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THAILAND'S SMARTEST AIRLINE

Thai AirAsia CEO Tassapon Biljeveld rolls over opponents in a cutthroat LCC market

Orient aviation 24 YEARS

Airbus strengthens China ties with A330 Tianjin centre

Asia leads world in LCC connectivity

Etihad names new group CEO to resurrect its airline business

INDUSTRY INSIGHT SPECIAL REPORT
Digital era delivers faster MRO turnarounds

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Warn airlines about missile threats

The war of words between U.S. President Donald Trump and North Korean dictator Kim Jong Un presents a very serious threat to airlines and their passengers and crew. North Korea's rockets have soared high over Japan's Hokkaido island before plunging into the Sea of Japan.

In response to the missile launches, European carriers Lufthansa, Swiss Air and SAS have altered their flight routes to avoid crossing the Sea of Japan when approaching Tokyo from Europe. After North Korea's second long-range missile test in July, a U.S. official revealed that Air France 293, flying from Tokyo to Paris, had flown across the rocket's flight path 10 minutes before it was launched.

Korean Air and Asiana Airlines have not adjusted their flight paths because their aircraft do not travel through northern Japan, nor have All Nippon Airways and Japan Airlines. The Japanese carriers said that they had no information about the timing or trajectory of missile launches so they had no reason to believe one route was safer than another.

Dozens of daily flights from North America also approach Japan from the north. Statistically, the chance of a missile hitting one of these planes may be low, but nevertheless it is a risk too far.

Some effort must be made to convince North Korea that civilian airlines be given warning of the timing of the tests. The International Air Transport Association (IATA) has some contact with the rogue state's aviation authorities. Hopefully approaches have been made, although in the present political climate it seems unlikely they will produce meaningful results.

The issue underscores the importance of convincing governments, whatever their views, that freedom of the air and the safety of flight routes for the world's airlines is paramount.

Dialogue needs to be redoubled to allow timely and accurate information about potential threats along the world's airways so carriers can divert their routings from danger. The devastating shoot-down of Malaysia Airlines MH 17 over the Ukraine in July 2014 is still too fresh in everyone's minds to allow such a tragedy to ever happen again. ■

TOM BALLANTYNE
Chief Correspondent
Orient Aviation Media Group

Former Abu Dhabi boss to chart Etihad's new course

All industry eyes will soon be on **Tony Douglas**, 55, a veteran Middle East hand who has been chosen to claw the **Etihad Aviation Group** back from the abyss of its failed global alliance strategy. Lancastrian Douglas, who began his working life as a toolmaker on the factory floor, is to depart as CEO of Britain's Ministry of Defence procurement division and assume control of the Gulf group in January.

The successor to James Hogan has deep credentials for the job. He has held senior positions in the Emirate including CEO of both the Adu Dhabi Airports Company and Abu Dhabi Ports. In the latter position, he was responsible for the successful delivery of Khalifa Port.

In Britain, Douglas worked for the British Airport Authority where his responsibilities have included managing director of the Heathrow Terminal 5 project, group supply chain director and group technical director at the authority and CEO of Heathrow Airport.

Douglas will take over from interim group CEO, Ray Gammell, who will return to his former role as group chief people and performance officer.

Etihad Aviation Group chairman, Al Mazrouei, said: "Douglas has guided the transformation of large organisations in the UAE and the UK and he understands the UAE and the region. He also is deeply knowledgeable about commercial aviation and keenly familiar with Etihad's challenges and opportunities in a rapidly changing industry."

Al Mazrouei said the new group CEO would guide the company in implementing "a range of strategic initiatives". Douglas has his work cut out for him. Two of the group's equity partners, airberlin and Alitalia, have entered administration. Recently Etihad sold its holding in Swiss regional carrier, Darwin Airline.

"Etihad is an economic and employment engine for the UAE and the region. With new infrastructure and attractions like the expanded airport, the Louvre Abu Dhabi and the Abu Dhabi Global Market, Etihad has a central role in supporting the UAE's position as a global hub of transportation, tourism, commerce and culture," Douglas said in a company statement.

The Etihad Aviation Group has five divisions and six airline equity partners - airberlin, Air Serbia, Air Seychelles, Alitalia, Jet Airways and Virgin Australia. The divisional heads are Etihad Airways CEO Peter Baumgarten; Etihad Airways Engineering CEO Abdul Khaliq Saeed; Etihad Airport

Services Chris Youlten; Hala Group managing director Gavin Halliday and Airline Equity Partners CEO Robin Kamark.

Under the leadership of former group CEO, James Hogan, who left the company earlier this year, Etihad pursued a strategy of a global alliance tied together with equity airline partnership across Europe and the Asia-Pacific.

Some of the investments have turned bad, a situation that resulted in the group reporting a US$1.87 billion loss for the 2016 year. In January it was announced that Hogan was stepping down from the top job. It was later confirmed he would leave the carrier by mid-year. ■

Asia leads world in budget carrier connectivity

Four out of five of the world's top international low-cost megahubs are in Asia, the annual **OAG Megahubs International Index** reported last month. Kuala Lumpur, home of the AirAsia Group, topped the list followed by Jakarta (2), Singapore (3), Delhi (4) and Los Angeles (5) in OAG's list of its 25 busiest interconnecting budget airline hubs.

Thirteen more Asia Pacific airports were among the top 50 of the global list, including top ten members India and Thailand, and China's Beijing, Shanghai and Guangzhou.

Kuala Lumpur was the clear global leader for connectivity said OAG, but Singapore was snapping at its heels with 35,000 possible low-cost connections in a single day, followed closely by Jakarta.

Speaking about connecting flights in general, **OAG executive vice president product management, Mark Clarkson**, said: "the Asia-Pacific is continuing to grow as a key area for connecting flights and China is at the forefront of the surge.

"Singapore tops the list of Asia-Pacific airports, which is not a surprise since it is the main connecting destination to Australasia. But the emergence of countries such as Indonesia and Malaysia paint a promising picture for the region's connectivity to the rest of the world.

"South Asia and Southeast Asia have led the success of LCCs by meeting international needs in the region, which is particularly important for less economically developed areas such as parts of India and smaller nations in the region." ■

New CEO named at Beijing's Ameco

China's **Ameco** has appointed a new CEO from within its head office ranks. Former executive vice president and chief strategy officer of the Sino-German joint venture, **Ni Jiang**, took over as CEO last month. Ni has been general manager at the former Air China Technics Chengdu Maintenance base as well as serving in several senior roles at the MRO's Beijing headquarters.

In 2015 Air China Technics and Ameco merged into one entity that integrated several Air China repair bases across the country. The merger also resulted in a changed **Ameco-Lufthansa Technik** joint venture equity structure. Under the "New Ameco" the Beijing headquartered maintenance company holds 75% of Ameco and the German MRO 25%. The group has maintained its role as the MRO for flag carrier, Air China, but is making a well-funded strategic push into the larger global market as China's airliner fleet continues to inflate. ***The digital challenge for Asia-Pacific MROs. Page 28.*** ■

WiFi a win-win for Asia-Pacific airlines

A London School of Economics study, **Sky High Economics**, Quantifying the Commercial Opportunities of Passenger Connectivity for the Global Airline Industry, has forecast that the inflight broadband market will be a US$130 billion global business by 2035 and that the Asia-Pacific will be the biggest market of all for the sector.

Conducted in conjunction with mobile global communications provider, **Inmarsat**, the study said the Asia-Pacific would benefit from US$10.3 billion in revenue by 2035, from all sectors of broadband IFE. Europe would be worth US$8.2 billion for the same period followed by North America (US$7.6 billion).

Broadband ancillary revenue would come from broadband access charges, e-commerce and destination shopping, advertising and premium content, the study said. ■

Thai airlines struggle despite safety upgrade

Restoration of Category 1 status for Thailand's aviation industry is a significant step forward in the recovery of the country's regulatory reputation, but Thai airlines will need more than improved credibility to return to profit. ***Chief correspondent, Tom Ballantyne, reports.***

Thailand's airlines are battered and bruised by regulatory missteps, shifting passenger tastes and weak leadership. And there is no doubt there will be more pain ahead.

Collectively, Thailand's 21 home grown airlines have been damaged in the minds of passengers by the 2015 imposition of an International Civil Aviation Organisation (ICAO) red flag on Thailand's aviation regulatory system. But fast growing and fiercely competitive budget carrier expansion has not helped their situation.

The impact on carriers of the industry stigma of the ICAO red flagging has been compounded by extremely low yields and increased fuel and fuel excise costs.

At press time, only Thai AirAsia had reported a profit for the year to date, and its results were much lower than for the same months in 2016.

Top of the list of loss-makers was government controlled Thai Airways International (THAI). It posted a net loss of $157.2 million in its second quarter to June 30, a much larger loss than the $88 million interim deficit of a year ago. For the first six months of 2017, it was in the red for $61.4 million, a reversal of a $93.4 million interim profit 12 months earlier.

Another poor performer, part-owned THAI budget carrier, Nok Air, has announced a second quarter loss of $22.7 million. Full service airline, Bangkok Airways, reported a first half loss of $15.8 million, 365% higher than its year ago loss of $3.4 million.

At Nok Air, a conflicted management situation looks set to be resolved following the resignation of well-connected CEO, Patee Sarasin, from the LCC on September 14. NokScoot CEO, Piya Yodmani, took his place. The top level change was widely believed to have been encouraged by THAI. Patee will remain at Nok Air as board vice chairman but his status as the continuing chairman of NokScoot has yet to be established.

Rival Thai AirAsia, which is the country's largest LCC, announced a $5.2 million profit for the three months to June 30, a 60% decline over last year. Its income for the six months was $22.4 million, 50% lower than in 2016.

It is difficult to assess the impact of the ICAO ruling on individual airlines, but there is no doubt it made life tough for Thai carriers. After the red flag was raised, some countries put limitations on operations by Thai airlines and also conducted safety audits on their aircraft. China, a key market for Thai carriers, allowed existing schedules to continue but barred flight launches.

The red flag is expected to be removed by year end, following a new ICAO safety audit scheduled for the last week of September. The restoration of category 1 ICAO status will lift network, capacity and equipment restrictions for all airlines issued with re-certification of Air Operator Certificates.

Nine airlines held re-certified AOCs at press time. They are Bangkok Airways, New Gen Airways, Nok Air, NokScoot, THAI, Thai AirAsia, Thai AirAsia X, Thai Lion Air and Thai Smile Airways.

Civil Aviation Authority of Thailand (CAAT) director, Chula Sukmanop, said the flaws in the country's aviation regulatory oversight system raised by ICAO have been addressed, including the amendment of laws related to the re-certification of Air Operator Certificates (Re-AOC) to airlines.

The CAAT and the Transport Ministry expect to receive the official results of ICAO's latest audit next month. Chula said the CAAT planned to complete the process of re-certifcation of the remaining 12 effected airlines by January 31 next year.

Signing off the AOC re-certification is considered fundamental to the CAAT's efforts to restore Thailand's aviation safety standing.

But uncertainty still clouds the industry in Thailand. Apart from the resignation of

Nok's Sarasin, THAI has been run by an acting president, Usanee Sangsingkeo, since January this year after former president, Charamporn Jotikasthira, completed his contract at the airline.

The failure to appoint a permanent president does not help Usunee's efforts to address many of THAI's perennial problems of underperforming staff and fleet and equipment mismatches.

THAI's latest loss, in the second quarter to June 30, was reported despite a 9.6% increase in revenue year-on-year, to $1.37 billion. Passengers carried jumped by 14.9% and load factor improved by 9%, to 78.5%. However, operating costs rose 8.6%, to $1.4 billion.

The biggest hit to THAI's bottom line for the reported months were currency losses of $72.6 million, booked losses from the dilution of the airline's shareholding in Nok Air ($12.9 million) and the impairment of assets and planes ($11.8 million).

Like its peers in the region, THAI is facing a deluge of budget competition. In the first half of this year, LCCs operating in Thailand accounted for 46.2% of all passengers moving through the country's six main airports, up from 43.9% in the same period last year.

Rising in tandem with passenger growth was the share of flights by LCCs. They operated 47.6% of overall aircraft movements recorded from January to June compared with 43.7% in the previous period.

Figures from Airports of Thailand (AoT), which runs big Thai airports such as Suvarnabhumi and Don Mueang in Bangkok, revealed LCCs increased their passenger numbers in the first half of the year by 13.7%, to 30.5 million. Budget passenger expansion also showed robust double-digit growth both internationally and domestically at 14.1% and 13.5%, respectively, to 10.9 million and 19.6 million.

There is no sign of this trend abating, although THAI's negative results are not stopping it from developing its network and fleet. THAI's Usanee said the airline will fly four times a week between Bangkok and Vienna from November and is to take delivery of five new planes - three Airbus A350-900XWBs and two Boeing B787-9s. It also will decommission two of its A330-300s by year end.

The company is taking part in the development of the U-tapao airport, with the goal of making it the most modern aviation repair hub in Asia-Pacific, she said.

But the low-cost airline army is continuing to expand and if ICAO's red flag is removed and the aviation industry is restored to Category 1 status, they will launch plans for massive expansion in China. It is a market where passenger traffic has been slow to recover after a well-publicized Thai/China zero-dollar tour scam was broken up two years ago.

Nok Air has announced it would launch its China campaign with new charter flights; a critical element of its turnaround strategy. The cash-strapped LCC will add ten China routes this month. The Chinese cities of Yinchuan, Baotou, Linyi, Yichang, Nanchang, and Haikao will be served non-stop from U-tapao, where only a handful of commercial airlines now operate, and charter routes from Bangkok's Don Mueang will fly to Zunyi and Changsha. Other new destinations on Nok's radar are the Philippines and India.

Thai Lion Air (TLA), associated with Indonesia's Lion Air group, is stepping up its operations. It flies B737s, but in November it will take delivery of its first A330-300, with two more of the type arriving at the carrier in December.

TLA CEO, Aswin Yangkirativorn, said the aircraft primarily will be used to launch regular services from its Bangkok Don Mueang base to China, Japan and South Korea. Traffic rights have been

Last chance for Nok Air

The new chief executive of Thai budget carrier, Nok Air, has immediately set about turning the struggling airline around. Piya Yodmani, who took over last month from Patee Sarasin, said: "My preoccupation is to stop the bleeding and ensure the business turnaround plan is brought to fruition as soon as possible."

Patee's departure was no surprise to industry observers. He had run the carrier since it was launched 14 years ago, although his relations with senior executives at Thai Airways (THAI), a 21.57% shareholder in Nok, often were turbulent. Patee will remain on the Nok Board and will serve as vice chairman.

Piya was chief executive of the long-haul budget carrier, NokScoot, part-owned by Singapore Airlines. He has resigned from that position to devote his full attention to the task ahead at Nok.

He said important priorities were restoring staff morale and building consumer confidence in the airline. In the last two years, Nok has had several damaging periods, including cockpit crew shortages after a mass exodus of pilots from the LCC in February 2016. The dispute caused outrage with passengers whose flights were frequently delayed or cancelled.

The airline has suffered combined losses of nearly $150 million since 2014. Piya would not commit to a specific time frame for returning Nok to profit. He said it would be a breach of SET (Stock Exchange of Thailand) rules, but he stressed he was eager to see it happen soon.

One of his first announcements was Nok's deferral of eight new B737 Max 8 jets and the decision to phase out seven existing aircraft to reduce the capacity of the fleet. Nok and Boeing have agreed the new planes will arrive at Nok a year later than originally scheduled. The seven retirements will save aircraft leasing costs.

Nok Air wants to raise the utilisation of its aircraft to an average of 11 hours a day from the current eight hours.

Piya's arrival at Nok has encouraged THAI to support a proposed $51.4 million share sale to raise funds for the airline. THAI would take up 245 million shares for $11.1 million. THAI appeared to have accepted the new CEO's business recovery plan to give Nok one final chance to succeed.

acquired to fly to Shanghai and the airline has applied to add Beijing to its network.

THAI's subsidiary, THAI Smile, is increasing Phuket-Guangzhou and Phuket-Shanghai from this month by four and seven flights a week, respectively. It also will offer more frequency elsewhere in China. Bangkok-Zhengzhou will shift up from five to seven flights a week, Bangkok-Changsha from four to seven a week and Bangkok-Chongqing from five to seven times a week.

THAI Smile acting chief executive, Wiwat Piyawiroj, said expanding its Chinese network would cash in on Thailand's prime source of tourists. The Tourism Authority of Thailand predicted 10 million Chinese will visit the country this year, up from eight million in 2016.

One relatively new entrant

into the market is privately-owned New Gen Airways, which operates a "scheduled charter model". Established in 2013, it is 51%-owned by a Thai maintenance, repair and overhaul (MRO) company and 49% by two Chinese travel agents based in Shanghai and Shenzhen.

The carrier moved into the black a year after it was launched. In each of the last two years, it has reported profits of more than $150 million. New Gen chief executive, Jarupong Sornprasit, recently said the scheduled charter model allowed it to stay away from the fierce price war at airlines in Thailand.

New Gen sells 100% of its tickets to travel agencies, which is unique among Thai carriers. It results in less exposure to competition, Jarupong said, especially as local airlines are losing market share to deep-pocketed foreign carriers. New Gen flies Chinese tourists to Thailand from 26 secondary cities on the Mainland with a fleet of 12 B737s

The fierce competitive environment has had a disastrous effect on airlines like Nok Air, a situation that will only intensify, as Singapore Airlines, Emirates, Etihad and Lufthansa increase flight frequencies to Thailand in response to growing demand from European, American and North Asian travellers, he said. "Our business model has kept us above the price war," he added.

THAI is committed to moving ahead with plans to ensure long-term profit growth, Usanee said. Its rehabilitation plan calls for the carrier to lower expenses and boost revenue.

She said the plan will focus largely on product and service improvement, fleet and network management, revenue and cost management, new investment and human resources." ■

RIGHT PLACE, RIGHT TIME

AirAsia has celebrated its 13th anniversary in Macau and appointed Celia Lao as AirAsia CEO for Hong Kong and Macau.

By Dominic Lalk

It all started in 2002 after Fernandes had bought loss-making AirAsia for one Malyasian ringgit (US$0.23) with the intention of bringing low-cost flying to the Asia-Pacific in 2001. Lao, then a young marketing manager of the six-year old – and struggling – Macau International Airport, met the Malaysian entrepreneur.

Lao was selling Macau and Fernandes asked if she could offer AirAsia a good deal to begin flying to the gambling enclave. "I was attending many international route conferences back then and nobody knew where Macau was. I needed to sell Macau first before selling the airport," she said.

Macau International Airport had opened in 1996, when Macau was a Portuguese colony. It was largely a vanity project that had became close to a white elephant airport in the Pearl River Delta. In the first three years of its operation, before Macau was returned to Mainland China, TAP Portugal flew one stop Macau-Bangkok-Lisbon A340 services twice weekly between the two cities.

TAP terminated the service in the lead up to Macau's handover to China in 1999. "In 2002, Macau was still a white elephant airport," said Lao. "At that time, because Taiwanese airlines could not fly directly to China, they would make a technical stop in Macau and then fly onto China," she said.

But gradually, from 2004, as the door opened to cross strait flights between the Mainland and Taiwan, Macau airport welcomed low-cost carriers to fill the revenue gap left by the departing Taiwan carriers.

"Macau airport made the right decision at the right time, otherwise it might still be a white elephant airport," said Lao. "Our (AirAsia) LCC traffic supplemented the loss of Taiwan traffic at the right time. "AirAsia helped put Macau on the map. People around the world, especially in the Asia-Pacific, started to know Macau once AirAsia operated there."

By this time, in 2004, Lao had moved to AirAsia, where she was the first person to be employed by the LCC in Hong Kong and Macau. Since then, she has risen through the ranks and is now CEO for the AirAsia group for Hong Kong and Macau. Her responsibilities include business development, route planning and government relations.

"Tony [Fernandes] always says I grew together with AirAsia. When I joined the airline, I was single. Now I have three kids," Lao told Orient Aviation from Macau.

"I took care of expansion in China. I set up Macau in 2004 and then Xiamen in 2005. At the time there were no low-cost carriers in China. Spring [Airlines] had not started. Low-cost airlines book everything online. In 2005 nobody had smartphones or credit cards. To be honest, it was very difficult in those early days," she said.

"But we were lucky because we went into China

> AirAsia flies to 15 destinations in the Mainland. The group is one of Airbus' best customers with its order of 174 A320ceo, 304 A320neo, 100 A321neo as well as 20 A330-300s, 66 A330neo and 10 A350-900s for its long-haul AirAsia X carriers

by channelling traffic through its hubs to feeder flights across Southeast Asia and also long-haul to Europe, Hawaii and Australia.

In Macau and Hong Kong, Lao is banking heavily on Mainland cross-border traffic for growth. In late August, AirAsia began partnering with Express Link, a new bus service that shuttles passengers from the Mainland border to Macau Airport. It is similar to the ferry services operated from several of China's Pearl River Delta ports to Hong Kong International Airport.

Lao hoped passenger volumes would increase by 20%-50% after the service has been established. "More than 80% of our clients are individual tourists," said Lao. "Therefore, the launch of the shuttle would greatly impact our [value proposition to] individual tourists." Approximately 30% of AirAsia customers in Hong Kong and Macau are tourists from the Mainland, she said.

"Different routes have different conditions. For example, 50% of Chinese tourists take the flight to Bangkok, but there are fewer for Kuala Lumpur because more Malaysians visit Macau," she said.

Flights from Macau to Southeast Asia's island resorts were under consideration, with Macau-Phuket most possibly the next route to be announced.

The 24-hour border crossing facilities between Macau and the Mainland as well as the completion of the Hong Kong-Zhuhai-Macau Bridge would improve Macau airport's market proposition, she said.

"Mainland travellers can exit from Macau and return home via Hong Kong so they can visit both Special Administrative Regions (SAR)," she said.

AirAsia Group's biggest opportunity yet will be on the Mainland. In May, the group signed an MoU with two Mainland partners to establish AirAsia China, a low-cost carrier to be based in Zhengzhou, the capital of Henan province.

The Chinese partners are the China Everbright Group, a conglomerate with a major shareholding in the Hong Kong-headquartered China Aircraft Leasing Group (CALC), and a state-controlled think tank, Henan Government Working Group.

At press time, it had added two Japanese investors to the venture. The parties have agreed, in addition to setting up the LCC, to invest in a dedicated low-cost terminal at Zhengzhou Airport, a MRO facility and an aviation academy to train pilots, engineers and cabin crew.

The AirAsia China investors believe Zhengzhou will become more important as China's 'One Belt, One Road' policy becomes a physical fact. Zhengzhou is one of China's key logistical hubs, with many of the world's largest cargo airlines offering scheduled services into Zhengzhou. Cargolux is in the process of establishing Cargolux China in Zhengzhou. ■

early. Our Mainland network is huge now. And you can see we managed to acquire some very good slots in key cities like Guangzhou and Shenzhen," she said, but added that unfortunately those days were over.

Lao said AirAsia's growth in Hong Kong is curtailed by acute slot shortages at its airport (HKIA) and will remain so until the third runway opens in 2023.

"In Hong Kong, we cannot open any routes. It is very constrained. The third runway will still take a very long time to finish. The Hong Kong Civil Aviation Department (HKCAD) encourages us to swap our A320s for A330s on flights to Kuala Lumpur and Bangkok to maximize the value of our slots," she said.

"We applied to fly to Jakarta, but we could not get the slots. We have applied many times, but still no Jakarta because the HKCAD gives preference to new destinations," she said.

AirAsia is not looking to form a joint venture in Hong Kong. "Remember what happened to Jetstar in Hong Kong. Already, we have signed Memorandums of Understanding (MoU) in China, Vietnam and Cambodia," she said.

"Resources also are becoming very limited in China. No slots are available even in second and third tier cities. It is the reason we are focusing more closely on Macau as a base for regional flights."

"Long-haul from Macau will come at a later stage. We must start more regional routes first, but it is definitely a possibility. Macau has open skies and many fifth freedom rights available. Between Malaysia and Macau and Thailand and Macau it's fully open. We could easily do, for example, Kuala Lumpur-Macau-Vancouver with an A330. This is something for the future."

AirAsia has double daily flights from Macau to each of its bases in Kuala Lumpur and Bangkok's Don Mueang airport. It also flies to Chiang Mai and U-Tapao. Recently, it inaugurated a three times weekly service from Macau to Jakarta, its third hub.

The airline group aimed to be a low-cost network carrier

ASSAULT ON CYBER VANDALISM

The threat of cyber-attacks on aviation critical IT systems is ever present. Alerted to the enormous damage cyber vandalism can inflict on their businesses, airlines are investing billions to protect their passengers, staff and every part of their operating systems from internet assault. *Chief correspondent, Tom Ballantyne, reports.*

Three years ago, published research by a well-regarded commercial aviation consultancy revealed that more than 40% of the world's airlines did not have any protection from cyber-attacks. This is no longer the case.

In a 2017 transport industry trends report published last month, it was estimated that this year airlines and airports will spend almost $33 billion on IT and the number one priority of that expenditure will be cyber security.

By 2020, the SITA Air Transport IT Trends report said, 95% of airlines and 96% of airports would have invested in cyber security protection and research to strengthen their defences against cyber assaults. "In the highly woven transport industry, cyber-attacks are a very real threat, said SITA president Air Travel Solutions, Ilya Gutlin.

The risk of cyber-attacks has been an increasingly common subject of discussion in recent years with security experts constantly warning the industry that a major event is inevitable.

Until now, hacker attacks have been relatively minor and airlines prefer not to discuss any invasions of their systems. A year ago, Philippine Airlines confirmed it had been the target of a cyber-attack but declined any requests for details about the incident. Recently, the release of the WannaCry virus was known to have struck at some of the systems at some airlines.

Analysts at global consultancy, PricewaterhouseCoopers (PwC), said cyber security has become an elevated risk and one of the most pressing issues for businesses, including aviation.

"Today's cyber adversaries are more persistent, skilled and technologically savvy than just a year ago. Leaders across all industries are taking notice," PwC said. Some 85% of airline chief executives the Big Four firm surveyed saw cyber security as a significant risk, reflecting the highly sensitive nature of flight systems and passenger data.

> Unscheduled disruptions of transport carrier operations can have a substantive economic impact on third parties and national economies. Preventing disruptions caused by cyber events is increasingly a primary focus for those involved in global air transport
>
> PricewaterhouseCooper (PwC)

"They also know they have to constantly monitor and evolve their cybersecurity programs to keep pace with advancing and shifting threat vectors from loyalty programs to aircraft operations to back-office technology platforms."

Along with SITA, software solutions provider IFS has pointed out that the use of the cloud and blockchain can reinforce cyber security in commercial aviation. "The aviation supply chain covers a wide variety of businesses, from original equipment manufacturers and Tier 1 suppliers to airlines, airports and third party MRO providers," it said.

"This presents an interesting dilemma because not only do you need to secure and protect data accumulated from each party, you also need to be able to share it across this broad supply chain.

"Blockchain technology is emerging for this very purpose. In a Blockchain, each record or 'block' of data has its own time stamp and is encrypted with credentials in a peer-to-peer relationship. It makes malicious tampering extremely difficult. All 'blocks' are linked to the previous block of data, meaning the only way to tamper with its content is to have the entire network of trusted peer-to-peer contributors collude to corrupt the chain."

IFS said Blockchain is still some way from widespread adoption and is just a concept for airlines at this time. "From keeping aircraft in the air to checking in passengers, aviation organisations rely heavily on IT systems.

Critical elements for effective cyber defence at airlines*

* **Oversight at the board level and building a security culture:**
A cybersecurity program has to rest on a risk-based framework that addresses risks across the airline including back-office IT, maintenance, operations, and consumer-facing systems because failure in one area can affect others. Management, employees, and the board must become more cyber aware as breaches can occur as a result of small lapses in procedure. But security awareness training is not enough. Airlines need to incorporate cyber awareness into the security culture, embedding cybersecurity into the organizational fabric.

* **Having a proactive approach that sets priorities:**
It is too expensive to protect all assets from all threats, so airlines must prioritize: assets, threats, and threat perpetrators. On assets, they have to recognize their protection obligations, identify associated digital assets, and focus aggressively on protecting those assets most valuable and critical to the organization. On threats, airlines need to prioritize and categorize the kinds of threats they are facing, both those known currently and those projected to emerge over the next few years, and recognize the signs of an attack early on. On perpetrators, they need to look at the players that are most threatening, a list which can include nation states, organized crime, and terrorists. Airlines cannot do this by themselves: They need to avail themselves of all existing tools, public and private, that can help mitigate risk.

* **Support international standards:**
There are no international standards for cybersecurity design and testing, which is widely acknowledged to be an issue. IATA has called for better sharing of airline cyber threats among governments and airlines worldwide and asked governments around the world to take a more active stance in improving cybersecurity.

* **Address supply chain risks:**
It's critical that airlines and their external partners (such as OEMs, MROs, IFEC (in-flight entertainment and communications] providers) collaborate on threats and response techniques to share best practices to increase the knowledge base. But, in addition, airlines have to monitor partners' operations for potential security breaches and manage the access of users to different systems.

* **Threat intelligence:**
Airlines must gather both external and internal threat intelligence from multiple sources including third-party vendors, subscription feeds, and agencies as well as system event and log information. This information can then be correlated and fed into a 24 x 7 x 365 security operations center (SOC) to help identify and prioritize threats. It's also key that airlines get involved at an industry level so they can raise awareness of threats among colleagues.

* **Security awareness:**
Whether it's the tampering of concourse devices, activity within the cabin (e.g., plugging into USB ports), or corporate espionage, awareness is often the front-line defense against threats. All airline employees, not just the physical and information security departments, have to share in that awareness and understand their roles and responsibilities in preventing cyber-attacks. For example, phishing attacks are still one of the most effective attack vectors used by adversaries; they are very easy to exploit and can yield significant returns even if just one target takes the bait. In such an attack, an employee is targeted to open an email link, which then downloads malware that infects the IT environment of the entire organization. Recently, executives have been the target of these types of attack because of their access to sensitive data. It's easy to see how one unwitting employee or executive can lead to significant damage.

**** Aviation Perspectives: cyber security and airlines***
PricewaterhouseCoopers (PwC)

> Airline executives are accustomed to managing high-risk business environments. Airline safety and security programs have been maintained at such a high standard that other industries have tried to emulate them. But now airlines are confronting a new set of risks in the cyber domain where the challenge of protecting their passengers, flight crews, and trading partners is rapidly becoming more complicated

"But data collected from the growing number of aircraft, routes and passengers has increased pressure on these systems, while legacy and inflexible IT systems are leaving airlines vulnerable to the growing threat of cyber-attacks."

Vice president strategy at IFS's Aviation & Defence Business Unit, Jeff Cass, said like most industries, airlines are realising that threats are just as likely to come from inside the organisation as from the outside.

"Cyber-attacks have been reported at airports across the world, and it seems only a matter of time before we see an attack on a major airline. In response to this threat, many commercial aviation organisations are actively hiring chief security officers. The SITA Airline IT Trends Survey said the number of airlines that were advancing preparations to manage cyber risks had almost doubled in three years."

With more IoT-enabled (Internet of Things) sensors being used, it is newer aircraft fleets that are more at risk from cyber vandalism. Increasingly being used for services such as passenger Wi-Fi, real-time air-to-ground communications are evolving to support mission critical functions such as inflight fuel adjustments and aircraft health monitoring, both of which could severely disrupt airlines if compromised. The safeguarding of data has become a major challenge for airlines, one that threatens to disrupt key practices for the entire industry.

Compliance remains a top priority, IFS said.

New generation cloud solutions can be set up in their own separate environments, which today have the potential to be far more secure than any previous private or on-premise data centre. "As the name suggests, cloud containers create isolated boundaries of data which means that if anything goes wrong in one container, it only affects that single cell and not the entire system – helping to reduce the threat of a wider cyber-attack," said Cass.

Keeping up with cyber developments requires airlines to adapt to new technology. Legacy systems pose a stumbling block, especially when it comes to dealing with compliance regulations and data protection – the cost of which can be damaging in an industry where safety is the top priority.

PwC said airlines must determine what "reasonable security" means for their organization. "What is reasonable for a regional carrier operating a single model fleet of regional jets built by one manufacturer and flying to 32 gates per day is vastly different from a global carrier operating a mixed fleet from multiple suppliers flying to hundreds of global destinations that include high cyber and physical security threat locations," it said.

"A good way to consider trade-offs for prevention is to analyse the horizontal breadth of protection and the vertical depth of preparedness. For example, if an airline invests too much in the latest prevention tools (vertical depth), it risks lagging in the horizontal investment to protect the breadth of the airline's value chain—interactions required with OEMs, MROs and global distribution systems (GDS).

"Conversely, carriers that underinvest in vertical preparedness risk having a security portfolio that lacks tools and techniques to detect and prevent more sophisticated attacks." ■

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Airbus strengthens China ties with A330 Tianjin centre

Joint venture partners, Airbus and China's AVIC, added more industrial might to their relationship with the opening of US$200 million A330 Completion & Delivery Centre in China last month. ***Chief correspondent, Tom Ballantyne, reports from Tianjin.***

When it comes to co-operation with China, Airbus chief operating officer and president commercial aircraft, Fabrice Brégier, has absolute clarity about Airbus' strategic goals.

Speaking at the opening ceremony of the joint venture A330 Completion & Delivery Centre in Tianjin last month, he said: "This is the best demonstration of a strategy that is balanced with Chinese partners who are strong and [you have] a good product, yes, it helps you penetrate the market," he said.

Brégier said following the ground breaking rollout of the its joint venture A320 Final Assembly Line in Tianjin 12 years ago, the group's new investment in Tianjin was fundamental to its long-term goal of dominating aircraft sales in China.

Brégier also confirmed that a ramp up in the number of A320s was being considered and that a completion delivery centre for Airbus' latest wide-body, the A350, was a possibility given there were enough orders for the aircraft from Chinese airlines.

Describing China as a "very business friendly country", Brégier said: "there is a direct connection between your investment and your capabilities to demonstrate you care about the Chinese industry and, at the same time, your market access."

Airbus' market share in China had increased from 20% to almost 50% since the Toulouse headquartered manufacturer opened its A320 Final Assembly Line in Tianjin, he said.

Brégier handed over the first A330 completed at Tianjin to Tianjin Airlines at the opening of the C&DC. While the A320 is assembled in Tianjin with components shipped from Europe, A330 aircraft passing through the C&DC are built in Europe then flown to the Mainland empty and unpainted.

When the airplanes arrive in Tianjin, the completion process includes cabin installation, aircraft painting, production flight tests, customer flight acceptance and aircraft delivery. More than 150 Chinese employees at the new C&DC were trained in Toulouse to staff the new facility.

Whether C&DCs for other

aircraft types will be constructed remained to be seen. Brégier said in Tianjin that Chinese carriers had ordered around 50 A350s. "We are supposed to deliver the first A350s to our Chinese customers before the end of this year. The A350 will be fantastic for the trans-Pacific network with its range and the seat count. Then the C&DC will be involved later to move to the A330 neo and the A350. We see it in the plan. We have additional big investment."

More problematic is the A380, which has been short of orders for several years. President and chief executive of Airbus China, Eric Chen, made a gutsy forecast about A380 prospects at the Tianjin launch when he said Chinese airlines (there are five A380s in China operated by China Southern) could be set to buy the plane in big numbers.

"What I can say is that if one airline takes the lead to order, the others will most probably follow. I would expect a domino effect. I am working to produce that domino effect which has not happened yet," Chen said.

"But I would expect them [Chinese airlines] to have 60 to 100 A380s. When I look at the market flow, the passenger flow and the route by route economics, I am fully confident Chinese carriers will need a minimum of 60 A380s in the next five to seven years."

Brégier said a C&DC for the A380 was a different question to be addressed. "We invest in this facility when there is a big market. So we need to make sure the market is mature. If there is a market, we are ready. We know how to co-operate and it might well also be on the A380," he said.

In the meantime, Airbus was studying an increase in production of its A320 aircraft. "We plan to ramp up to 60 aircraft a month - total production worldwide - there is extra potential. We have invested in a fourth assembly line in Hamburg. It would make sense to increase the output from China, which is our biggest market, so if we find a way to do it in a competitive manner we will decide to ramp up. The goal is to do it without substantial additional investments," Brégier said.

It is fair to accept that the biggest market for us [China] also deserves some industrial investment if we are to be seen as a good Chinese citizen. And I do believe we are seen, to a large extent, as a good Chinese citizen

Airbus COO and commercial aircraft president, **Fabrice Brégier**, speaking at the opening of the joint venture A330 completion & delivery centre in Tianjin on September 20

The new C&DC has a paint shop, a weighing hangar and one main hangar with three aircraft positions spread across 16,800 square metres. It will employ more than 250 people and will be ready to deliver two aircraft a month by early 2019.

"The inauguration of our A330 C&DC in Tianjin, together with the first of many deliveries, marks a new milestone for Airbus' international footprint and underlines the strong spirit of cooperation with our Chinese partners," said Brégier. "Wide-body aircraft completed in China is an Airbus, and an industry, first which demonstrates our mutual commitment to a strong and growing Chinese aviation sector."

"We are extremely pleased with the partnership we have at Tianjin. We don't intend to duplicate the assembly line for the A320. We have extended this partnership until 2026 [with AVIC] and I can tell you it will go much further because the A320 will be successful until at least 2030 for sure.

"The question mark will be what do we do when the new generation aircraft from Airbus are to be launched? We still have a few years to think about that."

While single aisle planes are a big part of the Airbus order book, Brégier sees more growth in China's wide body fleet. "There are two elements that justify a growth of wide bodies. First of all, I am sure part of the domestic market will move to wide bodies," he said.

"We have probably 60 330s flying domestic missions every day by Chinese customers, which is already significant, and that will continue because there are slot shortages. The second reason is you can see a big progression in traffic from and to China.

"The growth is probably around 20% to 30% every year so there will be more demand for wide bodies. This is why we invested in this cabin completion centre in China. It was supported initially by the first global order of 75 A330ceos [from China]. We expect soon to have additional orders."

Three of the world's top five A330 operators are Chinese: Air China, China eastern and China Southern – and there are 202 A330 family aircraft flying with Mainland carriers. ■

THAILAND'S SMARTEST AIRLINE

Thai AirAsia is the only Thai airline to be in profit this year. To maintain its winning streak, it is building a hub south of Bangkok to guarantee its expansion.

Dominic Lalk reports from Bangkok

Thai AirAsia's Tassapon Biljeveld is a man with a mission. The 50-year-old founding CEO of the only profitable carrier in Thailand this year told Orient Aviation he will stay around until he "kills some of the enemy airlines".

And he has his targets. "At the moment, the market is saturated. There's way more supply than demand. There's too many aircraft flying in the ASEAN airspace, especially in Thailand," he said.

"The authorities have to be more proactive in governing the airlines that don't have strong financial performance. If they go bankrupt at any time, it will affect the economy and also the passengers. There are rules and regulations on governance, but none of them are actively pursued.

"We actually have a problem with our CAAT (Civil Aviation Authority of Thailand). It has to be more proactive. For example, if you have a negative balance sheet, a huge number, but you want to bring in more aircraft, I think the CAAT has to raise some questions. Its people should ask these airlines how they think they can market their seats and new destinations if their balance sheet is so weak."

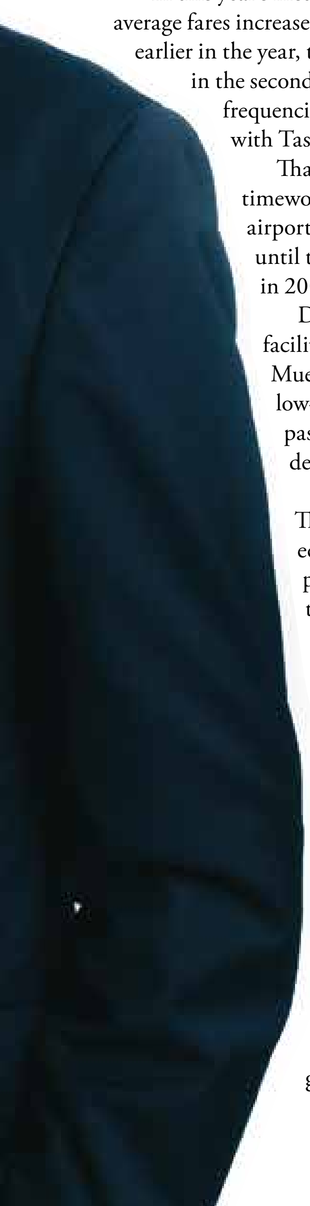
Tassapon conceded, however, that there is very little he can do to bring about change. "I can only voice my concerns to the authorities, which I have done. I have to make myself strong by looking at my costs, making sure my costs are low and my balance sheet is strong. Our balance sheet continues to be very strong. Our costs are the lowest in the country so that makes us stand out from our competitors," he said.

Aviation in Thailand had a turbulent 2016 and it is experiencing challenges this year. Profits and yields continue to dwindle at the kingdom's carriers and they are being forced to slow expansion. Nevertheless, Tassapon has a trick or two up his sleeve to beat the market and have Thai AirAsia come out on top.

"Life goes on. We are adding four to five aircraft a year, opening new destinations, hiring more staff," he told Orient Aviation in Bangkok. "It's moderate growth every year, but it's still growth."

For the first half of 2017, Thai AirAsia had revenues of 17,486 million baht (US$529 million), an improvement of 5% compared with the same months in 2016. The carrier's net profit was down 48%, however, to 741 million baht (US$22.4 million). Tassapon said the lower earnings were the result of higher fuel costs and a jet fuel excise tax on domestic flights that CAAT introduced in January.

In this year's first quarter, to March 30, Thai AirAsia's average fares increased 11% year-on-year.Despite its growth earlier in the year, the airline's yields declined by 5% in the second quarter as more carriers reinstated frequencies and launched routes in competition with Tassapon's carrier.



Thai AirAsia's main hub is Bangkok's timeworn Don Mueang Airport, Asia's oldest airport and Thailand's gateway to the world until the opening of Suvarnabhumi Airport in 2006.

Don Mueang is congested and its facilities need a facelift. In 2015, Don Mueang became the world's largest low-cost airport, handling 30.3 million passengers that year and exceeding its design capacity of 30 million.

Don Mueang is a flagship for Thailand's booming free market economy. At no other airport will passengers find as much competition for their business as they do there. It also is the hub for Nok Air, NokScoot, Thai Lion Air and New Gen Airways.

As a result, Thai AirAsia is under constant pressure to expand, differentiate and undercut the competition. But there are limitations at Don Mueng that even the savviest sales and marketing executives can't overcome: insufficient ramp space and slots.

"We are focusing on developing Pattaya U-Tapao Airport as our next main hub. Don Mueang is full. We have to explore new opportunities. We are working very closely with the government in developing U-Tapao Airport," he said.

"U-Tapao will be just like Don Mueang. Traffic will be ASEAN, Asia, China and India. AirAsia X, our long-haul unit, will be there as well.

"We can only add a few more aircraft to our operations in Don Mueang. It will be tough and it will be a long time before development takes place, e.g. new terminals and other infrastructure.

"The plans come and go, but as far as I know they [AOT] are not planning to build any terminals at the moment. Even if they started building today, the time frame to construct a terminal or extend the existing ones would be another five years at least. I would rather put some of my eggs in U-Tapao."

Thai AirAsia will not be alone at U-Tapao. Aggressive rivals like Thai Lion Air and New Gen Airways have set up bases at the airfield, with most of their flights targeting Mainland tourists. NewGen plans to make U-Tapao its new base because of slot constraints at the two Bangkok airports.

ICAO downgrade did not hurt Thai AirAsia

Thai AirAsia CEO, Tassapon Biljeveld, told Orient Aviation the airline's growth has not been effected by the International Civil Aviation Organization (ICAO) downgrade of Thailand's air safety rating to Category 2 in 2015.

"For Thai AirAsia, on our A320 fleet, we have no issue with the ICAO downgrade at all because China does not acknowledge the ICAO ruling. We have added many destinations and increased frequencies to China in the last two years," he said.

"In India, we have opened three cities this year and they don't really care about ICAO either. All the ASEAN (Association of Southeast Asian Nations), they don't care."

The situation is very different at Thai AirAsia's long-haul sibling, Thai AirAsia X (TAAX). "Our expansion had no correlation with the ICAO downgrade, but at TAAX we could not expand for the past three years now.

"We can only add frequencies to destinations where we fly. This year we are adding one flight to Incheon and one more flight to Narita, but there are no new destinations. Once it's lifted, TAAX will add more destinations in China and Japan."

The general consensus is that ICAO will soon restore Thailand's 'Category 1' rating after significant changes and improvements at the CAAT and Thai carriers have been implemented.

As part of that process, the CAAT revoked the air operator certificates (AOCs) of 13 Thai-registered airlines in early September, including those at Thai VietJet Air and Orient Thai Airlines, which meant they could only fly domestic services.

Tassapon said this had no impact on Thai AirAsia. "No, there's no impact. Not at all. Not at all. Of those 13, half of them are not in operation. They hold the AOC, but don't use it. The other half are mostly charter airlines. There's no effect for us because we don't have any transfer traffic from them," he said.

The airline's business is focused on charter flights between Thailand and China. It operates an average of 30 flights a week to 25 Mainland cities with its B737 fleet.

Hong Kong Airlines and LCC HK Express are considering flights from Hong Kong to U-Tapao. Hainan Airlines flies from U-Tapao to Sanya three times a week.

AirAsia has been rapidly building its network from U-Tapao since it launched flights from the airport in 2015. AirAsia flies to Kuala Lumpur and Tassapon's Thai AirAsia serves Chiang Mai, Hat Yai, Macau, Nanchang, Nanning, Phuket, Udon Thani and Ubon Ratchathani from U-Tapao.

The expanding airport is a 30 minute drive south of Pattaya, a coastal destination favoured by Mainland tourists. It will open a passenger terminal by year end and has the goal of increasing passenger arrivals from 800,000 a year to three million in 2020. In the second phase of its development, the Thai Navy-operated facility airport will boost capacity to 15 million passengers annually by 2022.

"The government is pushing very hard and providing quite good incentives to develop U-Tapao. A high-speed train will be going there and a lot of infrastructure is being put in place. We think we can rely on U-Tapao as our new future hub," Tassapon said.

Quizzed on whether the government was handing out subsidies for flights to U-Tapao, Tassapon said he would not call it that. "Rather, I would say that because the whole big piece of land there, all the hundreds of acres, was declared a special incentive zone for investment, we got the board of investment involved. We got some tax rebates, all sorts of things," he said.

U-Tapao is not the only Thai seaside destination the group hopes to conquer. Across the Gulf of Siam, in Hua Hin, AirAsia has just closed a deal with the local airport. "We just finalized it. AirAsia from Malaysia will be starting from there in November or December with flights between Hua Hin and Kuala Lumpur," he said.

"Thai AirAsia will probably commence flying from Hua Hin to either Singapore or Hong Kong. We are working on it. We have good support from the city and from the airport itself. Immigration facilities are in place."

Thai AirAsia has a fleet of 54 A320 aircraft, including four A320neo. It added three neos in the first half of this year and will take delivery of another three by December 31. "We are adding six aircraft this year and six next year. In the following three to four years we will be adding five aircraft annually," Tassapon said, and added all of its future deliveries will be the re-engined neo variant.

Now in its 14th year of operations, Thai AirAsia serves 52 destinations in 13 countries with 80 routes. This year it has added Don Mueang-Da Nang, Chiang Mai-Ubon Ratchathani, U-Tapao -Ubon Ratchathani and U-Tapao-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Phuket. It has increased frequencies out of Bangkok to Khon Kaen to five flights a day; Roi Et to three flights a day; Penang to two flights a day; Phnom Penh to three flights a day; Chiang Mai to Surat Thani to two flights per day and from Hat Yai to Kuala Lumpur and U-Tapao to Udon Thani also to twice daily flights, respectively.

In recent months, India has become a focus for expansion. The airline believed the Thailand – India market has huge potential for investment and tourism. In September, it launched flights from Bangkok to Jaipur and Tiruchirapalli, complementing its existing network to Bengaluru, Chennai, Delhi, Kochi and Kolkata. It also offers daily flights to the Maldives.

"The China market used to be very good, but since the zero baht tours crackdown it has not returned to where it was. Its a bit tough. We are not making a loss, but we are losing a lot of yield on our China routes. I hope next year it will go back to where it was, so China can become strong again," Tassapon said.

Thailand and Thai AirAsia have shifted their focus to individual Chinese travellers. The kingdom and its first budget airline also had some luck come their way after Chinese and South Korean diplomatic relations deteriorated over the deployment of U.S. military weapons in South Korea. As part of the fallout, Beijing banned Chinese tour groups from visiting South Korea, which gave a fillip to the Thai tourism. To June 30, Mainland arrivals in Thailand were up 8% over the same period in 2016.

Tassapon is worried that the threat of a glut in the market and over ordering is real, but he has more immediate issues to manage, including his investors. Challenged about Thai AirAsia's declining profitability in the first and second quarter of 2017, he was quick to point to the increased jet fuel price.

"I've been telling the investors that you cannot compare this year's numbers to last year's numbers. They will be down by at least 40%-50%. The fuel price last year was much less than this year. So, if you apply last year's fuel price to this year's operational environment, the number [profit/loss] would be exactly the same," he said. The airline has 74% of its fuel requirements hedged at US$62 per barrel for the remainder of 2017.

Tassapon is confident he will achieve a good result for Thai AirAsia in 2017, but he admitted the net profit could small. "I can't mention the numbers because the market will screw me, but my target passenger count is 19.5 million. I am 100% sure I will achieve that number. I will also achieve my revenue target, but in terms of profit, it might be a little bit down because of the yield erosion in the China market."

Thai AirAsia is 55%-owned by Asia Aviation PLC and 45%-owned by the Malaysia-based AirAsia Group. In 2016, King Power, Thailand's largest travel retail group, purchased a US$225 million stake in Thai AirAsia.

The acquisition of 39% of holding company Asia Aviation PLC makes King Power the second largest shareholder in Thai AirAsia. "Whenever we raise our hands they will come in and help us out, especially with regards to connections with the government and issues with the airport," Tassapon remarked on the King Power shareholding.

It would appear that Tassapon and his Thai AirAsia have the right friends in the right places and he is not ready to call it quits any time soon. "When I kill some of those enemy airlines, then I will move on," he laughed. ■

A321neo to solve capacity growth?

Thai AirAsia needs larger aircraft. The LCC has consistently high load factors. In 2015, its load factor averaged 81%. A year later, it had reached 84%. To date, in 2017, the carrier filled an average 88% of its available seats.

Another reason for the acquisition of higher-capacity aircraft is the growing congestion and slot shortage at many of the region's airports.

"We are working on acquiring the A321neo. We have not decided yet, but we are looking into it with our operations team because a lot of airports are slot-congested. As we cannot increase the frequency of our flights, we have to use bigger planes," Tassapon said.

"We are still crunching the numbers. The operational team is determining if we can turn around an A321 in the exact same time as an A320. If it works, we must be confirming some A321s."

AirAsia has 100 orders for the A321neo and approximately 260 more orders for the A320neo. Its contracts with Airbus offer the flexibility of converting A320s to larger A321s, according to the airline's latest operational requirements.

"For example, we have three flights a day from Bangkok to Hong Kong. I would like to add two, three more, because there is demand there, but Don Mueang is congested and in Hong Kong, obviously you can't get any more slots, so we need to look at bigger aircraft," said Tassapon.

"But if it's too big, like an A330 in the same slot, we cannot fulfil our turnaround promise. So the A321neo is something we are looking into. It's not that much bigger but at least you have 30-40 additional seats."

Digtal era demands smarter, faster MRO

Airline maintenance, repair and overhaul (MRO) is no longer a business of grease and toil. The hangar of the future will be abuzz with drones identifying MRO work minutes after a plane's arrival at a facility. Providers who do not offer these sophisticated MRO solutions risk losing business, *reports chief correspondent Tom Ballantyne.*

U-Tapao airport, 140 kilometres southeast of Bangkok, was not born in the digital age. Constructed jointly with the U.S. Air Force more than 50 years ago to support military action in the Vietnam War, the huge site languished almost unused for decades until 2014 when the Thai government legally transformed the facility and its adjacent vacant land into a joint civil-military airport.

Since then plans for U-Tapeo to be the centerpiece of US$5.7 billion project for MRO designed for the airlines of the 21st century have accelerated.

In the world of airline MRO, THAI is not alone in planning for the digital future of the MRO industry. Across the region, airline and independent MROs are investing hundreds of millions of dollars in new technologies at their facilities and adopting The Cloud and Big Data to fundamentally restructure MRO fleet management. They are installing systems that predict the time of parts replacement and using robots to carry out repairs.

In the Oliver Wyman 2017-2027 Fleet & MRO Forecast, the authors said the world's in-service commercial airline fleet will be 35,000 airplanes by 2027.

In ten years, 58% of the global fleet will be new generation aircraft. Commercial airline MRO growth is forecast to achieve a compound annual growth rate (CAGR) of 3.8% for the next decade, from $75.6 billion now to just over $109 billion a year in 2027. The major growth engine for MRO in these years will be Asia, especially China and India where the region will almost double its in-service fleet and related MRO business.

Asia-Pacific MRO will expand at a healthy 4.4% annually. China will be the standout market with its forecast MRO growth to be 10.1% a year and its market size predicted to grow more than 160%, the largest net growth in the world.

The region's airline expansion brings with it numerous challenges for MRO, which can only be solved with enhanced IT implementation in the hangar. Statistics reveal maintenance delays and unexpected downtime costs the airline industry an estimated $8 billion a year.

RUSADA, a U.S.-based aviation maintenance and engineering software company with offices in India, Singapore and Australia, said in a recent report that airlines would demand greater aircraft availability from MROs. Regulators, too, would enforce stricter compliance of MRO standards.

Present legacy systems or in-house solutions may not be fit-for-purpose to manage growth while the cost of maintaining these systems may be cost prohibitive, the company said.

Another software provider, Ottowa-based Mxi Technologies, said: "In this atmosphere of change and evolution, Cloud computing represents a significant technology that has the potential to transform the world of aviation MRO.

Industry insiders point out that today's components are precision crafted to tight tolerances, using high performance materials and additive manufacturing techniques. These components not only require rapid and exact inspection results to maintain safe and reliable aircraft operations, they demand new methods of inspection.

The top three advancements in the industry are three-dimensional (3-D) computed topography (CT), new visual inspection bore scopes and connected mobile, user-interfaces that appeal to the next generation of industry inspectors.

Aircraft designed and built after 2000 require technology that accommodates the new construction materials of carbon fiber composites, hybrid alloys, and special coatings as well as new data collection and measurement tools for advanced prognostication capability.

Properly harnessed, the capability for maintenance organizations to take action before a component fails promises to improve reliability and reduce costs. The challenge is that there are not yet proven systems to accept and analyze the data for proactive decision-making, the company said.

"From an airframe MRO perspective, providers must be able to handle the new composite and metal matrix materials dominant in the newest-generation aircraft, such as the B787 and A350. The newer technology includes much more sophisticated avionics and systems that are able to interface with health monitoring systems, designed to recognize pending system or component failures. This 'Big Data' capture and processing will require a clear strategy to take full advantage of its potential.

In this new era, component MROs must have the capital to invest in testing equipment and licenses to access OEM manuals and data for new parts. Line maintenance providers will experience challenges in training and use of the new aircraft health monitoring systems, fault isolation systems and software configuration protocols.

In another segment of the market, it is universally agreed that OEMs will continue to increase their share of the aftermarket using shrewd strategies that have proved successful to date. It is a shift that squeezes the independent MRO sector, particularly the smaller ones.

The Oliver Wyman forecast cautioned that advanced analytics and game-changing technologies remain elusive for many in the aftermarket, with only 20% of respondents to a survey seeing a material impact from these technologies on their businesses.

"Participating executives described their industry as constrained by old IT systems (62%) that lack functionality and flexibility and are often not compliant with changing regulations." Given the looming labor shortage and failure to upgrade technology, Oliver Wyman sees the prospect for rising maintenance costs and an increase in turnaround times (TAT) for scheduled maintenance ahead. In response, airlines are likely to retain more spare aircraft as a backup for potential servicing delays.

The Oliver Wyman forecast highlighted another trend. "Airlines around the world are sending nearly 30% of wide body heavy airframe maintenance work to the Asia Pacific. There will be an inflection point when capacity growth within Asia cannot keep pace with the MRO demand of its own countries and also foreign airlines. Operators will have to look elsewhere for their MRO needs. Notwithstanding the potential, capturing market share will not be simple," it said.

"Even when labor rate parity is reached, Asian MROs have demonstrated the capacity and skills to secure long-term contracts. While MROs in developing regions have wide-body capability, investment in facilities, equipment, tooling and training is essential. Paying the cost of capital for expansion will be necessary to compete." ■

GE explores the benefits of Big Data

At GE's Digital Investor Day last year, Kevin McAllister, then head of GE's Aviation Services unit but now running Boeing Commercial Airplanes, said GE has 35,000 engines feeding data from 100 million flights per year into its internally developed Predix platform, which GE Aviation moved onto last year. The data is analyzed and alerts issued if warranted. Predix's analytics capabilities have helped increase the number of total alerts and decrease the percentage of nuisance alerts, or false positives.

McAllister offered real-world examples of the impact analytics are having on the bottom lines of airlines, and by extension GE. One airline had 12 CF34 engines on six regional jets with abnormally high combustor baffle "distress".

GE's data scientists linked the affected aircraft to short-haul routes with low-cruise altitudes, which lead to higher internal engine temperatures. "It allowed us to isolate the maintenance actions to only six airplanes in the fleet," McAllister said. "This is a great opportunity to get down to actions by individual engine in a world of variation."

Another case involved a high-pressure turbine shroud wear problem showing up on some Boeing B777s. "In the old world, when you saw distress like that, you would begin to pull engines across the fleet," McAllister said. But analytics can quickly tie specific flight profiles to airframes, providing context that leads to insight. "You have to be able to segment variation-of-fleet so you can get down to actions by airline and by engine," he said.

In the B777 shroud case, GE modified maintenance procedures for engines regularly exposed to the harsh conditions. "We have eliminated on-wing inspection for this condition out in the fleet. If you know how distress is accumulating by engine, by part, you can work scope these engines on-wing. You can begin to design what you want to do when the engine comes off," GE said.

Lion Air MRO undercuts rivals

Preparing for growth. That is the task ahead for Southeast Asia's MROs as the region's airlines rapidly increase their demands for local maintenance services. To win business, Lion Air MRO intends to undercut the market when its island facility is tripled in size.

When it comes to pitching for business, PT Batam Aero Technic (BAT), the MRO subsidiary of Indonesia's Lion Air Group, believes it is on a winner. It claims it offers the same internationally recognized quality services to airlines at rates at least 30% cheaper than in Thailand and 50%-60% lower than Singapore.

The reason? According to the company it benefits from lower wages in Indonesia, a lower-cost operating environment and a

Ameco's ambitious global goals

Being the biggest airline MRO in China is not good enough for Beijing-based Ameco. It has plans to add capabilities to its portfolio.

Think Big. That's the strategy of Ameco Beijing as sets out to "fast develop its product competitiveness and comprehensive maintenance services in line with its strategy of being the leading MRO in global aviation", a recent company statement announced.

The joint venture MRO said besides developing capabilities for new generation aircraft, it was doubling its efforts in the modification and retrofit sectors. It has developed a parallel production line for B757 passenger-to-freighter conversions and intends to improve its B787 and Airbus A350 starter generator capabilities.

It also is building a landing gear overhaul capability. At present, Ameco conducts landing gear MRO for the A320 family, A330s, B737NGs and B747-400s.

In addition, Ameco will

sufficient supply of qualified personnel, enabling it to appeal to non-Indonesian airlines.

However, there is a catch. At present, capacity at BAT's facility on Batam, in Indonesia's Riau Islands, which is about 20 kilometres from Singapore and can accommodate 12 single-aisle and four wide-body jets, has its hands full in meeting the MRO requirements of the Lion group's combined fleet of more than 260 aircraft. And the queue won't get any smaller with the planned delivery of 226 more aircraft to Lion Air and its subsidiaries in the next five years.

But there will be space for other airlines, said BAT production manager Riki Supriadi Suparman. A new hangar will increase the MRO from 40,000 square metres to 120,000 square metres, which will be large enough to accommodate 30 single aisle jets under the one roof at the same time.

"We do not have any capacity to spare to third-party airlines now, but we will have some when the second hangar is put in place," he said. BAT believed that when the second hangar is opened in 2019, 20% of its capacity will be available for non-Lion customers.

The race to expand MRO capacity in Southeast Asia is hardly surprising. Last month Boeing forecast, in its latest Southeast Asia Current Market Outlook (CMO). there would be demand for 4,210 new planes worth $650 billion in Southeast Asia in the next 20 years. It predicted the region would continue its strong annual traffic growth of 6.2%, which outpaced the world average of 1.5%.

Jakarta's PT Garuda Maintenance Facility AeroAsia (GMF), a unit of Garuda Indonesia, has announced plans for a US$300 million share issue to fund an MRO centre, also on Batam. GMF, has 170 airline customers and is offering investors equity of between 20%-30% of the share sale.

President director, Iwan Joeniarto, said the sale proceeds will set up Batam facility and allow it to identify partners for its its expansion in Dubai, Australia and East Asia. "Our aim is to grow this company at the pace of 20% to 21% over the next five years. At present, 65% of our revenue comes from Garuda and the rest from other airlines. In five years that ratio will be reversed," said Joeniarto.

BAT offers MRO for B737-300, -400, -500, -600, -700, -800 and -900ERs as well as ATR 72-500, 72-600 turboprops and DHC-8 aircraft.

It plans to add A320neo, A320ceo, A330 and B737 MAX to its MRO capabilities. When the new hangar is completed the BAT workforce will increase from 1,000 to 3,200. The company has also been quick to rebut any suggestions that winning customers might be difficult because of Indonesia's past poor safety reputation.

It said that in July, the three-year-old Batam facility passed a safety and security audit by the U.S. Federal Aviation Administration (FAA). It has also been certified by the civil aviation authorities of Indonesia, Malaysia and Thailand and is capable of providing heavy maintenance work, including C and D checks. ■

establish a component workshop, that will build on its centre for thrust reverser repairs on the IAE V2500-V5, CFM International CFM56-5B, CFM56-3, CFM56-7B, and Rolls-Royce Trent 700 engines.

To cater for the growing VIP market, Ameco intended to open a workshop to meet completion demands for wide body aircraft. In January, it completed China's first C-check on an A319 business jet and is now seeking approvals from other airworthiness authorities for market expansion. Ameco has the capability to carry out completions on the business jet variants of the A330, the B737 and the B747.

In the last 12 months, Ameco has added customers for its airframe services from airlines in Germany, Czech Republic, Russia, Turkey, Iraq and Hong Kong, It said work from international airlines was leading to "fast growth", especially at its 10 line maintenance stations across China.

"Ameco is dedicating itself to meeting customers' maintenance needs and promoting brand image through the comprehensive and one-stop maintenance services," Ameco's executive vice president and chief marketing officer, Zhu Xiao, said.

With more than 11,000 employees, Ameco Beijing (Aircraft Maintenance and Engineering Corporation) is the biggest provider of technical support services for aircraft in China. Founded in 1989, it is a joint venture between Air China (75%) and Lufthansa Technik (25%). It specializes in the maintenance, repair and overhaul of aircraft, their engines and components.

As well as Air China, customers include more than 30 Chinese airlines and 40 international airlines. The company is building parallel production lines for passenger-to-freighter conversions on B757s.

In its engine overhaul business, Ameco said it was following the market trend of cooperating with the engine makers and has signed with several airlines for the servicing and repair of PW4000 and RB211 engines.

The MRO will build up its B787 and A350 generator capabilities to expand its Power by the Hour (PBH) services. It has been providing B787 maintenance services since 2014.

"Up to now, four international customers have selected Ameco for maintenance service on their Dreamliner aircraft in China. Ameco started line maintenance and releasing services for Air China's B787 fleet from May last year. We also started A350 maintenance service from November 2015 when we offered our first A350XWB releasing service for Finnair in Shanghai."

Ameco also overhauls and repairs 20,000 aircraft components, including landing gear, tires and brakes, hydraulic, pneumatic and mechanical components and avionics and electrical systems.

At Beijing Capital International Airport it operates two four-bay hangars, capable of accommodating four A380s at the one time. It also has a one bay hangar for B747 overhaulo and painting. At Chengdu Shuangliu International Airport, Ameco has a B757 three-bay hangar and an A321 three-bay hangar for checks and heavy maintenance services. ■

Jin Air agrees passenger service agreement with IBS

South Korea's Jin Air has signed an agreement with aviation IT provider, **IBS**, to develop a next generation passenger service system, the IFly Res passenger services system. **Jin Air president and CEO, Choi Jeong-ho**, said the IBS solution is expected to increase the airline's reservation, ticketing and transportation, expand online sales and strengthen customer service standards. IBS clients include Qantas Airways, British Airways and Lufthansa. ■

Mobil Jet Oil 387 approved for Pratt & Whitney engines

Global engine maker Pratt & Whitney has approved the use of **Mobil Jet Oil 387**, a synthetic High Performance Capability turbine engine oil for use on its **PurePower PW1100G-JM** and **PW1400G-JM** turbofan engines. Since its introduction in late 20-12, Mobil Jet Oil 387 has accumulated almost one million hours of on-wing performance. It is used to protect more than 250 aircraft at airlines worldwide.

"With its exceptional load carrying capabilities and ability to maintain film thickness between moving components,

Mobil Jet Oil 387 is well suited to protect the advanced gearboxes used in PW1100G-JM andPW1400G-JM engines from demanding operating conditions," **ExxonMobil global aviation lubricants sales manager, Vipin Rana**, said. ■

ATR and Phitek sign deal for IFE streaming technology

ATR and New Zealand aircraft technology supplier, **Phitek**, have signed a deal that will offer ATR operators the option of installing Phitek's standalone wireless IFE system on their airplanes. Available from June next year, the flexible system can be installed or removed as required and either fitted on new aircraft or retrofitted on existing planes.

ATR senior vice president programs and support, Tom Anderson, said" "ATR is constantly striving to improve the inflight experience we offer to ATR operators and their passengers. The IFE streaming allows passengers more ways to enjoy their flight while providing operators with additional revenue potential."

Phitek marketing director, Chris van der Loo, said: "We are delighted to supply ATR with our innovative WiFi streaming products. The fact that ATR has chosen Phitek is further proof of the quality of our smarter cabin products and their success in creating the ultimate inflight experience." ■

AFI KLM E&M consolidate alliance with Indonesia's GMF AeroAsia

AFI KLM E&M and Garuda Maintenance Facility AeroAsia have signed a Letter of Understanding to upgrade their longstanding relationship to a strategic alliance that will develop multi segment products that will deliver high valued added maintenance solutions to the market.

President and CEO of GMF AeroAsia, Iwan Joeniarto, said: "With more than 75 years of experience in aircraft maintenance and its reputation as one of the top two MROs in the world we believe that AFI KLM E&M is an excellent partner to enhance GMF's reputation worldwide."

The alliance between GMF and AFI KLM E&M is one of GMF's organic initiatives to accelerate its goal of becoming one of the top ten MROs in the world, Iwan said.

KLM E&M executive vice president, Ton Dortmans said: "We have been successful implementing the exchange of knowledge and workmanship

with GMF for many years and we are happy to extend this strong partnership."

In 2016, the two parties signed a Memorandum of Understanding (MoU) to establish MRO cooperation and in 2017 a second MoU was agreed to extend the partnership by establishing an exchange program for their expert teams. ■

Siemens and Singapore to drive digital transformation

Global technology powerhouse, **Siemens**, and the **Association of Aerospace Industries (Singapore)**, or AAIS, recently signed a Memorandum of Cooperation to advance the digital transformation of the Lion state's aerospace industry.

Siemens ASEAN executive vice president for digital factory and process industries and drives, Raimund Klein, and **AAIS vice president, Allan Ferrie**, agreed on behalf of their organisations to educate AAIS members about digitilisation, encourage the implementation of technologies and equip the industry sector with the knowledge to embrace change.

"We are very excited to embark on this partnership journey with AAIS. We look forward to working closely with the organization to raise the standards of Singapore's aerospace industry," Klein said.

Said AAIS' Ferrie: "We are very pleased to partner with Siemens in this digital transformation initiative. Our aim is to facilitate Singapore's aerospace industry in adopting digitalization. Companies are at different stages of understanding and reaping the benefits of it. This initiative will help bring us to the next level." ■

Budget Jeju Air adopts SITAONAIR AIRCOM FlightTracker

Jeju Air has become South Korea's first budget airline to adopt **SITAONAIR AIRCOM FlightTracker**, a system that will make the carrier's 29 B737s compliant with the new International Civil Aviation Organisation's (ICAO) flight tracking regulations that will come into effect next year.

The upgrade also will include the installation of SITAONAIR FlightMessenger on the Jeju Air fleet; a communications system that translates cockpit data and feeds it directly into an aircraft's existing IT infrastructure.

Jeju Air director of operations control centre, Kim Sanghoon, said the airline selected SITAONAIR AIRCOM FlightTracker and FlightMessenger because "they appealed to us for their rich functionality, seamless integration with our airline systems, their user friendliness and top quality customer support".

SITAONAIR vice president Asia-Pacific, Katrina Korzenowski, said: "Today's airlines face a number of practical challenges in tracking their aircraft, which we at SITAONAIR have made our mission to empower them to overcome." ■

PEOPLE

New dnata boss appointed in Singapore

__Global air services provider, dnata__, has moved up its Singapore's chief commercial officer, __Nick Moore, to CEO__ of operations in the Lion City. Moore led Jardine Aviation Services in Hong Kong and was a board member of several of the group's subsidiaries before he moved to dnata in Dubai in 2008. After his success as senior vice president services with the group, he transferred to Singapore earlier this year. He will take up his new position with immediate effect.

dnata acquired ground handler __Changi International Airport Services__, in 2004 and rebranded the company as dnata in 2011. It employs 1800 staff and services 40 international airlines at __Changi international airport__. ■

COMMUNICATIONS

Inmarsat's SwiftBroadband Safety and FLYHT conduct trials

__Global provider of mobile satellite communications, Inmarsat__, will demonstrate its advanced SwiftBroadband Safety (SB-S) solution in a flight trial with Canada's __FLYHT__ later this year.

Real-time aircraft intelligence and cockpit communications company, FLYHT, and Inmarsat will test their systems of real time aircraft diagnostics, performance monitoring, detection of exceedence-critical parameters and improved operational efficiency.

"In addition, we will demonstrate how our currently available technologies can provide the industry with cost effective solutions to emerging safety requirements such as the International Civil Aviation Organisation's (ICAO) imminent new requirements for aircraft flight tracking," __Inmarsat vice president of aviation safety and operational services, Captain Mary McMillan.__

__FLYHT CEO Tom Schultz__ said it was a great opportunity For FLYHT to work directly with Inmarsat. "FLYHT brings significant expertise [to the flight trial] in the areas of Autonomous Distress Tracking and the Timely Recovery of Flight Data. We look forward to testing out solution with Inmarsat and other trials partners, Schultz said.

SB-S is in use on Shenzhen Airlines, Hawaiian Airlines and United Airlines and has been selected by Airbus as the Light Cockpit Satcom Solution for its A320 and A330 aircraft

Separately, Inmarsat has signed a strategic agreement with aviation and high integrity solutions company, __Rockwell Collins__, for global distribution of its next generation SB-S solution. Airbus recently named Rockwell Collins the top supplier for systems and equipment cabin and propulsion at the Airbus supplier conference awards dinner in Tianjin last month. This is the second time the company has received the award. ■

BRIEFLY…

Hong Kong Airport Authority (HKAA) is planning to offer retail bonds of up to US$648 million as part of the airport operator's plans to raise $18.33 billion to fund the building of its third runway. No taxpayer money is involved in the project, which commenced last month. Additional funds for the new runway would be drawn from the HKAA's operating surplus, a passenger levy, bank loans and bonds purchased by institutional investors.

The **Zhenjiang Science and Technology investment company (ZTC)** has invested US$73.5 million to take control of the UK aircraft economy seat manufacturer, **Acro Aircraft Seating**. The parent company of ZTC is Shanghai listed **Zhejiang Tiancheng Controls Co.**, which produces seats for construction vehicles, trucks and passenger cars.

SITAONAIR has equipped **Singapore Airlines (SIA)** with its full suite of high speed connectivity-enabled services for the cabin including the availability of GX Aviation's high speed broadband connectivity that is on one of SIA's B777-300ERs.

Last month **SITAONAIR** also agreed with Philippine Airlines (PAL) to upgrade the carrier's onboard WiFi and crew communications on its B777s and on its ordered A350s and new A32111s.

Sabre Corporation has unveiled plans to launch its **Sabre Content Services for Lodging** in 2018, a platform that will integrate content including Sabre global distribution system and non-GDS sources such as aggregators, re-distributors and agency sourced content. ■