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AVIATION TURKEY

EXCLUSIVE INTERVIEW WITH JASON SUTCLIFFE
REGIONAL MARKETING DIRECTOR ROLLS ROYCE

QATAR AIRSPACE REDRAWN
FOR THE FIRST TIME IN 30 YEARS

FROM KAYSERI TO PRINCETON A SHORT BIOGRAPHY
OF THE FIRST TURKISH AERONAUTICAL ENGINEER EDUCATED IN TURKEY

SPECIAL INTERVIEW WITH NUR GÖKMAN
CEO OF HITIT COMPUTER SERVICESKEYVAN AND THAT IT IS A TURKISH COMPANY

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Strong Recovery in Air Travel...

Despite the war in Ukraine and travel restrictions in China, air travel resumed its strong recovery trend as of April. This was driven primarily by international demand.

According to IATA Air Passenger Market Analysis, in April 2022, Total demand for air travel in April 2022 (measured in revenue passenger kilometers or RPKs) was up 78.7% compared to April 2021 and slightly ahead of March 2022's 76.0% year-over-year increase. . Air passenger volumes are now 37.2% below pre-pandemic 2019 levels, which represents a 3.8% increase since last month. Seasonally adjusted data confirms the industry-wide improvement with a 2.5% month-onmonth (MoM) increase. Despite remaining travel restrictions in Asia Pacific and its regional impacts.

International RPKs rose 331.9% versus April 2021, an acceleration over the 289.9% rise in March 2022 compared to a year ago. Several route areas are actually above pre-pandemic levels, including Europe – Central America, Middle East – North America and North America – Central America. April 2022 international RPKs were down 43.4% compared to the same month in 2019.

New flexible entry conditions in previously travel-restricted Asian countries allow for foreign travelers to come in, fostering higher growth rates in the region. However, the divergence in the pace of the recovery between Asia Pacific and other markets persists.

Omicron still impacts domestic air travel overall. The decline in China PR has deepened as strict travel restrictions limit air travel in, to and from the country. There global domestic RPKs fell by 1.0% YoY in April.

Inflation, high jet fuel prices, and low consumer confidence are points of concern for the coming months, but international bookings nevertheless show a high willingness to travel abroad - a positive trend expected to last throughout this summer.. However, low unemployment rates and accumulated savings still benefit consumers in advanced economies . While the relationship between rising inflation and increase in cost of travel is not straightforward, inflation is expected to put additional pressure on the air transport industry. Climbing crude oil and jet fuel prices, as a consequence of the war in Ukraine, are also expected to increasingly impact air travel.

European airlines' April international traffic rose 480.0% versus April 2021, substantially up over the 434.3% increase in March 2022 versus the same month in 2021. Capacity rose 233.5% and load factor climbed 33.7 percentage points to 79.4%. Although the war in Ukraine continues, airlines based in Europe have not been impacted significantly. International traffic between Europe and other regions extended their gains in April. For the first time since the start of the pandemic, international traffic within Europe recovered to the 2019 RPK levels in seasonally adjusted terms, recording a 5.2% YoY increase.

Asia-Pacific airlines saw their April international traffic climb 290.8% compared to April 2021, significantly improved on the 197.2% gain registered in March 2022 versus March 2021. Capacity rose 88.6% and the load factor was up 34.6 percentage points to 66.8%, still the lowest among regions. Relaxed entry conditions for foreigners allowed international flows to grow in countries where traffic was limited. One can expect international traffic to return quickly in

Asia Pacific as remaining travel restrictions are relaxed though for now routes between this region and the rest of the world lag in global recovery.

Latin American and North American carriers' saw similar growth in April in YoY international RPK growth, up 263.2% and 230.2% respectively.

Recovery to 2019 levels is progressing in both regions, with increased flows coming from Europe, the Middle East and between those regions. International RPKs in the following routes are now above pre-pandemic levels. Latin American and North American carriers are now down 29.7% and 26.3% respectively versus the same month in 2019.

Latin American and North American carriers are now down 29.7% and 26.3% respectively versus the same month in 2019.

The recovery in international RPKs is strong also in the Middle East, with volumes up 265.0% YoY in April, though still down 35.7% compared to April 2019. Airlines based in Africa saw a 116.2% YoY growth rate in their international RPKs in April. This region is further behind on the path of recovery since vaccination rates are much lower than in other regions. International RPKs are down 42.5% compared to pre-pandemic levels which is nevertheless a 1.7% improvement since March 2022.

Enjoy the issue...

Ayşe Akalın
Editor in Chief

HITIT Computer Services Provide Services to Nearly 60 Airlines and Travel Companies in More than 40 Countries

by Şebnem Akalın

Şebnem Akalın: First of all, we would like to thank you for your time. After working as an executive at Turkish Airlines for many years, you established the solution-oriented technology company Hitit Computer Services (Hitit Bilgisayar Hizmetleri). Can you tell us about the idea of founding the company, how it came to be, its processes, and being a female executive in the aviation industry?

Nur Gökman: We established Hitit in 1994 with our belief in our country's young and visionary minds in the field of information technologies (IT). We did not want to depend on foreign countries, especially in aviation, and we knew that these technologies could be produced in our country. In those years, aviation technologies were newly developing, not only in Turkey but all over the world. Although the role of air transportation in the travel industry is not as significant as it is today, the growth trend that started at that time attracted those in the industry. Both new airlines were being established, and existing ones were trying to increase their income by trying different business models. At this point, aviation technologies started to come into play. We created a new industry in Turkey by founding Hitit with Dilek Ovacık.

The first project we developed was loyalty solutions. This solution, which we can define as the technology that planted the seeds of Miles&Smiles, has become the most preferred system in the world, enabling us to become a well-known company in the global aviation technologies sector.

Being a woman in the technology field is a different situation for our country. Working in an area such as aviation technologies was both different and challenging. But I can't say that I had difficulties as a female executive; I can only say that until we introduced ourselves, seeing women at the male-dominated tenders surprised people. They were even more surprised when we told them that we came from Turkey. This perception was broken as Hitit became an increasingly well-known company in the sector. On the other hand, in the first years of the company, we mainly worked with male staff, because besides our slow pace, the number of female computer engineers was also low. After the office we opened at Yıldız Technical University, our female colleagues started to join us gradually. Currently, 40% of our company consists of women. At management levels, this number is 60%. It is a great honor to have a very high level of female employees for a technology company, especially an aviation technologies company...

Şebnem Akalın: In your journey that started with passenger services, you began to provide services to several foreign airlines with domestic solutions. What can you tell us about your solutions and the top products and services you offer?

Nur Gökman: On this path we set out with loyalty systems, we also started to provide passenger service systems, operational solutions, and financial solutions to aviation and travel actors, respectively. Although our business partners are primarily airlines, we have also produced solutions for different companies in the sector, such as ground handling companies. Subsequently, we continued our developments to reflect our 360-degree service understanding and to enable the industry and passengers to benefit more from the opportunities offered by technology. We currently also have solutions in commercial products, travel solutions, and air cargo areas. Thus, our area of interest has become a large ecosystem, including travel agencies and air cargo companies.

We develop our solutions with new technologies compared to other solutions in the same segment in the industry, and we can provide solutions and services to airline companies regardless of their business models. In this context, we are at the forefront of companies with the most comprehensive product portfolio and systems in the world.

On the other hand, with our solutions that can meet all the needs of airlines, we are one of the pioneers of a concept known as the "one-stop-shop" in the sector, that is, all services can be provided from a single point. Airline companies using our software solutions can find solutions to all their needs both in passenger services and in their own internal processes without the need for other software support. In addition, we can provide services to airlines that need only one solution because our solutions can work in integration with other systems.

Şebnem Akalın: The number of airline companies you work with is increasing day by day. We know that major airlines worldwide are your customers; which airlines do you currently work with, and are there any new airlines that will be added to your network in the near future?

Today, we provide services to nearly 60 airlines and travel companies in more than 40 countries around the world. This covers vast geography spanning Africa to Asia, Europe to the Middle East, and North America to South America. We can say that there is no continent we have not set foot on except Australia. We are the first company in Turkey to export aviation technology. As a result, we derive nearly 80% of our revenues from exports. This is a significant achievement, especially in today's parameters.

One of the developments that made us very happy is that we have also become the choice of airlines that have worked with the world's leading technology providers for a long time. We concluded 2021 with 36% growth thanks to the agreements we signed with 13 new airline companies. Having a growth chart far above in our sector, we surpassed many companies from several different sectors. Our negotiations and tender processes continue all over the world. We expect to end 2022 with a remarkable increase in our customer portfolio.

Şebnem Akalın: In addition to passenger services, you have recently increased your activities with cargo solutions. Can you inform us about these? Which countries have started using your solutions, and what airlines do you expect to be added in the near future?

Nur Gökman: Thanks to our studies in air cargo that we started just before the pandemic, we currently have two air cargo products in our solution portfolio: Air Cargo Management System Solution (Crane CGO) and Local Cargo Services (Crane DOM).

When we look at it cyclically, the importance and operations of air cargo have increased considerably, especially during the pandemic period. Cargo is no longer a secondary area for airlines and is now recognized as necessary as passenger services because cargo has become a critical revenue generator for airline companies, especially in fragile and challenging times.

In parallel with this, the use of our air cargo solutions is increasing day by day. Behind this rise is not only the increase in cargo demand accelerated by the pandemic but also the preparation of our solutions with the latest technology and analysis of sectoral deficiencies.

Our Air Cargo Management System solution has recently been used in Turkmenistan Airlines, where we have been working in passenger service systems since 2016. We expect new airlines to use our air cargo solution in 2022.

Şebnem Akalın: At the end of 2021, you won 2 awards in the fields of "Aviation Software Company of the Year" and "Aviation Technology Company of the Year" from Bluesky Awards. Can you tell us a little about these awards?

Nur Gökman: Bluesky Awards is one of the first award programs in the aviation field in Turkey... As the first and largest 100% domestic company that produces aviation software in Turkey, it was no surprise for us to win these awards. Apart from the Bluesky Awards, we have won many awards in recent years. We have been selected as Turkey's biggest travel software exporter for the last three years. Since its establishment, Hitit

has won several domestic and international awards such as ITU Teknokent R&D Exporter Winner, Best Aviation Software Company in Eastern Europe, Europe's Leading Passenger Service System Provider, Europe's Leading Passenger Service System Provider, Best Airline Reporting System, the Most Niche Technology Company of the Year, Turkey's Best Sectoral Software Company, and Aviation Technology Company of the Year Award.

In addition, we returned with two awards from the Best of Sales Awards (BoSA), which was held for the fourth time this year by Sales Network in May 2022. As a result of the evaluation made by the independent jury members of the Sales Network, which has 99 corporate members, Hitit was awarded first place in the Sales Performance category with its sales figures in 2021. In the category of a Better World, where social responsibility projects are evaluated, we came second with our Flying Rackets project, which brings sports into the lives of children in a sustainable way.

These awards further encourage us to grow our business and strengthen our position in the airline and travel technology industry.

Şebnem Akalın: What can you tell us about your future plans, expectations, and goals for 10 years?

Nur Gökman: It is a fact that the COVID-19 pandemic has radically changed the plans and future expectations in the aviation industry at the end of 2019... On the other hand, the fact that we have grown out of the biggest crisis that the aviation industry has faced in the last 100 years reveals the importance of technology and digital transformation in the future. As a company that has increased its customer portfolio by 41% during the pandemic, we think that we can maintain our growth trend for the next 10 years. We aim to gradually increase the number of countries and airlines we work with and thus improve our contribution to Turkey's service exports.

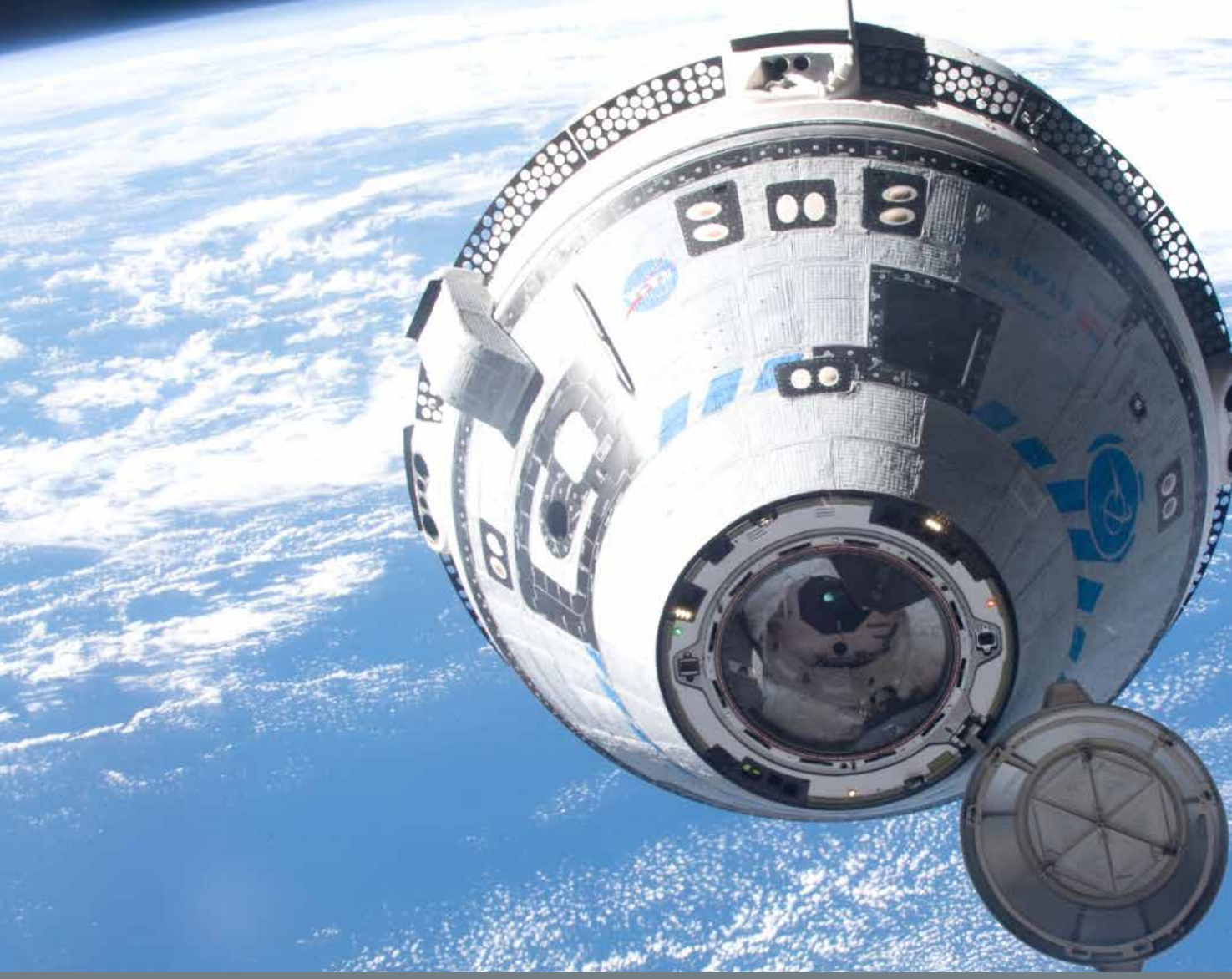
By marketing our other solutions on their own, we expect them to achieve global success like our reservation system, which is vital for airline companies, and become leaders in their fields.

In addition, we work with the awareness of fulfilling our duty to society and creating a better world by transferring our technology contribution to our industry to the social field. We also attach great importance to social responsibility projects within the scope of our sustainability policies. We organize projects and aid campaigns in many different areas, target different audiences, and continue our work in sports, healthy lifestyle, environment, welfare, education, and gender equality.

Şebnem Akalın: Thank you very much for your time. Is there anything else you would like to share with our readers?

Nur Gökman: I advise our young people to be patient while chasing their dreams and choose jobs they will love to do as hobbies. I recommend women advance in their careers by focusing on the goal they want to achieve, ignoring the obstacles they may encounter, and being confident in themselves. I see women as an indispensable part of business life and believe that women make a difference in business life with their creativity, empathy, and multifunctional abilities. There are numerous success stories in this sense in our country. Therefore, my humble advice to women would be to bring their creative ideas to life and believe in themselves more

Hitit CEO, Nur Gökman, and & CMO Nevra Onursal Karaağaç



Boeing's Starliner Spacecraft Returns to Earth After the Successful Test Flight

by Saffet UYANIK

Boeing's Starliner spacecraft made a safe return from its six-day test flight to the International Space Station (ISS) and back. The CST-100 Starliner spacecraft launched on May 19, 2022, as part of Boeing's Orbital Flight Test 2 (OFT-2) mission and successfully docked with the ISS on May 21, 2022. It stayed at the ISS for four days before undocking and landing at the U.S. Army's White Sands Missile Range on May 25, 2022.

The Boeing Orbital Flight Test-2 (OFT-2) is Starliner's second uncrewed flight test to the International Space Station as part of NASA's Commercial Crew Program. Orbital Flight Test-2 (OFT-2) was a repeat of Boeing's unsuccessful first Orbital Flight Test (OFT-1) of its Starliner spacecraft. OFT-2 was designed to show that Starliner is ready to carry astronauts to and from orbit for NASA, which signed a contract with Boeing for such services back in 2014.

Following liftoff, Starliner successfully entered Earth's orbit, performed a series of demonstrations of its capabilities, and docked with the orbital outpost 26 hours after launch. The Expedition 67 crew aboard the station opened hatches and entered the capsule for the first time, inspecting the spacecraft and verifying integration

with power and communications station systems for longer stays in the future. The station crew also unloaded 500 pounds of cargo delivered by Starliner and sent 600 pounds of cargo back to Earth.

The Starliner's landing occurred about four hours after undocking from its port at the station. The spacecraft gradually lowered its altitude with a deorbit burn as it approached Earth's atmosphere and then lit its thrusters before deploying parachutes to slow its descent. Three parachutes slowed the capsule to a gentle landing speed. It touched down onto its airbags in a remote area of the New Mexican desert, called White Sands, which has long been the site of aerospace and weapons tests.

Although the spacecraft had a glitch during its ascent, with two maneuvering thrusters shutting down due to pressure problems, the mission completed one of its most important test objectives, reaching the ISS and docking successfully. OFT-2 marks a critical development milestone in Boeing's development of Starliner, which has run into several obstacles and delays over the past three years.

The Starliner program's first Orbital Flight Test (OFT-1) in December 2019 failed to reach the station. Conducted by Boeing as part of NASA's Commercial Crew Program, the mission was planned to be an eight-day test flight. OFT-1 was launched on December 20, 2019; however, a software programming error with the spacecraft's Mission Elapsed Time (MET) clock caused the spacecraft to burn through much of its propellant into an incorrect orbit, forcing the test light cut short and preventing a rendezvous with the International Space Station (ISS). The mission was reduced to just two days, with the capsule safely landing at White Sands Space Harbor in New Mexico on December 22, 2019.

Boeing retrieved the spacecraft from the landing site and will transport it back to the company's Commercial Crew and Cargo Processing Facility at NASA's Kennedy Space Center in Florida. After NASA and Boeing review processes data from this test flight, teams will continue plans for Starliner and its expected next mission, the Crew Flight Test (CFT), to the space station.

Boeing Starliner

The Boeing CST-100 Starliner (CST-Crew Space Transportation) is a partially reusable spacecraft designed to transport crew to the International Space Station (ISS) and other low-Earth-orbit destinations. It is manufactured by Boeing for its participation in NASA's Commercial Crew Program (CCP). The spacecraft consists of a reusable crew module and an expendable service module. The spacecraft weighs 13 tons and measures 4.56 meters (15.0 ft) in diameter and 5.1 meters (17.0 ft) in height.

It is slightly larger than the Apollo command module and SpaceX Dragon 2 and smaller than the Orion capsule.

The Boeing Starliner holds a crew of up to seven people and is designed to be able to remain docked to ISS for up to seven months with the reusability of up to ten missions. It is designed to be compatible with the Atlas V, Delta IV, Falcon 9, and Vulcan Centaur launch vehicles.

After several rounds of competitive development contracts within the Commercial Crew Program starting in 2010, NASA selected the Boeing Starliner and SpaceX Crew Dragon for the Commercial Crew Transportation Capability (CCtCap) contract.

Commercial Crew Program (CCP)

Development of the Commercial Crew Program began in 2011. By investing in multiple American companies that are designing and developing transportation capabilities to and from low-Earth orbit and the International Space Station, NASA aims to establish safe, reliable, and cost-effective access to space. To achieve its goals, NASA used Space Act Agreements to partner with domestic companies capable of contributing to the development of a U.S. human spaceflight capability.

Throughout the process, NASA awarded more than $8.2 billion in Space Act Agreements (SAAs) and contracts under two Commercial Crew Development (CCDev) phases, the Commercial Crew Integrated Capability (CCiCap) initiative, Certification Products Contract (CPC), and Commercial Crew Transportation Capability (CCtCap).

During the CCDev1 phase, NASA awarded a total of $50 million to five companies to stimulate efforts within the private sector to aid in developing and demonstrating safe, reliable, and cost-effective crew transportation and capabilities. The second round of Commercial Crew Development (CCDev2) kicked off in April of 2011 when NASA awarded nearly $270 million to four companies to further develop and demonstrate safe, reliable, and cost-effective transportation capabilities. Winners of CCDev2 were Blue Origin (US$ 22 million), Boeing (US$ 92.3 million), SpaceX (US$ 75 million), and Sierra Nevada (US$ 80 million).

NASA later funded an additional US$ 20.6 million to Boeing and US$ 25.6 million to Sierra Nevada Corporation by exercising optional, pre-negotiated milestones, which were part of their original Space Act Agreements, to accelerate development. On December 10, 2012, NASA selected three companies and awarded nearly $30 million under the CPC contracts. In September 2014, NASA finally awarded two fixed-price (US$6.8 billion in total) CCtCap contracts to two companies (Boeing - $4.2 billion, SpaceX - $2.6 billion) following an open competition

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Qatar Airspace Redrawn
For the First Time After 30 Years!

A historic decision has been taken for aviation in the Middle East. Qatar has won its long campaign. The International Civil Aviation Organization (ICAO) has agreed to establish a brand-new airspace known as the "Doha FIR - Flight Information Region" under the control of Qatar. Qatar has taken control of its skies and airspace for the first time in its history. For the first time in nearly 30 years, the world's airspace map has been redrawn.

by Muhammed Yılmaz
Aeronautical Engineer

The Qatari government has been long striving to withdraw from the current arrangement, whereby Bahrain had the control almost all air traffic over Bahrain's territory and establish its own free airspace. Qatar was set out to implement a plan for dividing the Bahrain FIR (Flight Information Region), extending along most of the Western Persian Gulf, from the UAE to Kuwait, with a new approximately 200 km long border between Bahrain and Qatar, thereby carving out its airspace.

The International Civil Aviation Organization ICAO Council announced at a session on June 21, 2021, that it agreed in principle to establish a new Doha FIR and invited Bahrain and Qatar to "collaboratively negotiate" technical arrangements. After long negotiations, Qatar succeeded to obtain what it wanted on March 25, 2022.

Why Qatar Needed an Independent Airspace?

Until now, Qatar airspace has been under the control of Bahrain, except for the terminal area of Doha Hamad Airport. Bahrain's taking the control of most of the Gulf airspace dates back to 1971, after Qatar and Bahrain gained independence from the United Kingdom. According to the good relations between Qatar and Bahrain, the decision about the airspace was primarily determined based on the fact that Bahrain was where the majority of military airports and radars were located. Qatar had agreed at that time Bahrain's control and management of a disproportionately large airspace.

In the last 5 years, the balance in the region completely changed with the diplomatic disputes between the Middle East countries and the decision of many Gulf countries to impose an airspace blockade on Qatar.

On June 5, 2017, Bahrain, Saudi Arabia, Egypt and the UAE broke off diplomatic relations with Qatar and started to impose an economic embargo, accusing them of "backing various terrorist groups". While Qatar denied all the accusations of such countries, this situation

led to a crisis in the Gulf region. The extent of the crisis deepened so much that Qatar Airways were banned from the airspace of four countries. Following the airspace blockade decision, the Qatari government first unveiled its plan to create its own airspace in August 2018.

Qatar justified in its plan that the existing FIR limits no longer serve its own interests and that its proposal will reduce the complexity associated with inbound and outbound traffic, increase efficiency to enable optimized approaches and departures, achieve more equitable distribution of the workload between Qatar and Bahrain air traffic control. It was also noted that the management of this coordination by a country other than Qatar would lead to trust issues in the region, which has historically been a difficult geography. Thus, the Doha administration initiated a legal struggle within the framework of international regulations to take control of its own airspace.

Necessary consensus could not be reached on Qatar's proposal for a long time and it was decided to conduct a wider international evaluation in January 2020. All four countries previously imposed an airspace blockade on Qatar, as well as Yemen, objected to Qatar's plan.

Who were the Objectors and Why were they Objecting?

While stating that Qatar did not provide technical or operational justification for the proposal, Bahrain also argued that in a complex, high-density traffic area, the provision of an additional air navigation service would create an "unnecessary" coordination workload, increase costs, and potentially reduce safety.

While Bahrain stated that Qatar did not provide technical or operational justification for the proposal, providing an extra air navigation service in a complex, high-density traffic area would create an “unnecessary” coordination workload; argued that it would increase costs and potentially lead to security risks.

Egypt argued the current arrangement has proven to be secure and sound for decades and that Qatar's proposal "contradicted" with recommendations for uninterrupted traffic flow.

The Saudi representatives stated that the separation of the airspace would have a "major negative impact" on traffic and would result in "serious" capacity reductions and a mess.

The United Arab Emirates argued that the proposal would not provide any operational benefits, on the contrary, would "jeopardize" the mature operational process throughout the region.

Meanwhile Qatar repeatedly advocated at ICAO meetings that a specific Doha FIR proposal would improve security and create economic benefits to the airline industry. Qatar explored all possible options for a consensus on the proposal and claimed that some parties used delay tactics to further prolong the process. Qatar also declared that only five of the 55 country delegates objected to the proposal.

All four countries that imposed an airspace blockade on Qatar lifted their restrictions on Qatar following the Gulf Cooperation Council summit in Al-Ula, Saudi Arabia, in January 2021.

Doha FIR will be Established in Two Phases

The establishment of a Doha FIR shrinks Bahrain's existing airspace, and the control of one of the regions with the most intense air traffic in the world passes to Qatar. Upon the decision, around 70% of flights to the United Arab Emirates will be made over the new Qatari airspace.

Doha FIR shall be established in two phases. "Area A" of the Doha FIR is an "unlimited altitude" area to be controlled by Qatar. "Area B" will be controlled to an altitude of 24,500ft. for 2 years. Later Area B will join Area A, to become under the control of Qatar.

As no other example exists in the history of modern aviation for a country, not possessing its own airspace, to have obtained this right, this was recorded as an unprecedented decision in the commercial aviation world.

What is Airspace? Why is it Important?

Airspace is a term used for the portion of the atmosphere above any territory or territorial waters, the dimensions of which are determined by various laws, rules and treaties. Airspace in the skies is divided into "flight information region" known as "'FIR", just like the borders on maps. The control of flights over these regions is provided by the country to which they belong. Airplanes pay a fee for the use of the airspace to the country controlling such region.

Each country's airspace is divided into one or more flight information regions, depending on the country's size, position and air traffic. For example, approximately 1 million square kilometers of Turkish airspace is divided into Ankara FIR and Istanbul FIR, and UK airspace is divided into two flight information regions, Scottish FIR and London FIR.

According to the Chicago Convention signed in 1944, every state has complete and exclusive sovereignty over the airspace above its territory. All signatory states must allow the use of their airspace by aircraft of other states (with the exception of scheduled international flights) "without prior authorization".

TURKAY

Dağıtım/Uç Milli Yönlendirici

Dağıtım/Uç Milli Yönlendirici, 32 GBitps'e kadar çıkan anahtarlama hızıyla hem IPv4 hem de IPv6 uyumlu IP paketlerini OSPF ve BGP protokolleri ile yönlendirebilmektedir. Statik Yönlendirme ve UCMR yeteneğine sahip olan Milli Yönlendirici; IGMP, PIM, DHCP, DNS, IPsec ve IKE gibi birçok tamamlayıcı protokol desteğini de sunmaktadır.

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From Kayseri to Princeton
A short biography of the first Turkish aeronautical engineer educated in Turkey: Prof. Dr. Ahmed Cemal Eringen (1921-2009)

by Dr. Emir Öngüner
Freelance Researcher in Aviation History

In 1941, the Mechanical-Aeronautical branch was opened within the body of the Engineering School (former Istanbul Technical University) in Istanbul. This branch gave its first graduates in 1943 with only six people. The first among them, in order of diploma, is Ahmed Cemal Eringen, who was born on February 15, 1921, in Kayseri-Bünyan.

Accepted as an authority in the field of continuum mechanics in the world, Eringen is unfortunately not known in his homeland, where he left at the beginning of his 20s. As the first aeronautical engineer educated in Turkey, who spent almost 60 years of his life in the USA, Eringen earned numerous achievements in his career, and his name is kept alive with a medal (Eringen Medal) in the USA every year. So, who is Ahmed Cemal Eringen, who came out of Kayseri and ended his career as a professor at Princeton University?[1]

Eringen, at the THK factory in Ankara in the 1940s (Şükrü Er personal archive)

We do not have detailed information about his period in Turkey. After his graduation in 1943, Cemal Eringen was sent to Glenn L. Martin firm in the USA for an internship to gain aviation experience like other graduates. After the practical training he received here, he worked at the Turkish Aeronautical Association (THK) Aircraft Factory in Ankara until 1947 (Images 1 and 2). Wanting to continue his studies in the academic field, he went to the USA again. He began his studies in rigid body dynamics under Prof. Nicholas (Miklós) John Hoff at Brooklyn Polytechnic Institute. Nicholas Hoff is a former assistant to renowned mechanics professor Stephen Timoshenko at Stanford. Eringen's Ph.D. was a project funded by the Office of Naval Research of the US Navy (Project No: N6onr-263-Task Order II).[2] He received his doctorate in June 1948 with his thesis on the elasticity problem and buckling of sandwich beams (original thesis title: *Solution of two dimensional - mixed boundary layer problem of elasticity for rectangular orthotropic media and application to the buckling of sandwich beams).*[3]

Eringen transferred to the Illinois Institute of Technology (IIT) after his doctorate. He was

[1] *The main sources used in the preparation of the biography:*

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[2] *Eringen, A.C., Ripple-Type Bucking of Sandwich Columns, J. Aeron. Sci. 19/6 (1952): 409–417.*

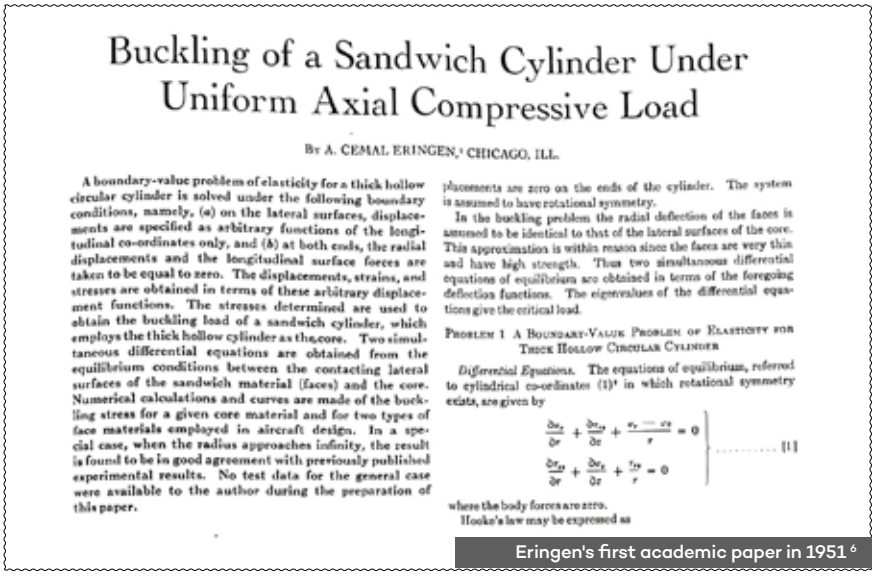
[3] *Taken from the "Mathematics Genealogy Project" data: https://www.mathgenealogy.org/id.php?id=147062. Last access: 04.06.2022.*

assigned to lecture on engineering mechanics. The first thing he did was to establish a comprehensive library in this field at the faculty. He published his first academic article in June 1951. In this study, he examines the buckling of sandwich cylinders under load (original title: Buckling of Sandwich Cylinder Under Uniform Axial Compressive Load, Image 3).[4] In the December 1951 issue of the Journal of Applied Mechanics, in which the article was published, Prof. George Gerard from New York University wrote a one-page commentary on Eringen's study.[5] During his five-year term at IIT, Eringen established a research program in the field of elastodynamics. He also touches on topics such as the vibration of circular membranes and plate buckling.

When he transferred to Purdue University in 1953, he broadened his research interests from structural dynamics to continuum mechanics. In 1962 he published his first book of 477 pages titled Nonlinear Theory of Continuous Media. But Eringen has a more serious vision in mind. He wanted to bring a new perspective by combining natural sciences and engineering under one roof. He proposed ideas about using mathematics, physics, chemistry, and biology to solve engineering problems. The research team he created within this framework is a first in the USA.

The concept of "engineering science" began to be cited in academia with the initiatives of Eringen. This definition means different things to many, has been interpreted contradictorily, and was initially discredited in academia. However, Eringen did not hesitate to take the necessary steps to realize this vision. In this context, he launched the International Journal of Engineering Science in 1963. In his writings and speeches, he states that engineering science plays an essential role in the development of people in technology-oriented societies. In the preface to the journal's first issue, he wrote that an engineer who lacks basic sciences would not be at a level to solve interdisciplinary technical problems. This newly established journal will be a new communication tool where natural scientists and engineers can meet on common ground.

First aeronautical engineers educated in Turkey in the same frame. Eringen is first from the left. (Sükrü Er personal archive)



Buckling of a Sandwich Cylinder Under Uniform Axial Compressive Load

By A. Cemal Eringen,[1] Chicago, Ill.

A boundary-value problem of elasticity for a thick hollow circular cylinder is solved under the following boundary conditions, namely, (a) on the lateral surfaces, displacements are specified as arbitrary functions of the longitudinal co-ordinates only, and (b) at both ends, the radial displacements and the longitudinal surface forces are taken to be equal to zero. The displacements, strains, and stresses are obtained in terms of these arbitrary displacement functions. The stresses determined are used to obtain the buckling load of a sandwich cylinder, which employs the thick hollow cylinder as the core. Two simultaneous differential equations are obtained from the equilibrium conditions between the contacting lateral surfaces of the sandwich material (faces) and the core. Numerical calculations and curves are made of the buckling stress for a given core material and for two types of face materials employed in aircraft design. In a special case, when the radius approaches infinity, the result is found to be in good agreement with previously published experimental results. No test data for the general case were available to the author during the preparation of this paper.

placements are zero on the ends of the cylinder. The system is assumed to have rotational symmetry.

In the buckling problem the radial deflection of the faces is assumed to be identical to that of the lateral surfaces of the core. This approximation is within reason since the faces are very thin and have high strength. Thus two simultaneous differential equations of equilibrium are obtained in terms of the foregoing deflection functions. The eigenvalues of the differential equations give the critical load.

Problem 1 A Boundary-Value Problem of Elasticity for Thick Hollow Circular Cylinder

Differential Equations. The equations of equilibrium, referred to cylindrical co-ordinates (1)[1] in which rotational symmetry exists, are given by

$$\frac{\partial \sigma_r}{\partial r} + \frac{\partial \tau_{rz}}{\partial z} + \frac{\sigma_r - \sigma_t}{r} = 0$$
$$\frac{\partial \tau_{rz}}{\partial r} + \frac{\partial \sigma_z}{\partial z} + \frac{\tau_{rz}}{r} = 0 \qquad [1]$$

where the body forces are zero.

Hooke's law may be expressed as

Eringen's first academic paper in 1951 [6]

[4] *J. Appl. Mech. 18(2), 1951: 195–202.*

[5] *Discussion of Buckling of a Sandwich Cylinder Under Uniform Axial Compressive Load, J. Appl. Mech. 18(4), 1951: 424-425.*

[6] *Thanks to Hilal Koç and Uğurcan Eroğlu for obtaining a copy of the article from the library of the ITU Faculty of Mechanical Engineering.*

On November 4, 1963, a few months after the establishment of the journal, Eringen gave the opening speech as the founding president of the Society of Engineering Science (SES) at an event with the participation of approximately 400 people from different branches (Image 4). He explains the purpose of the society as "the advancement of interdisciplinary research and the building of bridges between engineering and natural sciences." In a short time, the society collaborated with well-established associations such as the *American Society of Mechanical Engineers and the American Society of Civil Engineers*. Eringen was the president until 1973.

Eringen also applied his vision to his own academic work. He focused on interdisciplinary branches, not just one area. While at IIT, he mainly focused on classical elasticity and structural mechanics, while at Purdue, he studied wave motion and loads on structures such as beams, plates, and spheres. His research on random vibration and stochastic loads is one of the methods actively used in analyzing building structures against wind and earthquakes. In the 1960s, he also studies topics such as fluid dynamics, viscoelasticity, and electromagnetic interactions in solids and fluids.

Eringen (left first) with Subrahmanyan Chandrasekhar, Tracy Yerkes Thomas, and Harold Grad at the founding meeting of the society. (© Society of Engineering Science)

Eringen, who transferred to Princeton University in 1966 after thirteen years at Purdue, became interested in turbulence, liquid crystals, polymers, composite materials, and biomechanics. The presence of world-renowned theoretical physicists at Princeton leads Eringen to physics-based branches. The postgraduate students, postdoctoral researchers, and visiting professors in his team continued to use Eringen's methods to study basic and applied sciences as a whole in the countries they went to. As the head of the Princeton University School of Civil Engineering Continuum Physics working group, Eringen spread his name all over the world with his publications on beam problems, surface physics, composite materials, electrodynamics, and superconductivity (Image 5).

Eringen, when he was a professor at Princeton in the 1970s. (© Anwar Beg, Giants of Engineering Science, 2003)

Founded by Eringen, the SES society has started to issue the Eringen Medal to an academician selected from among the candidates who have achieved success in engineering science since 1976. The first scientist to receive the Eringen Medal, the inventor of the concept of fuzzy logic, was the Azerbaijani mathematician Lotfi Zadeh (Lotfali Askar-Zadeh). In 1980, experts such as the Hungarian-born physicist Edward Teller, the inventor of the hydrogen bomb, and in 1993, Turkish-born Fazıl Erdoğan were deemed worthy of this award. Today, as a tradition that is still up to date, the Eringen Medal continues to be awarded to successful scientists[7] (Image 6).

Until his retirement in 1991, Eringen published

[7] *For the list of Eringen Medals, see: https://socengsci.org/eringen-medal/, last access: 06.06.2022.*

13 books, 228 articles, 10 book chapters, 58 technical reports, and 13 non-technical articles throughout his career. He moved to Colorado during his retirement and continued his work there. The last article he prepared before his death was published as the preface to his book Mechanics of Generalized Continua: One Hundred Years after the Cosserats, published in 2010. He has joint articles with scholars from Turkey such as Erdoğan Şuhubi, Hilmi Demiray and Burhanettin Şemsi Altan. There is also a poetry book called "Pink Lily," published in Erzurum in 1937.

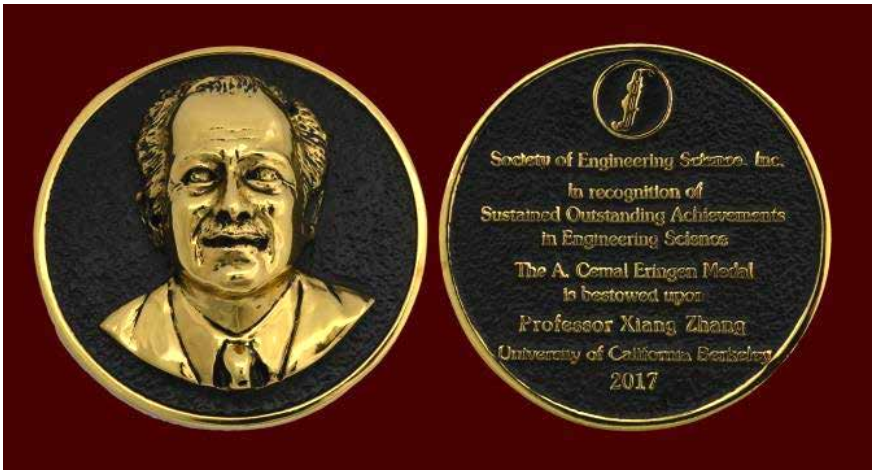
One of Eringen's doctoral students, Prof. James D. Lee, emeritus from George Washington University, gave the following information about Eringen: [8]

Certainly, Professor Eringen was one of the few pioneers of Continuum

Mechanics. Besides, in his book [1], Professor Eringen included a chapter

"Electrodynamics of Continua" which was the birth of Continuum Physics.

Later, Professor Eringen and Professor Maugin [2, 3] presented the thermomechanical-electromagnetic coupling theory from a unified viewpoint.



An example of the Eringen Medal awarded in 2017. (© University of Hong Kong)

This is the complete theory of continuum physics.

Since 1964, Professor Eringen had developed the microcontinuum field theories [4, 5] in which the medium is considered as an infinite collection of finite size and deformable particles. This is a giant step forward from classical continuum physics to micromorphic (including microstretch and micropolar) continuum physics. The formulation is systematic, comprehensive, and rigorous.

Meanwhile, Professor Eringen published a book "Nonlocal Continuum Field Theories" [2] which systematically presents field theories of electromagnetic solids and fluids with nonlocal effects in both space and time.

In summary, Professor Eringen's work enables us to study and perform research in the arena of nonlocal micromorphic continuum physics.

On Eringen's personality, first of all, Professor Eringen was a kind person. He treated students nicely and with respect. In doing research, Professor Eringen provided us (I was one of his Ph.D. students) with freedom and comprehensive (sometimes detailed) guidance."

Continuum mechanics expert Prof. Gérard A. Maugin describes Eringen as: [9]

"Eringen's renown as an educator, lecturer, and prolific author has attracted graduate students and visiting scholars from around the world. His style was markedly full of enthusiasm and not without this slight touch of charming naïveté that suits well great scientists. He was sought after throughout the world as a lecturer and had many presentations – at national and international congresses, symposia and summer schools – as well as so many lectures at academic institutions to his credit.

He did not like to engage in public controversies. He was extremely kind to all his students, co-workers, and visitors. The engineering science community at large has lost a great scientist, a friend, and a gentleman. Nobody served this community so dutifully and so-well for almost 60 years, as A. Cemal Eringen did through his seminal creative works and his untiring efforts of organization and dissemination of knowledge."

[8] *Correspondence with James Lee, 16.04.2022.*

[9] *Maugin, G.A., Eringen, A.C. (1921-2009): A lifelong dedication to engineering science, International Journal of Engineering Science 49 (2011): 1281–1283.*

His photograph from the book of the symposium organized on behalf of Eringen in 1988. (© Recent Advances in Engineering Science: A Symposium dedicated to A. Cemal Eringen, Springer, 1988)

Dr. Volkan İşbuğa, from Izmir Institute of Technology, describes the incident he witnessed while he was a doctoral student in Colorado as follows:[10]

"Eringen continued his work as a visiting professor at the University of Colorado. He gave a seminar in our department with the invitation of my doctoral thesis advisor, but I could not attend that seminar. My doctoral thesis was about a theory he developed. My teacher said he wanted to introduce us, but I was not lucky. After his death, I went to his house and met his daughter. Upon Eringen's will, Ms. Meva wanted to donate his entire library to the university he graduated from in Turkey or to another Turkish university. I contacted some universities, but there was no response. He had a truly enormous library. The University of Colorado also only accepted individual pieces since the books were available there. So I took pictures of some of Eringen's notes from his undergraduate days. I still have them. The International Journal of Engineering Science, of which Cemal Eringen is the editor-in-chief, published a special issue for Eringen after his death. Scientists working in the same field in the academic world were included in this issue, to which we also contributed."

Prof. Erkan Öterkuş from the University of Strathclyde interprets Eringen's scientific studies as:[11]

"Cemal Eringen is one of the leading figures in continuum mechanics. The most popular study topic now is 'nonlocal elasticity.' At the time of Cemal Eringen and those who worked with him on this subject, nanotechnology was not very advanced. As nanotechnology develops, both the subject of 'nonlocal elasticity' and the name Eringen have come to the fore more recently. Not only in Turkey but all over the world, Cemal Eringen is recognized and appreciated today, perhaps more after his death.

Eringen has worked on many different subjects. Among them, micromorphic formulation may become a much more popular topic in the near future with the development of new generation metamaterials. He also has pioneering studies on what we call 'multiphysics' analysis, that is, more than one physical event affects each other.

They worked together with Ahmet Çakmak, the grandson of Marshal Fevzi Çakmak, at the Faculty of Civil Engineering at Princeton University. On the subject of rigid body dynamics, one should mention Fazıl Erdoğan and Ali Argon, along with Cemal Eringen. These professors are world-renowned scientists who are considered authorities in their fields."

Prof. Cengiz Çamcı from the University of Pennsylvania summarized Eringen's fields of study as:[12]

" Mr. Cemal put forward an idea called 'unified field theory' in the field of continuum mechanics. He would put subjects such as fluid mechanics, rheology, heat transfer, elasticity, strength, thermodynamics, and liquid crystals into a single analytical framework. He did not deal with solution methods much, but he presented a magnificent analytical structure that looked at many issues from the same window.

What Cemal Eringen offers is a comprehensive engineering science approach. These findings may not directly serve today's engineering solutions, but they are scientifically valuable in the very long run. Turkish scholars such as Atilla Aşkar, Akın Tezel, Fazıl Erdoğan, Nihat Berker and Esin İnan were influenced by Cemal Eringen."

To sum up, Ahmed Cemal Eringen from Kayseri is the first Turkish aeronautical engineer who was born, raised, and educated in Turkey. He practiced his profession in his country for about three years. From 1947 when he moved to the USA, he continued his academic studies in this country until his death in 2009. The world-renowned Eringen school was not born in Turkey but in the USA. Although Eringen does not have a known specific contribution to aeronautical engineering, it is evident that he has made seminal contributions to many engineering branches with his scientific studies. It is a shame for all of us that such a valuable Turkish scientist is not recognized in his own country

A photograph of Eringen taken at his home in Colorado before his death. Left to right: Meva Eringen (his daughter), Gérard Maugin, Cemal Eringen, James Lee. (© James Lee)

[10] *Correspondence with Volkan İşbuğ, 11.04.2022.*
[11] *Correspondence with Erkan Öterkuş, 12.04.2022.*
[12] *Correspondence with Cengiz Çamcı, 13.04.2022*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Jason Sutcliffe: Our Priority for Civil Aviation is to Maximize Value from Existing Capabilities and Position the Business for the Transition to Net Zero

Aviation Turkey: Mr. Jason Sutcliffe, first of all thank very much for your time. How would you evaluate the current position of RR in the global commercial aviation sector?

Jason Sutcliffe: Well, thank you very much for having me.

At Rolls-Royce, we believe in the positive, transforming potential of technology. We pioneer the power that matters and seek to deliver clean, safe and competitive solutions to meet our planet's vital power needs.

Our priority for Civil Aviation is to maximize value from existing capabilities and position the business for the transition to net zero. We have a large installed product base of more than 5,700 large engines and around 9,700 business aviation and regional engines. We also have a large order book with more than 1,500 new large engines due to be delivered over the next few years, representing 52% market share and supporting our fleet growth expectations in the medium term.

Today we power the latest generation of passenger aircraft such as the Airbus A350 and A330neo and the Boeing 787. In business aviation, we power some of the largest, fastest, and longest-range business jets available.

We are also seizing new opportunities for growth. For example, the Airbus A350 is powered exclusively by our Trent XWB engines and has been a tremendous success in the market. We were therefore delighted at the Airbus decision to launch a freighter version of this aircraft at a time when there is continued demand for freighter services .Our Pearl family of business jet engines achieved new successes, with the Pearl 10X chosen by Dassault for its brand-new flagship aircraft, the Falcon 10X, and the Pearl 700 selected by Gulfstream to power its latest ultra-long-range jet, the G800.

All of our engines are supported by service agreements that maximize aircraft availability, allowing our customers to provide the levels of customer service demanded by a globalized world.

Our technologies are also enablers to help us support customers address our global desire to remain connected, but do so sustainably. We are already developing our next generation of gas turbine, creating new levels of efficiency and therefore sustainability. We have pledged to ensure our existing engines are compatible with 100% Sustainable Aviation Fuel by 2023. And we are continuing to push forward with new technologies and fuels such as hybrid-electric and all-electric systems as well as hydrogen.

Aviation Turkey: What can you tell us about market share of Turkey's civil aviation sector in your region?

Jason Sutcliffe: We were delighted when Turkish Airlines selected our Trent 700 engines to power A330 aircraft for the first time in 200X, and since then our relationship has continue to grow and develop, underpinned by our TotalCare service commitment to provide 24/7 engine health monitoring from our specialist operations in Derby, UK, which enables proactive management of engine servicing. Today we now support engines powering 26 A330s and six A350s, with another 18 A350s on order.

Aviation Turkey: What can you say about the ongoing or future projects you carry out in the field of civil aviation in Turkey? Do you seek further cooperation especially in the field of engine maintenance?

Jason Sutcliffe: Turkey is full of opportunities, and we are committed to support the country to reach its full potential. It is a strategic market for us with its diversified order book and strong business volume. Therefore, we continue to provide our best solutions to support the industry in Turkey.

For example, our long-term partnership with Turkish Airlines (THY) started with their selection of Rolls-Royce Trent 700 engines to power Airbus A330s in 2009. Today, THY is currently operating a number of Rolls-Royce powered Airbus A330s under the TotalCare service agreement.

This is more than just an engine maintenance plan, it is a service concept based upon predictability and reliability. It gives our customers a secured cost of operating and maintaining their Trent 700 engines through a dollar-per-flying-hour payment mechanism.

It delivers enhanced aircraft availability thanks to Rolls-Royce's in-depth engine knowledge that draws on our advanced engine health monitoring.

Additionally, Rolls-Royce powered Airbus A330 & A340, and Gulfstream Business Jets are being used for VIP operations. THY also ordered Airbus A350 aircraft powered with Trent XWB engines which entered into service starting from 2020.

We have an Airline Support Team at Turkish Technic Yesilkoy facilities providing on-the-ground support to our airline customers in Turkey & Central Asia. We hope to keep working together with Turkish Airlines as well as other airlines by providing our new technologies and services.

In a nutshell, we always look for new opportunities, ways, or further collaborations to make a positive impact in the Turkish aviation industry.

Aviation Turkey: Nowadays aviation industry invests in a future with zero carbon projects. Can you inform our readers about Rolls Royce's ongoing zero carbon projects?

Jason Sutcliffe: We are now laying out our technology pathway to net zero and committing to ensuring our new products will be compatible with net zero operation by 2030, and all our products compatible by 2050.

To combat the climate crisis, we also know that power must be made compatible with net zero carbon emissions. For us

this is a societal imperative as well as one of the greatest commercial and technological opportunities of our time. Therefore, our strategy for Civil Aerospace for net zero focuses on improving engine efficiency, enabling the use of Sustainable Aviation Fuels (SAFs), and being at the forefront of developing innovative propulsion technologies.

We are completing the build of a demonstrator of our next generation of gas turbine, UltraFan, which will be 25% more fuel efficient than the first generation of Trent engine. And that efficiency also means improved sustainability.

It is a tremendously exciting programme for us: the demonstrator engine has a fan diameter of 140 inches, making it the largest aero engine in the world and its very first test run will be on 100% Sustainable Aviation fuel.

The technology is scalable, meaning UltraFan will be available at 25,000lb to 100,000lb, making it applicable for both narrowbody and widebody future aircraft programmes.

In terms of SAF, we are playing a significant role in advocating for its use. That means both reminding the industry that SAF can be used in a 50% blend for flight right not and also supporting efforts to take certification on to 100% unblended SAF.

We've committed to ensuring our current engines are compatible with 100% SAF by 2023 and have carried out a number of tests, both in flight and on testbeds, to confirm this.

For example, we supported an Airbus A350 flight, powered by our Trent XWB and on an A380 powered by our Trent 900 engine. Additionally, we have partnered with Boeing and World Energy to carry out a test flight of our own 747 Flying Testbed aircraft using 100 percent SAF on a Trent 1000 engine.

We have also incorporated SAF adoption into our services, including our new SAFinity service for business jets, for which Shell is the exclusive SAF supplier.

We are also committed to the use of SAF in our own operations and are about to start using a 10% SAF blend on all our engine testing that takes place at our facilities in Derby and Bristol, UK, as well as Dahlewitz in Germany

Our decarbonization strategy will ensure that Rolls-Royce is not only compatible with, but actively supporting a net zero future. We believe there are few companies better placed than Rolls-Royce to pioneer the vital solutions we need.

Aviation Turkey: Rolls Royce is one of the important players for manufacturing innovative engines and electric aircraft in the sector, what kind of technologies you are currently developing while protecting the environment?

Jason Sutcliffe: We apply our engineering expertise to maximize performance, efficiency, and reliability to continually reduce the

environmental impact of our products and services. Each year we invest heavily in research and development to maximize performance, efficiency, and reliability; further reducing the environmental impact of our products and services. Our commitment is to continuously improve the environmental performance of our products and services, with a particular focus on lowering fuel consumption, emissions, and noise.

As a part of our commitment, we have an increased focus on electrification and a number of projects underway. Because there are opportunities for hybrid-electric and all-electric applications, particularly in the urban air mobility (UAM), commuter and regional markets in aviation. Therefore, we have been working on an incredibly exciting project called ACCEL (Accelerating the Electrification of Flight) with the UK Government and partners at Electroflight and YASA. It's a highly specialized challenge to build the world's fastest all-electric aircraft. Through our ACCEL project, we aimed to build the world's fastest all-electric plane and develop our electrical expertise. Our "Spirit of Innovation" aircraft completed its first flight. The aircraft reached a top speed of 555.9 km/h (345.4 mph) over 3 kilometers, beating the existing record by 213.04 km/h (132mph). We have now officially broken two world speed records as verified by the World Air Sports Federation. The aircraft also achieved 532.1km/h (330 mph) over 15 kilometers – 292.8km/h (182 mph) faster than the previous record. As well as a stunning technical achievement, the project and world record run provided important data for our future electric power and propulsion systems for all-electric urban air mobility (UAM) and hybrid-electric commuter aircraft. The characteristics that 'air-taxis' require from batteries, for instance, are very similar to what was developed for the 'Spirit of Innovation'.

Our electrical power system is also set to power Vertical Aerospace's flagship UAM aircraft. This will be integrated into the piloted all-electric vertical take-off and landing (eVTOL) vehicle, which will carry up to four passengers for 100+ miles at cruise speeds of over 200mph and is on course to certify in 2024. We have also joined forces with airframer Tecnam and Widerøe, the largest regional airline in Scandinavia, to deliver an all-electric passenger aircraft for the commuter market, targeted to be ready for revenue service in 2026.

In the megawatt class, we have carried out tests on our Power Generation System 1 generator at Bristol, UK, and Trondheim, Norway, using an AE2100 engine – this has provided us with an enormous amount of learning and gives us a technology leadership position for the future.

In line with the commitments we also have made under the UN Race to Zero campaign, we are aligning our entire business model to the Paris Climate Agreement goals, to limit global temperature rise to 1.5°C.

We envision technology acquisition and innovation ahead of customer need, over 20-year horizons. This ongoing commitment to innovation is essential to meeting customers and society's needs for sustainable power

A New Commander Needed !

by Muhammed Yılmaz

As the dark clouds still hovering over the US aircraft manufacturer Boeing, the company is facing crisis upon crisis. Entering the most turbulent period in its history, with the 737 MAX experiencing two consecutive accidents within 5 months and the aircraft being grounded throughout the world for 20 months, Boeing has not managed to recover since then.

While the MAX crisis was still not over, manufacturing defects and flaws were detected one after another in the 787 Dreamliner aircraft. It has been announced that the target delivery date for the 777X delayed by at least five years (according to the initial schedule), after Boeing has failed to deliver 787s to customers for more than a year. Considering that all such crises were endured together with the negative effects of Covid-19, hitting hard the entire aviation sector, it would not be wrong to say that Boeing is extremely overwhelmed and exhausted.

"Boeing has lost its way. They need a fresh vision, strategy and maybe a new leadership!", said Domhnal Slattery, CEO of Dublin-based Avolon, the world's second largest aircraft charter company, and it may be worth paying attention to.

O'Leary, CEO of Ryanair, one of Boeing's largest customers, well-known for his sharp tongue remarks, is not as polite as Slattery in this regard. O'Leary, who describes Boeing executives as “running around like headless chickens”, criticizes the company for having a very poor management performance.

No 777X Until 2025!

Earlier it was announced that the 777X, planned to be the new flagship in the wide-body aircraft market, would first come into service in 2020. It was then officially announced that the first delivery, postponed to 2021 and later to 2022, could not be made until 2025.

The Boeing 777X was envisioned as the latest version of the US manufacturer's most popular wide-body aircraft, the 777. Two different models, 777-8 and 777-9, were determined and designed to have both longer range and be larger than the existing 777s. Related actions were also taken even for the cargo version of the aircraft.

Considering that giant Jumbo jets such as the Airbus A380 and Boeing 747-8 do not have equivalents globally, the 777X is certainly to be the largest new aircraft to be manufactured over the next decade. Yet, the 777X's entry into service has been delayed multiple times for various reasons, from the Covid-19 pandemic to manufacturing and engine problems, and to certification issues.

777X - Reasons for Delay

The 777X, Boeing's latest twin-engine wide-body model, was first unveiled at the Dubai Airshow in 2013. The Boeing 777X, which should have completed its first test flight in mid-2019, was only able to take to the skies at the beginning of 2020. The reason for this delay was the recurring General Electric GE9X engine problems that would power the aircraft. These engines, caused delays in the certification process of the aircraft, were known as the world's largest and most powerful aircraft engine powering a commercial aircraft.

Yet it wasn't the only problem with the 777X. In 777X's certification process, during a pressure test applied to the aircraft, the cargo door could not endure the stress level and completely ruptured. This deepened the crisis since Boeing is under a much tighter certification process for the 777X by the FAA, after the tragic developments encountered in the 737 MAX aircraft.

The US Federal Aviation Administration FAA announced that the Boeing 777X would not be certified until mid-to-late 2023, due to incomplete data and preliminary safety checks.

One of the most solid justifications of the FAA's concerns was that the 777X experienced an "uncommanded pitching event" during a test flight in late 2020, meaning the nose of the aircraft pitched either up or down without pilot commands.

Back then, numerous e-mails were published showing that Boeing used a system “equivalent to” the Maneuvering Characteristics Augmentation System (MCAS) that caused the 737 MAX crisis also in the 777X. The US manufacturer flatly denied that the systems on the two aircraft were identical.

The FAA's report noted that the critical avionics system newly proposed to Boeing did not meet regulatory requirements and that modifications on the flight control system were worrisome. It was reported that the technical data required for type certification has not reached a point where it appears the aircraft type design is mature and can be expected to meet the applicable regulations. In short, the FAA told Boeing that the plane is not ready yet. Upon this development, Boeing has been suffering from tremendous loss of confidence. It seems the days of Boeing being able to tell the FAA “Just trust us” are long gone.

Airlines and Passengers Are Also Edgy!

Boeing' is now targeting the end of 2024 for certification of the 777X, with the first delivery expected in early 2025. Many airlines placing orders for the 777X are obviously dissatisfied with such problems and delays, as they rely on Boeing's delivery schedule for their fleet and network planning. The fact that the first delivery being delayed for five years and continuing to extend is not something ordinary for the airlines. Tim Clark,

Chairman of Emirates, the launch customer of the aircraft, has been expressing his discomfort with such delays at every opportunity for a very long time.

Continuing delivery delays of the Boeing 777X are an issue affecting not only the airlines but also the passengers. As many airlines planned to start using the 777X as their new flagship in their fleet, they were planning in parallel to implement new cabin concepts on these aircraft.

Emirates will integrate the new first-class concept into 777X aircraft, currently available on a very limited number of 777-300ER aircraft. Cathay Pacific will introduce a completely new first and business class concept on the 777X. Singapore Airlines is expected to use new first-class cabin on the 777X. Lufthansa was poised to launch its new business class concept on the 777X, but now it is expected to launch on the 787 and A350 in 2023.

Dreamliner Crisis Also Deepening

Various problems discovered in the manufacturing process of the 787 aircraft have completely halted deliveries of the 787 for over a year. Following the announcements claiming that deliveries would resume in October 2021, then in early 2022, and finally in late April 2022, Boeing's latest statement is that deliveries will start in late 2022. But the FAA's concerns would probably lead to further delays in resuming deliveries.

Boeing was said to have submitted incomplete documentation to the Federal Aviation Administration to resume deliveries of its 787 Dreamliner aircraft. Even though Boeing states that the ongoing negotiations with the FAA are fully transparent, it is claimed that no progress is yet to be achieved as some of the requests from the FAA for resuming 787 deliveries have been overlooked. For the time being, Boeing 787 Dreamliner delivery resume date is still unclear.

Aircraft Stock Increases

After initially suspending deliveries in October 2020, deliveries could be resumed for a short while between April and June of 2021. Over a year of delay has had a severe impact on many airlines' plans, creating a huge backlog for Boeing and having to cut production capacity to reduce the number of planes not delivered.

It is estimated that the pause of 787 deliveries for about a year has costed $5.5 billion to Boeing to date. Boeing's 787 jets are worth $12.5 billion, with 100 Dreamliners in inventory, being parked and undelivered to customers.

The FAA insists that the problems with the 787 are much deeper than a few simple manufacturing problems. In February, the FAA announced that it would not allow the plane maker to self-certify its new 787 jets and that a "systemic fix" to the company's manufacturing processes was needed. The FAA declared it will retain the authority to issue airworthiness certificates until it is confident "Boeing's quality control and manufacturing processes consistently produce 787s that meet FAA design standards."

To destock the undelivered 787 Dreamliner and 737 MAX in stock, to bear the burden of compensation, to overcome all the problems and bottlenecks related to the supply chain, to face up the difficulties arising from the war between Russia and Ukraine on regional and global aviation, to heal the wounds of the terrible economic crash caused by the pandemic, to overcome the global perception that Boeing aircraft are unsafe and to quell shareholders' unease are just a few of the fighting fronts that the US plane maker has to struggle simultaneously. It seems challenging to win this battle with the current management mindset. Therefore, for my part, it is necessary to immediately start looking for a real commander, who can break the logjam that the company is in and return it to its former shining days. Or else, we may have to watch documentaries like Downfall on Netflix about Boeing!

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RUSSIAN ROULETTE IN THE SKIES

by Muhammed Yılmaz

Russia's attacks on Ukraine started on February 24th led to developments that turned the global aviation industry upside down. It seems serious efforts, time and financial resources will be needed across the industry to deal with the negative effects of the radical decisions taken by the Moscow administration.

All started with the western countries' imposing sanctions on Russia regarding its invasion of Ukraine. Numerous aircraft charter companies, mostly from Ireland and EU member states, terminated their lease agreements with Russian airlines and requested Russian operators to return their aircraft by March 28th. However, the Russians refused to cooperate with western companies.

According to the Russian Ministry of Transport, as of February 24th, a total of 1,367 aircraft, 745 of which were foreign-owned, were operating in the fleet of Russian airlines. 980 of them were passenger aircraft. 515 of them were mostly owned by Irish-based lessors. The total value of leased aircraft in Russia is thought to be over 12 billion dollars.

The Russian government advised airlines to seize the planes as anti-sanction measures, rather than returning them to the leasing companies. As 78 of the leased planes were seized by their owners abroad. It is known 425 of the leased planes are now within the borders of Russia.

Airplanes Confiscated!

Then there was a shocking development disrupting the balance of the industry. Deputy Prime Minister Yuri Borisov announced that the leased aircraft in the fleet of Russian airlines will remain in Russia. The Moscow administration, in violation of international rules, decided to confiscate the leased planes and passed a law allowing the planes to be registered in Russia. The law, intended to support civil aviation and signed by Russian President Vladimir Putin, gave Russian airlines the right to register foreign aircraft they leased to Russia and to issue local certificates of airworthiness by the Russian civil aviation authority.

Bermuda and Ireland, where most of the country's aircraft are registered, have suspended aircraft airworthiness certificates. After such a move, which normally requires the aircraft to be grounded, the Russians registered the planes in Russia and insured them through Russian reinsurance companies which are the subsidiaries of the Russian Central Bank. With the amendments made in the Russian Aviation Law, Russian airlines have paved the way to continue their domestic operations by keeping their foreign leased aircraft, meaning the seizure of aircraft by the Russian state.

So long as the planes stay in Russia, there is no way for the leasing companies to take the possession of their planes back. The Russians also do not make lease payments, as they are also excluded from the international payments system SWIFT. It is thought that the Russian's move to confiscate the planes to maintain the stable operation of the national transport system could be the historic aviation insurance loss. The market is expected to see an eventual loss of between $1 billion and $4 billion after reinsurance.

Vladimir Putin also announced that they will provide 100 billion Ruble ($1.25 billion) support to airlines to help them cope with the consequences of the sanctions, and a state subsidy for domestic flights in 2022.

Insurance Companies under risk to remain solvent!

The Russian airlines' not returning the planes may lead some of the aircraft leasing companies into insolvencies. Insurance companies are also under serious risk as leasing companies are hoping to get a hefty payout under war risk insurance. The leasing companies, claiming that a declaration of war is not necessarily required to claim under a war-risk policy, is pushing the insurance companies by claiming that nationalization, seizure and restraint under government orders are also covered.

Russia's transfer of leased aircraft to its own registry contradicts the international rules that prohibit an aircraft from being registered in more than one country at the same time. Once the crisis is over, this situation is likely to turn into litigation between Russian airlines, lessors and insurance companies that could last for decades. With these moves that will change the balance throughout global aviation industry, Russia is at the most serious risk of defaulting on its debts in history.

Western leasing companies are seeking ways to assign their agreements with Russian carriers to Chinese leasing companies, as China is one of the few countries that continues to maintain relations with Russia at the pre-war level. Assignment of lease agreement to another company is on the table as an option, yet with little chance of success and requiring heavy bureaucratic and legal procedures.

HOW RUSSIAN AVIATION PREVENTS BANKRUPTCY?

Western sanctions also prevent the supply of spare parts and maintenance services to Russian airlines. After the European Union member states, Canada and the United States closed their airspace to Russia, two giant manufacturers Boeing and Airbus also joined forces to impose sanctions on Russia. Both companies announced that they have cut off Russian airlines' access to the spare parts they need to maintain and safely fly their jets. Upon engine manufacturers and other service companies' also taking part in this decision, Russia, the aviation sector of which is foreign-dependent by around 70%, put itself in a tight spot.

The problems in receiving spare parts and maintenance & repair services for aircraft in active use are among the most critical setbacks of Russia. Authorities are examining how Iran has managed to conduct flights under bans over the years.

Poor maintenance and lack of spare parts is primary cause factor for plane crashes in the long run. The pace of Russian aviation's coming to a halt depends on the size of the airlines' fleets and how much time left in the maintenance schedule of actively used aircraft.

Domestic flights will continue as long as parts are supplied. In the long run, Russian airlines will have no alternative but to become more self-sufficient to continue flying. About two-thirds of the commercial aircraft fleet in Russia consists of aircraft made by non-Russian plane makers. The only way that these planes conduct their flights may be to minimize the existing fleet and make parts transfer between planes.

This will cause the commercial aircraft fleet in Russia to gradually become smaller, leading

to more older and unsafe aircraft over time. Unless Russia takes action to evade the sanctions, the problems we have seen in Iran in the past will inevitably arise in Russia as well.

Airfares will go up

The increasing oil prices due to the political and social instabilities experienced have always been reflected to airfares. The reactions of the western world to Russia's attacks on Ukraine, affected the easy access to crude oil and led to supply and demand imbalance, thus affecting the airfares directly. For airlines, a 10% rise in fuel prices triggers about 3% increase in overall operating costs, thus forcing the airlines to increase their ticket prices.

The closure of the airspace of the US, EU countries, Canada and Russia to each other forced airlines to seek alternate routes, resulting in the lengthening of many flight routes and they also stopped flying many passenger routes. This causes social, economic and environmental problems due to the lengthening of flight routes, longer flight times and higher fuel consumption. The flight operating cost of a wide-body passenger aircraft is around 10,000 Euros per hour. Extending the flight time by 2-3 hours due to airspace bans increases the total round-trip flight cost for airlines by between 40,000 and 60,000 Euros.

If the Russia-Ukraine War continues and the global oil supply continues to be affected by this crisis, we can expect to see airfares going up this summer than we anticipated.

Russia accounted for around 6% of global air traffic capacity in 2021. Russia, the world's 11th largest aviation market, is becoming more and more helpless due to the devastating economic impacts of the sanctions, its prevention in access to spare parts and maintenance services, and the closure of the North American and European airspace. On the other hand, the anti-sanction measures adopted Russia are shaking the global aviation industry. Let's see how the Russian roulette in the skies will end up...


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Airbus is Strengthening its Presence in the UK

Airbus is strengthening its presence in the UK with the launch of a Zero Emission Development Centre (ZEDC) for hydrogen technologies.

A priority for the UK ZEDC will be the development of a cost-competitive cryogenic fuel system required for the successful entry-into-service of Airbus' ZEROe passenger aircraft by 2035 and to accelerate UK skills and know-how on hydrogen-propulsion technologies.

The UK ZEDC will benefit from the recent commitment by the UK Government to guarantee £685 million of funding to the Aerospace Technology Institute (ATI) over the next three years to support the development of zero-carbon and ultra-low-emission aircraft technologies.

"Establishing the ZEDC in the UK expands Airbus' in-house industrial capabilities to design, develop, test and manufacture cryogenic hydrogen storage tanks and related systems for the ZEROe project across Airbus' four home countries. This, coupled with our partnership with ATI, will allow us to leverage our respective expertise to realise the potential of hydrogen technology to support the decarbonisation of the aviation industry,"said Sabine Klauke, Airbus Chief Technical Officer.

Technology development at the new UK ZEDC, to be based in Filton, Bristol, has already started and will cover the full product and industrial capabilities from components up to whole system and cryogenic testing. End-to-end fuel systems development, a speciality of Airbus in the UK, is one of the most complex technologies crucial to the performance of a future hydrogen aircraft.

The ZEDC complements Airbus' existing Research and Technology footprint in the UK, as well as the work on cryogenic liquid hydrogen tanks being done at Airbus' existing ZEDCs in Madrid, Spain and Stade, Germany (composite structure technologies) and in Nantes, France and Bremen, Germany (metallic structural technologies). All Airbus ZEDCs are expected to be fully operational and ready for ground testing with the first fully functional cryogenic hydrogen tank during 2023, and with flight testing starting in 2026.

With this new facility, Airbus reaffirms its long-term commitment to remain a major player in Britain's world-leading aerospace ecosystem, working with the Jet Zero Council to driveforward research in the sector, supporting green jobs and helping the UK meet its ambitious net zero targets.

The launch of the UK ZEDC follows the opening of the £40 million AIRTeC research and testing facility in Filton in June 2021, jointly funded by the ATI and Airbus, to deliver the next generation of aircraft wing, landing-gear systems and fuel system designs.

ÇELEBİ PLATINUM DİYARBAKIR CIP LOUNGE

Çelebi Aviation
Expands Its Service Portfolio In Turkey

Established in 1958 as Turkey's first private ground handling company, Çelebi Aviation aims to increase the variety and quality of the services it delivers to its business partners and is performing activities to this end.

As one of the pioneering brands in the field of ground handling and cargo services, Çelebi has previously added Platinum services to its Premium service category, including meet and greet services, fast-track, lounge services to offer a unique travel experience to its valued guests.

Çelebi Aviation, well-known within the sector with the innovations adopted throughout its services since the day it was founded, will launch the Lounge services in Turkey which it currently offers at the Budapest Station. It will start to serve at Diyarbakır Airport in June. Offering various Platinum services to its valued guests at Budapest Airport as well as 13 airports in Turkey for more than 15 years, Çelebi aims to offer to all commercial flight passengers, especially to the business world, the CIP Lounge that it is prepping to launch in Diyarbakır.

To carry on its high-level service approach in Diyarbakır as well, for providing the highest comfort and making its guests feel privileged, Çelebi will be able to serve 126 passengers in the CIP Lounge, which has an indoor area of more than a thousand square meters and a parking lot with a capacity of 32 vehicles. Thanks to Diyarbakır CIP Lounge, which will be its first lounge services in Turkey, Çelebi aims to cover the need in the region. The CIP Lounge, which will serve many passengers, especially the representatives of the business world operating in the region, will also make serious contributions to the economy of Diyarbakır. The official opening ceremony is planned to be held in June and many politicians and bureaucrats of the region, as well as representatives from the business world and NGOs are expected to attend the ceremony. Diyarbakır Çelebi CIP Lounge will also create employment opportunities in the region.

Premium Economy Experience with Emirates Airlines

Emirates opened Premium Economy cabin for sale from 1 June 2022. The new cabin class, which offers luxurious seats, more legroom, and a service to rival many airlines' business offering, will be available to Emirates customers travelling on popular A380 routes to London, Paris, Sydney from 1 August, and Christchurch from December.

Emirates is the only airline in the region to offer a Premium Economy cabin. Sir Tim Clark, President Emirates Airline said: "As with everything we do, Emirates Premium Economy will be exceptional in its class, with minute attention given to every aspect of the customer experience. Customers trading up from Economy will be getting excellent value. "Since we first introduced our Premium Economy seats in January 2021, the positive response and demand has been tremendous. We currently have six A380s equipped with this cabin class, which limits our initial deployment, but our intention is to offer this experience to many more markets across our network. This November, we will begin our retrofit programme to install Premium Economy on 67 A380s and 53 Boeing 777s. At the end of the programme, Emirates will have 126 aircraft fitted out with Premium Economy cabins, as well as our latest interiors across other cabins. It is a major investment to ensure our customers continue to have the best experience in the sky."

Dedicated check-in area for Premium Economy at Dubai International airport. Once onboard, customers will immediately notice the quiet luxury in Emirates' Premium Economy cabin. A wood panel finishing similar to Business Class sets the cabin's mood, and each seat is designed to provide optimal comfort and support with 6-way adjustable headrests.

The cream-coloured leather seats have a generous pitch of up to 40 inches, is 19.5 inches wide, and reclines 8 inches into a comfortable cradle position with ample room to stretch out. It also offers calf rests and footrests for additional comfort, in addition to many other thoughtful touches such as easily accessible in-seat charging points and a side cocktail table.

Customers can get comfortable under soft, sustainable blankets made from recycled plastic bottles, and snuggle into the generously sized pillow, both designed uniquely for Premium Economy. They can also refresh themselves with the complimentary amenity kits which come in reusable, sustainable bags, and contain items which are all made with some element of recycled or sustainable materials.

Incorporating elements inspired by Business Class, customers will be welcomed onboard with a welcome drink in fine glassware. During meal service, a selection of generous meals made with seasonal ingredients and regional influences will be served on chinaware, accompanied by stainless steel cutlery wrapped in linen napkin. The drinks menu will include a selection of beverages including premium wines and a sparkling Chandon wine. There are also liqueurs available after meals, with chocolates.

Each seat has a 13.3" screen, one of the largest in its class, to enjoy the unmatched array of up to 5,000 channels of music, movies, TV, news and other content on Emirates' award-winning ice.

On a four-class Emirates A380, the Premium Economy cabin is located at the front of the main deck with 56 seats laid out in 2-4-2 configuration. On the Emirates Boeing 777, up to 24 Premium Economy seats will be installed in a dedicated cabin section between Business and Economy.

Avion Express Extends its Partnership with SunExpress for 2022 Summer Season

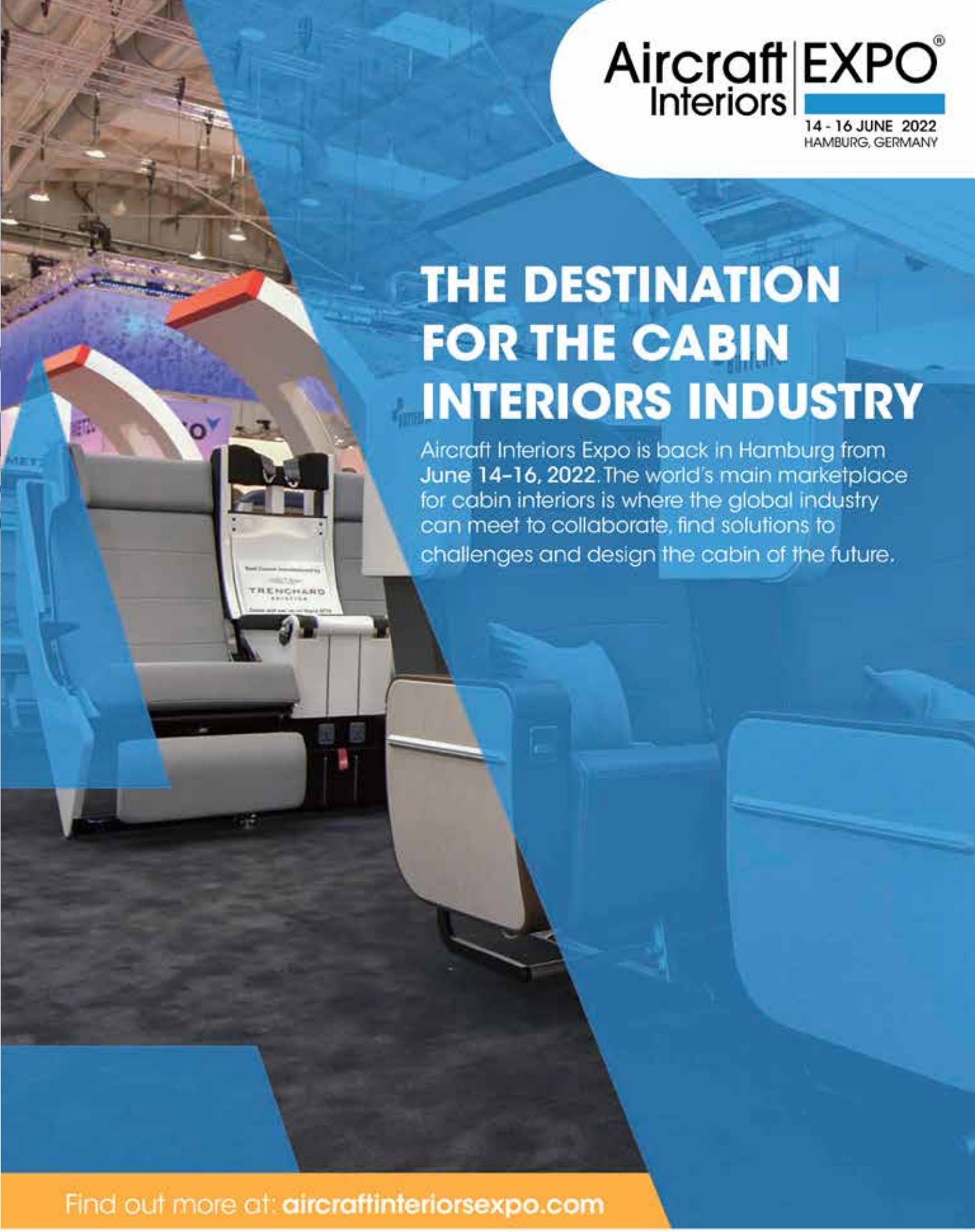
Leading global ACMI (Aircraft, Crew, Maintenance, and Insurance) operator, Avion Express, has announced that the company will be continuing its partnership with SunExpress for the summer season of 2022. During the season, Avion Express will damp-lease 6 aircraft to operate on behalf of Sun Express in the Antalya Airport (AYT) base.

The pent-up travel demand that has been continuing since last year, brought sky-rocketing holiday booking numbers for the current summer season. The continuation of the partnership between Avion Express and SunExpress reflects that and will aid in meeting the demand.

Avion Express is the leading narrow-body ACMI and charter operator operating Airbus A320 family aircraft and a family member of Avia Solutions Group – a leading aerospace services group. For over 17 years, Avion Express has established long-term partnerships with clients across the globe, moving 2.8 million passengers annually.

SunExpress is a joint airline venture of Lufthansa and Turkish Airlines. This summer season, the airline has been flying to 15 cities in Turkey, including, Antalya, Konya, and Mardin, as well as international destinations, which include Beirut, Milan, Nantes, Manchester, Tel Aviv, Budapest, and Skopje.

"We are extremely proud to continue our relationship with SunExpress and provide additional capacity for summer 2022. We are also excited to be back to and be based in one of the busiest destinations of summer in Europe – Antalya, and experience summer operations in full swing. I would like to thank both teams for hard work, dedication, and cooperation up to now and I am sure summer 2022 will be fruitful for both airlines," says Avion Express Vice President Commercial Dainius Staniulis.



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Inmarsat and Honeywell are **Setting a New Benchmark** in Satellite Communications

Inmarsat and Honeywell are setting a new benchmark in satellite communications with the launch of SwiftJet, their latest inflight connectivity service for the business aviation industry. It will enter commercial service in the first half of 2023 and deliver the fastest ever speeds over L-band.

As one of the first new services to be introduced on Inmarsat's ELERA satellite network, SwiftJet will offer seamless global coverage across flight routes with maximum speeds of 2.6Mbps, up to six times faster than Inmarsat's existing business aviation connectivity solution over L-band. This will allow passengers to create a secure 'office in the sky' with enhanced capabilities for video calls, web browsing, email, texting, cloud-syncing and collaboration tools such as Microsoft Teams. Social media and video applications such as TikTok and YouTube, which were previously challenging over L-band, will also be enabled.

As the latest addition to Inmarsat's market-leading portfolio of business aviation inflight connectivity services, SwiftJet will be available alongside Jet ConneX (JX) and SwiftBroadband (SBB), which have been activated on thousands of jets worldwide. JX is the most popular and widely-adopted premium, high-speed solution available today, powered by a global constellation of Ka-band satellites. Additionally, SBB offers speeds of 432Kbps over L-band using smaller antennas that are suitable as a secondary system to JX or as primary connectivity for smaller or older aircraft.

SwiftJet uses advanced hardware from Inmarsat's partner Honeywell, which can be equipped on a broad range of aircraft and also supports cockpit and safety services. Existing customers of Inmarsat's SBB service will benefit from a natural upgrade path without needing to replace any externally-mounted aircraft equipment, while new customers will experience the same ease of installation as with any Inmarsat L-band terminal. The service also creates new opportunities in the smaller jet market, which have previously been restricted to basic voice or text connectivity that fails to meet the needs of modern day travellers. It is available to pre-order through Honeywell, with additional incentives in an early adopter campaign.

Inmarsat is launching the Following a period of turbulence over the past two years due to the global pandemic, a recent survey by Inmarsat and Corporate Jet Investor (CJI) found that almost 80% of respondents around the world believe more frequent business aviation flights will be taken in the next year. Furthermore, a staggering 90% feel that online activities will dominate the principals' time in the air, split between business and leisure.

ELERA capabilities are being further enhanced with the addition of two Inmarsat-6 satellites, the largest and most sophisticated commercial communications satellites ever built, both of which the 2030s, reinforcing the service's long-term value. The L-band capacity on each I-6 satellite will be substantially greater than Inmarsat's 4th generation spacecraft, delivering 50% more capacity per beam in addition to unlimited beam routing flexibility.

The I-6 series of satellites will also play a crucial role in the ongoing growth of Inmarsat's unique ORCHESTRA dynamic mesh network, which will bring existing geosynchronous (GEO) satellites together with low earth orbit satellites (LEO) and terrestrial 5G to form an integrated, high-performance solution, unmatched by any existing or planned competitor offering.


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ITA Airways Becomes First Italian A350 Operator

TA Airways, Italy's new national carrier, has taken delivery of its first A350, becoming the 40th operator of the type. The aircraft, which is on lease from ALAFCO, landed for the first time in Italy at Rome Fiumicino Leonardo da Vinci International Airport on Wednesday evening. ITA Airways' A350 cabin is configured in a two-class layout, with 334 seats comprising 33 full lie-flat bed Business and 301 Economy seats.

ITA Airways' A350 will start operations early June 2022 to serve the new intercontinental routes that the company will open in the summer season from Rome Fiumicino to Los Angeles, Buenos Aires and Sao Paulo.

In December 2021, the Italian carrier firmed up an order for 28 Airbus, including 18 Single Aisle (seven A220s, 11 A320neos) and 10 A330neos, the latest version of the most popular A330 widebody airliner. Moreover, ITA Airways already leased more than 50 additional new generation Airbus aircraft, six of which are A350s, to complement their fleet modernisation.

The Airbus A350's clean-sheet design features state-of-the-art aerodynamics, fuselage and wings made of advanced materials, plus the most fuel-efficient Rolls-Royce Trent XWB engines. Together, these latest technologies translate into unrivalled levels of operational efficiency and sustainability for ITA Airways, with a 25% reduction in fuel-burn and CO2 emissions compared to previous generation aircraft.

Turkey's First Unmanned Helicopter, The ALPIN

Manufacturing Turkey's first unmanned helicopter, the ALPIN, TITRA has strengthened its presence in both civil aviation and UAV fields by making a strategic cooperation agreement with Cicare, one of the world's prominent helicopter builders.

As part of this agreement, TITRA, performing in the fields of unmanned systems, healthcare technologies and smart cities, aims to sell Cicare Helicopters in Turkey and to countries in the region, provide authorized service support, conduct joint production and to use such helicopters TITRA's aviation projects.

Cicare, one of the well-established aviation companies of Argentina and Latin America with its over 60 years of experience, aims to increase its market share in Turkey, the Turkic States, the Middle East, and North Africa on account of the strategic cooperation with TITRA and to open up new opportunities with the help of TITRA's experience.

Cicare's CEO Juan Cicare said: "This cooperation with TITRA will create new opportunities for both companies and countries. This agreement will be the beginning of a journey towards the growth of both companies and the strengthening of their technologies, with the aim of producing major components of our ultra-light aircraft in Turkey."

TITRA's CEO Davut Yilmaz said: "With the strategic cooperation with Cicare, we have taken a step forward in transforming the manned helicopter to an unmanned aircraft. We will be the distributor and authorized service center of Cicare helicopters, both on sportive and civil aviation side, for Turkey and the countries in the region, and we will ensure the production of the critical parts of such helicopters domestically in the future. We aim to make TITRA a reputable brand in the field of manned and unmanned helicopters, with the investments on infrastructure, equipment and human capital we have made and will make."

IGA Istanbul Airport Becomes a Trustee Member of TIACA

With the substantial share of Turkish Airlines and Turkish Cargo, IGA Istanbul Airport offers transportation activities to 120 countries, 60 capitals and 130 destinations within a 3-hour flight distance and provides benefits to airlines flying to and from Istanbul for air cargo.

The "cargo city", to reach an annual cargo capacity of 2 million tons in 2023 and 4.5 million tons when all phases are finalized, also offers its users the opportunity to make long-term planning over a wide zone. IGA Istanbul Airport provides high operational efficiency for cargo transportation with its infrastructure and service quality as well as its geographic advantage.

The airport stands out for its features such as fast parking for cargo aircraft, easy transportation to and from passenger aircraft parked close to the terminal and passenger walkways through 3 separate tunnels on the apron, parking lots just next to the warehouses, and a capacity to simultaneously accommodate over 29 wide-body aircraft.

Having gained international recognition for the advantages it offers, IGA Istanbul Airport has been upgraded from Corporate Membership in The International Air Cargo Association (TIACA) to Trustee Membership. With this change – as a symbol of trust on global scale, IGA Istanbul Airport now has the right to contribute to TIACA's vision and mission as well as board voting.

Providing a large storage capacity for international e-commerce businesses, IGA Istanbul Airport is regarded as a cargo-friendly airport with its focus on digitalization and efficiency improvement.

STELIA Aerospace and AERQ will Showcase OPERA® for A320neo Family in Hamburg

The first step of this collaboration will be revealed at Aircraft Interiors Expo 2022 in Hamburg and is the integration of a 32" UHD OLED Welcome Board in the front row monument of OPERA® for A320neo family. As a cabin touchpoint, the Welcome Board greets passengers onboard the aircraft, offers useful flight information, tips and advertisements and helps airlines enhance their brand awareness.

Launched in 2020, OPERA® is STELIA Aerospace's new "Full Flat, Full Access, Full Privacy" Business Class seat, offering the highest standard wide-body comfort on single-aisle aircraft and is optimised for the A320neo family, including the first and last row monuments.

The state-of-the-art 32" UHD OLED Welcome Board brings OLED display technology quality to the cabin. This collaboration for AIX 2022 is an outstanding opportunity to showcase the endless possibilities that OLED displays bring to the cabin, such as integration into cabin monuments. This highlights the flexibility and modularity of Cabin Digital Signage based on OLED technology which could also be applied to virtual ceilings or windows and to divide cabins in a new and stunning way.

This front row monument screen for OPERA® is available for the A320neo family and will soon be for the A321XLR.

Thales Strengthens its Partnership with Dassault Aviation

Thales announced the expansion of its collaboration with Dassault Aviation through the signature of a maintenance agreement signed on April 1, 2022 for electrical systems on Falcon 900 and Falcon 2000 Series Fleets.

This partnership began with the Falcon family of Business Jets back in the seventies starting with the Falcon 50 followed by the Falcon 200, Falcon 900 and Falcon 2000, and most recently the Falcon 6X. Dassault Aviation and Thales share the same commitment to excellence in design innovation and for reliable and affordable electrical generation and conversion products. More than 2100 Falcon aircraft operate worldwide cumulating over 21,000,000 flight hours in 2021.

Both companies achieved a new stage in their relationship through the signature of a partnership agreement. Through this agreement Thales and Dassault Aviation will bring to Falcon operators unprecedented value for Premium Services along with significant reductions in Direct Maintenance Cost (DMC) and a robust incentive campaign for Starter Generators P/N 8060-160 upgrade to a new P/N 8060-170.

This upgrade offer on the Thales Starter Generator improves DMC while providing annual savings for operators thanks to design enhancements that help reduce maintenance operations including brush wear inspections and removals.

First Woman to Pilot AW609 Tiltrotor

Leonardo hosted Her Highness Sheikha Mozah Bint Marwan Al Maktoum at its United States' helicopter headquarters in Philadelphia, providing her the opportunity to personally test the revolutionary AW609, the world's first tiltrotor set to receive civil certification.

"Demonstrating the AW609's combined fixed and rotary-winded piloting capabilities was a true milestone for the team in Philadelphia." said William Hunt, Managing Director, Leonardo Helicopters in the U.S.

The AW609 is one of the most significant technological innovations in the civil aviation landscape, melding the helicopter's operational versatility (taking off and landing vertically) and the airplane's performance advantages (pressurized cabin, speed, altitude and endurance abilities), opening new and exciting possibilities for passenger transport and public service.

Her Highness Sheikha Mozah Bint Marwan Al Maktoum was the first woman to pilot the AW609, setting a new and important milestone for female pilots in civil aviation.

"Piloting the AW609 has been on my bucket list since I first saw the early prototype images. It is the natural evolution of my piloting experience, merging both fixed and rotary-winged piloting skills. I am still pinching myself for this opportunity! Aircrafts like this one make me feel really excited about the future of aviation, a future now open to more women who chose this industry."

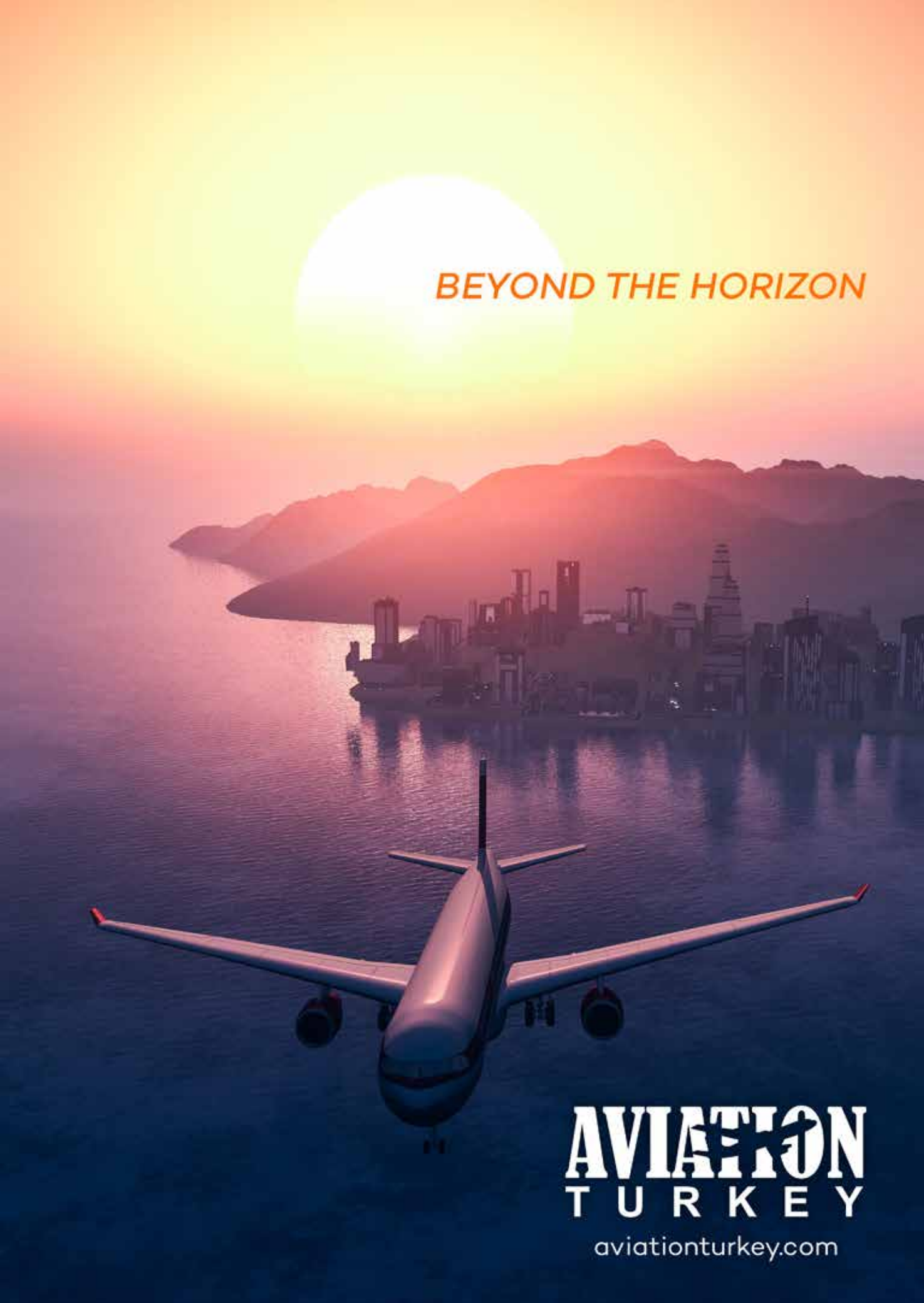
The AW609 will revolutionize point to point transport. The tiltrotor can take off and land vertically and hover like a helicopter, and fly offering passengers the comfort of a turboprop airplane. Able to operate different kind of missions, including VIP transport, emergency medical service, search and rescue, and government applications, the AW609 can fly at a speed of more than 500 km/h with a range of almost 1,400 km, which can reach 2,000 with auxiliary tanks.

Uzakrota Focusing Especially on Germany and the European Region

Established by Gökhan Erdoğan in 2010, Uzakrota has two centers in the United States and Turkey. Since the day it was founded, it has brought together the big names of the industry, various players such as online travel agencies, airline companies, hotels, technological startup companies, accommodation investors, technology companies come together; shares events, predictions, insights from their own perspectives, and evaluates possible cooperation opportunities. Farrota makes a great contribution to world tourism by bringing together leading names, bright minds and professionals through panels, hosting promising successful companies in the booth area, and making the big players in the same booth accessible to everyone. The partnerships established at the Uzakrota summits are increasing day by day and continue to make a name for themselves.

In the past, in addition to the regional and global summits and award ceremonies in big cities such as Berlin, London, New York, Belgrade, Athens and Istanbul, 3 regional and 2 global online summits held at the time of closure, the uncertainty of the future, the predictions of the leaders, during the historical recession of the sector and managed to become the channel needed to minimize it with its foresights. Taking the opportunity to reduce the restrictions, it quickly returned to its missed face-to-face activities in 2022. It held two successful summits in Belgrade and Berlin in April, and the planning of the Baku and Istanbul events, which will take place towards the end of the year, continues.

Over the years, new brands have been added under the roof of Uzakrota. While Checkin By Uzakrota focuses on the events held in the Balkans, the Departure Travel Summit, which is held in partnership with COOR TRR, aims to take the success of Uzakrota to the next level by focusing especially on Germany and the European region.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