 20sqm on each floor.

The chalets will also look different. The familiar red has now gone and, instead, the chalet's tent-like roof line will now be in blue-and-white stripes to reflect the event's new branding.

Each day there will be spectacular aerial shows from one of world's great flying display teams –

Patrouille de France and Italy's Frecce Tricolori – and there will be some interesting solo performances.

The major coup for the show is the presence of the F-22. The Lockheed Martin aircraft dubbed the 'Raptor' was developed in conjunction with Boeing, Pratt & Whitney and the USAF and it was widely expected to be a highlight at Paris Airshow this year but its appearance was cancelled amidst political upset as the US Government froze the aircraft's production.

There are no plans for an export version and the Raptor's stealth and capabilities are believed to be widely greater than any competitor and so the US felt additional spending was unnecessary and saw no need for promoting the type. So the attendance of the Raptor is a coup for F&E and a demonstration, perhaps, of the commitment the US Government and industry has for the show and the growing business in the region.

China, too, is keen to show its progress and is sending AVIC's advanced jet trainer Falcon L-15 – which will be seen for the first time in a display flight outside its home country.

It is being developed by Nanchang-based Hongdu Aviation Industry Group (HAIG). The development programme was reportedly assisted by Russian Yakovlev OKB. The first prototype made its maiden flight on March 13 2006 and the second prototype first flew on May 10 2008. The aircraft is designed to provide pilot training for the third-generation fighters such as Su-27, Su-30, J-10, and J-11.

From Europe there is a mock-up of the Eurofighter but, no doubt, the M346 from Aeromacchi – the selected trainer for the UAE air force – will also be at the show.

Indeed the region's thirst for new equipment and technology could be the key to Dubai's growing success.

Within the Middle East region's commercial aviation market, Airbus has predicted that international air passenger traffic will grow 6.6% over the next decade, making it the world's fastest-growing region for aviation. It added that the number of aircraft serving the region would almost triple by 2028.

Boeing, too, has asserted that air travel in the Middle East is stronger than in most global regions, reporting that the market is valued at US\$300 billion over the next two decades, with a requirement for more than 1,700 commercial jets.

SHOW INFORMATION

The show runs from November 15-19 at the Dubai Airport Expo just a few kilometres east of the main international airport.

Tickets and registration for trade visitors are available online at www.dubaiairshow.aero
Flying displays will be at approximately 14.00h each day.

Arabian Aerospace online news service www.arabianaerospace.aero will be bringing news, interviews and pictures from the show as it happens.

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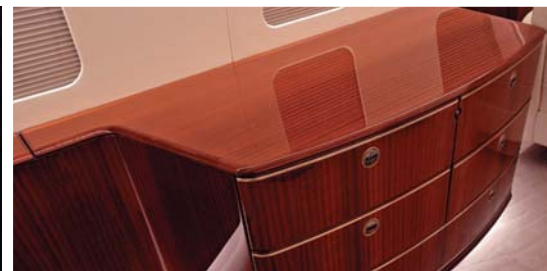
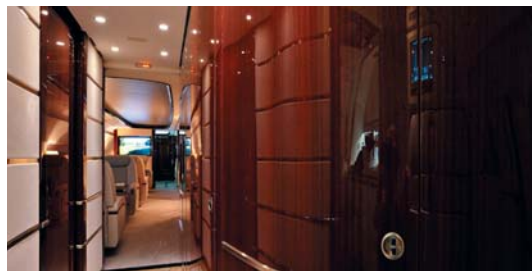
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Displays with much more than a whiff of teamwork

French joie de vivre will dovetail with typical Italian panache as the nations' national aerobatic teams dance the skies over Dubai, leaving behind them nothing but excited, astonished onlookers enjoying the whiff of patriotic coloured smoke and the half-echo of military jet engines.

Geoff Thomas looks at the Dubai 2009 aerobatic display teams.

THE PATROUILLE DE FRANCE

Although the team of eight Dassault-Breguet/Dornier Alpha Jets traces its origins back to the early 1930s, the Patrouille de France or 'French patrol' name was created in 1953 by an air-show commentator in Algeria, who got rather over-excited and renamed the team in an outburst of patriotic fervour!

The French air force's Alpha Jets are painted in blue, white and red, mirroring the coloured smoke that they leave in the sky as they perform their looping and rolling aerobatic manoeuvres with typically Gallic flair.

And if you have ever been in the French capital on July 14, you'll have witnessed one of the Patrouille de France's signature events as they open the Bastille Day parade with a low-level flight along the Champs Elysees.

This year, for the first time, the team has featured a female pilot as Commandant Virginie Guyot has joined the squad with a view to taking over as team leader in 2010.

Before joining the team, she flew a French air force Mirage F1 CR fighter and completed two tours of duty based at Kandahar in the Afghan war zone.

Commandant Guyot, who is 33 and the mother of a young daughter, never saw flying fighter jets as being a 'man only' job. On the contrary, she says that "flying a plane nowadays requires finesse more than physical force".

Flying at 'Athos 4' this year – the team's positions are all named after Olivier d'Athos de la Fère, one of the leading characters in Alexandre Dumas' novel *The Three Musketeers* – Commandant Guyot certainly brings a touch of extra glamour to the team.

However, she is far more interested in being recognised as a professional pilot who just happens to be serving a tour of duty with the Patrouille de France.

THE FRECCHE TRICOLORI

The Frecche Tricolori (literally the three-coloured arrows) has been the Italian air force's official national aerobatic team since 1961. The team – Pattuglia Acrobatica Nazionale, or National Acrobatic Patrol – flies ten (nine plus one solo) of the attractive and extremely manoeuvrable Aermacchi MB-339-A/PAN two-seat fighter-trainer aircraft.

Capable of reaching almost 900km/h at sea level, the team's MB-339s are renowned for being flown with tremendous verve and the pilots invariably leave a lasting impression on appreciative audiences around the globe.

A team of ten aircraft is believed to be the largest in the world of jet formation aerobatics and the squad's stated aim is "to represent the professionalism not only of the Italian air force, but also of all the Italian armed forces and our entire country. We are professionals joined by a passion and a love for both our country and for our team".

A part of the Italian air force's 313th Aerobatic Training Group, the Frecche Tricolori's signature display items include a demonstration of 'crazy flying' like the ones that featured years ago when biplane fighters ruled the skies. And although it looks simple to fly that badly, it's an example of precision piloting that you won't see anywhere else in the world of jet aerobatics.

The team's display lasts for a full 25 minutes and includes 36 separate manoeuvres that are all linked together so that the sky in front of the audience is seldom empty of aircraft or the smoke in the colours of the Italian national flag.

Based in north east Italy – at Rivolto del Friuli in the Udine region – the members of the team are all military jet pilots who have put themselves forward for selection. Each year one or two new pilots are chosen – but only after they have served for a minimum of ten years in the Italian air force.



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Middle Eastern ambition and British expertise add up to a golden chance for mutually beneficial collaboration, John Ellis of the Farnborough Aerospace Consortium tells Brendan Gallagher.

Britain: the right solution for the Middle East

With projects like Dubai World Central, the huge airport, technology and services complex due to enter initial operation next year, the United Arab Emirates is pinning its faith on aerospace as a driver of prosperity far into the future.

One man who agrees wholeheartedly with the strategy is John Ellis, business development director in the UAE and the rest of the Gulf Co-operation Council states for the UK's Farnborough Aerospace Consortium (FAC). "The Middle East is going to be a global aerospace hub," he said. "So British companies need to find all kinds of ways to engage with the region, and that includes collaborative ventures."

Ellis is the Middle East face of the regional trade body for the aerospace and defence industry in south-east England. Part-funded by the South-East England Development Agency, FAC is tasked with oiling the wheels of commerce for the 350 or so companies that make up its membership. Activities include helping small to medium-sized enterprises (SMEs) to work with the Tier 1 prime contractors, fostering technology development and transfer, sharing best practice, training, and facilitating local and international trading.

The FAC members are drawn from all the main aerospace sectors. Membership is growing, with the security segment proving particularly active: a 22-member sub-consortium called National Resilience and Homeland Security was formed recently. FAC works closely with other regional trade associations such as the Midlands Aerospace Association, with the Society of British Aerospace Companies (SBAC), and with the government export promotion body UK Trade and Investment (UKTI).

"In the export market Britain can't compete with many other countries on anything involving manual labour – we're just too expensive," said Ellis. "Our future lies in the provision of solutions based on new technologies, new ways of doing things. Some of the products now coming out of the UK are unmatched elsewhere – at FAC we see ourselves as one of the conduits that will get them to markets around the world."

Opening doors in the UAE and elsewhere in the Middle East is Ellis's job. "A few years ago we analysed markets worldwide in terms of their potential for the UK aerospace industry and the UAE came out top," he recalled. "We opened an office in Dubai in 2007 and since then we have facilitated the entry of around 30 member companies into the UAE market. We also operate from Abu Dhabi and from Tripoli in Libya, and Qatar is next on the list."

Ellis brings a wealth of personal experience to the task.



"Some of the products now coming out of the UK are unmatched elsewhere – at FAC we see ourselves as one of the conduits that will get them to markets around the world."

John Ellis

He started his career with a provider of training in safety and emergency procedures and security. In the early 1990s he started his own company to serve airlines worldwide. Up to 10,000 pilots and cabin crew were trained every year, many of them for clients in the Middle East.

In 1999 he launched aviationjobsearch.com, which soon came to be heavily used by Middle Eastern carriers, and the first half of this decade saw him spending an average of six months a year in the region. He sold the two businesses in 2005 and spent the next two years helping the new buyer to develop further in the Middle East before joining FAC in 2007.

That combination of cultural common sense and specialist business knowledge has left Ellis and his team particularly well placed to shepherd FAC member companies into the UAE and neighbouring countries.

"There's strong demand in the region for UK consultancies and training organisations," he explained. "At the same time, we can provide companies with solid practical advice on what it takes to do business in this part of the world."

But first, the would-be new entrants have to show that they are ready to benefit from what FAC has to offer. "We check in advance that applicant companies are likely to succeed when they enter this market, and occasionally we do turn people down," he explained. "We make sure that they are ready to follow a business model that we have defined – we know what works and what doesn't."

Once a company has made the grade it can rely on a wide range of support services in return for its £12,000-a-year subscription. "Members can initially use our offices in the region before, with our help, setting up locally-staffed premises of their own," said Ellis. "We can also supply detailed market analyses, draw up shortlists of potential clients, arrange introductions and work with the companies on every aspect of their business strategies."

With his background in training, Ellis is keen to emphasise this aspect of the FAC package. "It's vital that company employees who will live in the region be fully prepared so that they can fit in quickly and be effective from the word go," he insisted. "Indeed, we regard as mandatory the half-day course that we offer to senior managers so that they can understand what it takes to do business in the Arab world." The typical FAC member is a highly specialised SME that can often meet part of a local requirement but doesn't have the resources for all of it. Ellis regularly sees opportunities to assemble teams of companies in complementary fields to build integrated offerings.

The consortium will be represented by at least six companies exhibiting at the show under the FAC brand.

European exhibitors continue to see the advantages of supporting the Dubai Airshow with official delegations and national pavilions from the major aerospace centres. Kelly Clark takes a look at some of the leading participants

Why people want to be at the fastest growing airshow in the world

THE UK



The show is the chosen arena to reveal a new UK trade organisation to the international stage. As from last month, the Society of British Aerospace

Companies (SBAC) and the Defence Manufacturers Association (DMA) merged under the name of A|D|S – the UK's aerospace, defence and security trade body.

Ian Godden, chairman of A|D|S, said: "The formation heralds the emergence of a new power advancing the UK's aerospace, defence and security industries. A|D|S will begin to deliver enhanced benefits for its 800 member companies through its constituent parts starting to operate as a single entity."

The organisation will be taking the opportunity to promote other UK companies at the show.

David Scotter, director of aerospace market development and exhibitions at A|D|S, said: "Since as far back as 1964, when BAC supplied platforms to Saudi Arabia, UK aerospace and defence companies have seen the opportunity and importance of engaging in the Middle East. In more recent times, this can be seen through the support of SBAC for the Dubai Airshow since its inauguration in 1989. SBAC's subsidiary, Farnborough International (FIL) also has a role in establishing next January's first Bahrain Airshow.

"Dubai is one of the most important airshows on the circuit and SBAC has always seen it as an important venue to demonstrate the best of British. It is also why we are proud to use the show as the first foray on to the international scene for the new UK trade association A|D|S.

"However, it is not just A|D|S we will be promoting in Dubai, but also the exciting and innovative companies that will be present on the UK pavilion stand, such as Hale Hamilton, Britten-Norman and MB Aerospace.

"With more SMEs than France, Italy, Germany, Spain and Norway put together, the UK has a wealth

of talent that is looking to build on the current high level of relations between our two regions. Already one of the UK's regional trade associations, Farnborough Aerospace Consortium, has established two offices in the region to provide support to its members and A|D|S, likewise, is looking at the growing presence in the region, with the view to setting up an office in the near future to support our members.

"Market conditions in the region are ripe for support and investment, which is why we have been seeing larger global aerospace companies, like Rolls-Royce, BAE Systems and Selex, increasingly keen to establish and build on their current presence. Events such as the Dubai Airshow are prime opportunities for this and A|D|S will be proud to represent the best of British once more at the Middle East's most important air show."

The UK Trade and Investment Defence and Security Organisation (UKTI DSO) will also feature at the show again this year.

UKTI DSO works with industry and overseas governments to ensure UK equipment, products and services are promoted in the best possible way. The organisation's employees provide specialist export advice and practical assistance to the two sectors, working closely with both industry and the Ministry of Defence to provide the essential government-to-government dimension to company-led marketing campaigns.

Spokesman Adam Thomas said: "This is one of the most important shows, not only regionally, but globally. We have been going to this show for many years. We want to continue to show our commitment to the Emirates, that we value it and do not take it for granted. We will be there in force to build relationships.

"It is a highly competitive region and so we want to make people aware of our capabilities. We will also be there to promote joint partnerships. We want companies to try to find potential joint venture partners and see if we can find investment opportunities on both sides."



David Scotter: "Market conditions in the region are ripe for support and investment."

THE NETHERLANDS



A Holland pavilion will host the Dutch aerospace industry and visitors will be able to find out more about seven companies, including AkzoNobel

Aerospace Coatings, Avio-Diepen, Belgraver, Defence Materiel Organisation, Driessen Aerospace Group, NCIM Group and Sun Test Systems.

The pavilion is organised by the Netherlands Aerospace Group (NAG), which incorporates the national association of aerospace companies and organisations engaged in education, R&D, engineering, manufacturing and maintenance repair and overhaul of civil and military equipment.

Members improve their business position by being part of an active association that covers more than 95% of the Dutch aerospace industry.

NAG supports members in worldwide business development by:

- facilitating the set-up of national pavilions at major airshows and conferences;
- acting as a national point of contact to represent members;
- organising international trade missions and matchmaking events;
- actively scanning the global market for business opportunities.

NAG also provides the following general services:

- organising courses, seminars and meetings on specific areas of interest;
- representing members in national and international forums;
- analysing and protecting members' interests.

A spokesman for NAG said: "The Dutch industry has been present at the Dubai Airshow since the very beginning. Representation at the show, as well as Paris and Farnborough, has always been a key element in our activities because of the excellent perspectives of the region.

"The Middle East offers great potential, especially for the MRO sector. Two-thirds of our companies are active within that sector.

"Furthermore, the Middle East is still the most important market for companies which are active in the private jet segment. The United Arab Emirates is still a growing factor in the Middle East. This offers major international business opportunities."

The Dutch pavilion can be found in the West Hall of the Airport Expo, stand W468. Apart from representation of the total Dutch aerospace industry, it is possible to meet up with the following companies:

■ AkzoNobel Aerospace Coatings has been appearing at the Dubai Airshow since 2001 and will be there once again.

The company strives to develop, manufacture and supply high-quality coating solutions to serve the current and future needs of the aviation



industry worldwide. It says it is always finding ways to improve its products and provide new practical answers to customer needs, including reduced process times, technical support, enhanced protection to aircraft and unique colours with brilliance.

This year it will be focusing on how its products and services can help save time and cut costs by shortening coating and maintenance schedules.

Coatings products featured on the stand include a new two-coat system, Aerodur 3001/3002, described as "one of the most important developments for a decade" and which, the company says, can save up to 30% cycle/process time, as well as significant application, cost and aesthetic maintenance benefits for airlines and OEMs.

In order to carry out quick repair, either at a maintenance check or during the turn-around time of the aircraft, AkzoNobel introduces the Burst Pack 'fit for purpose' concept. René Bremer, sales manager for the Middle East, said: "This little device is both time-saving and environmentally progressive. It is as simple as can be. By the action of squeezing the pack, you safely rupture the internal seal and the base and hardener can be mixed in the correct ratio within a minute."

Since the volume is 40ml only, waste is reduced considerably compared to the 'classic' touch-up method. Burst Packs are "quick repair" by definition.

For military applications, Aerodur 5000 is a super durable, high performance, new generation military aircraft camouflage coating, which can be applied in only one coat on new builds, in routine maintenance or in the field when camouflage repairs are needed quickly.

Vincent van der Laa, global marketing specialist for the company, said: "For AkzoNobel Aerospace Coatings, being present at the Dubai Airshow gives us the opportunity for relationship marketing and introducing new

concepts or products. The Middle East is a dynamic area when it comes to MRO activities and airline operations, which is why it is so important to us."

■ Avio-Diepen is a global commercial aerospace distributor for a wide range of factory new parts and components, serving airlines and manufacturers of aircraft and aircraft components throughout the world. A spokesman said: "Our activities can be divided into three main groups – sales/distribution of aircraft parts and components; supply chain management and technical sales. Avio-Diepen has offices and distribution facilities in Europe, the United States and the Far East, thus providing maximum availability, fast delivery, and minimized shipping cost."

■ Belgraver Aircraft Interiors, founded in 1956, is the leading manufacturer of non-structural aircraft interior and aircraft seat parts with production facilities in the Netherlands and Dubai. EASA Form One-certified products include food trays, shrouds, fairings, arm caps, cushions, seat covers, curtains, baby bassinets and magazine racks.

■ The Defence Materiel Organisation (DMO) provides modern, robust, safe and high-quality material to all operational users throughout the armed forces. It takes care of the materiel throughout its life – from procurement to upkeep and through to disposal. The DMO draws up the materiel logistics policy needed to perform those tasks. A spokesman said: "The DMO listens to its customers' wishes and delivers products and services in a timely fashion, on the basis of binding agreements and reasonable prices."

■ Driessen Aerospace Group's new MAXFlex 2 Galley, which was jointly developed with Boeing



for the B737 Sky Interior, is designed to improve passenger service for a better flying experience. Driessen also features the latest, durable lightweight trolleys and the successful Vario drawers, which will be exhibited in Dubai. Driessen is leading in the design and manufacturing of high-quality galleys, galley

equipment and cargo equipment. The company is part of Zodiac.

■ The NCIM-Group is one of the fastest-growing information and communication technology (ICT) service providers in the Netherlands. A spokesman said: "Our aim is to

create added value for our customers by solving complicated IT issues and problems and become the best IT services organisation in the Netherlands by employing highly-qualified professionals." The range of services provided by the NCIM-Group is distinguished in four areas: software development and testing, system engineers, project management and consultancy.

■ Sun Electric Systems designs a special range of mobile and stationary aircraft hydraulics testers (AHT) and is involved in various aircraft hydraulic projects.

Vast experience has been acquired over almost 40 years of testing different types of aircraft hydraulic systems and components.

The company has also been involved in other aircraft areas – electric systems, cooling of avionics, health monitoring, prognostics and testing in general.

The AHTs are used on the F4 Phantom, Alpha Jet, F16, Tornado, Hawk, Harrier, Jaguar, Eurofighter, Do 328, F50, Transall a.o. etc.

Sun AHTs also test systems of the Lynx, Sea King, Bell Uh-1D, CH53, Cougar, Chinook, Tigre, Puma, BO 105, Apache, EH101 and others.

A spokesman said: "The AHTs are



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Recruitment Support to the Aviation Industry



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supplied worldwide; the military forces of Germany, UK, Denmark and the Netherlands, as well as aircraft industries like Daimler Chrysler Aerospace, Dornier, BAE Systems, Eurocopter and others, number among the satisfied main users, which is why the Dubai Airshow is so important to us."

Sun is a partner in the Dutch Consortium for Prognostics and Health Management for the JSF program.

■ Fokker Services combines OEM design knowledge and independent after-sales MRO support to produce performance-based aircraft MRO services.

A spokesman said: "Being Type Certificate holder of all 750 Fokker aircraft operated today, Fokker Services has all the skills, facilities, equipment and systems in place to deliver total support solutions to aircraft operators and owners in the continued competitive operation of our fleet.

"Fokker Services has earned its position as a unique and valuable partner for the global aerospace industry, supporting a large fleet of various aircraft types. Capabilities include component availability programs, flight-hour-based component repairs, engineering and documentation support and airframe maintenance, conversion and completion capabilities."

The Africa, Eastern Europe and Middle East Region is very important for Fokker Services as it has a number of operators based in those areas, utilising the Fokker 70, 100, 50 as well as even the F27 and F28. Also the Dash 8 100/200/300 are key platforms for Fokker Services.

A spokesman said: "We foresee a significant increase in the number of Fokker aircraft flying in the region in the upcoming years. The theme is for continued competitive operation focusing at lower direct operating and maintenance costs, increasing passenger comfort levels and contributing to environmental friendly initiatives.

"Furthermore, we offer key component repair capabilities on numerous platforms. Also, we will most probably promote the new program on fleet lifetime extension at the Dubai Airshow.

"Just being at the event reconfirms the quality of our solutions, our key position in the independent aviation services market based on our heritage. Our goal is to meet many current customers, do lots of industry networking and attract new customers for Fokker operation in the region.

"For Fokker, the Middle East – including Eastern Europe, Turkey and Africa – is a growing market. The region seems to be less affected by the crises than other regions. Also, Fokker Elmo last year opened a production facility in Izmir, so the region in total for all our Fokker activities is crucial for our future."

BELGIUM

SARAH: The Special Aerial Response Autonomous Helicopter



Belgium is featuring at the Dubai Airshow for the first time. Skywin Wallonie is the aerospace competitiveness cluster of the Walloon Region

and is organising the Belgian Aerospace presence.

Created in 2006 in order to increase the competitiveness of Walloon enterprises in the aeronautics and space sectors, Skywin represents 100 members coming mainly from industry, but also universities and dedicated research centres.

This represents a total of more than 7,000 direct jobs in the region and a turnover of €1.25 billion.

Skywin gathers several major regional players like Alcatel Alenia Space, FN Herstal, Forges de Zeebrugge, Sabca, Sonaca, Spacebel, Techspace Aero and Thales Communication Belgium, as well as numerous innovative and proactive SMEs working in engines, structures, systems and equipment technologies.

Members' activities consist of R&D, design, virtual prototyping, manufacturing, MRO and upgrades of airplanes, helicopters, UAV, engines sub-assemblies or rocket components and space equipments and related services.

A spokesman said: "Skywin's objective is to foster and promote the technological advance of the Walloon Region in the aerospace sector and therefore to supply competitive products and services which are the mainstay of business development. That is why events such as the Dubai Airshow are so important to us. By means of formal or less formal encounters, one of Skywin's missions is to create new business opportunities to its members.

"More than ever, in these difficult times for the economy, a convivial and efficient networking platform is a good way to reinforce the links and mutual knowledge of regional and European actors of the aerospace sector."

Skywin activities can be categorized into three sections:

- Innovation Projects – Since 2006, the

cluster organised five calls for projects. The four previous calls led to 15 projects for a total budget of €75m.

- Clustering activities – The clustering process, strongly supported by authorities, is mainly based on business development actions, setting-up of partnerships, benchmarking and technology watch programs.

- International business development – The cluster supports and promotes its members' know-how in various trade fairs and dedicated aerospace events, such as the Dubai Airshow. The cluster also promotes trans-national or trans-regional co-operation and operates in good intelligence with similar clusters in Europe.

Other companies appearing from Belgium include:

■ Flying-Cam Aerial Robotic Engineering Division is launching its third generation of unmanned helicopter – the Flying-Cam SARAH: Special Aerial Response Autonomous Helicopter – in the UAE for the first time.

SARAH includes green and maintenance-free full electric propulsion, Flying-Cam proprietary autopilot system, DGPS precision positioning and navigation, HD COFDM video transmission and a three axis drift-less gyro-stabilized HD camera head.

With a fleet of FC II unmanned helicopters operating in Europe, the USA, Asia and, soon, in Middle East, Flying-Cam is the worldwide leader in close-range aerial filming.

A spokesman said: "With an Academy Award, Flying-Cam projects include films such as *GI Joe*, *Hancock*, *U Me Aur Hum*, *Red Cliff*, *Curse of the Golden Flower*, *Mission Impossible*, *Da Vinci Code*, *Harry Potter*, *James Bond*; commercials for BMW, Cipla, VW and broadcast live events such as F1 and MoD challenge.

"Besides the entertainment industry, the aerial imagery intelligence of the SARAH system is now bringing its applications into operation in the intelligence, surveillance and reconnaissance (ISR) fields, as well as in civil

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applications such as industrial inspection and fire-fighting.”

■ WAN (Wallonia Aerotraining Network) is an organisation designed to prepare men and women for various aeronautical professions. In addition to its main activity of training, WAN has established a complete network of resources in the aeronautical world and covers all the needs encountered in the sector. It also provides a wide variety of training directly related to needs encountered in the market. All the technologies and methodologies are state-of-the-art in design, manufacturing, repair and inspection of engines and other equipment.

■ SABCA is a medium-sized aeronautics company specialising in the design, development and manufacturing of major metallic and composite structures for aircraft including Airbus and Dassault.

For the Airbus A350XWB the company manufactures the FSS (Flap Support Structure) in metallic and the FSF (Flap Support Fairing) in composite. For the A380, SABCA makes the centre rear lower shell in metallic and for the Airbus A340 it makes the pressure floor. SABCA also provides the composite horizontal tail skin for the Gulfstream G650, and for the Dassault Falcon business jets it builds the upper tailplane surface in composite.

SABCA has also developed, through major programs worldwide, an unmatched expertise for MRO and upgrades of many military aircraft (fixed and rotary wings) including Lockheed Martin F16, Fairchild A10 Thunderbolt, Dassault Mirage F1, Dassault Alphajet, Northrop Grumman F5, Agusta A109 and Westland Sea King.

A spokesman said: “SABCA, after having completed the upgrade of the Belgian Dassault Alphajet fleet, was again selected by the French Armée de l’Air for the avionics upgrade of 20 aircraft in partnership with THALES Avionics. The purpose of this renovation was to equip the Alphajet with a navigation and weapon system (NWS) capable of ensuring complete pilot training up to their conversion on to modern combat fighters such as the Mirage 2000-5 or the Rafale.

“SABCA’s involvement includes aircraft modification definition, aircraft modification kits design and production, lead-the-fleet aircraft modification, ground and flight tests, pre-series aircraft modification, ILS (documentation, training, spares) delivery and in-country support and so on.”



SABCA: unmatched expertise.

GERMANY



Messe Berlin is in charge of the organisation and exhibition management of the German Pavilion at this year’s Dubai Airshow.

Messe Berlin has been organising international trade fairs and congresses for many decades. It offers expert orientation, navigation and presentation in specialist areas of the market and brings together supply and demand to enable dialogue.

The company offers those taking part in trade fairs and congresses the best possible platform for successful communication. A spokesman said: “We conduct business on people’s behalf in more than 130 countries. Our subsidiaries – Messe Berlin Singapore Pte Ltd in Singapore and Global Produce Events GmbH in Bangkok – and the foreign representatives around the world, are a guarantee that exhibitors and visitors can always find a knowledgeable local contact for our events, trade fairs and congresses.

“We offer a broad consultation and supervisory assistance in Berlin and abroad – from initial contact to participation at a trade fair. This service includes notification of state support, information on convenient accommodations and on stand construction, as well as explanations of visa regulations, cultural and trade law issues.

“Messe Berlin’s subsidiaries, partners and staff ensure we are able to provide exhibitors and congress

organisers with professional, comprehensive and individual services. Our job is to do everything to make people’s life easier, so that they can focus entirely on their trade fair or congress. Our customers benefit from our all-round assistance, as well as from our staff’s dedication and tireless commitment.

“Making business flourish is Messe Berlin’s job and we are here to assist. We provide expertise, global contacts and are continuously expanding our international networks, so that people always have a reliable partner at their side. We are represented in 100 countries all around the globe. Our trade fairs travel abroad too, providing people with easy and first-time opportunities to take on new markets.”

The spokesman added: “Every year we organise more than 100 in-house and guest events, at regional, national and international level, which has given us decades of in-depth experience from which people can benefit. Our clients will be delighted with our all-round assistance, but also with the passionate commitment that our team members invest.”

The official German presentation is being sponsored by Federal Ministry of Economics and Technology (BMWi) in co-operation with the Association of German Trade Fair Industry (AUMA).

The presentation is supported by German Aerospace Industries Association (BDL e.V.).

There are 17 participating companies in the German Pavilion.

SWITZERLAND



Jet Aviation, a wholly-owned subsidiary of General Dynamics, is supporting the show once again. Founded in Switzerland in 1967, Jet

Aviation is one of the leading business aviation services companies in the world.

Close to 5,700 employees cater to client needs from more than 25 airport facilities throughout Europe, the Middle East, Asia and North and South America.

The company provides maintenance, completions and refurbishment, engineering, fixed base operations, along with aircraft management, charter services, aircraft sales and personnel services.

Jet Aviation’s European and US aircraft management and charter divisions jointly operate a fleet of more than 200 aircraft.

More than 50% of Jet Aviation’s business is generated in Europe, followed by North America, the Middle East and Asia.

A spokesman said: “As the company’s global growth continues with new acquisitions or the expansion of existing facilities, Jet Aviation will continue to provide its clients with an ever-

broadening menu of complementary services combined with the highest level of customer support.

“Today, Jet Aviation provides global executive jet charter services, flight planning and flight tracking, aircraft management and flight support services and extensive international support for corporate flight operations.

“It also offers fixed base operations (FBO), completions services including outfitting and refurbishment, maintenance and repair, avionics services, engineering services and aircraft sales and acquisition.”

Roland Buecheler, director of global events and corporate branding, said: “We have participated in the Dubai Airshow numerous times; pretty much from the beginning.

“Like any other company, we see there is the potential in the region for us to try to show what services we are offering to potential buyers. That is why we are taking part.

“We have our own company in Dubai providing maintenance and FBO services. We also have bases in Saudi Arabia, the Middle East and around the world. Therefore the Middle East is an important region for us to build relationships.”

FRANCE



Novae Technology is a spin-off of an industrial group highly specialised in aeronautics.

The French company was created ten years ago with the aim of providing

a high level of technical support services for space, defence and aeronautics industries around the world.

Novae Technology is dedicated to providing specific and up-to-date technical consultancy and technical support services.



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YOUR PRIVATE AIRSPACE.



It is not so long ago that local aerospace professionals would go to the Dubai Airshow to see what Western companies were bringing to the Middle East. Things have changed dramatically and this year's event has attracted a swathe of local exhibitors whose businesses are going from strength to strength.

Liz Moscrop reports

Right: EgyptAir training is seeing customers.

Far right: Alsalam takes care of C130s for the Royal Saudi Airforce.

Inset: EIAST launched UAE's first satellite.



Now East is meeting

The biennial five-day extravaganza that is the Dubai Airshow will, once again, throw open its doors to the aviation world's great and good on November 15 – but it is the Middle Eastern participants who are, arguably, telling the most interesting story.

Highlights on display include the advanced jet trainer Falcon L-15 from China-based AVIC, and a full-scale replica of the Eurofighter. There will be full-scale mock-ups of the Airbus A350 XWB cabin and Eurocopter's 16-seater civilian helicopter, the EC175.

However, Homaid Al Shemmeri, associate director of local giant Mubadala Aerospace, is excited about the huge growth in the number of local exhibitors present. "As the UAE becomes a major force within the global aerospace industry, Dubai Airshow increasingly becomes an important platform for us," he pointed out.

The huge influx of aircraft into the region has given rise to a matching demand for engineers and maintenance companies. Many are using the show as a vehicle to show off their wares.

Bahrain-based SA Mena Avionics, a joint

venture between MENA Aerospace Enterprises and Scandinavian Avionics, recently earned its FAA approval, complementing the Bahraini and EASA approvals it already had. Technical manager, Mohammed Zainal, said: "Our services fill a void in the market. Most aircraft operators have had no choice but to remove the faulty devices from the aircraft and send them offshore for repair. By providing the service locally or regionally, the delays and costs are dramatically reduced, allowing the aircraft to return to service sooner."

Centre of excellence

Egypt is making its mark as a centre of excellence, with local companies, such as Spot Air, providing MRO services to airlines, as well as wet and dry leasing, purchasing, marketing and flight support. It also operates air ambulance flights under its own AOC, in addition to private jet charter flights. In 2008 the firm carried more than 33,630 passengers.

Egypt is also home to Egyptair Training Services (ETS). At present 49% of ETS business

comes from its parent airline but the company wants to push that ratio down by six per cent over the next few years. The company believes that exhibiting at Dubai will help it win customers. Eng M Gamal Said, ETS director of marketing and sales said: "We also cater for more airlines in the region, including surplus training for Emirates. We intend to expand and the Dubai Airshow is an ideal platform for us to meet current and potential clients."

Egypt's ASE Group has also taken a booth at the show. Earlier this year, the ground handler earned its IATA Safety Audit for Ground Operations Certification. The same process is underway for the company's Sharm El Sheikh and Luxor bases.

Sharjah-based trip support services provider Skyplan is also at the show for the first time, partly to promote its new office in Dubai. Mohammad Sami, CEO said: "It is impossible to underestimate the value of an event like the Dubai Airshow in terms of networking and relationship development."

Fellow flight planner Sonic Jet Aviation



West on level terms

Services has also taken a booth. The Sharjah and Kabul-based company offers flight support as well as aircraft sales and leasing.

Saudi Arabia is also fielding exhibitors, such as Alsalam, which is based in the industrial park at the King Khalid International Airport north of Riyadh. The 21-year-old Boeing-backed company provides commercial, business and military aircraft maintenance, modification, manufacturing and related services for the likes of the Saudi Airforce and Qatar Airways. With three climate-controlled hangars, each capable of housing B747-400 sized aircraft, Alsalam can perform heavy checks and a wide range of support shop capabilities, including composite repairs. The company is also a Boeing Business Jet (BBJ) authorised repair centre.

Riyadh-headquartered Al Raha Group for Technical Services is also at the show. The firm has been in business since 1986 and provides aircraft ground equipment, logistics support and MRO services, as well as consulting.

There are several other MRO providers in attendance, such as UAE's Star Aviation Group,

which supplies parts and materials including engines, auxiliary power units, landing gear and avionics to airlines, air charter operators, private operators, cargo and general aviation operators.

Emirates Aviation Supply has also taken a booth. Its activities range from the supply of aircraft parts, components and entire systems to military and civilian users, as well as technical servicing, maintenance and consulting. It also works on Emirates' own aircraft as well as those of Air Arabia and Aero Asia.

Deliver its message

Emojet, the aviation fuels arm of Emarat at Dubai International Airport, sees the show as an opportunity to deliver its message. Rashid Al Shamsi, general manager said: "We are committed to making life better for our customers by delivering the highest quality products and services. We also have a strong social and environmental programme that supports community interests."

Operators, too, see the value of exhibiting. Beirut-based Easyfly offers private VIP charter

services for business and pleasure trips in Lebanon. Sagher Dagher said: "The Dubai Airshow helps us to build connections with global partners and explore new products, services, markets and alliances."

The Emirates Institution Advanced Science & Technology will also be promoting its services. The company hit the headlines this summer when 16 of its engineers successfully launched the UAE's first government satellite. DubaiSat-1 was developed by a South Korean firm with the cooperation of 16 UAE engineers from EIAST.

So the airshow is going from strength to strength. Alison Weller, director of event organiser F&E Aerospace is bullish about its potential. "I am cautiously optimistic that the Dubai Airshow will signal a return to a healthy marketplace and the opportunity for exhibitors and visitors alike to take advantage of the upturn," she said.

From the ground to outer space this year's event is a fascinating snapshot of how the aerospace industry is evolving in the Middle East.



The ATR-600 offers great promise for the region and (inset) A Libyan ATR will be at the Dubai show.

The French and Italians have always been enthusiastic supporters of the Dubai Airshow and one exhibitor embodying the best of both countries is attending on a high.

ATR is an equal-share partnership between Alenia Aeronautica (Finmeccanica Group) and EADS, and is the market leader in the manufacture of turboprops for the 50-70-seat market.

While regional jets have made the headlines over the past decade, the turboprop has made a great comeback as lower fuel costs at little speed sacrifice has become more important to operators.

Also short field performance and the ability to operate in hot and dusty conditions have seen the European manufacturer become an aircraft of choice in North Africa and parts of the Middle East.

And that is why ATR is celebrating.

Last month it announced a new customer in Libya and also unveiled its latest models, for which Royal Air Maroc (RAM) will be the launch customer.

The new customer is Libya's flag carrier Libyan Airlines, which ordered two ATR 42-500s.

The aircraft are configured with 48 seats and are equipped with new PW 127M engines. They are due to be delivered now.

Captain Mohamed Ibsem, chief executive

ATR happy to show off its dash of flair

officer of Libyan Airlines, said: "We decided to purchase the ATR aircraft because of their flexibility to operate in challenging conditions and tough environments, like the ones that can be found at some destinations in the Libyan desert.

"Thanks to our brand new ATR 42-500s, we will be able to improve the quality of our regular air connectivity to several local communities, thus contributing to strengthen both human and business links in our country."

But it is new latest planned edition to the ATR stable that will be catching the attention at the Dubai show – the dash 600 series.

The first aircraft was unveiled in Toulouse last month. Both the ATR 42 and the ATR 72 will have dash 600 versions and will enter service in 2011. To date, ATR has recorded orders for 59 of these aircraft (five ATR 42-600 and 54 ATR 72-600).

The ATR 72-600 is fitted with new Pratt & Whitney 127M engines. These provide five per cent additional thermodynamic power at take-off, thus improving performance on short

runways, in hot weather and at high altitude.

The incorporation of the "boost function" enables use of this additional power only when called for by the take-off conditions. Consequently, maintenance costs and fuel consumption are minimised.

In addition, these new engines allow the aircraft to increase the single-engine altitude by 1000 feet (300 meters).

With an aim to increasing the aircraft payload, a maximum take-off weight of 23,000kg for the ATR 72-600 can now be attained.

This first ATR 72-600 set to go to RAM is also the first to be fitted with the new, latest generation avionics suite, specifically developed for the '-600' series. These new avionics comprise the latest computer systems for navigational aids, flight data recording, automatic piloting and communications, entailing a better flight interface.

The new cockpit, which integrates five LCD screens, is also fitted with a new multi-purpose computer (MPC) enabling optimized



Fuel is the lifeblood of the aviation industry so it is no surprise that the Dubai Airshow is playing host to three major providers. Liz Moscrop reports.

What's in the pipeline for oil companies...

Although aviation fuel is often cursed as a major expense or polluter, the industry that produces it is constantly under pressure to drive down costs and carbon emissions.

The third largest oil exporter in the world is Abu Dhabi's home-grown giant National Oil Company (ADNOC), which is rocking up to demonstrate how it is serving the industry at the Dubai Airshow.

Presided over by His Highness Sheikh Khalifa bin Zayed Al Nahayan, Abu Dhabi's ruler and UAE president, ADNOC's activities include exploration, refining, marketing and supply.

It serves some 50 airlines at six state-of-the-art fuelling facilities at airports across the UAE – Abu Dhabi, Bateen, Al Ain, Fujairah, Sharjah and Ras Al Khaimah International.

ADNOC works hard to improve its supply chain. This autumn one of its subsidiaries, Takreer, invited tenders to start to build a network to transport fuel from its refineries to Abu Dhabi International Airport.

Eventually there will be pipelines linking the Ruwais and Abu Dhabi refineries to the Al-Ain and Mussafah depots, as well as to the airport.

Despite the ongoing investment development for future growth, aviation fuel producers have been hard hit worldwide by the economic slump and downturns in global airline passenger traffic.

ADNOC, for example, is maintaining reductions in crude oil sales for November to Asian refiners at 15%.

The move is "in accordance with the OPEC decision to reduce production", the company said.

Oil companies are under pressure in a

weakened world market. Newswire Dow Jones reported that tanker bookings for jet fuel exports from the Middle East to Europe fell after exports hit seasonal peaks in June.

With stockpiles of middle distillates in Europe at historically high levels – and demand not expected to recover until 2010 – analysts predict that there will be even less fuel flowing out of the Middle East in the near future.

However, in line with regional aircraft fleet growth, ADNOC has its eye on future recovery and plans to increase its capacity to 1.8 million barrels per day by 2016.

Air BP is also bullish about the future, and is looking hard at the region. The company has major operations at Aden, Beirut, Dubai and Sharjah airports and joint venture operations at Jeddah and Medina airports in Saudi Arabia.

The group's local exploration and production activities include several joint ventures with ADNOC. CEO, Dev Sanyal said: "At Air BP we pride ourselves on our customer focus and commitment and we will continue to work hard to develop our range of offers, and to identify opportunities for mutual advantage."

Shell Aviation will also be taking part in the Dubai event. Last year the company launched AeroJet fuel at the Middle East Business Aviation show.

The product contains an active biocide/fungicide additive that prevents growth of bacteria and fungi in a tank, which is caused by the formation of water. Richard Jory, regional GM said: "We are pleased that we can now cater to the needs of our customers in the region."



HH Khalifa Bin Zayed Al Nahyan heads up Adnoc, the third largest oil exporter in the world.

integration of all systems and better and faster computing capability. This new MPC will also facilitate aircraft maintenance operations.

The ATR 72-600 avionics integrate an autopilot, which will be CAT IIIA certified. This will allow a minimum decision height for landing of 50 feet (15 meters), thus optimizing aircraft operational capabilities during landing under deteriorated weather conditions.

Additionally, the new ATR '600' avionics improve the required navigation performance, facilitating more direct approaches to airports, especially to the most congested, offering an even greater reduction in fuel consumption. Finally, it enables simplification and increased reliability of the cockpit systems, significantly reducing their maintenance costs.

The '600' series ATRs will also be fitted with a new cabin incorporating new lighter and more comfortable seats and larger overhead baggage bins.

Targeted at providing passengers with optimized comfort, the new cabin will also be equipped with light-emitting diode (LED) lighting and in-flight entertainment systems.

ATR will also be talking to customers about its VIP conversions. The aircraft's operating flexibility and wide cabin make it an ideal business aircraft and the company has seen a number of new orders, including Thailand's royal fleet this year.

Muhammad Sami: valuable support.



Skyplan plots its growth in Dubai

Flight support services provider Skyplan is poised to launch its second facility in the UAE at the Dubai Airport Free Zone following the success of a similar venture in the Sharjah International Airport Free Zone.

The Middle East-based subsidiary of the world's oldest flight planning company aims to become a leading provider of flight support services in the region. Company president Adrian Bone said: "The Middle East is still a growing aviation market and, after the success of Sharjah, our new Dubai offices will continue to deliver our valuable support, products and services to our existing and new customers."

Canadian headquartered Skyplan started out in North America selling dispatching and flight planning services to small and medium-sized airlines. High demand for its flight support services saw the company expand and it has now been serving clients in the international market for the past 25 years.

Skyplan is one of the few providers in the world that owns and supports its own flight planning software. Bone said: "Our system is extremely reliable and, because we offer a scalable service, we can cater for the commercial, corporate and helicopter operators with very competitive pricing. Paying per flight negates the need for the operator to hire a permanent member of staff, especially useful while we are in recession."

The firm generates more than 3,000 flight plans per day worldwide and has integrated its services into four mainstream business segments.

The first is hosted flight planning, whereby its clients access the company's XML and proprietary CyberTrac 1 web-based software to generate their flight plans. The company is recognized by many of the global aviation authorities and its customers are able to transmit flight plans directly via email, AFTN, SITA, ARINC and fax.

The firm's second revenue stream comes from traditional dispatch support – generating complete flight packages for pilots. Skyplan's dispatchers are trained in-house and work round the clock in rotating shifts, providing live technical and operational assistance when required.

Thirdly, the company provides international trip

planning, where in-house staff complete the complex processes involved with operating an international flight, such as test flight plans, ground handling arrangements, obtaining flight permits and other requirements of planning an international flight.

Muhammad Sami, Skyplan's managing director for the UAE said: "Our system is capable of building flight plans swiftly with or without a weather briefing and final flight plans are delivered in less than ten seconds. The majority of the current corporate and commercial aircraft types are pre-built into our system. This aircraft library is a useful tool for both operators and our resellers." Thanks to this library the company says that it takes two to four days to add new aircraft, rather than the five to six weeks it would take an operator or reseller adding a single new type.

Skyplan's last income stream comes from fuel. The company has arrangements with major fuel providers worldwide, enabling it to offer its customers a competitive rate thanks to its large fuel uplift.

Sami said: "The Middle East is constantly evolving higher flight safety standards and we are excited to be part of that process by providing real-time technical assistance to operators. We received overwhelming support from our clients when we said we would

provide a localized presence. Dubai is close to our Sharjah operation and is an international hub where most of our current and potential clients have a presence." The firm is the only such company to offer 24/7 traditional flight dispatch in both North America and the Middle East.

The company's regional client base consists of local service providers to airlines in both the commercial and corporate sectors, as well as airlines that operate into the Middle East, such as Kingfisher.

Sunam Datta, Kingfisher's general manager said: "We have a long-established relationship with Skyplan, not least because it is more cost-effective and efficient for us to use a company that provides the software, the dispatch expertise and the facility to manage our whole trip. It is hugely beneficial to us that they are opening in Dubai and can provide us with instant local support at one of our destinations."

"Final flight plans are delivered in less than ten seconds."

Muhammad Sami



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Security at the FINGERTIPS

*The use of biometric information – such as fingerprints and facial images to identify travellers – promises to increase security and efficiency at airports. Middle Eastern states are among the first to put the theory to the test. **Brendan Gallagher** reports.*

Cairo International's new Terminal 3, which entered service earlier this year, is as well equipped with electronic passenger handling and information systems as any airport facility in the world.

Among the 14 separate capabilities is the first biometric immigration gate system to be implemented in Egypt and North Africa. But it's just the latest in a string of such installations in the Middle East, which is leading adoption of the technology.

The prime contractor responsible for integrating the Sagem Sécurité-developed system into Cairo Terminal 3 is ARINC.

"Middle Eastern states, with the UAE in the forefront, have been investing in biometrics for at least five years," said Paul Hickox, regional director for the US-headquartered IT and communications provider. "The Europeans, for example, have been slower off the mark and are only now coming into the biometric age."

This assessment is shared by SITA, ARINC's Geneva-based rival in the race for airport systems integration

business. "The Middle East probably has the most well established biometric systems, with the USA and the Far East following," said Sean Farrell, director of SITA's biometric centre of excellence in Boston, Massachusetts. "Europe is finally getting under way, prompted by this year's mandate requiring the adoption of e-passports – that's really going to drive deployment."

In the meantime, the Gulf States are setting the pace, implementing solutions based on the recognition of fingerprints and facial images. In Cairo the Sagem fingerprint recognition system is currently under trial in preparation for operational introduction early next year. "Though we have been heavily involved in the US Visit voluntary programme for border control for the past four or five years, this is our first foray into biometrics in the Middle East," reported Hickox. "But we are talking to a number of other countries in the region and in Africa."

Early-adopter states include Dubai, Abu Dhabi and Qatar. "In those countries the use of biometrics to improve the

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efficiency of border controls is an intrinsic part of the airport and how it operates," said Hickox. "They quickly grasped the significance of the technology and have moved as fast as anybody."

The biometric provision in the three states is used primarily for immigration control. Dubai, for example, issues biometric credentials to immigrant workers to track their arrivals and departures. After disembarking from the aircraft, the returning worker presents himself at the e-gate system, where the information on the biometric card is captured and then compared against fingerprints taken on the spot. If the two tally, verifying the traveller's identity, he is free to pass through the gate.

With their concerns over security and immigration, governments continue to spearhead the adoption of biometrics in airports. Under the US Visit programme, for example, every non-US resident arriving in the country currently has to provide a full set of fingerprints and a facial image. The intention is to go further in the future, also capturing fingerprints on the way out so that the individual's departure can be tallied with the original entry record.

But now the airlines are also waking up to the possible benefits for their passenger processing in the terminal. "The industry is looking to use biometrics to extend the passenger self-service capabilities that they are already adopting to save staff costs and better use airport space," revealed SITA's Farrell. "If they succeed, it will be a win-

win for everybody. The feedback about today's self-service systems is that passengers like being in control, while the airlines get to cut their labour costs."

Farrell foresees the eventual advent of a largely paperless passage through the airport based on a biometric credential like an e-passport or a national residency card of the kind issued in Abu Dhabi and Dubai. "Typically, the passenger could use the credential to check in at a self-service kiosk, providing a fingerprint as verification to guard against document theft," he said. "Then a fingerprint would suffice at each subsequent step, from bag drop, via security to actually boarding the aircraft."

One variation on the theme could be the use of airline-sponsored biometric credentials. "The carriers might want to issue them to their frequent fliers," Farrell explained. "That would allow them to provide a new range of fast-track differentiated services."

Following several years of ad hoc biometrics work in Europe and the USA, SITA is close to bringing to market its own suite of software and hardware products under the BioThenticate label – and Middle Eastern airports could be among the first to put them into service.

Farrell said: "We recognised that biometrics was going to be critical to us as a provider of border management solutions and IT infrastructure for airports. After examining the potential impact of the technology across our portfolio we decided to develop a software

platform that will allow us to integrate biometrics throughout our existing range of services."

The BioThenticate software and associated hardware are designed to support end-to-end border management and airport processing applications. Functions include the initial "enrolment" of the traveller – with a desktop system in a dedicated room, at a check-in kiosk or with a handheld device – and subsequent verification with fingerprinting or facial recognition. "Our software will provide the glue to make all this work together," enthused Farrell.

BioThenticate hardware will include e-gates for two different applications – immigration and aircraft boarding. "Boarding typically has lower security requirements," explained Farrell. "So we will offer a one-door system, to be lightly supervised by airline staff, that will require the passenger to identify himself before opening to let him on to the aircraft."

The immigration model will be more complex: "The traveller will identify himself with a biometric credential, such as an e-passport or national identity card, in order to pass through the first door. Then he will provide a fingerprint or facial image for verification. Only then will the second door open to let him into the country."

How soon can travellers in the Middle East expect to come across SITA-supplied biometrics in action? "Governments and airports are looking to buy this kind of equipment and we are in contact with a number of them," said Farrell. "We expect to be able to announce pilot programmes in the region from the first quarter of next year."

Quality helps Munich Airport to buck the recession

As other airports are feeling the effects of the economic crisis, Munich is bucking the trend – by expanding its space and operations.

As of last month, a new route between Munich and Oman will be serviced three times a day. On top of that, work is continuing on the airport's third runway and passenger terminal, which is due to be completed in 2013.

So how is Europe's number two airport managing to remain such a high-flyer?

Reinhard Zeiler, Munich Airport's head of airport consultancy, has a simple answer: "We have a very high quality airport. Munich is a nice new airport with new facilities set up from the very beginning. We have a management which very much focuses on the development of its own personnel and increasing efficiency in processes and operations."

While other airports report serious drops in business, Munich saw 34 million passengers pass through and 432,000 movements in 2008. And, despite the recession taking hold this year, it is only expecting a dip of nine per cent in its passenger figures – much less, it says, than other airports.

Zeiler added: "Munich is one of the very important hubs for Germany. Terminal two, which we were very proud to open in 2003, solely deals with Lufthansa traffic. It is a joint venture between Munich Airport and Lufthansa so we are operating



From the roof of Barcelona to the deserts of the Middle East, Munich Airport is consulting around the world.

together. The idea behind this is to ensure terminal two is purely customer-orientated. When there are lots of other airlines operating, it is difficult to concentrate on individual passengers as much as you might want.

"A total of 46% of passengers in terminal two need a transfer, which is a high amount. As we have a central control at this hub, we can make these transfers more efficient as the airport takes control of

baggage handling and Lufthansa can co-ordinate flight times."

Munich Airport has a lot of traffic to and from the Middle East, with Emirates flying twice a day and Lufthansa flying to Dubai.

The new-look Munich Airport opened in May 1992 – moving from the old site to the new overnight. The impressively smooth transition earned the airport an introduction into the niche market of consultancy.

Since then, the airport's consultancy business has helped numerous other countries carry out similar major changes, including Malaysia in 1998, Athens in 2001 and Bangkok in 2006. The team has also assisted with the development of terminal three in Abu Dhabi this year and is currently helping improve operational efficiency in Bahrain.

Zeiler said: "When we opened in 1992, the long-term future of the airport was already laid out. Unlike other airports we, therefore, do not now have the problems of trying to expand – the space for our third runway was already planned in."

"After the third runway and passenger terminal, we still have space for more satellites and passengers in the long-term future.

"We are keen to remain a high quality airport, to expand our consultancy business into other areas such as providing specialist IT and helping airports become more green."

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Big is beautiful

*The information systems at Cairo International's new Terminal 3 don't just set a new standard for North Africa – they're as good as any in the world, writes **Brendan Gallagher.***

This summer Egypt's national airports operator took formal delivery of the new Terminal 3 at Cairo International. Like so many of the facilities recently introduced across the Middle East and North Africa, it's on the grand scale – as large as its two predecessors combined, with a maximum annual capacity of 14 million passengers – and beautifully styled inside and out.

If anything, the technology that lies beneath the terminal's gleaming exterior is even more impressive. "We delivered, installed and integrated 14 different information-handling systems," said Paul Hickox, ARINC's regional director for the Middle East. "They form one of the most diverse and wide-ranging capabilities we have ever supplied anywhere in the world. It's a very significant project for us as an airport master systems integrator."

Built over a five-year period, the \$400 million terminal features two piers housing a total of 23 gates, two of which can handle the Airbus A380. Concourses connect the piers to the main building, with its 110 check-in desks, seven baggage carousels and total of 54 passport control desks for outgoing and incoming travellers.

Biometric border control from Sagem Sécurité of France is one of the 14 capabilities integrated by ARINC Managed Services under a \$27 million contract awarded in 2006. Sagem's Biometric Immigration Gate (BIG) system is the first to be implemented in Egypt. Other innovations include the world's first operational application of a context-aware wireless network and hand-held devices to give ground staff need-to-know access to ramp management information, and the Middle East's first common-use self-service (CUSS) check-in kiosks.

Long-established ARINC products deployed at the new terminal include the iMUSE common-use system for check-in desks, the IP-based AirVUE flight information display, AirDB airport operational database, AirPlan resource management system, and passenger information kiosks. ARINC also supplied the connectivity – local-area networks and voice-over-IP (VoIP) telephony – that underpins these systems.



Intent on avoiding problems like those that marred the opening of London Heathrow's Terminal 5, ARINC and the Cairo Airport Company orchestrated a seven-month ramp-up leading to full operations. Following a symbolic inauguration attended by Egyptian president Hosni Mubarak last December, Cairo T3 opened for commercial operations at the end of April, when national carrier Egyptair moved in and carried out the first flight, to New York JFK.

The following two weeks saw the terminal running at an initial capacity of five flights a day, and by the end of the first month of operations some 111,000 passengers had passed through.

Egyptair's international services were cut over at the end of May, the carrier's Star Alliance partners moved in during June, and final proving of all the ARINC-supplied systems was completed in August. Terminal 3 is now home to 27 international and domestic airlines carrying 11,000 passengers a day on some 200 scheduled flights.

Right first time

"Full service was reached about a year-and-a-half later than the original timetable," reported Hickox. "Though our part of the the project came in on budget, entry into service was delayed because the customer wanted to get the opening right and not have any repeat of the Heathrow T5 fun and games. Having a terminal that was right first time really mattered to them."

And that's what has been achieved, Hickox maintains. "Just as we did at Dubai Terminal 3 last year, we opened in Cairo without a single hiccup or failure," he said. "Final proving was completed on August 20 and the terminal is now running at full capacity. We're supplying the customer with two years of maintenance and support, and keeping on-site teams in place to ensure they enjoy the best possible service."

Many observers see the biometric immigration gates, with their ability to allow qualified passengers to enter Egypt with minimum delay, as the most state-of-the-art aspect of the new terminal. But it is another capability, the context-aware ramp management system supplied by ARINC in partnership with Franco-Swedish software provider Appear Networks, that places Cairo Terminal 3 at the very forefront of airport technology.

Appear's IQ back-end wireless platform and click & run software for hand-held devices support what the company describes as "context-aware service discovery" – short-range wireless delivery of selected information to mobile workers, depending on their location, personal profile and pre-set permissions. Applications include passenger and flight information, catering orders, security, and maintenance management.

Combined with its recent track record at Cairo, Dubai and the ongoing Doha International, ARINC's ability to furnish such leading-edge capabilities leaves the company well placed to contest several other airport projects that are now out to tender in Egypt and elsewhere in the Middle East.

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DFS flight controllers in action at Langen Control Centre, Germany

Air traffic efficiencies a 'must' says DFS boss

With aviation facing the harsh reality of the economic downturn, Steve Nichols looks at one of the most crucial issues affecting the Middle East.

The future of air navigation services in the Middle East will depend on organisations looking closely at efficiency and cost-effectiveness and taking a holistic approach to solving those challenges.

That's the view of Achim Baumann, regional manager Middle East at DFS Deutsche Flugsicherung GmbH, one of Europe's largest air navigation service providers (ANSP).

Baumann says that the economic downturn is not only an issue in Europe, but also in the MENA region.

He suggests there are three ways of becoming more efficient in air traffic management, while enhancing safety: "One is to harmonise the airspace structures and operational concepts, as the airspace in the Middle East is, to a great extent, fragmented," he said. "Stakeholders should also consider if their existing systems are being fully utilised with all their abilities and capacities before investing in new ones.

"The reliability of flights in the Middle East could also be further enhanced if everybody involved in the flight and turn-around process received the information they needed in a reliable and timely manner.

"However, in order to reach more efficiency for the complete air traffic management (ATM) system, it is necessary to view all the elements holistically and to collaborate beyond national borders."

DFS practices what it preaches. In 2002, it completed a comprehensive restructuring of German airspace and reduced the number of sectors, despite an increase in air traffic.

User-preferred routing

This type of restructuring – apart from enhanced safety – also led to efficiencies as more direct flight paths became available. Furthermore, better use of aircraft and air traffic management technology can result in an extended application of user-preferred routing.

The International Air Transport Association (IATA) says that since 2006 it has saved \$40 million by shortening routes and \$46 million by adopting Area Navigation (RNAV) approaches in the MENA region.

Moreover DFS, together with the Munich Airport operator, introduced the first Airport Collaborative Decision Making (CDM) process in 2007, based on the approach by Eurocontrol, the European Organisation for the Safety of Air Navigation.

A study on Airport CDM Network Impact Assessment, based on experience at Munich, has shown that the

implementation of airport CDM could increase sector capacity within the core area by up to four per cent.

According to Achim Baumann, military organisations should also be included in the planning.

DFS was one of the sponsors of the Air Traffic Control Optimization Summit, held in Dubai in October, where better civil/military collaboration, both in airspace and ATM systems, was the theme of an address by the company's military policies specialist Volker Gördlt. He said that with increasing pressure on airspace it is imperative that this collaboration takes place.

The Civil Air Navigation Services Organisation (CANSO) Middle East Regional Office, which was established in June 2009 and which is actively supported by DFS, focuses on ensuring that Middle East airspace can meet future demands. Several workshops have already been held to deal with this challenge.

Jeopardise the sustainability

In January, IATA also called on governments, air navigation service providers (ANSPs) and aviation groups to urgently address air traffic inefficiencies that jeopardise the sustainability of Middle Eastern aviation.

Dr Majdi Sabri, regional vice president IATA Middle East North Africa, said: "The Middle East is one of the most dynamic aviation markets in the world, expanding from five per cent of international traffic to 10% in the past seven years. But we are not immune to the global recession.

"Airlines in this region will lose \$200 million in 2009 as traffic growth slows dramatically. In this environment every cent counts and both aviation and the environment can no longer afford a wasteful air traffic control system."

DFS has other ways of bringing efficiencies to the industry. At the upcoming Dubai Airshow (stand W346c) it will be demonstrating its approaches to safety and efficiency using the Incident Analyser tool, which allows air traffic situations to be visualised and replayed.

Also at the show will be its 4D Planner, an arrival manager that optimises the approach sequence at airports. The demonstrator on the stand will be displaying an airspace situation from the Middle Eastern region.

DFS is very active in the MENA region and is currently working on the procurement and installation of primary and secondary radar systems in Bahrain and in procedure design in Saudi Arabia.

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Bahrain gears up for top-flight show

With less than two months before the inaugural Bahrain air show, the organisers – Bahrain's Department of Civil Aviation and Farnborough International – are stepping up activities.

National carrier Gulf Air gave the show a boost when it opted to paint aircraft in its A300 fleet with a special design to promote the event, which takes place at the Shakhir Air Base from January 21-23.

As well as promoting the show, Bahrain's national airline is also helping cover some costs for delegates to the event.

The carrier is offering a 20% discount on flights to Bahrain for participants and visitors. Discounted flights are on offer for departures to Bahrain between January 17 and January 26 and are available to book online until January 17. Information is available on the official BIAS website www.bahraininternationalairshow.com

Gulf Air was announced as the official carrier back in April and Willy Boulter, the airline's chief commercial officer, said the show is an important event for both Bahrain and Gulf Air as 2010 marks 60 years of Bahrain civil aviation and 60 years of Gulf Air.

"We are, therefore, delighted to be offering delegates coming to this event a special fare on our flights. Bahrain has long been a pioneer in the aviation industry and I am sure

that this Bahrain International Airshow will be a great success."

Gulf Air is taking one of the 40 chalets at the event and will feature aircraft in the daily flying display. The show has been well supported by the aviation and defence community both locally and internationally. Exhibitors include Abu Dhabi Airport Company, ADS, Aero Toy Store, BAE Systems, Bahrain Aerospace, Bell Helicopters, Bexair, Blenheim Capital Partners, Boeing, Bombardier Aerospace, Cessna, EADS, Gulf Air, Gulfstream, Hawker Beechcraft, Lockheed Martin, MAZ Consultancy, Prestige Jet, Rolls-Royce, SELEX, Sikorsky, TAG Aeronautics and UKTI DSO.

Each company will have a luxury five star chalet unit for the three days and will meet with high-level visiting delegations and key international procurement personnel.

Organiser, Amanda Stainer, exhibitions & events director for Farnborough International, said: "BIAS will particularly benefit from the strength of commitment by the Bahraini Royal Family, ministerial departments and CAA, all of whom are working tirelessly to ensure that the very highest level delegations and VIP guests will be delivered to air show participants."

Development of the show site in Sakhir is progressing well. The show website shows the current state of building.

A YEAR OF MAJOR EVENTS

2010 will be a busy year for the aerospace industry throughout the MENA region. *Arabian Aerospace* will be at the following events providing coverage and distributing the magazine.

■ **Bahrain International Airshow 2010**
– January 21-23 – Bahrain

■ **AeroExpo 2010**
– January 27-30 – Marrakech, Morocco

■ **Al Ain Aerobatic Show**
– January 27-31 – Al Ain, UAE

■ **Singapore Airshow**
– February 2-7 – Changi, Singapore

■ **Second Annual Airport Security Middle East**
– February 7-10 – Dubai, UAE

■ **MRO Middle East 2010**
– February 28-March 1 – Dubai, UAE

■ **Aircraft Interiors Middle East (AIME) 2010**
– February 28-March 1 – Dubai, UAE

■ **Aerospace & Defence Training Show (ADTS)**
– March 3-4 – Airport Expo, Dubai, UAE

■ **Low Cost Airlines World MENA**
– April 12 – Cairo, Egypt

■ **Third Annual Aviation Outlook MENA**
– April 13-15 – Cairo, Egypt

■ **Airport Show Dubai**
– April 25-27 – Dubai, UAE

■ **EBACE**
– May 4-6 – Geneva, Switzerland

■ **Arabian Travel Market**
– May 4-7 – Dubai, UAE

■ **SOFEX**
– May 10-13 – Amman, Jordan

■ **Aircraft Interiors Expo**
– May 18-20 – Hamburg, Germany

■ **IATA AGM**
– June 6-8 – Berlin, Germany

■ **ILA Berlin Air Show**
– June 8-13 – Berlin, Germany

■ **Farnborough 2010**
– July 19-25 – Farnborough, UK

■ **16th World Routes Development Forum**
– September 19-21 – Vancouver, Canada

■ **Gulf VIP & On Board Design**
– September 27-29 – Manama, Bahrain

■ **NBAA**
– October 19-21 – Atlanta, USA

■ **Helishow Dubai 2010**
– November 2-4 – Dubai, UAE

■ **MEBA 2010**
– December 7-9 – Dubai, UAE



FLYDUBAI BRINGS TWO TO THE TOP TABLE

Dubai's low-cost carrier, flydubai, has announced the appointment of former Emirates Airline executive Hamad Obaidalla (left) as chief commercial officer and Neil Mills from easyJet as chief financial officer.

The appointments bring more than 30 years of combined expertise, both local and international, to the most senior levels of the airline and form a key part of the organisation's drive for rapid expansion.

Obaidalla, a UAE national, brings an unrivalled depth of knowledge to his new role after 20 years at Emirates Airline, where he was most recently divisional senior vice president, network operations.

His key management roles within Emirates involved operations in Saudi Arabia, East Africa, Yemen and Iran and provided a wealth of valuable working experience in the region.

A British/South African, Mills brings specific knowledge and expertise from the budget airline sector, coming from one of Europe's best-known and most successful low-cost carriers. He spent 12 years with the airline, where his last position was procurement director.

Ghaith Al Ghaith, CEO of flydubai, described the appointments as being invaluable to the company's aspirations for growth. "Both Hamad and Neil bring a wealth of expertise to flydubai and I am delighted to be able to warmly welcome them to our growing team. We are embarking on an exciting journey as innovators in the low-cost sector and I am glad that we have such senior staff from two of the world's most successful airlines to travel with us."

Cairncross steps up at ExecuJet

Quintin Cairncross has been appointed operations director for ExecuJet Middle East and is overseeing the fully-managed aircraft fleet in the region.

Cairncross comes with extensive aviation experience from the South African Air Force, South African Airways and Emirates, where he also carried the positions of safety auditor, quality auditor and deputy chief flying examiner.

He holds Type Rating Examiner (TRE) and instructor ratings and has more than 13,000 flight hours.

He spent a brief period with Grob Aerospace in the role of director of flight training before joining ExecuJet in 2008.

In addition to his role in the Middle East, Cairncross continues to be group director flight training & safety for The ExecuJet Aviation Group worldwide.

Enz replaces Curtis at Rizon

Swiss-born Patrick Enz, a former vice president at Jet Aviation, is to replace Will Curtis, who has spearheaded the development of the company in Doha and Biggin Hill near London.

Brand new 120,000 sq ft hangar facilities housing new MRO and FBO activity at both locations are now close to opening.

Enz has previously worked with Swissair and

Lufthansa and, prior to running his own business aviation consultancy, he was vice president business development at Jet Aviation Management in Zurich.

Boeing change leadership team

Boeing Commercial Airplanes president and CEO Scott Carson announced that he will retire from the company at the end of 2009.

Boeing chairman, president and CEO Jim McNerney has named Jim Albaugh, 59, to Carson's leadership role at Boeing Commercial Airplanes (BCA), and Dennis Muilenburg, 45, to succeed Albaugh as president and CEO of Boeing Integrated Defense Systems (IDS).

Nishiyori and Torres for Etihad Japan

Etihad Airways has announced the appointment of Masatsugu Nishiyori and Juan Torres to head up its offices in Japan.

Based in Tokyo, Nishiyori will serve as the airline's vice president – general manager in Japan, while Torres becomes commercial manager.

Nishiyori has held several senior strategic roles in All Nippon Airways (ANA) in finance, sales and marketing, network strategy and distribution. He has extensive knowledge of the Japanese market in addition to international

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experience in the United States, where he headed up the sales and marketing team when ANA started services in 1986.

Torres has a wealth of commercial airline experience in senior management positions at KLM Royal Dutch Airlines and Etihad Airways, most recently as country manager, Philippines.

Etihad is scheduled to start a five-flights-a-week service from its Abu Dhabi home base to Tokyo from March 2010.

Jet propels

Kusserow

Jet Aviation has appointed Frank Kusserow as director and head of FBO services for EMEA & Asia.

Kusserow will continue in his role as director FBO at Jet Aviation Dusseldorf,

Germany, and will work closely with all facility-based FBO directors throughout the EMEA & Asia region.

In his new role, he will report directly to Christof Späth, senior vice president MRO & FBO services for EMEA & Asia.

Mahoney lands Honeywell role

Honeywell has announced that Tim Mahoney has been named president and CEO of its \$11bn aerospace business. Mahoney will report to Honeywell chairman and CEO Dave Cote. Mahoney succeeds Rob Gillette, who is leaving Honeywell to become CEO of First Solar Inc, an Arizona-based manufacturer of solar modules.

ROYAL JORDANIAN'S NEW PRESIDENT AND CEO



Hussein Dabbas has succeeded Samer Majali as president and chief executive of Royal Jordanian airline (RJ). Majali stepped down at the end of July to become chief executive of Gulf Air.

Dabbas is an expert in the civil aviation and the air transport industry. He joined Royal Jordanian in 1979 and holds a master's degree in international management and marketing from Thunderbird School of Global Management, Arizona, and a BSc in business administration from the University of San Francisco, California, USA.

Dabbas held several positions at RJ, particularly in the commercial and marketing sector – the last being vice president of marketing, sales and services, since 2005.

He was head of the marketing and sales department between 2001 and 2005 and assistant vice president for passengers sales and marketing between 1996 and 1999. Between 1992 and 1996, he was general manager for the United States operation based in New York, and assistant vice president, marketing between 1989 and 1992.

Dabbas is a board member of the Jordan Tourism Board, a member of the IATA Industry Affairs Committee, the RJ representative at the Arab Air Carriers Organization (AACO) commercial committee and the company's representative at the oneworld commercial committee OMC. He is also a board member of Royal Wings charter airline, and head of the management committee of Royal Tours.

Dabbas was born in Amman in 1955. He is married with two children.

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SEAN MAFFETT

The man who is the voice behind the region's premier flying display talks to Arabian Aerospace about his job at the Dubai Airshow



1

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■ How did you get involved in Airshow commentating?

I spent 20 years as RAF navigator and staff officer (and private pilot). I have spent the past 20 years as a freelance broadcast journalist for BBC and commentated at more than 110 air shows. This year, I was proud to be the official commentator for the world's one and only flying Vulcan.

■ What sort of preparation do you have to go through before the show starts – for instance, are you in Dubai for all of the rehearsals?

I spend many hours of research on each and every aircraft in the flying display, including talking to every pilot in the show. This year, budgetary considerations mean that I won't arrive in Dubai until two days before the dress rehearsal so we are cutting it rather fine – but we'll make it work!

■ What do you do when you are not at air shows?

Commentary at historic events for organisations like English Heritage; moderator for conferences and awards ceremonies; aviation-related TV and video programmes. I am an on-screen and on-air aviation expert, voice-over artist and doting granddad.

■ What are the biggest challenges you face in your job?

The biggest challenge is persuading show organisers of the significance of commentary! I believe that, for a flying display to achieve its full (and very expensive) potential, three things need to be on top form – the aircrew, the aircraft, and the commentary team. On a smaller scale, making sure that the commentary gets out to the people who want to hear it!

■ What have been the best and worst moments of your career as a commentator?

Probably the most difficult was at the last Dubai show when a Boeing 777 was parked next to my commentary position – I couldn't see anything out to my left, including aircraft approaching or manoeuvring. Probably the best was broadcasting for BBC TV and radio on the RAF's Lancaster flying over Buckingham Palace in the Battle of Britain 40th anniversary flypast. Other great moments include flying in a Spitfire and a Mustang, and also with the Red Arrows, and (separately) as a wing walker. Among my proudest moments include receiving a Royal Television Society award for an aviation programme commentary, and being nominated by the BBC for a Sony Radio Award for a programme on which I went on the 1994 trip of the replica Vimy to Australia.

“ I believe that, for a flying display to achieve its full (and very expensive) potential, three things need to be on top form – the aircrew, the aircraft, and the commentary team. ”



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