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WILL COVID-19 VACCINATION ENABLE THE REOPENING OF BORDERS?


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2020/2021

Yayın Türü
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In this Exclusive Interview, we talked with Ms. Çiğdem Özkan, General Manager of ACM Air Charter Company, about Air Charter Market, Business Jet services and Airport fueling services. Ms. Özkan also informed us sincerely to be a woman in aviation sector. And also Ms. Özkan informed us about being a Woman in the Aviation Sector

nts

Will the COVID-19 Vaccination Enable the Reopening of Borders?

With increasing numbers of countries starts their Covid-19 vaccination roll-out. Some countries have made a lot of progress in their vaccination campaigns, but the others have just started.

Then a question has arisen; will vaccination be mandatory for the global aviation industry to go back to normal and enable reopening the borders?

IATA recently announced that they support unrestricted access to travel for vaccinated travelers. In cases where vaccination is not possible, access to quarantine-free travel should be provided through COVID-19 testing strategies based on widely available, free-of-charge tests.

More than 20 countries have wholly or partially lifted restrictions for vaccinated travelers. Germany is among the latest countries to make quarantine alleviations for vaccinated travelers. Vaccinated travelers are no longer subject to quarantine measures (except from certain high-risk countries). Germany has also removed quarantine requirements for travelers with a negative COVID-19 test result (except from certain high-risk countries).

The German government decision followed a review of scientific advice from the world-renowned Robert Koch Institute (RKI), which concluded that vaccinated travelers are no longer significant in the spread of the disease and do not pose a major risk to the German population

In the US, the Centers for Disease Control and Prevention (US CDC) has noted that “with a 90% effective vaccine, pre-travel testing, post-travel testing, and 7-day self-quarantine provide minimal additional benefit.” According to the US CDC, alleviations from COVID-19 restrictions are a powerful motivator for vaccination, particularly in communities where vaccine hesitancy is prevalent. This is an additional and important benefit of restriction-free travel for those vaccinated.

On the other hand The European Parliament approved the introduction of EU Covid-19 certificates, which are intended to facilitate travel this summer. The member states, which are expected to align the certificates with their own national vaccination certificates and systems, are discussing the details of the scheme in the European Council. The EU Digital COVID Certificate (EUDCC), previously called the Digital Green Certificate, will allow for travel restrictions to lift across all 27 member states - and will be available for specific non-EU countries, too. The certificate will not be a precondition to exercise the right to free movement and will not be considered a travel document. It will cover an individual's vaccination, test and/or recovery status a digitally signed QR code in available in a digital and paper-based format, depending on the choice of the recipients.

It is expected to be effective as of July 1st 2021 but there is a discussion going on whether the

document could result in discrimination against those who haven't been vaccinated. Against to this discussion the Commission released a sheet and stated that People who are not vaccinated must be able to continue to exercise their free movement rights, where necessary subject to limitations such as testing or quarantine/ self-isolation.

EU Member States have agreed to allow more travelers from third countries to enter the block, in particular vaccinated travelers, who have been inoculated with a COVID-19 vaccine approved by the European Medicines Agency (EMA). EMA has started a rolling review of China's Sinovac COVID-19 vaccine. Rolling reviews are aimed at speeding up the approval process by allowing researchers to submit findings in real-time before final trial data is available.

I hope, from onwards, we all have safer and quarantine- free flights away from unprecedented incidents in the future.

Ayşe Akalın
Editor in Chief

Digital Health Passport for Air Travels

Muhammed Yılmaz spoke to Nick Careen, IATA's Senior Vice President of Airport, Passenger and Cargo Security and the executor of the Travel Pass project, about Aviation Industry and especially the Travel Pass project.

by Muhammed Yılmaz
Aeronautical Engineer

The COVID-19 pandemic that has severely hit the aviation industry also led to various changes, some temporary and some permanent, in our travels. The most prominent of those is the digital travel passport.

Various decisions of countries regarding border closures and quarantine practices have seriously distanced people from traveling. Recent developments in vaccination were also expected to increase the demand for air travel. However, the difficulties arisen in the supply and global distribution of the vaccine, the emergence of new virus variants and the continuation of the ongoing total lockdown in many countries, especially in European countries, lead to dissatisfaction in the sector in terms of the long-awaited momentum. Analysts say that 2021, carrying high hopes for recovery, could be even worse than 2020.

Australian Qantas CEO Alan Joyce's expression "No jab, no fly", requiring mandatory COVID-19 vaccination for passengers, has also become a new concern as it will have a negative impact on the industry's recovery.

The International Air Transport Association IATA has announced that they are strictly against such a practice. Since the first day of the outbreak, IATA has been making recommendations for people to travel more and to increase global mobility. Within this framework, it calls for rapid, affordable (US$ 7) and systematic COVID-19 testing for all passengers before departure at all airports around the world, for governments worldwide to accept the results of these tests, and for countries to stop their border closure and quarantine practices. It also calls the International Civil Aviation Organization ICAO for duty to make this a global standard.

IATA, on the other hand, continues its efforts to make its mobile application widely used in the industry, which will contain passengers' health information about COVID-19 and provide up-to-date information on travel restrictions.

Travel Pass, which will host critical travel information, allowing passengers to share COVID-19 test results and vaccination certificates with airlines and governments, is thought to reduce people's anxiety about traveling, as the application becomes a norm in the industry.

With the Travel Pass, which we can summarize as the Digital Travel Health Certificate, passport information of the passenger will be linked with test and vaccine certificates from participating laboratories around the world and global health requirements records.

Based on open standards and open source, the App will not store any passenger data centrally, instead it will operate as a verification system with the help of block chain technology.

Emirates, Etihad, Qatar Airways, Air New Zealand, Singapore Airlines and Copa Airlines are among the carriers that have agreed to use the Travel Pass application and it is believed other airlines will follow these companies.

I spoke to Nick Careen, IATA's Senior Vice President of Airport, Passenger and Cargo Security, about the project. He is also the executor of the Travel Pass project.

What is a Travel Pass?

Nick Careen: IATA Travel Pass is a mobile application that helps travelers to store and manage their verified certifications for COVID-19 tests or COVID-19 vaccines. This will be important for governments that are likely to require either verified testing or vaccination proof as a condition of international travel during and after the COVID-19 pandemic. The IATA Travel Pass will be more secure and efficient than current paper processes used to manage health requirements (the International Certificate of Vaccination or Prophylaxis, for example). This will be important given the potentially enormous scale of testing or vaccine verifications that will need to be securely managed.

What information does the Travel Pass contain?

Nick Careen: The IATA Travel Pass has four open and interoperable modules which together create the end-to-end solution. IATA Travel Pass incorporates;

Global registry of health requirements – enables passengers to find accurate information on travel, testing and eventually vaccine requirements for their journey.

Global registry of testing / vaccination centers – enables passengers to find testing centers and labs at their departure location which meet the standards for testing and vaccination requirements of their destination.


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Lab App – enables authorized labs and test centers to securely share test and vaccination certificates with passengers.

Contactless Travel App - enables passengers to (1) create a 'digital passport', (2) receive test and vaccination certificates and verify that they are sufficient for their itinerary, and (3) share testing or vaccination certificates with airlines and authorities to facilitate travel. This app can also be used by travelers to manage travel documentation digitally and seamlessly throughout their journey, improving travel experience.

With whom and how will users' information be shared?

Nick Careen: Travelers always remain in control of their data with their privacy protected. The IATA Travel Pass does not store any data centrally. It simply links entities that need verification (airlines and governments) with the test or vaccination data when travelers permit. This last point is key. No verification will go to an airline or a government without the authorization of the traveler. When needed, the traveler will be prompted to release their certificates to authorities and other stakeholders. If the passenger chooses to do so, the data is sent by them from their phones directly to the other entity. Travelers always remain in control of their data with their privacy protected.

What measures have been taken to prevent information from reaching unwanted persons?

Nick Careen: IATA Travel Pass has been developed using the latest standards from the W3C consortium, the Travel Pass is built on top of a public block chain acting as a decentralized root of trust that truly provides identity for all. This is the concept of self-sovereign identity (SSI) and verifiable credentials. As the protocol used by Travel Pass is based on open standards and open source (The Hyperledger Indy Project), it gives to the participants the assurance that their identity will never be under the control of a single company or federation.

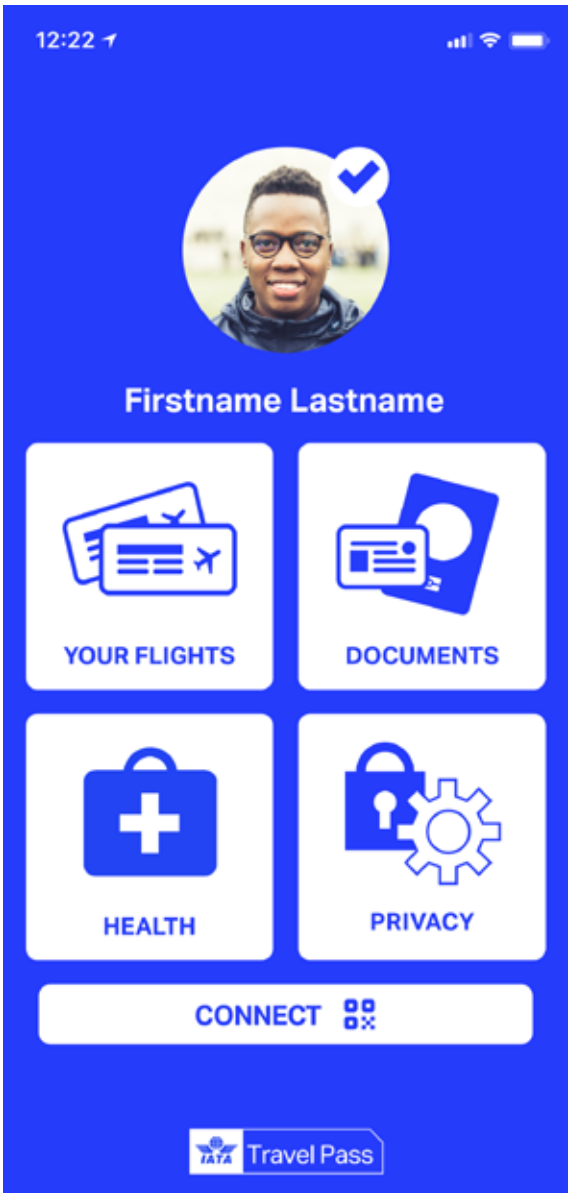
The Sovrin Foundation which operates the public block chain behind Travel Pass is the first global

public utility working as a community of privacy experts from around the world to serve as a guarantee that the network can be trusted by all stakeholders, meeting the strongest privacy standards in the world while being available to all with the required performance to grow at Internet scale.

The result is a scalable and cost-effective solution where the personal data stays on the mobile device of the passenger in his/her total control. Travel Pass facilitates the exchange of encrypted keys between stakeholders (labs, airlines and authorities) via ultra-secured protocols to allow them to verify the authenticity of key documents, therefore protecting the bio-safety of the flight.

What is the purpose of the project paperless?

Nick Careen: Paperless is safer. Paper test results come not only in different formats and languages, but they can also be easily manipulated. Check-in agents need to follow extensive entry requirement guidance and try to determine the authenticity of multiple non-standard test documents passengers present to them. This leads to health check inefficiencies, errors and fraud – an increasing problem around the world.



IATA Travel Pass modernizes, through digitalization, an existing system of paper test and vaccine certificates. IATA Travel Pass moves existing paper processes to a digital platform.

What are the differences of Travel Pass from other similar applications?

Nick Careen: IATA Travel Pass is unique due to the combination of technology and the rules engine supporting the app and in the fact that it been designed by the industry for the industry.

The solution has built using block chain technology. This brings certain benefits firstly it is decentralized meaning that there is no central IATA database with passengers' data, all passengers data is stored on the passenger's own phone. Secondly, the passenger controls their own data on their phone and can choose to share it with airlines and other parties. The App does not enable 3rd parties to access any passenger data, e.g. Google.

The app's the rules engine better known as the Global registry of health requirements –which enables passengers to find accurate information on travel, testing and eventually vaccine requirements for their journey is powered by Timatic, which helped airlines to ensure that the travel documentation of 700 million travelers met government entry requirements in 2019.

The app has been designed by the industry for the industry a travel advisory group made up of airlines provides input into the apps development.

How much budget has IATA allocated for this project?

Nick Careen: is still a work in progress. There are some cost-efficiencies as the IATA Travel Pass relies on some existing IATA solutions like the IATA Contactless Travel App and Timatic. We do not, however, intend to disclose the development cost.

Which airlines and countries officially support the Travel Pass application?

Nick Careen: Since kicking off the development of IATA Travel Pass in December, we are fast approaching the roll out of the first full pilot with Singapore Airlines at the end of March. This will be followed by a pilot with IAG and trials with Qatar Airways, Emirates, Etihad Airways, and Copa Airlines along with another 15 airlines. We have also received public endorsement for IATA Travel Pass from the government of Panama and discussions are ongoing with other governments.

What is the process required to start using the project? (For airlines, airports or governments)

They just need to contact IATA - IATATravelPass@iata.org

Is the infrastructure of all airlines and airports sufficient to implement this system?

Nick Careen: Yes

Will there be any fees for using the application? (For passengers, airlines, airports or governments)

IATA Travel Pass will be free for passengers to download and use. For airline we aim to make this solution as low cost for airlines as possible while ensuring that the solution is robust. Final pricing has yet to be determined.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What is the calendar for the implementation of the project?

Nick Careen: The first-cross border pilots started end of 2020 and the iOS and android launch is slated for the end of March 2021.

To be ready for when governments re-open borders, we are working as fast as we can with our member airlines to bring this to market.

How effective does IATA think the Travel Pass application is in terms of the recovery of the aviation industry, which has plummeted due to the pandemic?

Nick Careen: It will be crucial. To reopen borders without quarantine, governments need to be confident that they are mitigating the risk of importing COVID-19. Testing or proof of vaccine is the solution. IATA Travel Pass will manage and verify the secure flow of necessary testing or vaccine information among governments, airlines, laboratories, and travelers giving governments confidence in a passenger COVID-19 status.

What are the biggest obstacles to the Travel Pass project being applicable all over the world?

Nick Careen: Lack of harmonized health standards. We need the World Health Organization and International Civil Aviation Organization to move faster to develop digital certificates for Covid-19 vaccines and testing, respectively (this is so we can ensure equivalence, mutual recognition, and acceptance for your citizens when they travel around the world). We also need border or other agencies needs to accept digital passenger test/vaccination certificates on a passengers' phone and not just on paper.

There are a number of people who think that the widespread use of this practice will have a negative impact on people's travel demand. How do you intend to overcome this problem? (Especially for those who do not want to be vaccinated)

Nick Careen: Governments, not airlines and not IATA, make the rules on entry requirements for travelers. Airlines and passengers need to comply. Governments will also decide if vaccinations will be mandatory or voluntary for their populations. If governments make vaccinations a requirement for travel, airlines will comply, and the IATA Travel Pass will help them

In this Exclusive Interview, we talked with Ms. Çiğdem Özkan, General Manager of ACM Air Charter Company, about Air Charter Market, Business Jet services and Airport fueling services. Ms. Özkan also informed us sincerely to be a woman in aviation sector. And also Ms. Özkan informed us about being a Woman in the Aviation Sector

by Şebnem Akalın

Şebnem Akalın: Ms. Çiğdem ÖZKAN, first of all thank you for taking the time for the interview. Could you briefly tell us about yourself? When did you start working at the aviation industry? Are there any difficulties of being a woman in aviation industry? Or what kind of advantages do you think being a woman in aviation provide to your work?

Çiğdem Özkan: I was born in 1983 in Diyarbakır. I completed my elementary, secondary and high school education in Diyarbakır. After graduating from the Business Management department at USA BREYER STATE University, I studied for my post-graduate degree in the same area at York University. I worked at family company for a while. I continued my professional career at a private ground services company and worked there for three years. Then I returned to academic life at the Beykent University and studied Architecture - Interior Architecture Double Major there. After working at the architecture sector for a while, I decided to work at the aviation industry in İstanbul, considering the vast business opportunities in this city. I started to work for the ACM Air Charter Market Company that has operated in this sector for long years and aimed to bring my previous experiences to this company for elevating it to further levels with a brand new vision. Currently, I am working as a general manager at the ACM Air Charter Company.

Rather than a discipline tackling the structures, I regard architecture as a discipline approaching all aspects of life through a multi-dimensional, innovative and aesthetic perspective. This profession taught me how to solve problems and to constantly create and achieve better in this sense and shaped my decision to take part in the aviation sector dominated by men and bring a female perspective to this industry. My personal opinion is that in any industry a woman's touch adds meaning to any job and embellishes it. Women have always played a major role in tackling fine details and generating practical and rational solutions.

Şebnem Akalın: ACM Air Charter Market delivers a wide range of services. Could you inform us on such services?

Çiğdem Özkan: Presently, as Air Charter Market, we provide ground services, representation, supervision and fuel services to aircraft at many stations. Currently, we are active in 25 airports throughout the country. We are providing such services abroad as a supporting company in cooperation with many real and legal entities.

In parallel with the development in technologies and transport infrastructure, aviation has become an area that gathers people and countries the most. Therefore, I always desired to elevate this sector to better levels, globally. Taking the indispensability of aviation in this sense in the long run and with a vision to enable more comfortable travels without dependency on time schedules, we started to offer private jet rental services as ACM airlines in addition to our company that conducts representation and supervision activities.

Şebnem Akalın: As an unprecedented threat to the world, the COVID-19 pandemic has undoubtedly affected the aviation industry the most. Has this led to a change in your roadmap? Could you tell us about your activities and operations in the upcoming period?

Çiğdem Özkan: The Covid-19 pandemic that impacted the entire world in all aspects has also adversely affected the transport and aviation sectors. There have been restrictions applied by the governments and states. The number of travels decreased severely. Accordingly, we have adopted measures at the utmost level for our workplace, our employees and our services in line with the existing implementations of the Ministry of Transport's Directorate General of Civil Aviation and the recommendations of scientists. We aim to continue to provide safe, healthy and qualified travel experiences in the upcoming period as well. ,

Şebnem Akalın: We observe that there has been an increase in private jet charters due to the pandemic. Chartering private jets is one of the services offered by your company, so do you think there has been an increase? What precautions do you take and what kind of services do you offer to your customers for these demands?

Çiğdem Özkan: Today, ACM Air Charter Market maintains its private jet services as part of the International and Local Travel Support. We serve our customers with two air vehicles in our company's fleet to represent our company better in the global market in the long run. These aircraft are the Gulfstream GIV aircraft named GAP and ATA which were previously used by the presidents and prime ministers of our country. By the end of April, we will be receiving our third aircraft. In this way, we plan to improve our services and provide more qualified services to intense demands during the pandemic and post-pandemic period.

Şebnem Akalın: As summer approaches, the civil aviation sector normally revives. However, many organizations claim that summer 2021 will also be under the negative impact of pandemic and the recovery is expected by summer 2022. The ups and downs in the sector are said to be W-Shaped before full recovery. What are your comments on this issue considering the incoming demands?

Çiğdem Özkan: We project that the pandemic will affect 2021 summer in a negative way as it did during the summer of 2020. The increasing number of cases results in additional restrictions and measures and we are on top of the list of the most affected sectors. Despite the decrease in the demands in general, as we offer rather private and customized services, new demands began to arise for private flights. Once the course of the pandemic heads towards a positive direction, we will experience faster progress in the representation area with the increasing activities of other airlines.

Şebnem Akalın: Vaccination tours abroad are quite popular recently. It is projected that services such as jet charters will create a new market for organizing vaccination tours. What are your views and comments on this?

Çiğdem Özkan: In fact, we observe a gradual start in a new and major demand in the area of "vaccination tourism" in line with the permits of

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the countries. Our team has been intensely working on market research. I can say that the vaccination tours will become a travelling option in the forthcoming months. We have been pursuing intense negotiations with the travel companies over such travel packages.

Şebnem Akalın: In addition to providing full ground services, including surveillance and representation to commercial flights, business jets, private flights, helicopters, cargo flights and military flights, your company also offers fuel supply services. What would you like to say about ACM fuel?

Çiğdem Özkan: As ACM Fuel, we offer refueling services at all the airports in Turkey. The airports where our staff provides physical refueling services with our equipment are as follows: İstanbul Atatürk Airport (ISL) - İzmir Adnan Menderes Airport (ADB) - Dalaman Airport (DLM) - Tekirdağ Çorlu Airport (TEQ) - Bodrum Airport (BJV) - Ankara Esenboğa Airport (ESB) - Denizli Airport (DNZ) - Isparta Airport (ISE) - Alanya Gazipaşa Airport (GZP).

With our ACM Bunker Fuel Delivery License, we provide refueling services with the JET-A1 fuel we procure from SOCAR and TÜPRAŞ refineries. We deliver this fuel to our VIP jets at the airports in Turkey and the foreign-flagged airlines to which we also deliver Representation and Supervision services. Presently, we deliver refueling services with our 19 refueling air vehicles at our airports with a capacity of 25.000 to 35.000 liters and our depots at the airports with a total capacity of 1.285.000 liters. With our competitive prices and service quality, we aim to become the leading fuel provider in the sector.

Şebnem Akalın: We know that you deliver services at important airports of Turkey. At which airports do you currently deliver services and are there any new airports to be included in your service network in the near future?

Çiğdem Özkan: We deliver our services in the 25 critical airports of our country, particularly at the new İstanbul Airport. We are actively providing services to cargo and passenger aircraft, private jets and helicopters and act as a facilitator as ACM. We are always able to expand our service network in accordance with the demands of our airlines with the addition of new airlines' flight network to our company, by obtaining licenses for other airports.

Şebnem Akalın: Ms. ÖZKAN, is there any message you would like to convey to Aviation Turkey readers?

Çiğdem Özkan: I am pleased to take part in this issue of your magazine. We have been following the Aviation Turkey magazine with great interest.

The aviation sector that has been growing and developing rapidly in our country always needs a qualified workforce. As a person who considers aviation as a passion, I advise young people to head for this sector without hesitation, which has a key role with global prominence. In addition to receiving education in areas such as finance, management and tourism needed by the market, learning English and even a second foreign language will provide them with additional facilities, smooth their way and will broaden their career choices. Our future is in the youth, and the "Future is in the skies"

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Nuri Demirağ and the First Turkish Fighter Aircraft Project (Nu.D.40)

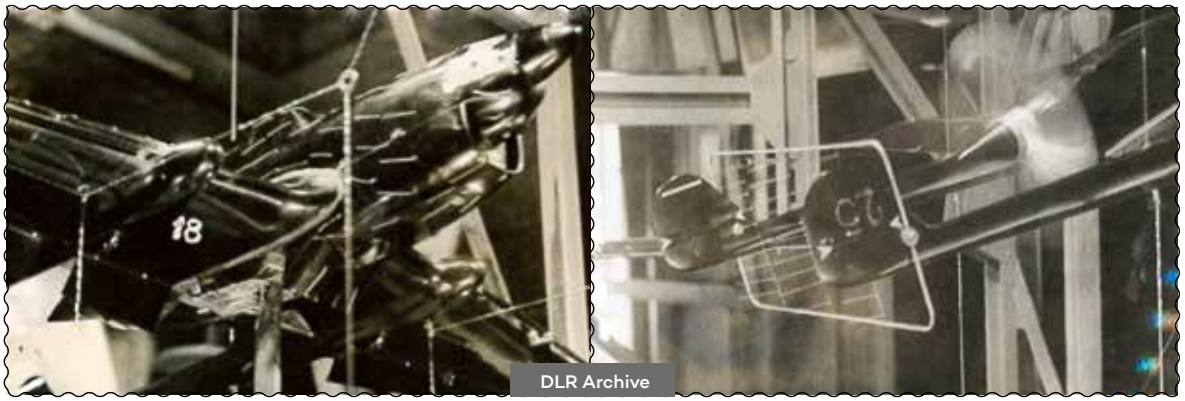
by Dr. Emir Öngüner
Freelance Researcher in Aviation History

Nuri Demirağ (1886-1957), who has an important place in Turkish aviation history, was an influential entrepreneur who is respected by the Turkish nation today with his visionary ideas. After his civil service in Istanbul and the newspaper named Türk Zaferi (Turkish Victory), which he published during his business life in the aftermath of World War I, Demirağ in fact clued how he would proceed in the future in his will that he prepared in 1925. In this will, he expressed that he would spend all his earnings, except for the needs of his family, for the development his country. Upon the establishment of the Republic, the spirit of development became prominent also in the fields of economy, education and industry. In the aftermath of 1923, Nuri Demirağ concentrated on indigenous and independent industry and took part in projects such as railway and highway contracting, factory, dam, mining business. Demirağ's concept of sovereignty is based on investing

in the next generation with indigenous and independent R&D and industry. The surname Demirağ was given to his family in 1934 by the founder of the Republic of Turkey and the first President Mustafa Kemal Atatürk, due to his efforts in the establishment of the Anatolian railway network With the foundation of the Turkish Aeronautical Association in 1925, the Republic of Turkey's activities in the field of aviation started. According to Demirağ, aviation was the driving force of the independent industry under the conditions of that period. The supply of aircraft to the Turkish Armed Forces started with the procurement abroad, and in time, domestic production started. Demirağ aimed to assume the civilian wing of domestic aircraft production and aimed to catch the wave of the Republic in parallel with the progress of aviation with the world. For this reason, in 1936, the Nuri Demirağ Airplane Workshop (NuDTA) was established in Beşiktaş and the necessary studies were initiated. On the other hand, the land of Elmas Pasha Farm was purchased in Yeşilköy and a large airport was built in this area. This area is today's Istanbul Atatürk Airport grounds.

Demirağ planned to undertake the civilian side of the domestic aircraft production and aimed to achieve progress in aviation simultaneously with the world. To this end, he established the Nuri Demirağ Airplane Workshop (NuDTA) in Beşiktaş in 1936 and initiated the necessary work. On the other hand, the land of Elmas Pasha Farm at Yeşilköy was purchased and a large airport was built there, which is today's Istanbul Atatürk Airport land.

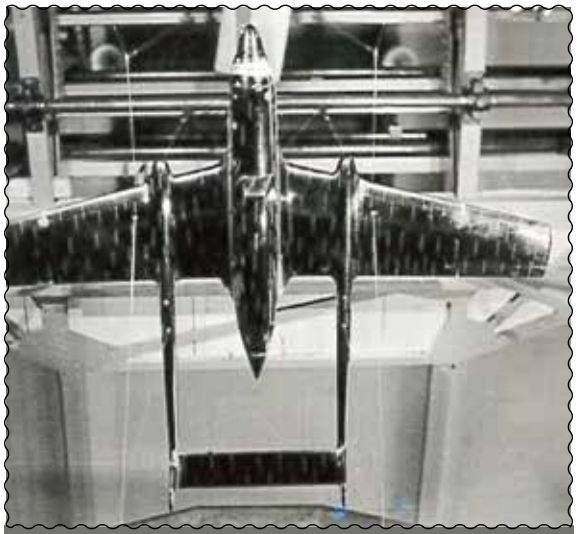
Nuri Demirağ also had to develop the manpower required for the aircraft factory it established. Technicians, pilots and ground services personnel should also have been trained in addition to engineers. The important thing was to lead the establishment of institutions that will provide training at international level in



Turkey (Istanbul and Sivas). There were also reports on newspapers stating that Demirağ sent students abroad for aeronautical engineering education. It is known that while he was running the workshop in Beşiktaş, he was also in contact with the School of Engineering (Istanbul Technical University) at Gümüşsuyu. All such details show how much Demirağ attaches importance to investing in human and to university-industry cooperation.

In addition to the Nu.D.36 and Nu.D.38 coded training and passenger aircraft known in Turkey, another project of Demirağ and his team, which has been recently discovered, is a clear indicator of visionary approach. Demirağ stated in various interviews that he avoided production under licenses and that he aimed to produce Turkish-type airplanes with indigenous designs, and this is one of the most evident examples that can be given to the concept of nationality in the industry. With this perspective, Nu.D.40, the first Turkish fighter jet project, the design studies of which were initiated in 1937 at the workshop in Beşiktaş, was planned to be capable of competing with those of equivalent class in Europe and America.

Since no suitable experimental setup was available in Turkey in those years for aerodynamic tests, one of the most important stages in the development process of the draft project, it was cooperated with the famous Aerodynamic Test Institution AVA in Germany. The communication process started in May 1937 continued uninterruptedly until the autumn of 1939, when the World War II began. The necessary tests deemed appropriate by Demirağ's technical team on the prototype of Nu.D.40 produced in AVA with technical drawings sent from Turkey were carried out in the wind tunnel and the related reports were sent to Turkey. Unfortunately, the fact that the communication interrupted with the start of the war had a negative impact on the project. The process was sustained due to the failure of Turkey to pay the full fee requested by AVA and long time no hear from Turkey, and the events went against both Demirağ and Turkey with the German Aviation Ministry's involvement in the process in 1940. The fact that the related fee could not be collected as per the review made by the Ministry, it was deemed appropriate to submit the technical reports of the Turkish fighter aircraft project Nu.D.40 to Junkers and Focke-Achgelis companies and to the state archive. It was then found out that Junkers worked on a prototype



photos taken during aerodynamic tests of the Turkish fighter jet project Nu.D.40 (DLR Archive)

similar to the Nu.D.40, but the production could not be realized due to the lack of a production license from the Ministry. As it can be seen, the conditions of war hindered Nuri Demirağ Aircraft Workshop from continuing to develop this aircraft, and Nu.D.40 was unfortunately left to its fate.

It is seen that with the first Turkish fighter jet project Nu.D.40, the design of which started in 1937, Turkey has the potential to become one of the few countries that can produce fighter aircraft in the world before World War II. The uncovering of the Nu.D.40 project, which has remained hidden on the dusty shelves of the archives for more than 80 years, reminds us once again of the importance of experimental infrastructure and corporate archiving concepts in the aviation industry. As of 2020, TUSAŞ has launched an initiative to realize this dream of Demirağ and will produce the Nu.D.40 in accordance with its original design and bring it to the Turkish skies it belongs to.

The years 1938-39 witnessed events such as the death of the famous aeronautical engineer Selahattin Alan, the death of Atatürk and the World War II. Since NuDTA was a commercial enterprise, it had to sell the aircraft it produced, as expected, and make a profit. The unfavorable circumstances in Demirağ's aviation story in fact started just there. Engineer-pilot Selahattin Alan crashed and died during his flight with his Nu.D.36 aircraft, the orders received from the Turkish Aeronautical Association were canceled and accordingly the situation started to become worse for the workshop. After the end of World War II, in 1945, the world started to proceed towards a bipolar structure. The America-oriented North Atlantic block where Turkey took side also had a crucial impact on Turkish industry and economy. The new world order after 1945 showed its influence also in Turkey. The expropriation of the airport, the closure of the workshop and a number of similar events discouraged Demirağ from his keeping on activities in the field of aviation.

Nu.D.40, reactivated in 2020 by TUSAŞ as per the original drawings

Nuri Demirağ, who also treasured the concept of family, clearly stated what would make him happy with the following words: “Happiness is the taking off of thousands of Turkish-made airplanes with a hand gesture while sitting in a meadow and drinking my tea.” It is the duty of every Turkish citizen to keep his memory and vision alive in this period during the great accomplishments of the Turkish aviation industry.

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COVID-19: Both a Poison & an Antidote for Aviation Industry

by Muhammed Yılmaz
Aeronautical Engineer

While the global aviation industry has been hit by the biggest crisis in its history due to COVID-19, the air cargo, one of the key components of the industry, started to experience the golden era in its history.

When border closures, travel restrictions and inconsistent quarantine practices came together with people's fears of getting infected, passenger traffic has dropped dramatically, more than 40 percent of passenger aircraft in the airline's fleet around the world have grounded and been waiting for meeting the sky again.

On the contrary, with the sharp drop in passenger flights as well as the decrease in the belly cargo capacity carried in the cargo compartment of the passenger aircraft, cargo planes have been in great demand and conducted flights more than ever. With less capacity, huge earnings were achieved.

To summarize, passenger aircraft yearn to fly, cargo planes yearn to rest during the pandemic!

For the time being, on one hand all the stakeholders of the industry are struggling to survive, on the other hand they are preparing for the new aviation industry to emerge in the post pandemic period. Calculations are made to grab a bigger piece from the pie by taking the proper position according to market dynamics and creating circumstances where the impacts are minimized.

For the post pandemic period, it may be not enough to consider the temporary and permanent effects that emerge merely in the aviation industry for taking the proper position. In the scenario of returning to pre-pandemic levels in terms of passenger traffic, structural changes will probably occur also in issues such as the growth, change and transformation of global supply chains. This issue directly concerns all stakeholders of the aviation industry in their future plans.

The inevitable rise of E-Commerce

Since the pandemic restricts the mobility of all people worldwide and keeps us locked in our homes, naturally, traditional physical retail channels have shrunk quite dramatically. All consumers had to opt online shopping for all their needs.


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E-commerce sales in the U.S. only grew by 32% in 2020 hitting US$791 billion. Only one company took share about half of this amount. Yes correct, it is Amazon.com.

E-commerce sector in Turkey closed the year 2020 with 65% growth and the volume was approximately TRY 250 billion. In 2021, it is expected to exceed TRY 400 billion.

Sectoral reports reveal that the COVID-19 crisis has speeded up the world's inevitable transition to e-commerce by five to ten years. The Economist Magazine names this pandemic-induced growth and acceleration in the field of e-commerce as "tech-celeration".

Air Cargo and autonomous systems take advantage of the E-Commerce

According to industry experts, the boom in e-commerce will serve air cargo. In the transportation of commercial products around the world, the 1% shift from sea transportation to air cargo means over 10% growth in the air cargo sector.

New distribution channels created by e-commerce giants such as Amazon rock the entire system to its foundations. Now, an era has begun what the industry describes as B2B2C, where products are delivered from factories or production centers to logistics centers and from there to customers in smaller sizes and with higher frequencies. This system is believed to significantly increase the drone delivery processes in the near future, the work on the establishment of technological and legislation infrastructure in this regard has gained momentum. In other words, the rise of e-commerce will have a direct impact on the air cargo as well as the development of autonomous air vehicle technologies.

Despite the global recession, figures showing that air cargo activities reached pre-pandemic level in the last quarter of 2020 provide a clear outlook for the future.

The financial statements of all companies performing air cargo activities, including FedEx, UPS, DHL and Atlas Air for 2020 contain quite positive details. Looking at the bigger picture, we see that air cargo represented 12% of the total revenue of the airline industry in 2019, whereas it achieved around 30% in 2020.

As air travels return to pre-crisis levels with the increase in vaccination rates and in the light of other positive developments, the belly cargo capacity of passenger aircraft will certainly increase. In this case, even though the revenues seem to decrease unavoidably for the air cargo sector, when the system achieves the equilibrium again, the air cargo sector will have completed its biggest growth trend in its history and will be in search for new growth opportunities.

Direct and indirect effects of COVID-19 pandemic on the industry

Aircraft manufacturers complain about customers who have requested to cancel their previous orders or postpone the final deliveries. The production programs of the aircraft have been revised several times in the recent year. The production capacity had to be reduced. The only thing that can be considered positive for manufacturers in this process is the increasing demand for new

cargo planes. Part of the workforce in production has been shifted to these demanded planes.

On the other hand, there has been a huge demand in the transformation of passenger aircraft into cargo planes recently, and as a consequence the companies having transformed their passenger aircraft to cargo planes are happy. The number of aircraft that will be permanently transformed to cargo planes is expected to increase by 36% in 2021 to 90% and to 109% in 2022. The companies that transformed their passenger plane to cargo planes have already closed their business calendar for the next 2 years.

One of the important factors that make such transformations attractive is that the market value of aircraft aged 15 and over has dropped by nearly 30% during the pandemic. Current estimates suggest that international passenger travel demand will not return to pre-pandemic levels by 2024 and accordingly it justifies this trend.

Permanent transformations, which are more critical than the temporary transformation activities of airlines that are unable to conduct passenger flights due to the pandemic, may expand more depending on the future growth in air freight demand. Existing companies have already taken action to increase their capacities, while investors have already taken action to establish new companies in the sector.

Regarding the transformation into cargo planes, there is an increasing trend for the 737-800, A321 and A330 models. Older aircraft such as the Boeing 767 have started to be more in demand for transformation over the past few years as Amazon built its own fleet.

It is also another key factor that the belly cargo capacity of passenger aircraft will decrease in the post-pandemic period due to the increase in retirement rates of twin aisle aircraft during the pandemic. The factors, such as the airlines' having announced that they would focus on narrow-body aircraft that can fly longer in the short and medium term, and Airbus' speeded up activities for launching new models such as the A321LR and A321XLR, confirm all such scenarios.

The estimations made in the industry suggest that the share of twin aisle aircraft, which was previously 24% in the total aircraft manufactured, will decrease to 16% following the pandemic.

Transformation activities will continue to expand in the post-pandemic period, because following the pandemic, there will be plenty of retired or withdrawn passenger aircraft in the market. Moreover, such aircraft will find buyers at prices well below the market average. This will increase the number of transformations from passenger aircraft to cargo plane.

Another field that will benefit from this process is companies performing maintenance, repair and overhaul services. Approximately 1.900 cargo planes that fly actively today are much older than passenger aircraft and are quite worn out during this period. This means aircraft maintenance companies and parts suppliers will have a lot to do. In particular, companies that provide maintenance services to old aircraft fleets and supply spare parts for these aircraft are likely to achieve a significant revenue growth.

To sum up, the impact of COVID-19 pandemic has been huge to the aviation industry, while on the other hand, it promises hopes for the future for the industry in general over the significant acceleration it has created in air freight, one of the components of the industry. From that perspective, isn't it fair to say COVID-19 pandemic is both a poison and an antidote for aviation industry?

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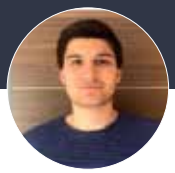

by Muhammed Kerem Sarı

by Enes Kocatopçu

Enes Kocatopçu ve Muhammed Kerem Sarı made an interview with Directorate General for Civil Aviation's former Director General Bahri Kesici, who has retired due to age limit in the beginning of the previous month. In this interview, Enes Kocatopçu ve Muhammed Kerem Sarı had the opportunity to ask Bahri Kesici questions about Civil Aviation activities and initiatives in Turkey.

BCI4@ Team: Who is Bahri Kesici? Could you briefly tell about your aviation enthusiasm since your youth and your career in this area?

Bahri Kesici: I was born in 1956. I went to elementary school in Emirli village, secondary school's first grade in Kavak Secondary School in Samsun, then studied at Kırıkkale High School including the second grade and studied the senior year at Ankara Atatürk Anatolian High School and graduated. I got into METU Electrical and Electronics Engineering Department, continued my academic studies as a military student as Aeronautical Engineer Lieutenant, and graduated.I worked as an engineer and manager for twelve years in fields such as aircraft maintenance, calibration, and electronic systems. After working as the Calibration Laboratory Commander at the 4th Main Jet Base Command, I worked for two years as a Technical Liaison Officer at the U.S. Wright Patterson AFB. I was appointed to Ministry of National Defense's F-16 Department in 1196 and during 1997-2000 worked at the Project Management Department at Air Force Command's Plans and Principles Directorate. Voluntarily retired as a Senior Lieutenant Commander in early 2000, I worked freelance for a while, and in 2002, I became a candidate to be nominated as Samsun MP. Later, I worked as a business development manager at a factory at OSTİM, acted as the Mayor of Kavak Municipality in 2004-2009 and was assigned as the Deputy Director General at Directorate General for Civil Aviation in 2009. Performed as the Director General for the last four years, I retired as of 5 January 2021 after my career of nearly 40 years.

BCI4@ Team: Would you briefly speak about the level reached in "Manufacturing in Aviation" and "Utilization in Aviation" during your term as the Director General, and about civil aviation in Turkey?

Bahri Kesici: Without doubt, Manufacturing in Aviation and Manufacturing in Aviation are not the concepts that can be described with our term. From a historical perspective, similar with other nations of the world, a movement occurred in our country's aviation in

1910s, a fruitful progress was made in the advancing years, within the scope of Manufacturing in Aviation, countless heroes of the times worked at the Turkish Aeronautical Association such as Vecihi Hürkuş, Selahattin Alan, Nuri Demirağ and achieved major success. However, especially during the World War II and in its aftermath, aviation became stationary. Still, during the term of late Turgut Özal, substantial progress was achieved in defense industry aviation production, though the goods were imported or the production was made under licenses. Significant progress was achieved after 2003 in civil aviation or air transportation fields in terms of infrastructure and aircraft and passenger numbers, even records were set, and our country remained among top twenty countries in the world. These developments were specific to Utilization in Aviation and they led to major achievements in social welfare. When we speak of Manufacturing in Aviation, we think of factors such as design, domestic manufacturing, certification, generated projects, number of people employed at foreign aviation organizations, thesis written in our universities and international publications. During our term, Hürkuş Aircraft designed by TUSAŞ was certified, substantial progress was achieved in Gökbey Helicopter's certification process, engine certification process of TEİ production engine was launched, progress was made in the design and production of the indigenous balloon, certain initiatives were made regarding some amateur air vehicles' design, UAV field gained ground, İGA İstanbul Airport was built and certified. These are gains for our country, yet thinking of our country's potential, we need to achieve more. There have been major achievements in infrastructure required for transition to Manufacturing in Aviation and the focus will be intensively on design and production in the upcoming period.

BCI4@ Team: We know that you are interested in amateur aviation, hot air balloons and unmanned air vehicles. How do you evaluate the developments in these areas and the future of them through the perspective of "Manufacturing in Aviation" and "Utilization in Aviation"?

Bahri Kesici: To begin with, amateur aviation is in fact the basis of aviation. When we look at the countries with developed aviation, we see great number of amateur air vehicles and amateur aviators, and kit plane building is also popular. Another field is the hot air balloons and I believe that the highest number of commercial balloon operations in the world exists in Turkey. Developed countries have rather amateur or sportive operations or fly hot air balloons in festivals. Certain regions and countries, mostly Africa, also operate commercial balloon tours.Regarding Unmanned Air Vehicles – UAVs, though relatively new, this sector has the potential to become quite popular in the future. We unfortunately remain at the forefront in Utilization in Aviation in terms of amateur aviation, hot air balloons and UAVs. I should mention that hundreds of hot air balloons currently performing flights in our country have been imported. Then again, we are witnessing certain pleasing developments. Our two companies active in the design and manufacturing processes of hot air balloons are located at the Cappadocia region and we are pleased with their existence. I am optimistic about the following process since Manufacturing in Aviation has been launched in this field. Domestic air vehicles used by amateurs or for training purposes are foreign origins. This is unfortunate because many of our engineers and technicians return astonished from their business travels for purchasing training aircraft, as they cannot understand how we cannot build such platforms in our country despite all the facilities we own. The know-how, equipment and infrastructure to achieve the production of such platforms exist in our country but the entrepreneurial spirit has not reached the required level. We encouraged many companies, including TUSAŞ to step in such areas in many conferences yet no progress has been made. Certification culture is still not in the sufficient level and this issue is quite overrated by the governmental authorities. Surely, these factors discourage the entrepreneurs. We are gradually overcoming this obstacle as well. Regarding the UAVs, Chinese companies are fully dominating the market. Though it has been slightly challenging, we strived to operate cargo drones when I was a Board Member at PTT yet we failed to receive concrete results. However, UAV use in civil area continues to spread now, as it becomes more popular, the businesses and processes will become faster and more economical. UAV activities in governmental and defense areas have climbed to the top of the list in the world, therefore, designing and manufacturing our own UAVs in the civil area and launching the utilization of

UAVs in all stages of life, in agriculture, in mapping, healthcare, search and rescue activities, in press, monitoring forest fires, cargos and in all other areas seem essential. I project that we will become more successful in UAVs in the future. If we manage to design and manufacture all platforms, from amateur aircraft to hot air balloons and to UAVs, we will have more say in the world and then achieve Manufacturing in Aviation. Obviously, our country has the sufficient know-how.

BCI4@ Team: Could you briefly tell about the SGHM's activities during the global COVID-19 pandemic?

With the outbreak of the pandemic, even when the virus first hit China we initiated meetings with the sector and made plans to minimize the pandemic's impacts. However, we had to adopt restrictions in line with our government's decision when all countries imposed flight restrictions. We made new regulations with international aviation organizations, with ICAO in particular and with ECAC, EUROCONTROL, EASA and ACI and started to adopt measures to prevent the spread of the pandemic.

As we accomplished these actions, we strived to adopt measures required to conduct the flights and normalize the life. We also took certain steps to prevent financial bottlenecks in our sector. Within this context, the exams have been delayed, license and authorization periods have been extended and face-to-face training has been limited.

The measures need to be adopted by the airlines, security units and entire sector for preventing the spread of the pandemic have been identified and issued as a circular. For the first time in the world, all our airports have been certified. Additionally postponements and discounts have been made in our tariffs to support the sector financially.

Our government also provided support through methods such as the short-time working allowance and VAT rate discount. From where we stand now, we can see that the recovery of the sector will take time due to the ongoing travel restrictions.

Domestic lines are expected to become more active after the vaccination but the international flights are projected to return to their normal course in nearly 3 years. I expect a boom in aviation and tourism sooner if the vaccination reaches success, as people are tired of the travel restrictions.

BCI4@ Team: In respect with today and future, upon the pandemic, we have been observing an increase in the demand and business volume of general aviation segments such as air cargo, air ambulance, business aviation and air taxi. This increase is expected to remain in the future, the process is projected to linger. In fact, a certain customer group is expected to prefer general aviation more. Related air vehicle manufacturers are claimed to develop certain strategies that align with this change. Concerning this development, starting from areas with high potential, what is your opinion on the projects on the launch of FBO implementation in airports and even the construction and operation of General Aviation Airports that enable cultural aviation activities?

Bahri Kesici: There are no problems regarding the airport infrastructure particularly in our country, partially the problem lays in our understanding. Cargo bears great importance in the following process and it will continue to matter. Ambulance, air taxi and general aviation will gain momentum.

In my opinion, whether there is a General Aviation Terminal or not, our existing airports are sufficient for such services. However, the services to be provided should be regulated and service prices should be lowered accordingly. General Directorate of State Airports Authority and other airport operators should evaluate this issue well. In my view, specialization regarding FBO concept is of essence as during business travels especially conducted with small aircraft, time and quality come into prominence more. The demand should be perceived well and timely adjustment should be provided when delivering the services. Our private sector already has such dynamism. Perhaps, the privatization activities should be increased.

BCI4@ Team: This year, you mentioned in your message regarding the International Civil Aviation Day, "...for the 2019-2023 period, ICAO identified the theme for the International Civil Aviation Day as 'Advancing Innovation for Global Aviation Development'...from now on, no sector can survive without data sharing and cooperation..." What are your evaluations and suggestions for the young people regarding developing cooperation and efforts towards communication and data sharing technologies?

Bahri Kesici: As you have also mentioned, ICAO identified the theme for 2019-2023 as Innovation,

so there is a need to achieve new and different things, tell new things, innovations that will excite the society and aviation society are required. On the other hand, data and information will increase as it is shared and will be serving the humanity. Growth is not possible by being introverted, constant interaction is mandatory. What should the young people do? Youth already implies energy and at the same time divergent thinking, in a sense youth means innovation, surely I do not imply anarchism. The pie will grow bigger as we share our knowledge and will be enough for all to survive. Besides, your effort as the BCI4@ team is to share this interview via certain channels, what Aviation Turkey magazine does, is the share of know-how and experience. In fact, we all should, and in particular, the youth should be open to innovation and sharing. Sometimes people refrain from sharing information due to competition, but the master is never scared of his apprentice as he is already ahead of the apprentice with this know-how and experience. In short, we will not be scared to share.

BCI4@ Team: As Turkey, how do we contribute to the NGAP (New Generation Aviation Professionals) initiation formed by the ICAO to train qualified and competent aviation experts to operate, manage and maintain the global air transportation system of the future? What are your projects regarding this and what do you expect from the youth?

Bahri Kesici: Our country is among the pioneers of the NGAP program introduced by the ICAO. We have been attending the events and conferences within this scope and many universities in our country have been included in the program. However, the COVID-19 pandemic slowed down all such activities. We consider NGAP as a program compatible with the ICAO's theme for 2019-2023. Perhaps one or more country-wide conferences can be arranged to increase awareness and enhance the participation when the pandemic retreats.

BCI4@ Team: What type of capabilities in terms of "Knowledge", "Skills" and "Competence" do you think the young people should have who are receiving education and training in aviation area? What are your comments on building "Authority-Educational Institution-Industry" cooperation and its effective functioning?

Bahri Kesici: As you know, we have various educational institutions focusing on aviation, and our universities contain departments on aeronautical engineering, air transportation management/ aviation management, cabin services There are also trainings on pilotage, air traffic control, aircraft maintenance areas which require licenses from the aviation authority. The content, scope and competence of these training programs have been designed at international standards. Universities, academies and vocational and technical high schools under the Ministry of National Education (MEB) have to train professionals in cooperation with the DGCA in line with sector and country's requirements. This is partly achieved, but many people graduate from schools or departments within the body of Council of Higher Education (YÖK) and MEB. People who received vocational or professional education in aviation can hardly find jobs in sectors other than our sector. Therefore, it is useful to align with the requirements and expectations of the sector in this field in a more controlled manner. In this way, instead of establishing redundant schools or departments, training people in accordance with the demands will be achieved. Perhaps this can be accomplished by building councils on a legal ground.

BCI4@ Team: You also recommend aviators to place "PhD" and "Pilot" titles before their names. Could you explain further the reason of this?

Bahri Kesici: We have to enhance our professional careers to gain more reputation in Manufacturing in Aviation along with Utilization in Aviation in the world or have a say in global aviation. First thing to do is not refraining from air platform and flying or in other words not perceiving aircraft, flying or being a pilot as a taboo. Our professionals employed at civil aviation should have doctorate diplomas so that we could gain accountability in the international arena. Of course, as I express these words, I use and/or, as all professions regarding aviation are important; being a pilot, an air traffic controller, and technician require license. Other than that, there are ATSEP, AIM, Flight operation and engineering as well as miscellaneous expertise. I advise them not to only focus on one of these professions but at the same time get a PhD degree in one of these or in other branches. Otherwise, we cannot exceed the average level, and in that case, we cannot have a say in the world. Our country has a high level of moral geography and sphere of influence; we already have the potential to become a model alone.

BCI4@ Team: During your term as the Director General, as a Turkish civil aviation authority, a directive on "Developing the Social Gender Balance" in aviation was issued. Based on this directive, an "Advisory Board for the Social Gender Balance Development Commission" was formed as working groups that embrace the entire sector. Turkey was the first country to accomplish systematic implementations in "Developing Social Gender Balance" area by holding regular meetings and events with these groups. Aware of Turkey's efforts at ICAO level, a special invitation was sent for the "Social Gender Balance Development Commission" for the event held in the following period. What do you think about "Social Gender Balance" in Turkish civil aviation and the future of the activities to that end?

Bahri Kesici: Maintaining the gender balance is not easy, sometimes challenges arise. The rate of female professionals is lower in aviation; perhaps these rates are different in education and healthcare industry. In fact, there is no gender discrimination in aviation in our country, but we need to raise more awareness and encourage women. With the approval and support of the sector, DGCA has conducted remarkable activities in this area, made regulations and gained success, even though these activities slowed down due to the pandemic, they are expected to expand in time. Aviation is an industry with professional activities where women and men have equal opportunities. More awareness is required.

BCI4@ Team: Do you believe that founding a "Council of Youth" comprised of persons who will contribute to the management of the Turkish civil aviation authority and aspire to work at such jobs is useful? Do you have plans to such end? Do you think building a "Council of Seniors" from the persons who have know-how and experience and worked in this sector is beneficial? Are there any plans in this context?

Bahri Kesici: Concepts such as youth council and seniors' council are quite critical. The Student Pilots Association and Aviation for All Association are mostly formed by young people form and we executed certain programs with them. More programs may be conducted later. I suggested these associations to build a federation, in that case, they are able to embrace every segment and major events can be organized easily. On the other hand, we could not carry out many activities regarding the Council of Seniors. At least we planned an event with the former director generals of DGCA but it was cancelled due to the pandemic. In my opinion, there is great advantage in executing these institutionally with a certain degree of authority. Why not? The youth of this land wishes to become more successful, it should be made possible.

BCI4@ Team: Is there a plan to launch a regular "Aviation Summit" based on the yearly activities and progress evaluations in aviation to identify the points and resources in the related period? What are your comments on this issue?

Bahri Kesici: Actually, an aviation summit was planned but it was postponed due to the pandemic. Then again, the 12th Transportation Council will be held at İstanbul Atatürk Airport on 6-8 October 2021 and subjects related to aviation will be examined. We held various meetings, conferences and events regarding aviation but we did not have the chance to carry out an aviation summit because of the pandemic. I believe they will be organized in the upcoming period.

BCI4@ Team: Do you have additional remarks for the readers?

Bahri Kesici: Thank you for giving me this opportunity. Aviation is a field without any borders. The world is connected through two factors; one is the internet and the other is aviation. During my career at the DGCA, I always said, "I am collaborating with the best team in the world", and now I am repeating it. All units of our civil aviation sector are in this best team. Records have been set during the last ten years, our flight network has expanded; these achievements have been reached particularly with the contribution of our President Recep Tayyip Erdoğan and all our ministers and employees. I have acted as the DGCA's 16th Director General; I would like to mention all the services and achievements gratefully. I believe that the future of aviation is bright in our country.

We, Enes Kocatopçu and Muhammed Kerem Sarı are very delightful to make this interview and we also thank our interview mentors dear Esma Görkem Ersoy and Dear Cem Akalın for their major contributions in building our questions.


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Aviation Industry will be Reshaped From Scratch

Dr. Batuğhan Karaer
Chairman of the Finance Association, Turkey

King Sisyphus is a figure in Greek mythology famous for his eternal punishment. Sisyphus, who was punished by the gods for rolling the boulder up a hill that would always roll down again, consciously accepted his punishment, and although he knew that it would roll down again, he kept on rolling the boulder up with all his might. [1] This is an eternal punishment for Sisyphus.

At the meeting held in Istanbul in 2008, Giovanni Bisignani, the then Director General and CEO of IATA, likened the aviation industry to Sisyphus, stating that after a long uphill journey a giant boulder of bad news is driving the sector back down. Since Bisignani's such statement, we have witnessed that the industry rolled down a few times with the boulder. I think the biggest pandemic of the century also dragged the sector down from the summit to the furthest place, hence to a long and challenging uphill journey.

As I mentioned in my previous articles, as airlines are a common component of the industry I believe it is necessary to focus on airlines in order to see the impacts of the pandemic on the industry. We can easily comprehend how the sector has rolled down from the losses and debts as of the end of 2020. At the end of 2020, Turkish Airlines announced US$ 742 million loss, German airline company Lufthansa Group € 6.7 billion, United Airlines US$ 7.1 billion, Pegasus Airlines US$ 266 million, Southwest Airlines US$ 3.1 billion - its first annual loss since its establishment, and all other airlines reported significant losses. The International Air Transport Association (IATA) forecasts that the airline companies make a total net loss of US$118 billion in 2020 due to the Covid-19 pandemic, and demand falls by 65.9%. It also states that companies can return to profitability towards the end of 2021. While the vaccination rollout raised hopes as we entered 2021, restrictions and lack of ticket sales lead to silent and nervous wait within the sector. Currently, the industry is not in a position to respond to a possible sudden high demand because the necessary arrangements are slow and weak due to financial difficulties.

While the differences between the financial outlooks of the companies before the pandemic were in shades of gray, the majority are now in the black area. Furthermore, they will inevitably be separated with clear lines as black and white in the post-pandemic period. Because companies, whose financial structures have not deteriorated much and/or received sufficient state aids, will recover faster after the pandemic and start to take hold of the regions and routes of other weak companies. Strong companies will have flexibility in their profit margins, while weak ones will not compromise their profitability. As a result, we will be able to see quite clearly that the companies will fall into the black or white area at the end of 2021 and the beginning of 2022. In the post pandemic period, we will unfortunately see that some of the companies will file for bankruptcy and some others will declare new collaborations and mergers/acquisitions.

On the other hand, the airlines of the countries that are leading the vaccination race and achieve herd immunity the fastest should also be taken into account. Currently, the US, China and the UK are ahead of the race. Despite the financial disruption, the US and Chinese airlines may gain momentum in exiting from the crisis with the increase of domestic flights and some international flights, and this may lead them to get ahead of other companies.

While 42 airlines with more than two thousand aircraft in their fleets have declared bankruptcy since the beginning of the pandemic, some others have been nationalized. On the other hand, we also hear that nearly 30 new airline companies have been established or at establishment phase in all over the world. The strategies and steps to be taken by such new companies as well as what they bring to the sector are issue of concern.

As for Turkey, as I mentioned in my previous article, we see that Turkish Airlines and Pegasus Airlines maintain their financial and functional operability despite the negative impact of the pandemic. There is no clear information about other companies but all stakeholders of the sector

[1] *The Sisyphus Statement of Albert Camus published by Can Publishing House*

have started to express their expectations regarding direct or indirect support since the beginning of the year. Even though nearly € 2 billion support was announced to be given, no support has been received so far (except for the support provided to tour operators, airlines and all other companies).[2]

We are aware of the current severe situation and we discuss how to exit this crisis. We are now entering a path free of dark clouds for the sector, where hopes blossom and positivity is higher than pessimism. First and above all, we know there is a robust demand, and people's desire to travel has increased a lot for the post pandemic period. On the other hand, before the outbreak, the flexibility that allows customers to make travels in line with their own wishes and needs (dynamic packaging) was getting trendy. However, the pandemic suspended this new model. In the post pandemic period, thanks to dynamic packaging (the opportunity for the airline to meet with the customer directly without a tour operator/agency), the additional income to be obtained through offering various services to passengers such as hotels, car rentals, etc. will also play a significant role in binding up the wounds.

Again, we will see certain sales, which we only see in low-cost airlines in the past such as in-flight food and beverages (buy on board), luggage, seats, etc. that increase additional income, will become widespread in flag carriers (such as Lufthansa) and network airlines.

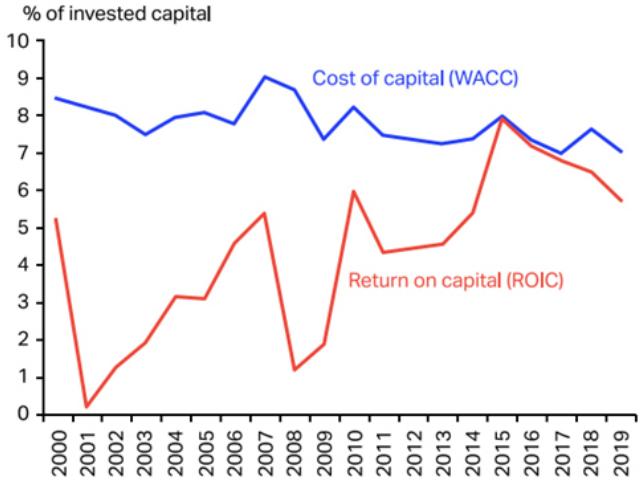
In IATA's 2020 annual review report, we see that the aviation industry closed 2019 with a net profit of US$ 25.9 billion after tax. We can clearly see that the above mentioned US$ 118 billion loss (perhaps more with the financial statements to be declared) can be recovered only within 4-5 years after returning to normal and to 2019 levels. At least two-year period is needed for easy management of debts, if everything goes well.

In the meantime, another critical question arises. When will the airlines achieve the level of contributing to their shareholders and investors after they enter into the process of improving their financial situation and binding most of their wounds? In order to answer this question, it is helpful to look at ROIC (Return on Invested Capital) and WACC (Weighted Average Cost of Capital) of the sector in previous years. When we look at the graph, the picture is not positive at all. The expected situation is that the return on the company's capital is higher than the cost of capital (ROIC > WACC), thus creating an effect that increases the assets of its shareholders. However, the graph we see unfortunately illustrates the opposite; in other words, the aviation sector has continued its activities in a way to reduce the assets of its shareholders since 2000. The fact that we have witnessed many bankruptcies and mergers as a result of events and developments since 2000 also validates this graph. While the sector has been in distress for many years, it is difficult to predict when it will contribute to its investors / shareholders even after the pandemic. We can predict how debts can be managed and reduced, but it is difficult to predict when the ROIC > WACC is achieved and how it will be sustainable.

It is obvious that the aviation industry will be reshaped from scratch and various new business models will emerge, as in many other industries after the pandemic crisis. No matter from which perspective we look at the sector, the acceleration in economic growth is interdependent with the aviation industry. The aviation industry's continuation of its profitable activities that create added value is of great significance both for the global economy and country economies. Countries that are aware of how considerably the aviation industry contributes to the world and the economy do not hesitate to provide billions of dollars of aids. However, the main issue is searching for an answer on how the sector can keep on its way by achieving sustainable added value in the post pandemic period, and finding a solution. Until a permanent solution is reached, the aviation industry will not be able to avoid the rolling-the-boulder-up-cycle, just like King Sisyphus.

Industry Return on Investment and the cost of Capital

Sources: IATA, Datastream, The Airline Analyst



[2] *https://www.airporthaber.com/havacilik-haberleri/turk-sivil-havacilik-sektoru-2-milyar-euroluk-destek-istiyor.html*

Understanding the Future of Aviation with the Facts and Figures of Today!

BCI4@ Team interviewed with SolarStratos Initiator and Pilot Raphaël Domjan.

BCI4@ Team: Where did the Solar Stratos idea come from and would you please tell us about this plane?

Raphael Domjan: The idea was born when I crossed the pacific ocean aboard PlanetSolar, I was wondering what I could do once our successful adventure more ambitious than the first round the world with solar energy. At night in the middle of the South Pacific, the Milky Way is bright and every minute a shooting star passes over your head. This is where the idea of trying to reach the stratosphere with solar energy was born. A dream came true 4,000 years later.

BCI4@ Team: What are the key steps to initiate a start-up like SolarStratos?

Raphael Domjan:

- Find the idea
- Carry out a feasibility study
- Bring together a team and skills
- Find the financial means and technical partners
- Succeed

BCI4@ Team: You are trying to achieve something that has not been done before. What is the main disruptor you have encountered so far?

Raphael Domjan: The goal is to achieve something that has never been attempted, but with existing technologies. At this stage we have not yet really made a break or disruptor in our adventure. But we learn a lot every day.

BCI4@ Team: Did the COVID-19 pandemic have any effect on this project?

Raphael Domjan: The Covid19 made our life more difficult of course, but we are explorers, we try to use this difficulty as an advantage.

BCI4@ Team: It seems you are very dedicated to using renewable energy in your projects. Why is it important to use solar power rather than fossil fuels globally?

Raphael Domjan: We are currently burning 300 tonnes of fossil fuel per second. First of all, it is not sustainable and also dangerous for our climate. We want to show that we can achieve incredible things thanks to renewable energies and electricity

BCI4@ Team: Technically speaking, there are some formidable concerns about high altitude solar powered aircraft, such as that their aerostructures become very fragile due to high power/weight requirements. What would be your technical team's modern approach vis-a-vis those challenges different from legacy work?

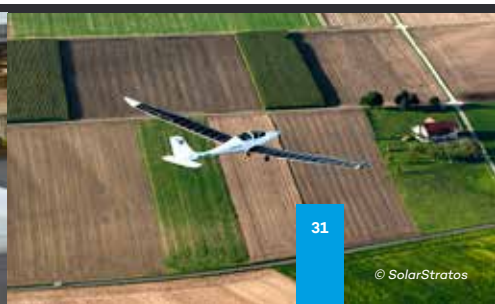
Raphael Domjan: We want to fly at high altitudes with a light aircraft, which must consume little energy and therefore fly slowly. We think outside the box and learn with my team and our technical partners every day how to solve complex problems. It's exciting.

BCI4@ Team: Would you be thinking in the future about maybe enrichening your approach by also considering hydrogen energy alternative, despite its own challenges?

Raphael Domjan: We are always open to new technologies, hydrogen is one of the solutions of the future for the aviation of the future. But its use is not appropriate in our project.

BCI4@ Team: We know that fearless pioneers like you live and experiment at the extremes of flight-test, but would you ever consider having extra safety measures in your designs like ballistic parachute etc?

Raphael Domjan: I am an adventurer; but, my job is to limit risks. All flights where the wearing of a parachute is possible, are carried out with a parachute for each crew member. Certain flights cannot be carried out with a parachute; but, we have to test the plane and the flight profiles beforehand. In this case, the risks are greater; but, a risk-free adventure is no longer called adventure.

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BCI4@ Team: Would you tell us about your technical and management team?

Raphael Domjan: We have a small team, very motivated and super competent that enables us to carry out this adventure, with brilliant and passionate people. It is a privilege for me to work with these incredible people.

BCI4@ Team: What would be the next steps for further development of SolarStratos?

Raphael Domjan: We hope to participate in the development of electric aviation and also we hope that our know-how could allow the development of high altitude solar drones in the future.

BCI4@ Team: Do you expect SolarStratos and similar initiatives increase in number in the near future?

Raphael Domjan: This is already the case. There are more and more adventure projects and communication explorations emerging for promotion of environmental protection.

BCI4@ Team: Is there any interest or support from Turkey to SolarStratos? What do you think about collaborating with some institutions in Turkey? For example, Turkey Space Agency who manages Turkey's National Space Program.

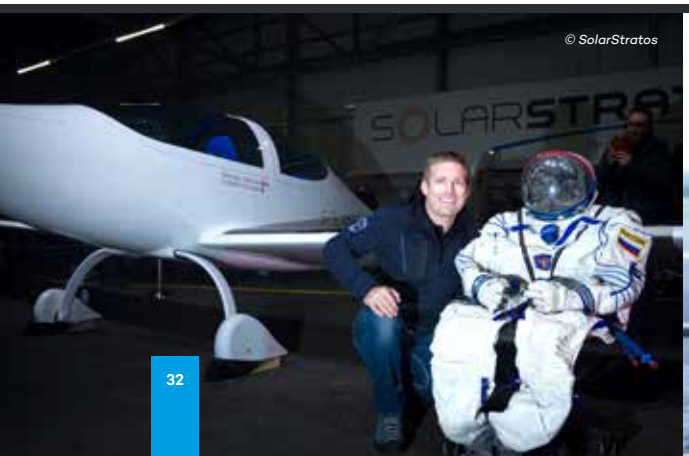
Raphael Domjan: We are a project born in Switzerland, but we are very happy when other countries or institutions are willing to engage with us in this dream of reaching to the stratosphere with solar energy. So, yes we are open to any collaboration.

BCI4@ Team: What would you recommend to young aviators who dream to work at SolarStratos?

Raphael Domjan: Just follow us, maybe we will need new talents very soon.

BCI4@ Team: Anything else do you want to add?

Raphael Domjan: We are destroying the world, when we have all it takes to change and become sustainable. Renewable energies, technology, raw materials. This will also be profitable for our economy, and especially for countries like Turkey which has a good geographical location with a high potential for renewable energy production. We are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all responsible for change in order to preserving our beautiful blue planet.

Characteristics

SolarStratos is the first commercial two-seater solar plane in history, it will also be the first manned solar plane penetrating the stratosphere. Calin Gologan (Elektra-Solar GmbH – technical partner SolarStratos) is the designer. The basis of the commercial aircraft will be used and the aircraft will be pushed to the limit of its ability to succeed in our crazy bet. This tandem two-seater, with a wingspan of 24 meters and a weight of 450 kilos will fly like any other aircraft.

An Aeroplane To Science

Exploring distant space we wish to contribute primarily to the protection of our atmosphere, this requires a better understanding of what is happening. The SolarStratos Mission will fly at an altitude little frequented in a fragile environment, propelled solely by solar energy without any pollutant emissions and will give us the possibility to make new measurements, never done before. In the future, the exploration of the stratosphere may allow us to extend and to understand humanity... Who knows...

Reference: https://www.solarstratos.com/en/plane/


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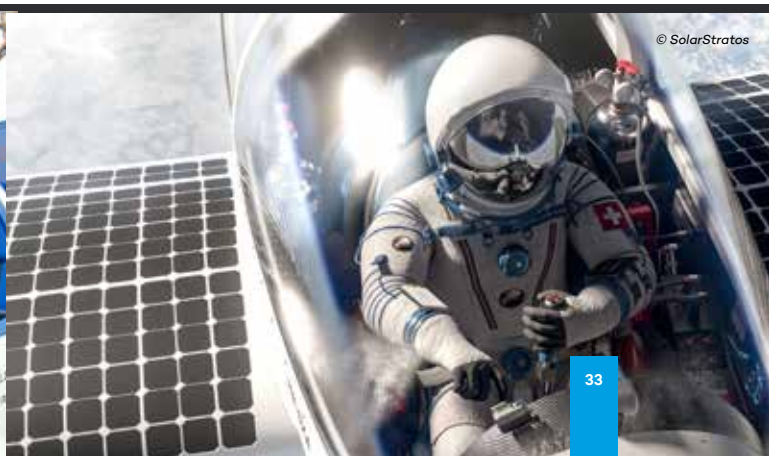
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NO ENTRY: How do Pilots' English Language Proficiency Gradually Deteriorate During COVID-19

by Gökhan Demirdöken,
Researcher & English
Language Instructor

After having your Sunday breakfast, take a cup of coffee and be seated on your favorite spot at home. Now take a deep breath, close your eyes, and think about what has changed in your life over the year. If you are a doctor or a nurse, you may have longer working hours in these days; if you are a teacher, you are most likely to try to catch up with what the latest instructional technology tools offer for your distance teaching setting. However, if you are a pilot, you may spend the rest of your day making a reservation for Amazon Flex, Uber Eats, Grabhub or seeking a job on the internet because you are simply one of thousands of other commercial pilots that have been laid off since 2020. That's one of the biggest and most dramatic consequences of Covid-19.

Flying has always been a dream for many people. Once you have your dream job, you never dream of doing any other profession anytime soon. However, the global pandemic has struck aviation industry so hard that it has become quite normal to see former pilots having totally different careers around the world. While some of them are lucky to get the opportunity to run their own business, others simply work at supermarkets, phone companies or land transportation companies. One of such examples is from Turkey where former pilots and flight attendants now make money driving taxi. Australia, as another example, now has a finance company founded by a former Qantas pilot Rick Garner, who is providing financial advice and arranging loans for aviation professionals. Such drastic changes in the lives of aviation professionals have not only affected them but also their families negatively, yet the latest developments with regard to the transportation of vaccines are hopefully expected to bring hope for aviation industry in 2021.

As of February 2021, the sufferings of aviation industry during the pandemic have been already well-documented. US Bureau of Transportation Statistics reported that annual commercial flights have decreased by 48% in 2020 from the 9.46 million flights in 2019. Similarly, Eurocontrol released

the latest statistics regarding the air traffic density in Europe in 2020. It was thereby reported that air traffic has significantly decreased by 65.7% from February 2020 to February 2021 compared to February 2019. What's more the number of airlines ceasing or suspending operations has reached more than forty within the last couple of months. What's worse than ever, the only relatively bright spot of the aviation stats was the domestic market

in 2020, which recently deteriorated in December 2020. However, there is still hope for the rest of 2021 as more and more people will be vaccinated around the world. Global flight statistic for January 2021 also proves it. Although the number of commercial flights has not increased significantly in January 2021, there is a slow yet relatively promising recovery from December 2020 to present day both in Europe and North-Central America.

Having seen the initial indications of a possible recovery for the aviation industry, it is now high time for airlines to focus on identifying the negative consequences of Covid-19. In order to have a speedy recovery, it is of utmost importance for airlines to listen out the scholars with regard to the ways pilots have been negatively affected by the pandemic. These include issues like stress management, depression, anxiety, cognitive regression which may negatively affect safety in aviation. However, the most important issue for pilots is the language attrition.

What is anguage attrition?

Language attrition can be defined as the decline in any language skill for a reason. Therefore, language attrition in pilots should be investigated within the scope of language skills. To do so, it is crucial to identify the language skills and various reasons for such decline in these skills. While listening and reading are considered as receptive skills, speaking and writing are considered as productive skill. Also, while the former requires the interpretation of a message whether in the form of sound or words, the latter is the end product of a number of complex cognitive processes. Therefore, radio communication in aviation can be argued to include both receptive and productive language skills. On the one hand, pilots are expected to listen to radio messages, interpret it and then take action accordingly. On the other hand, after having constructed any kind of meaning out of the radio message, pilots are expected to respond to air traffic controllers. In this sense, they must complete several cognitive tasks as well as maintaining the control of aircraft and cooperation with other cockpit crew. As a result, they are challenged to deal with a significant amount of cognitive load during standard flight operations. However, they are definitely cognitively overloaded during abnormal flight operations like engine failures, fire in the cabin, cockpit, or cargo compartment, malfunctioning of flight instruments, etc. That's why, they are trained to handle such issues as smoothly as possible. Yet, there are some instances that they cannot foresee. Language attrition is one of such instances that happens over a certain period of time for some reasons.

What triggered language attrition?

The starting point for the investigation of the loss of listening comprehension and speaking skills of pilots should be the construct of time. That's to say language attrition does not happen at once rather, it is the consequence of a a chain of events in human life. In this sense, it is quite similar to aviation accidents which mostly take place as a result of several issues leading to the accident.

Therefore, it can be argued that detrimental effects of Covid-19 can be considered as the 'hitman'

of the chain of events resulting in the loss of certain language skills of pilots. As of January 2020, with the incidence of the first wave of Covid-19, the aviation industry started to face with the inevitable market loss during the rest of 2020. In the following months, with the spread of the virus around the world, airline companies started to announce widescale domestic and international flight cancellations which, in turn, led to less demand on the number of active pilots. This was followed first by salary cuts, and then by temporary lay-offs and finally permanent lay-offs around the world.

At the end of the day, all we had was thousands of grounded aircrafts and unemployed pilots. This was probably the most significant issue that triggered the language attrition for pilots. Over time, those who learned English as a second or foreign language or simply for the purpose of doing his/her profession started to spend little or no time in the cockpit yet a significant amount of time at home. Therefore, contrary to their routine, Turkish pilots, for instance, started to use their mother tongue more than Aviation English, and the gradual decline in their language competency had already started without even noticing it.

Who is responsible for this 'decline'?

Human beings are, by birth, equipped with certain skills to process information. Among many others, the ability to store information temporarily is probably the most notable skill and it is the core responsibility of our working memory to manage this skill. Therefore, working memory has long been investigated by scholars to draw meaningful conclusions about its relationship with language learning. In this regard, while some scholars distinguished between holding an idea in mind and retrieving it after its disappearance, others focused on more detailed examination of WM such as how it functions and what its limit is. For the professionals in aviation industry, the best interpretation of its effect on pilots can be made as follows: Working memory is, in its simplest form, the cognitive system which can store a small amount of information. That's why, pilots are able to store only a certain amount of the radiotelephony message while listening to the air traffic controllers. What's more this cognitive system is known to store that certain amount of information for a certain amount of time, which is roughly 30 second depending on the task human beings deal with. If we think of any radiotelephony message transmitted by air traffic controllers, it is not surprising to find out that it includes a considerable amount of information. Therefore, any pilot whose mother tongue was other than English would have some kind of difficulty in storing and processing radiotelephony messages while doing their profession. However, in cases like Covid-19, they would have little or no opportunity to practice it which, in turn, results in the decline of listening comprehension skill. That is, for sure, not limited to listening comprehension. Being isolated from English language speaking settings can also have detrimental effects on pilots' speaking skills. All things considered; it is possible to conclude that working memory definitely influences pilots' ability to process radiotelephony messages. Those with a high working memory capacity can be expected to complete this action easily. On the other hand, having a relatively limited working memory capacity can slow down the same process. Similarly, the latter group of pilots may not be as proficient as the first group in terms of productive language skills like speaking and writing. However, it would be a huge mistake to identify working memory as one and only factor that is related to language attrition. Rather, there are some environmental factors as well.

L2 attrition and its environmental reasons

Human beings go through a number of fixed developmental stages as they get older. As infants of 3-6 months-old, they are preset to listen to other people around them and produce speech sounds mostly in the form of babbling. This initial stage of speaking is then followed by the production of a limited amount of words at around 12-15 months. Later, they normally move on to the more complex speech productions. All of these speech production stages naturally occur as babies are exposed to linguistic input. However, speech production may take place quite late for some children due mostly to isolation from speech communities. Therefore, this process of acquiring the mother tongue is of utmost importance and it needs to be closely monitored. Apart from the acquiring the mother tongue, human beings also learn some additional languages depending on their interests or needs. While a businessperson may desire to learn

Chinese for commercial reasons, another person may simply desire to learn English out of interest. In the case of learning Aviation English, it is mostly out of global language proficiency regulations. Once you finally made up your mind to be a pilot, you have two options as a non-native speaker of English: either to attend a language course or move to a different place where English language is the medium of communication. In the first case, you are more likely to expose yourself to the target language in the classroom and thus, learning may take longer compared to the second case which puts the target language in the center of your life and thus, you are exposed to that language more often and effortlessly. After having attained a certain degree of proficiency in the target language, you are expected to perform the duties of your profession easily. The reason for that is because you will keep using the language actively as part of your profession. However, once you are deprived of such opportunity to use and practice the language, the so-called language attrition starts playing an irreversible role in your life. That's pretty much what thousands of pilots have started to encounter with temporary or permanent layoffs since 2020.

With regards to language attrition, we should hereby distinguish different types of it due to environmental factors. The most common classification is made by Theo Van Els, a Dutch academic. He first identifies the loss of mother tongue in an environment where it is the medium of communication and dialect loss is a very common example of it. Second, he mentions losing the mother tongue in an environment where it is not the medium of communication and this is often exemplified with immigrants losing their mother tongue after permanently leaving their country of origin. Third, Van Els addresses the loss of a second or foreign language in your native speaking environment, which can simply be exemplified with the loss of any foreign language you learned at school. Finally, we learn about a less common phenomenon of losing the second or foreign language in an environment where learners use that language and it is because of aging most of the time. Although it is not exactly to our best knowledge how human beings store and make use of different languages, something is for sure that we are likely to lose them unless we are exposed to that language. Within the scope of Van Els's framework, it is now possible to identify the environmental factors influencing pilots' loss of English language. As the number of non-native English-speaking pilots has outnumbered the native English-speaking pilots, the aviation industry can be argued to include mostly learners of Aviation English in an instructional setting. Therefore, the third category in Van Els's framework appears to be the concern of aviation industry. That's to say, the aviation industry will be severely challenged by pilots who have already started to be affected by the issue of language attrition due to little or no exposure to English language during the lockdown and temporary lay-off. Having established what might trigger language attrition, we should now explain the theories of language attrition so that a more meaningful conclusion can be drawn for the aviation industry.

Hypotheses of language attrition

Have you ever had difficulty in recalling the callsign in any of your flight operations? The answer is probably yes because it is quite natural to experience similar issues of forgetting what we know by heart. There exist several reasons for why you might have forgotten the callsign or any other piece of information, even your wife's name in the worst-case scenario. In an attempt to make this issue of forgetting more clear for human beings, German psychologist Hermann Ebbinghaus conducted a study and concluded that the amount of learned knowledge is closely related to the amount of time invested. In other words, as the time passes by more and more, we need more repetitions and more frequent use of that piece of information. This was called decay theory of forgetting. If we do not use the knowledge over the course of time, it will surely decay. Another attempt investigating this issue resulted in the theory of interference. Being one of the most important theories of forgetting, it refers to the conflict between our previous knowledge and current knowledge, and the recently learned information may block the previously learned information. Last but not least, the retrieval-failure hypothesis to forgetting means human beings store different pieces of information on different levels in the brain. Therefore, our access to different levels can be restricted over time.

Throughout our lives, we suffer from different types of these forgetting hypotheses, and these all happen all of a sudden and unconsciously. In a similar vein, we may also experience a further stage of forgetting which may cause language attrition. As for the

latter, several theories have been developed. While the regression hypothesis, the earliest one, proposes that language acquisition and learning happen in stages, hence language attrition is a natural mirror image of acquisition and language attrition happens in different stages such as top to bottom. Another approach to language attrition, last-learned-first-forgotten hypothesis, suggests that some things, which are learned last, are the first to be forgotten on condition that learners are not exposed to the target language anymore. A similar approach, Best-learned-last-forgotten hypothesis, states that the intensity and quality of knowledge matter and it is difficult to forget something if it is better learned. Finally, linguistic-feature hypothesis suggests that the language being learned is more likely to be forgotten if it bears little or no similarities with the mother tongue and that less functional or less frequent components of the target language are forgotten easily. In this sense, we can conclude that, one way or another, language attrition is encountered in any stage of our life. Therefore, our focus should be on developing a better understanding of the process of language attrition so that necessary steps can be taken before it is too late for the aviation industry.

Process of L2 attrition

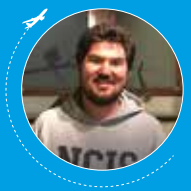
The real question is 'How do we lose the ability to speak a language?' The most reasonable answer for this question dates back to 1980s. The American psychologist Howard Gardner explained the way people tend to suffer from language attrition. He proposed in 1982 that language attrition includes three consecutive stages in time. The first stage starts with language learning process, which lasts for varying amounts of time for each learner. In the case of Aviation English, while a pilot may attain Level 4 (Operational) proficiency in English in a year, another pilot may easily

develop the same level of proficiency in less than three months depending on their background knowledge, aptitude to learn a foreign language, age, or other individual and environmental factors. In Gardner's framework, stage 2 occurs when language learning is terminated. This may result from achieving a certain level of proficiency or from involuntarily terminating the learning process for different reasons. This stage is also called incubation period, which includes no type of language use or training. The final stage includes the assessment of the degree of language loss. As there is no certain amount of time between stage 2 and 3, the extent to which a person suffers from language attrition may definitely be expected to vary. While it can be observed at an alarming rate in less than a year for some pilots after the first wave of layoffs, the same observation can only be made after a longer period of time for different pilots. Therefore, pilots should definitely be enrolled in refreshing trainings with a direct focus on English language proficiency before they are called back for duty.

Can pilots really relearn?

As famous NFL player Jerry Smith puts it, "Safety isn't expensive, it's priceless." Language attrition, in this sense, is now the biggest threat for safety. Taking this into account, the aviation industry should search for ways to overcome it before it is too late. Luckily, the science comes into play at this point as Bert Weltens reported that there was an increase in reading and listening comprehension. Although his report brings hope for the aviation industry, it should be noted right here that his finding was limited to receptive language skill. Therefore, we are still far from drawing any conclusion about the possibility of relearning productive skills, which are as crucial in aviation as receptive skills. In order to foster the relearning process, the motivational factors should be investigated carefully. It is usually the case that people tend to attain the desired outcomes of a project faster so long as they are motivated internally and/or externally. That's to say pilots' motivational needs should be addressed for a speedy recovery in aviation industry. It should be taken into account that no matter how smooth the whole flight can be, the pilot will always be appreciated by the smoothness of her landing, and thus we will have just one try to set the things right in the near future

Bio-Inspiration in Flapping-Wing UAVs



Göksel Keskin
Junior Researcher, Department of Biological Physics, Eötvös Lorand University / Glider Pilot

(a) Actual wing

(b) Simplifiad wing

(a) PLA

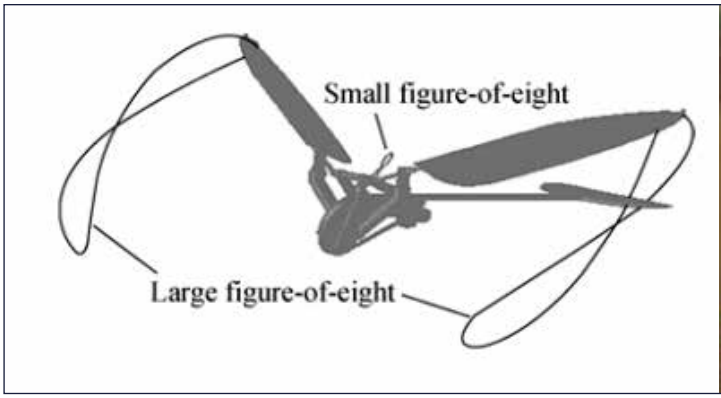
(b) Acrylic

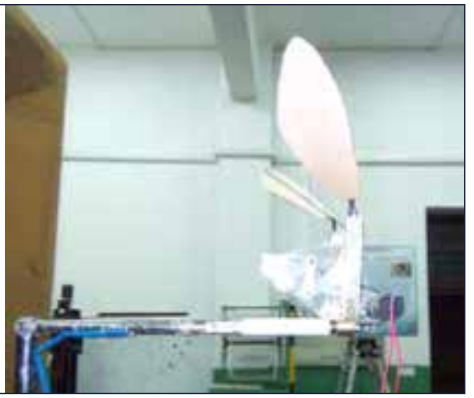
(c) ABS

For centuries, humans have been inspired by the flight of birds, bats, and insects. As it's mentioned in previous articles, early attempts at building aircraft by replicating the shape of bird and bat wings. Flying animals that power and control flight by flapping their wings perform excellent flight stability and manoeuvrability while steering and manoeuvring by rapidly and continuously varying their wing kinematics. Current studies about flapping-wing designs are generally classified in micro air vehicle status. Micro air vehicles (MAVs) are a relatively new and rapidly growing area of aerospace research. They were first defined by the US Defense Advanced Research Projects Agency (DARPA) in 1997 as unmanned aircraft that are less than 15 cm in any dimension. Later in 2005, the DARPA defined aircraft with all dimensions less than 7.5 cm and lighter than 10 g (carrying 2 g payload) as nano air vehicles (NAVs). MAVs (or NAVs) generally fit into one of the three categories: fixed wing, rotorcraft, or biomimetic. Biomimetic MAVs (BMAVs) mimic the flapping wing motion of flying organisms (e.g., insects, birds, bats, etc.).

Comparison between an actual dragonfly wing and the simplified wing frame is invented and used by a research group. Spatial network analysis utilizes geometric objects within a region specified by vertices or edges. Although this method is commonly used in geographical information systems (GIS) to explore geographic spatial patterns, the idea of applying this algorithm to a biological structure was first introduced in this article. It was inspired by observing the compactly arranged geometrical patterns inherent to dragonfly wings. This method allows this complex biological structure to be mimicked by a simplified frame structure that can be fabricated by machining or 3D printing. The results show that the ABS wing has considerable flexibility in the chordwise direction, whereas the PLA and acrylic wings show better conformity to an actual dragonfly wing in the spanwise direction.

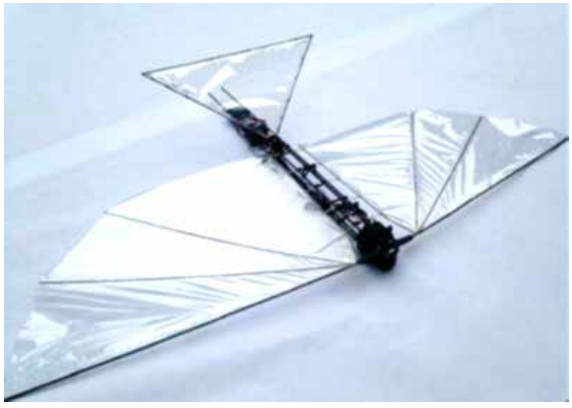
Based on the wing motion of the bee, a multi-DOF (multi-degrees of freedom) mechanism with complex three type motions for the bee-like MAV was proposed. The tips of bee wings can trace a figure-of-eight or banana, and



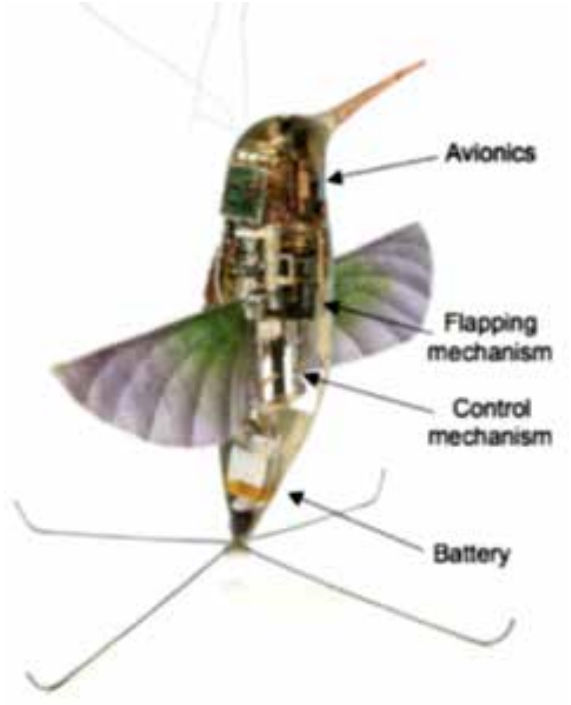


two wings can twist. New structural properties and multi-DOF flappingwings were studied according to the bee flight mechanism, including six links and seven kinematic pairs. With the kinematic chain transform theory, a new pattern flapping-wing mechanism was analyzed. A parameter optimization model of the mechanism was established to realize the motion track of the bee. The flapping-wing with compound motion can produce higher lift and thrust. The motion parameters that have influence on lift and thrust of flapping-wing include plunging amplitude, plunging frequency, sliding amplitude, pitching mean angle and pitching amplitude. The increase of pitching mean angle reduces the thrust. A miniaturized flight control system with high quality was developed in the center of MAV.

More recently, Robo Raven, a highly maneuverable robotic bird due to its independent wing control was developed in the Advanced Manufacturing Lab at the University of Maryland. Each wing driven by a high-speed, high-torque servo. As a result, a desired wing position or velocity can be programmed in order to achieve a wide range of flapping profiles and aerobatic maneuvers by varying flapping



frequencies, flapping ranges, and positions. Robo Raven has a wingspan of 114.3 cm, a platform weight of 285 g with wings, a maximum flight weight of 328.8 g, a payload of 43.8 g, and consumes 36 W during flight. Like most FWAVs Robo Raven has a limited flight time due to the small on-board 370 mAh lithium polymer battery used to power the platform. With the limited flight time and large surface area provided by the wings, it was used as the base platform for this research. The goal of this work is to increase vehicle endurance and overall system efficiency though the usage of multifunctional structures, specifically integrated flexible solar cells and batteries.



Another microflyer has a wingspan of 16.5 cm and a total mass of 19 g. It can hover for around 4 min and can fly at a speed of 6.7 m/s. The flapping-wing mechanism is powered by DC motors and the wing-flapping frequency is 30 Hz. The remarkable feature of this microflyer is that it has a fuselage shaped and painted to make it look like a real hummingbird, which makes it ideal for covert operations. The elec¬ tronics and control system were developed in-house and are enclosed within the body. All the control inputs are gener¬ ated by varying the lift on the wings, and the vehicle does not rely on a tail for stability. The microflyer can fly stably outdoors under the control of a human pilot and transmits live video to a ground station.

Flying animals are the most futuristic and advanced flyers on Earth, and bioinspired flapping flight systems as an integrated system offer an alternative paradigm for MAVs when scaled down to insect and bird size, which, however, normally brings low-speed aerodynamics and flight control challenges in achieving autonomous flight. Replication and inspiration from all living things will be constantly applied to unmanned aerial vehicle systems with the development of techonology.

Who is Responsible for the Engine Parts Rain?

February 20, 2021 was recorded as the day when plane parts fell from the sky in the Netherlands and the US. Fortunately, no serious injury or death was reported. However, the entire aviation industry has stirred up due to these incidents and their repercussions over the past few days. Let's look for the answers of what exactly happened, why it happened, and what will happen next.

United Airlines Suffers Major Engine Failure After Takeoff

A failure occurred in the right engine of the Boeing 777-200 aircraft, which took off with 10 crew and 231 passengers to make the Denver-Honolulu flight of the US United Airlines.

Numerous fragments broken off the plane fell down on houses and people in Broomfield, about 24km north of Denver. After the incident that caused a great panic both in the air and on the ground, pilots managed to land the plane in Denver safely.

Same Incident Occurred 3 Years Ago!

The incident that United went through stirred up the aviation industry, because almost exactly the same occurred 3 years ago.

In February 2018, another United Airlines flight with Boeing 777 experienced a similar incident en route from San Francisco to Honolulu. About half an hour before landing, fan blade number 11 in the right engine of the plane broke. This broken part caused critical damage to the engine. In less than a second, the protective engine cowling exploded and detached. Fragments of the plane's engine rained down on the Pacific Ocean. In the meantime, some of the detached fragments also damaged the fuselage. Fortunately, the cockpit crew managed to safely land the plane.

Japan Airlines Suffered from The Same Problem In December 2020!

by Muhammed Yılmaz
Aeronautical Engineer

Last December, similar incident occurred after the break off of the left engine's 16th fan blade of Japan Airlines' Boeing 777, making its Naha-Tokyo flight. The pilots managed to land the plane safely in that incident as well.

One of the most important reasons why air travel is the safest mode of transportation is that the authorities, airline companies, aircraft and engine manufacturers

learn and took lessons from every incident and take the necessary actions to prevent their repetition.

It seems the history is repeating itself with the same airline, same aircraft and same engine type, in a flight to Honolulu. Unfortunately, the repetition of something in aviation and its frequency does not bode well. There is something wrong with this!

All Three Airplanes Are Quite Old

United's 777, the engine of which has failed, is the fifth oldest plane off the production line. It joined United's fleet in September 1995. The airplanes in all three incidents I mentioned are among the oldest 777 aircraft that were manufactured and delivered in the first two years after the 777 was launched and are actively used today.

The Pratt & Whitney engines that have problems in these three incidents are certainly not the engines that were delivered with the airplanes. Engines are removed from the aircraft periodically for regular maintenance. They continue to fly in different planes after a major overhaul.

The engine that failed in the 2018 incident was produced in 1996. It had flown for 77.593 hours and made 13.921 landings and take-offs. The engine that failed on February 20th had flown for 43.060 hours and made 33.518 landings and take-offs.

Uncontained Engine Failure!

Engines failure during flights is quite rare. Incidents where rotating, moving parts in the engine break away and damage the outer casing protecting the engine are called uncontained engine failure and indicate a potentially imminent danger when it occurs.

As a result of the investigation conducted by the US National Transportation Safety Board (NTSB) regarding the incident in February 2018, it was determined that the incident occurred as a result of the broken fan blades in the engine. It was detected that during the inspection of the engines, the inspectors failed to spot signs that one of the blades was weak. It was understood that the crack near where the fan blade broke off was not noticed during maintenance and caused this terrible incident.

It was determined that engine manufacturer Pratt & Whitney was unable to provide a sound procedure for inspecting and checking fan blades.

NTSB concluded that the fan blades of all PW4000 series engines should be inspected and the old records should be reviewed following the fan blade breakage during United's flight. In response, the FAA issued an Airworthiness Directive in March 2019 covering changes to the initial and repetitive checks of the fan blades on this engine.

Negligence of Pratt & Whitney

The problems in engines exploded during flight do not occur all of a sudden. As airplanes and engines age, microscopic cracks occur in their mechanical parts due to stress, which can grow over time and

become bothersome. The purpose of the maintenance is to periodically check such cracks to prevent them from turning into fractures that could endanger the plane.

Pratt & Whitney has a facility in Connecticut that inspects the fan blades of PW-4000 engines using a method known as non-destructive testing. The NTSB investigation regarding the incident in 2018 found several mistakes in the inspection process of the fan blades. In the thermal acoustic imaging method developed in 2005 to examine the interior surfaces of the blades, it was revealed that some cracks were recorded as "a defect in the paint".

In other words, it was found out that some flaws that could explode the engine during the flight were noticed but ignored. In another previous report, it was stated that the number of fan blades waiting to be examined increased significantly and the personnel to conduct the inspection were frequently asked to work overtime. To be specific, there was a practice leading to human error. The reports also included that there was no formal training procedure on how to conduct such inspection at the facility.

The exact cause of the incident that took place on February 20th is currently unknown. However, the images of the damaged engine reveal that one of the 22 fan blades in the engine broke fully and snapped off the one next to it. This seriously increases the probability of a fatigue-related break similar to the incident in 2018.

As a result of the first investigations made by the NTSB, the details that fatigue-related cracks were detected on the internal surfaces of the broken fan blade appeared in the media a few weeks after the incident.

Experts are trained to carefully and methodically evaluate the available evidence before reaching a definitive conclusion regarding such incidents. The investigation process may possibly take a year or more.

Boeing: "It's Not Our Fault"

US manufacturer Boeing has been on the agenda for the last two years with its 737 MAX model aircraft, which were grounded worldwide after two fatal crashes. The fact that there have been several problems also in 787 Dreamliner recently and that Boeing suspended to deliver such aircraft to its customers for months has created a serious negative perception in the public. Following the incidents encountered by the United, rumors like "Are there any problems also about 777s?" started as a result of the recent negative reputation of Boeing around the world. Even though the Boeing senior management announced that the problem was not related to them, it is for sure that they will have to work harder to overcome this negative perception of the company and its aircraft. Perhaps the clearest conclusion to be drawn from this incident is that Boeing has to initiate an effective perception and reputation management program.

777S with P&W Engines Grounded

Japan ordered airlines to ground Boeing 777 jets equipped with the type of engine that failed in the U.S. incident. A total of 32 aircraft in the fleet of Japan Airlines and All Nippon Airways were grounded. Shortly after, the FAA issued a directive requiring an urgent inspection of such engines. United Airlines also grounded a total of 24 777s in its fleet. South Korea also adopted a similar decision. UK, on the other hand, temporarily banned 777s from entering its airspace.

Boeing 777 Engine Options

Boeing 777 customers are offered 3 different engine options. These are General Electric GE90 series, Pratt & Whitney PW-4000 series and Rolls-Royce Trent 800 series engines.

In both incidents encountered by the United Airlines, the engines that failed were Pratt & Whitney PW4077 engines. 128 out of over 1600 777 jets delivered to airlines are powered with this particular engine type. While 69 of such 128 jets are in-service, 59 of them are in-storage due to the pandemic.

Are The 777S Of Turkish Airlines Affected?

There are a considerable number of Boeing 777 aircraft in the Turkish Airlines fleet, but THY prefers to use General Electric GE90 series engines in these jets.

Does the Problem Occur in Other Types of Aircraft?

PW4000 engines power various commercial aircraft, including the Airbus A300, A310, A330, Boeing 747, 767, and MD-11. However, the PW4000-112 series engines are only used in Boeing 777-200 and 777-300 aircraft. In other words, the problem is not expected to occur in any aircraft other than the 777 family.

Airbus Aircraft Have Also Faced Troubles with P&W Engines

Airbus has recently suffered from a similar problem. The European manufacturer offered operators to purchase its A320neo family aircraft two engine options with improved fuel efficiency: Pratt & Whitney's PW1100G series and the LEAP-1A series developed by CFM.

Shortly before the delivery of the first A320neo to Qatar Airways, the level of the problem with the Pratt & Whitney PW1100G engines grew so much that the Qataris decided not to purchase the aircraft. The launch operator of the aircraft became Lufthansa after a late switch with Qatar Airways. Soon afterwards, airlines with A320neo using this engine type started to face several problems one after another, especially the cooling issue in the engine.

It was revealed that the engine had also software errors, such as sending erroneous messages to the cockpit, in addition to the physical problem. After the PW1100G engines were put into service, several airlines faced problems that would necessitate grounding their aircraft. The major problems involved combustion chamber distress, low pressure turbine (LPT), gear box failures and engine vibrations.

These problems put many airlines, especially Indian airlines, in a difficult situation, including Turkish Airlines.

On the other hand, the PW1500G engines powering the Airbus A220 have also come up with various problems several times.

737 Jets with CFM56 Engines Have Also Experienced Such Problems

The Boeing 777 is not the only aircraft model that has suffered multiple uncontained engine failures in recent years. In 2016 and 2018, 737s powered by CFM56 engines suffered from fatigue fracture that resulted in catastrophic failure. During the 2018 flight of Southwest Airlines, a fragment of the engine hit and smashed the window, causing a passenger to get partially sucked out of the aircraft and die

The Republic of Turkey, The Ministry of Trade, Supports Wof Expo 2021 Participants From Turkey

World of Freight (WOF) Expo 2021 will be held on October 6 - 8, 2021 Incheba Expo, Bratislava – Slovakia. WOF Expo 2021 is only few months away. Taking place in the heart of Europe, Bratislava – Slovakia, makes WOF Expo the ideal place to be the logistics hub of the CEE region. This will be the first Expo that will relocate across the countries of the CEE region yearly in order to create a common and stable platform for freight/supply chain providers and industrial/manufacturing companies with a specific focus on the CEE region.

WOF Expo 2021 will welcome international participants from 44+ countries. It will connect shippers, retailers, wholesalers, manufacturers with the most up-to-date supply chain solution providers to maximize their network and operations, clarify the prospects of future technologies, streamline processes and deliver a flexible and sustainable supply chain future after a challenging pandemic period. WOF EXPO 2021 is now on the list of "Individual Participation Supported Fairs." It means 50% of the eligible Turkish participants' expenses, up to $ 15,000, will be contributed by the Government of Turkey. This offers the following benefits: participation expenses (floor rent, stand, decoration, insurance, registration, transportation, internet, electricity, cleaning expenses) and travel costs for a round-trip in economy class up to two representatives.

The companies which will attend the WOF Expo 2021 with the stand and are located in Turkey performing in the international freight/cargo service and are engaged in the international logistics management, and transport operations shall enjoy specified supports within the scope of this regulation. WOF EXPO 2021 will be a driving force to kick new business opportunities after a challenging pandemic period! Join us to unlock the potential and prospects of future technologies, discover the latest available solutions to supply chain aspects, and streamline processes.

WOF EXPO presents fantastic networking tools such as 1-on-1 MEETINGS: participants will book their meeting before and during the event. There will be VIP Networking Lounge which participants will reserve a table for a meeting. And there is going to be WOF connect cocktail networking event.

Conference with phenomenal content. Sustained growth in e-commerce, progressive digitization of logistics processes, the revolutionary impact of Industry 4.0 on transport and logistics.

WOF Awards Gala Event, where we will award the most innovative companies in logistics, e-commerce and supply chain, voted by Smart Freight Forwarder, Start-up Hero, Shipping Line Efficiency, Air Cargo Excellence, Speedy Flow Airport, Innovation of the Year, Last Mile Expert, Port of the Future, and Green Impact.



Our Misson

The @Team has come together with the aim of developing projects at home and around the world, reflecting its passion for aviation and space, with a team profile that proves that the aviation industry can appeal to people from all disciplines, regardless of their field of training.

Our Vision

The @Team underlines that everyone can seek their own future in the skies, with our team profile proving that the aviation industry can appeal to people from all disciplines regardless of their field of training, and at the same time, we aim to inspire fellow students with our ideas and projects and encourage new creative ideas and new collaborations through an appropriate inspiring environment where are ideas free to soar.

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
Middle East Technical University

Middle East Technical University (METU) is founded in 1956 to contribute to the development of Turkey and Middle East countries and especially to train people to create a skilled workforce in the fields of natural and social sciences. METU hosts over 27,000 students from Turkey and 94 different countries, studying toward countless academic degrees.

Department of Aerospace Engineering

Initially established in 1981 as Aeronautical Engineering, the Department of Aerospace Engineering aims to educate students and do research in aerospace sciences to contribute to the economic progress and welfare of the society. With its well-qualified faculty, Aerospace Engineering Department adopts the most recent teaching and learning methods and equips its students with real-life problem-solving techniques.

Middle East Technical University - Aerospace Society

Middle East Technical University - Aviation and Space Society (HUT) is a student community established within METU Aerospace Engineering Department in order to operate in the amateur, scientific and industrial fields of aviation and space sciences. It is one of the pioneering and exemplary aviation communities in Turkey. The community members are from different departments, including, but are not limited to, Aerospace Engineering, Electrical - Electronics Engineering, Chemical Engineering and Physics.

Mission of the METU - Aerospace Society

The prime goal of METU Aviation and Space Society (HUT) is introducing and popularizing aviation to youth. In order to contribute to the technical, social, and personal development of the members at the highest level, HUT organizes various activities, seminars, educations, social and technical trips every year. In international organizations, which HUT is a member of, HUT aims to represent Turkey, Turkish culture, Ankara, and METU in the best possible way.

Logo and Slogan of the METU - Aerospace Society

ODTÜ HAVACILIK VE UZAY TOPLULUĞU

''Build the wings of your future!''

Activities of the METU - Aerospace Society

AVIATION DAYS

METU Aviation Days, held annually, is one of our biggest events where we host aerospace professionals from various fields and bring them together with aerospace students and enthusiasts. Our speakers include academicians, leading engineers from the industry, pilots and more. The presence of specialists and representatives from some of the leading aerospace companies such as Turkish Aerospace Industries and ROKETSAN allows our participants to expand their network.

Board Members of the METU - Aerospace Society

President: Olcay ÖZKAN - Aerospace Engineering

Head of the Communication: Ömer Faruk KÖKLÜKAYA - Aerospace Engineering

Head of the Education: Ahmet PEHLİVANOĞLU - Aerospace Engineering

Head of the Finance: Ömer Faruk ONUR - Aerospace Engineering

International Contact Manager: Barış ÖZGÖRGEN - Electrical - Electronics Engineering

Head of the Organization: Ayla RASİMGİL - Chemical Engineering

President of the Rocket Society: Alpcan TUNÇ - Physics Education

Technical Events

Courses

We offer courses such as general physics, Phyton, MATLAB and more in order to help our members improve themselves in both school subjects and extracurricular ones. Moreover, our society holds a model airplane building course each term from which our members and aerospace engineering students benefit.

Field Trips

In our field trips we visit some of the top aerospace and defense manufacturers, enabling our members to engage with the executives and workers of the companies. We get to ask our questions about the sector, see the work environment and expand our vision and network. Some of our recent field trips include trips to ROKETSAN Elmadağ Facility and TUBITAK Space Technologies Research Center.

Social Events

Our society hosts a number of social events serving different purposes each year. Our annual party, Aero-night, lets our members and aerospace engineering students socialize whereas the talks we host with the faculty instructors lays the bridge between students and instructors.

Metu Aerospace Society (HUT) as a Member of Euroavia

Since 2002, HUT is one of the 42 member societies of EUROAVIA (European Association of Aerospace Students). EUROAVIA aims to connect aviation students all around Europe and establishes a respected community in the aerospace industry. HUT members are privileged to be a part of this community. Every active HUT member is encouraged to participate in annual international events of EUROAVIA.

Looking to the Future

As HUT, we just established a technical team for students, and we want to increase our competence in technical parts of aviation with our work in this team.

Contact Information of the METU - Aerospace Society

@odtuhut

@odtuhut

flying.mass@gmail.com

Last Word

As our community, we thank Aviation Turkey Magazine for giving us the opportunity to introduce ourselves and get to know other communities.

Istanbul Bilgi Univesity

Adopting the principle of "Non scholae, sed vitae discimus" (learning not for school but for life), Istanbul Bilgi University was founded on June 7, 1996, to make a difference in university education. Contributing to its students and the academic life in Turkey with 4 main campuses, Istanbul Bilgi University has become an educational institution that is recognized worldwide with innovations on university education.

IBU - Flyers of Bilgi Aviation Club

IBU Flyers of Bilgi Aviation Club was established in 2016 by the students of the Civil Aviation Vocational School and has been actively continuing its activities since then. Our club comprises of two teams: management team and class representative team. Our objective is to inspire our fellow students, regardless of their study fields, about what they can do in this sector, and related activities and organizations have been organized to this end. We strive to further develop our club by collaborating with other clubs of our university. Our club is among the leading clubs of our school with more than 300 members.

Mission of IBU - Flyers of Bilgi Aviation Club

We aim to provide information on aviation to all Bilgi students regardless of their study fields and to infuse them with aviation culture. We also aim to introduce the aviation sector to our fellow students through the activities to be held during the year.

IBU - Flyers of Bilgi Aviation Club Board Member

President: Hüseyin Berker Aras - International Trade and Business

Vice President: Sinem Alemdaroğlu - Aviation Management

Vice President: Emre Can Yılmaz - International Trade and Business

Board Member: Berna Güvenel - Civil Air Transportation Management

Board Member: Sema Demir - Civil Air Transportation Management

Board Member: Furkan Başaran - Aviation Management

Board Member: Berk Yücepur - Aviation Management

Board Member: Yağız Çekin - Aviation Management

Board Member: Aleyna Şener - Civil Aviation Cabin Services

Board Member: Mehmet Eyican - Civil Aviation Cabin Services

IBU - Flyers of Bilgi Aviation Club Logo and Slogan

"We Fly With Our Dreams!"

IBU - Flyers of Bilgi Aviation Club Major Events

Current Developments in Aviation

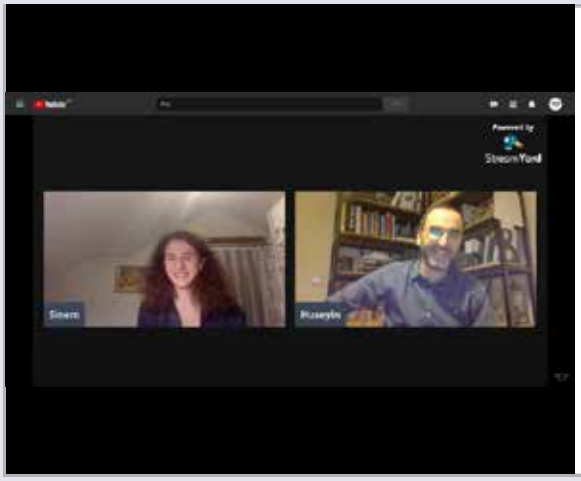
In our event titled "Current Developments in Aviation", Dr. Devrim Gün informed us about the measures to be taken in aviation and the required level of security. Atty. Lale Kaplan gave briefing on the aviation law and criminal proceedings. Turkish Airlines Captain Pilot Menderes Çakıcı informed us about the qualifications the pilot should have, the information that a person should pay attention to in becoming a pilot, and the aircraft and flight information. Derya Pekruh Gerçeker, Marketing and Services Manager of Singapore Airlines, explained the importance of marketing in aviation and how it affects the image of an airline.

Air Conversations

In our "Air Conversations" event, Turkish Airlines Senior Cabin Crew Ahmet Kolik gave answers to the questions on "How can I be a cabin crew? What are the difficulties, advantages and disadvantages?" by giving examples on his daily business life.

Speaking From the Cockpit

In this event, Turkish Airlines Captain Pilot Uğur Demiröz informed us about the challenges awaiting the students who want to pursue a career as a pilot in the aviation industry, the lives of the pilots, their trainings, and how important their contribution is to the transportation sector.



FoB Talks

We have held our FoB Talks online through our YouTube channel with many guests such as Student Pilot Denizhan Sayışman, Turkish Airlines Cabin Crew Gülay Alageyik, Turkey Air Traffic Control Center Air Traffic Controller Gökay Güven, Turkish Cargo Loadmaster Emrah Köylü, Onur Air Cargo Manager K. Göksenin Seyhan, ULS Cargo Flight Operations Specialist Hüseyin Uzun and Singapore Airlines Marketing and Services Manager Derya Gerçeker. The aim of this event is to have a conversation with the speakers we invite about their academic and professional lives, accompanied by a moderator.

To Become a Manager in Aviation

In cooperation with the Business Club of our university, we held an event with the participation of Air Astana Airlines Cargo Manager of Turkey Taner Aksoy, Turkish Airlines Innovation Manager Ahmet Faruk and Turkish Airlines Cockpit Recruitment Manager Dr. Muhittin Hasan Uncular, as speakers. They gave information about the managerial positions in the aviation industry and the recruitment process.

Looking to the Future

As Flyers of Bilgi Aviation Club, we know that aviation is there with us in many parts of our lives and we try to overcome the bias people have together with all our fellows who want to walk this path with us. It is of great importance for us that people actually understand how critical the aviation industry is. In a world where everyone lives together and aviation technology expands and develops greatly, aviation will always take place on the top for us.

IBU - Flyers of Bilgi Aviation Club Contact Details

Last Word

As Flyers of Bilgi Aviation Club, we aim to properly explain the aviation culture to everyone, and we will proceed by helping to and seeking advice of those who walk on this path. We hope all the efforts we exerted will help this sector grow effectively.

International Airport in the Northwest of Germany; MÜNSTER OSNABRÜCK

With an attractive unique catchment area with 3.3m inhabitants, extending to 9.0m people within 90 minute drive time (North-western part of Germany as well as eastern part of the Netherlands) as well as a diversified international population within catchment area Münster Osnabrück airport is becaming a preferred airport.

In 2019 more than 235.000 passengers traveled between Münster airport and Turkey which represents almost 25% of the total passenger number of 992.553. And 2020 20.092 passengers traveled between Münster airport and Turkey which represents almost 10% of the total passenger number of 225.048 (total passenger number was down by 77% which also represents the German average during pandemic).

Despite the crisis and pandemic in summer 2020 five Turkish destinations: Adana, Izmir, Antalya, Kayseri and Zonguldak with Zonguldak operated for the first time as new destination from Münster and with this market share Münster Osnabrück airport is the airport in Germany with the highest market share of the Turkish market from the total passenger numbers.

Airport is getting ready to welcome passengers from Adana, Antalya, Izmir, Kayseri, Zonguldak and also from Ankara as the newest destination but on the other hand there is no flight between Istanbul and Münster.

All other airports in Germany start with Antalya and Istanbul, before other destinations in Turkey might follow.

Münster/Osnabrück is unique with six destinations in Turkey including Zonguldak, but with no Istanbul flights.

Münster/Osnabrück Airport is 24/7/365 open without night curfew and without slot restrictions, which brings most flexibility to all airlines.

Brussels Airline Continues to Bring the Best of Belgium to the World

Six years ago, Brussels Airlines launched its first Belgian Icon with a single hand-painted aircraft carrying a never-seen before livery. Together with Moulinsart, the airline created Rackham, an aircraft livery dedicated to the world famous Belgian cartoon character Tintin, covered in a 37m long black shark based on the original drawing by the hand of Hergé. The Belgian Icon series is one of many ways how the airline wants to show ambassadorship for its country. The airline will continue to bring the best of Belgium to the world.

As Rackham – which is still one of the most photographed planes in the world – has reached its repainting deadline, Moulinsart and Brussels Airlines agreed to prolong their partnership and restore the aircraft painting in its original state, meaning that Rackham will stay in the airline's fleet for at least 5 more years. While the painting on the outside remains almost identical, the interior of the aircraft will be upgraded with more Tintin illustrations by the hand of Hergé. With the renewal of its first Belgian Icon, Brussels Airlines confirms its continued ambassadorship for Belgium. Moreover the airline aims at always counting at least five Belgian Icons in its fleet.

Moulinsart, who adapted the original drawings to the unusual curves of an Airbus A320, will follow up on the repainting of Rackham's fuselage together with Brussels Airlines' Maintenance department. The restauration of the painting and adaptations of the interior is expected to be finished in June 2021.

After Rackham in 2015, the airline welcomed two special liveries in 2016: Magritte and Trident, dedicated to the Red Devils, Belgium's national soccer team. One year later Amare, a tribute to the music festival Tomorrowland, joined the fleet, followed by Aerosmurf and Bruegel in 2018 and 2019 respectively.

While Rackham will be restored in its original state, OO-SNC, the aircraft that carried the Magritte livery for five years, is being transformed into an aircraft wearing the Star Alliance logo/colors, the world's leading airline alliance Brussels Airlines is member of since December 2009. After 6,403 flights and 8,371,324 flown kilometers, Brussels Airlines waves Magritte goodbye. In the past 5 years, 866,331 passengers got the chance to fly the beautiful aircraft covered

with the famous clouds and birds taken from three of René Magritte's paintings.

Trident on the other hand remains dedicated to one of Belgium's most popular sports: soccer. The popular livery will receive a partial repaint on the outside as well as an updated interior. As of 25May 2021, the aircraft with registration number OO-SNA will fly around with portraits of both the Red Devils and the Red Flames on the inside until it leaves the Brussels Airlines fleet in November 2022.

Amare, Brussels Airlines' aircraft honoring The World's Best Music Festival "Tomorrowland" will bear its livery until 2023. The fifth Belgian Icon Aerosmurf, dedicated to Belgium's beloved small, blue characters, the Smurfs, will carry its drawings until 2024. The airline's youngest special livery, dedicated to one of the most talented artists of the sixteenth century, Flemish Master Pieter Bruegel the Elder, will remain in the fleet until 2024. Any possible changes to or replacements for these last three icons are not known yet, but the airline confirms that it will continue with the Belgian Icon series in the future.

ACJ319neo, the Most Spacious Cabins of any Business jet

Airbus Corporate Jets has won an additional ACJ319neo order with an undisclosed customer, highlighting the market appeal for this aircraft that offers a unique flying experience with its spacious cabin and intercontinental range.

The ACJ319neo will be equipped with CFM International's LEAP-1A engines. 12 ACJ320neo Family customers have now placed a total of 16 orders including six ACJ319neo. "We are delighted to win another order for the ACJ319neo. Customers will enjoy travelling in the spacious cabin whilst flying intercontinental routes. The ACJ319neo has a robust reliability. Customers will as well benefit from a higher passenger capacity with exceptional comfort and similar operating costs to traditional business jets because of more cost-efficient maintenance, training, and better value," said Benoit Defforge, ACJ President. With the ability to fly eight passengers 6,750 nm/12,500 km or 15 hours, the ACJ319neo will bring much of the world within nonstop range. Deliveries of the ACJ319neo started in 2019 and three are already in operation with three customers.

The ACJ319neo is part of the ACJ320neo Family, featuring the most spacious cabins of any business jet, while being similar in size to competing large-cabin aircraft. The ACJ320neo Family also delivers similar operating costs because of its lower maintenance and training overheads – part of its airliner heritage – deliver a similar total cost when combined with fuel and navigation and landing charges and as a direct consequence, it also has a much more favorable CO2 footprint. Over 13,000 Airbus aircraft have been delivered worldwide, supported by a globe-spanning network of spares and training centres, giving corporate jet customers unmatched support in the field. Airbus corporate jet customers also benefit from services tailored to their particular needs, such as the "one call handles all" corporate jet customer care centre (C4you), customised maintenance programmes and the ACJ Service Centre Network.

Innovative Surface Technology from Lufthansa Technik and BASF

Lufthansa Cargo will equip all Boeing 777 freighters with AeroSHARK starting from 2022. Innovative surface technology from Lufthansa Technik and BASF improves fuel efficiency and helps airlines to reach sustainability targets.

The lower the frictional resistance of an aircraft in the air, the lower the fuel consumption. Using nature as a role model, the aviation industry has been intensively researching ways to reduce aerodynamic drag for many years. Now Lufthansa Technik and BASF have succeeded in making the breakthrough as part of a joint project. AeroSHARK, a surface film that mimics the fine structure of a shark's skin, is to be rolled out on Lufthansa Cargo's entire freighter fleet from the beginning of 2022, making the aircraft more economical and reducing emissions.

The surface structure consisting of riblets measuring around 50 micrometers imitates the properties of sharkskin and therefore optimizes the aerodynamics on flow-related parts of the aircraft. This means that less fuel is needed overall. For Lufthansa Cargo's Boeing 777F freighters, Lufthansa Technik estimates a drag reduction of more than one percent. For the entire fleet of ten aircraft, this translates to annual savings of around 3,700 tons of kerosene and just under 11,700 tons of CO_2 emissions, which is the equivalent of 48 individual freight flights from Frankfurt to Shanghai.

The aviation industry has been researching the use of sharkskin for aircraft for many years, albeit often just on a small scale. For the first time at the end of 2019, Lufthansa Technik and BASF fitted almost the entire lower half of a Lufthansa Boeing 747-400's fuselage with 500 square meters of such a jointly developed sharkskin surface and had this modification certified by EASA. This aircraft (registration D-ABTK) subsequently validated the savings potential of the technology on scheduled long-haul services during more than 1,500 flight hours. This provided unequivocal proof that emissions were reduced by around 0.8% thanks to the sharkskin modification. The savings for the Boeing 777F are estimated to be even higher, because the application areas are even larger in this case due to the absence of window rows on a freighter, among other reasons. The savings are validated using a software for fuel consumption analyses developed by Lufthansa Technik, which allows the effectiveness of a wide variety of different aircraft modifications to be demonstrated reliably based on comprehensive data.

Lufthansa Technik and BASF intend to continue developing the new technology consistently to include additional aircraft types and even larger surfaces so that they can support airlines around the globe even more comprehensively in the future in reaching their sustainability goals. Initial model calculations show that use of sharkskin technology at its highest expansion level could reduce CO_2 emissions by as much as three percent.

Turkish Cargo, Expanding Cargo Flight Network

Turkish Airlines' ascendant air cargo brand Turkish Cargo keeps growing steadily by strengthening its flight network. After Frankfurt, Turkish Cargo has now added Munich, the developed economical city of Germany, among its destinations served with direct cargo flights. The dynamic brand of the sector, maintaining increase its number of direct cargo flights with Munich cargo flights to be started on May 7, 2021.

Commenting on the launch of Munich as a direct cargo destination, Turkish Cargo's Chief Cargo Officer Turhan Ozen said; "Besides making a remarkable contribution to the need for global air cargo transportation, we are glad to add Munich, a substantial business center, to our flight network, and continue to offer a stable and reliable cooperation to the leading exporters of the market.

As one of the prepotent air cargo brands in the world, we are aware, and resolutely fulfill our critical role in the development of our country and in increasing the competitiveness of

global trade. We perform this mission not only with the transportation we carry out, but also with producing, opening areas, contributing the development of sectors, and creating a large logistics ecosystem."

Munich is considered as the technological metropolis of Germany, and it hosts the market leaders in automotive, electronics, medical and biotechnological products. Turkish Cargo aims to strengthen the air cargo bridge it has established between Europe and the Middle East with the reliable, fast and direct air transportation it offers to logistics service providers with Airbus A330F type wide body cargo aircraft on IST-MUC-IST cargo flights.

Connecting the continents, Turkish Cargo has the world's largest direct cargo flight network consisting of 96 destinations among air cargo brands, 25 direct cargos, excluding express carriers. It continues to carry out global business processes with the fleet of Turkish Airlines consist from 363 aircraft including 25 dedicated freighters. Achieving sustainable growth with its infrastructure, operational capabilities, fleet and expert teams in the field, Turkish Cargo aims to be one of the top 3 air cargo brands in the world. With its innovation mission, it continues to develop pioneering projects in the field of digitalization and innovation in a sustainable way to increase its service quality in changing world.

TUSAŞ Delivers Sets to Spirit For a Total of 200 Aircraft

Turkish Aerospace (TUSAŞ) continues to make deliveries to Spirit, one of the leading companies in the global aviation industry. TUSAŞ first started to deliver the detail parts in 2012 and then the first finished product in 2014 for the Airbus A220 Fixed Trailing Edge, for a total of 200 aircraft so far. TUSAŞ aims to deliver a total of 1770 aircraft sets within the scope of the project.

As part of the "Fixed Trailing Edge", which is referred to as the part to which the moving parts (Spoiler, Aileron etc.) and the landing gear are attached, there are 2 inner and 2 outer spars, one on each wing, in a set for one aircraft. In this framework, while continuing the production at full steam, TUSAŞ completed the delivery of the sets for a total of 200 aircraft. TUSAŞ, which was deemed worthy of many awards in the production of air structures, which it carries out as a "sole source" for several leading aviation companies, especially Airbus and Boeing, continues its production activities based on quality and error-free manufacturing processes.

TUSAŞ President and CEO Temel KOTİL said, “We have achieved another milestone in our deliveries we have realized to Spirit, one of the catalyst brands of the global aircraft structural part industry. We are very excited to deliver the 200th of the critical parts we manufacture for Airbus A220 aircraft. Our strategic cooperation with Spirit goes back many years. I congratulate all my colleagues who have contributed both at Spirit and TUSAŞ, and hope our strategic cooperation will continue fruitfully.”

Rolls-Royce Pearl Family Continues to Grow

Rolls-Royce has officially unveiled the Pearl® 10X, the third and most powerful member of its market-leading Pearl engine family for the business aviation market. The engine has been optimised to exclusively power Dassault's brand-new flagship aircraft, the Falcon 10X, which was revealed during a digital ceremony at Le Bourget airport in Paris on 07 May 2021.

With more than 3,600 business jets powered by Rolls-Royce engines in service, Rolls-Royce is the world's leading engine supplier in this market. Rolls-Royce Pearl 10X is the newest member of the state-of-the-art Pearl engine family and the first Rolls-Royce engine ever to power a business jet of the famous French airframer. Dassault's selection of the Pearl 10X for its new top of range product is another testament to Rolls-Royce position as the engine manufacturer of choice in business aviation.

The Pearl 10X features the Advance2 engine core, the most efficient core available across the business aviation sector, and combines it with a high-performance low-pressure system, resulting in a superior thrust of more than 18,000lb. Compared to Rolls-Royce's last generation of business aviation engines the Pearl 10X offers a 5% higher efficiency, while delivering outstanding low noise and emissions performance. The result is an engine that offers a market-leading combination of power and efficiency. This combination will enable customers and operators to have premium airport accessibility and fly ultra-long-range connections whilst also being able to travel nearly as fast as the speed of sound.

It brings together innovative technologies derived from the Rolls-Royce Advance2 demonstrator programme and proven Pearl family features to deliver world-class environmental performance. This includes a highly-efficient blisked fan; a high pressure compressor with a market-leading pressure ratio and six blisked stages; an ultra-low emissions combustor; a two-stage shroudless high pressure turbine as well as an enhanced four-stage low pressure turbine that is one of the most efficient and compact in the industry. This suite of technologies is all housed together within a brand new, ultra-slimline nacelle from Spirit AeroSystems.

The engine is being developed at the Rolls-Royce Centre of Excellence for Business Aviation Engines in Dahlewitz, Germany, and is currently undergoing a comprehensive test programme, which includes the capability to operate on 100% Sustainable Aviation Fuels.

One of the new key features of the Pearl 10X will be 3D-printed combustor tiles, manufactured by an advanced Additive Layer Manufacturing process. This pioneering technology, which supports the exceptional environmental performance of the engine, has been developed and extensively tested as part of our Advance2 programme.

Chris Cholerton, President Civil Aerospace, Rolls-Royce, said: "This is a very special day for Rolls-Royce and the dedicated Pearl team, who have been passionately working behind the scenes to make

this programme a reality. We are extremely proud that Dassault has chosen us to power their flagship Falcon 10X, and I would like to congratulate the Dassault family as well as the Falcon team on this special occasion. Today marks the start of a successful partnership and, with our pioneering Pearl 10X engine and leading customer service, I look forward to supporting Dassault as they continue to impress their customers in the ultra-long-range corporate jet market."

Eric Trappier, Chairman and CEO, Dassault Aviation, said: "The Pearl 10X is perfectly matched to our performance requirements for our new, ultra-long-range jet and proved itself to be the best solution also for reliability and efficiency. New technologies within its core and its digital controls make it the benchmark for powerplant technology in this business aviation segment.

Moreover, Rolls Royce's track record for product support ensures an outstanding customer service experience."

Dr Dirk Geisinger, Director Business Aviation and Chairman Rolls-Royce Deutschland, added: Excellent customer support is a key focus for Dassault and Rolls-Royce – both of us have been ranked number one in our own categories for consecutive years in AIN's Product Support Surveys. As the leading engine manufacturer in Business Aviation, our customers can trust in us to deliver outstanding levels of in-service support.

Designed for outstanding reliability, the Pearl family is supported by Rolls Royce CorporateCare® Enhanced, the most comprehensive service programme in business aviation. CorporateCare Enhanced offers substantial financial and operational benefits to customers, increasing asset value and liquidity, mitigating maintenance cost risk and protecting against the unforeseen costs of unscheduled events anywhere in the world. Increased aircraft availability, reduced management burden, full risk transfer, direct priority access to the Rolls-Royce services infrastructure and remote site assistance are further customer benefits.

The Pearl engine family is part of the Rolls-Royce IntelligentEngine vision of a future where product and service become indistinguishable thanks to advancements in digital capability. As well as a new-generation Engine Health Monitoring System that introduces advanced vibration detection, the family benefits from the incorporation of advanced remote engine diagnostics. It is also enabled for bi-directional communications, allowing for easy remote reconfiguration of engine-monitoring features from the ground. Cloud-based analytics, smart algorithms and Artificial Intelligence continue to play an increasing role in delivering exceptional levels of availability and greater peace of mind for our customers.

STELIA Aerospace Participates in Dassault Aviation's Brand New High-end Business Jet

This new contract confirms STELIA Aerospace's excellency and competitiveness in the field of aerostructures and pilot seats, on the high-end business aviation segment. It focuses on two projects regarding the Falcon 10X, which was officially launched on 6 May 2021.

- Developing and providing four aerostructure sub-assemblies for the aircraft's central fuselage section (lower shell, aft fuel tank, upper fuselage section and emergency exit door). These sub-assemblies will be developed by STELIA Aerospace's teams following new innovative processes, based on total digital continuity, from design to mass production.

- Developing and manufacturing new generation pilot and co-pilot seats, aimed at improving the comfort and rest of the pilots.

Air Race E Expands with New Electric Race Classes

Air Race E, the electric air race, has announced it is launching two new distinct race classes: one an airplane and the other a VTOL (Vertical Take Off and Landing aircraft). The move to amplify its operations and create more races is the direct result of high levels of interest and demand from across the industry.

The new airplane formula will be named the Performance Class and will be based on a standard electric powertrain, which will focus on optimisation, efficiency and extracting the maximum potential out of a powertrain. Air Race E is developing this new race plane under its own roof with the help of leading manufacturers in the industry.

Some modifications and enhancements will be allowed in the Performance Class to continue Air Race E's mission of accelerating

technological innovation and showcasing new technologies in the aerospace electrification industry.

Air Race E's existing race airplane formula will be re-named the Open Class referring to the fact that any and all manufacturers can produce their own unique powertrain configurations up to 150kW power. Both airplane classes will be raced according to the same rules but with differences governing the powertrains.

The new electric VTOL class will be named the V-Class. VTOLs – often called flying cars – are a different category of aircraft altogether and at the forefront of electric technology in aerospace. Air Race E is positioning this class as "The World's First Vertical Motorsport." The race format and rules will be somewhat different than the other two race classes and will be revealed soon.

Jeff Zaltman, CEO of Air Race E, said: "The launch of the new Performance Class and V-Class will allow us to include more stakeholders in our project and greatly increase our ability to meet the needs of the industry while organising a thrilling motorsport.

"The Performance Class will provide deeper insights on power management and best practices and will steer more dedication to the sub-systems such as cooling, battery management systems, power electronics and aerodynamics.

"The V-Class demonstrates a major step-change in air racing. Air Race E will be working directly with the top pioneering organisations in the e-VTOL world to shape the event to be at the vanguard of both technology and entertainment in this next generation of motorsport."

Airbus Helicopters has Started In-Flight Tests on Board its Flightlab

Airbus Helicopters has started in-flight tests on board its Flightlab, a platform-agnostic flying laboratory exclusively dedicated to maturing new technologies. Airbus Helicopters' Flightlab provides an agile and efficient test bed to quickly test technologies that could later equip Airbus' current helicopter range, and even more disruptive ones for future fixed-wing aircraft or (e)VTOL platforms.

Airbus Helicopters intends to pursue the testing of hybrid and electric propulsion technologies with its Flightlab demonstrator, as well as exploring autonomy, and other technologies aimed at reducing helicopter sound levels or improving maintenance and flight safety.

"Investing in the future remains essential, even in times of crisis, especially when those innovations bring added value to our customers by targeting increased safety, reduced pilot workload, and reduced sound levels," said Bruno Even, Airbus Helicopters CEO. "Having a dedicated platform to test these new technologies brings the future of flight a step closer and is a clear reflection of our priorities at Airbus Helicopters," he added.

Flight tests started last April when the demonstrator was used to measure helicopter sound levels in urban areas and to particularly study how buildings may affect people's perception. First results show that buildings play an important role in masking or amplifying sound levels and these studies will be instrumental when the time comes for sound modelling and regulation setting, especially for Urban Air Mobility (UAM) initiatives. Testing was pursued in December to evaluate the Rotor Strike Alerting System (RSAS) aimed at alerting crews about the imminent risk of collision with the main and tail rotors.

Tests this year will include an image-detection solution with cameras to enable low altitude navigation, the viability of a dedicated Health and Usage Monitoring System (HUMS) for light helicopters, and an Engine Back-up System, which will provide emergency electric power in the event of a turbine failure. Testing on the Flightlab will continue in 2022 in order to evaluate a new ergonomic design of intuitive pilot flight controls intended to further reduce pilot workload, which could be applicable to traditional helicopters as well as other VTOL formulas such as UAM.

The Flightlab is an Airbus-wide initiative, which reflects the company's approach to innovation focused on delivering value to customers. Airbus already has several well-known Flightlabs such as the A340 MSN1, used to assess the feasibility of introducing laminar flow wing technology on a large airliner, and the A350 Airspace Explorer used to evaluate connected cabin technologies inflight.

JetBlue Takes Delivery of A321LR with the First Airspace Interior

U.S.-based JetBlue Airways has taken delivery of its first of 13 A321LR aircraft featuring Airbus' new Airspace interior. These new A321LRs support JetBlue's plan to open its highly anticipated transatlantic services, starting with direct flights to London later this year. In addition to these 13 new A321LRs, the airline also has on order another 57 Airbus aircraft comprising other A321neo variants – which will also feature Airspace cabins. By bringing Airspace to the Single-Aisle Family, JetBlue's A321 cabins will be the very first to feature Airbus' new award-winning cabin design-language and passenger-pleasing cabin features -- which are consistent with Airbus' A330neo and A350 Widebody aircraft. Robin Hayes, CEO of JetBlue Airways Corp. said: "At JetBlue we are eagerly looking forward to introducing the Airbus A321 Long Range single-aisle aircraft with Airbus' Airspace interior for our new transatlantic services. These aircraft will allow us to offer our customers attentive, boutique-style service, while also ensuring ample personal space, larger overhead bins, customized lighting and a design that gives the cabin a wide-body feel." ""We are thrilled to have JetBlue set yet another trend and introduce Airbus' new Airspace cabin on its long range service," said Christian Scherer, Airbus Chief Commercial Officer. "For sure the outstanding comfort and in-flight transatlantic experience on board these aircraft will be a winner – for JetBlue, its valued passengers and crew alike!" Airspace brings to the A320 Family the following passenger-pleasing cabin enhancements: unique welcome and customisable hero lighting (which helps reduce jet lag); new slimmer sidewall panels for extra personal space at shoulder level; better views through the windows with their redesigned bezels and completely integrated window shades; the latest full LED lighting technologies; the largest overhead bin in class; and new lavatories with hygienic touchless features and antimicrobial surfaces. In addition to these Airspace elements, the A320 Family's wide cabin cross-section also enables JetBlue to offer its passengers true long-haul comfort in all classes, with 24 full-flat adaptive-

mattress seats in the airline's Mint premium-class private suites, while 114 economy passengers will appreciate the widest 18.4inch seats with a contoured seat-back for extra knee space. Most of these economy seats will offer a full 32inch pitch, while four rows will be optimised for "Even More Space" seating -- offering around an additional five inches for the most legroom in any transatlantic economy class seat. JetBlue's passengers in these A321LRs will also be able to stay connected throughout the flight with the airline's unlimited, free high-speed Wi-Fi. In addition, they will have access to a curated selection of live TV channels focused on news and sports, and an extensive library of seatback entertainment – allowing for a 'multiple screen' experience onboard. Seats will also feature easy-to-reach in-seat power, featuring AC and USB-C ports to keep their hand-held devices fully charged. As well as offering the rich portfolio of entertainment and connectivity options for each passenger, the in-seat equipment on these aircraft will also put the customer in control of their food choices, allowing them to customize their own meal right on their seatback screen. In 2017 at the APEX Expo in Long Beach, JetBlue was unveiled as the launching customer for Airbus' Airspace cabin for the A320 Family. Following the announcement, Airbus and JetBlue worked together to bring to reality a new level of passenger experience for JetBlue's passengers in its A321LRs featuring Airspace for the first time. The longstanding partnership between Airbus and JetBlue began in 1999 when JetBlue was launched and took delivery of its first A320. Two years later the airline placed an order for 48 Airbus planes. Following years of extraordinary growth, JetBlue now operates a fleet of more than 200 A320 and A321 aircraft and has around another 70 on order -- including more of these A321LRs, as well as other A321neo variants – all of which will feature Airspace interiors. In addition, the airline has also placed orders for Airbus' smallest Single-Aisle Family member, the A220 airliner, the first of which will soon enter service. The A321LR, a member of the A320neo Family, delivers 30 percent fuel savings and nearly 50 percent reduction in noise footprint compared to previous generations of aircraft. With an increased range of up to 4,000nm (7,400km), the A321LR is the unrivalled long-range route opener, featuring true transatlantic capability and premium wide-body comfort in a single-aisle aircraft cabin. With its new fleet the airlines benefit from the lowest operating costs in the respective size categories, as well as the unique commonality between variants of the Airbus Family. At the end of March 2021, the A320neo Family had received more than 7,450 firm orders from over 120 customers worldwide.

AURA AERO and VERKOR Collaboration will Help Optimize Lithium/ion cellsor Aeronautics

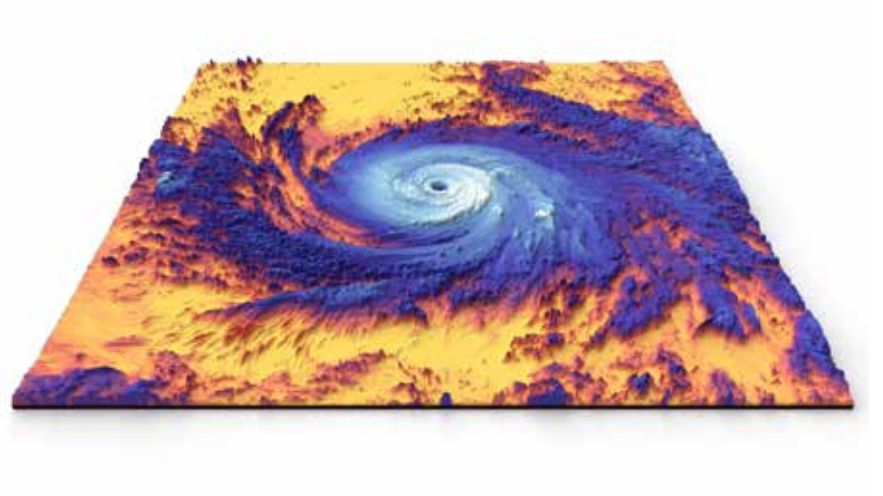
Aura Aero and Verkor these two French companies, both innovative and environment-conscious, will be able to industrialize electric propulsion in aviation for the first time. This collaboration will help optimize lithium/ion cells for aeronautics, a very much expected revolution, which has started several years ago in the automobile sector.

Jérémy Caussade, CEO and co-founder of AURA AERO, said: ' VERKOR is based on the same values as AURA AERO : innovation, traceability and respect of the environment. By bringing together our technologies, we will be able to launch the industrialization of our electric aircraft, while VERKOR will gain access to the aeronautical market. It is a win-win partnership, and most of all it is a new step towards the aviation of tomorrow, low-carbon aviation' .

According to Benoit Lemaignan, CEO and co-founder of VERKOR : 'The main intention of VERKOR is to reduce the impact on climate of mobilities and their transitions. This partnership with AURA AERO is the foundation stone in building an electric aeronautical industry, which is one of today's challenges in order to decarbonize air transport. From my experience at Airbus, I have a good knowledge of the aeronautical industry and I am delighted that VERKOR can be one of the actors of this technological evolution'.

New NASA Earth System Observatory to Help Address, Mitigate Climate Change

NASA will design a new set of Earth-focused missions to provide key information to guide efforts related to climate change, disaster mitigation, fighting forest fires, and improving real-time agricultural processes. With the Earth System Observatory, each satellite will be uniquely designed to complement the others, working in tandem to create a 3D, holistic view of Earth, from bedrock to atmosphere.



"I've seen firsthand the impact of hurricanes made more intense and destructive by climate change, like Maria and Irma. The Biden-Harris Administration's response to climate change matches the magnitude of the threat: a whole of government, all hands-on-deck approach to meet this moment," said NASA Administrator Sen. Bill Nelson. "Over the past three decades, much of what we've learned about the Earth's changing climate is built on NASA satellite observations and research. NASA's new Earth System Observatory will expand that work, providing the world with an unprecedented understanding of our Earth's climate system, arming us with next-generation data critical to mitigating climate change, and protecting our communities in the face of natural disasters."

The observatory follows recommendations from the 2017 Earth Science Decadal Survey by the National Academies of Sciences, Engineering and Medicine, which lays out ambitious but critically necessary research and observation guidance.

Areas of focus for the observatory include: Aerosols: Answering the critical question of how aerosols affect the global energy balance, a key source of uncertainty in predicting climate change. Cloud, Convection, and Precipitation: Tackling the largest sources of uncertainty in future projections of climate change, air quality forecasting, and prediction of severe weather. Mass Change: Providing drought assessment and forecasting, associated planning for water use for agriculture, as well as supporting natural hazard response. Surface Biology and Geology: Understanding climate changes that impact food and agriculture, habitation, and natural resources, by answering open questions about the fluxes of carbon, water, nutrients, and energy within and between ecosystems and the atmosphere, the ocean, and the Earth. Surface Deformation and Change: Quantifying models of sea-level and landscape change driven by climate change, hazard forecasts, and disaster impact assessments, including dynamics of earthquakes, volcanoes, landslides, glaciers, groundwater, and Earth's interior.

The Third US State to Launch Humans into Space

Virgin Galactic on May 22, 2021 completed its third spaceflight and the first ever spaceflight from Spaceport America, New Mexico. Today's flight sees New Mexico become the third US state to launch humans into space.

VSS Unity achieved a speed of Mach 3 after being released from the mothership, VMS Eve, and reached space, at an altitude of 55.45 miles before gliding smoothly to a runway landing at Spaceport America.

On VSS Unity's flight deck were CJ Sturckow and Dave Mackay, while Kelly Latimer and Michael Masucci piloted VMS Eve. CJ, who flew as pilot-in-command, becomes the first person ever to have flown to space from three different states. The crew experienced extraordinary views of the bright, blue-rimmed curvature of the earth against the blackness of space. New Mexico's White Sands National Park sparkled brilliantly below. Their experience today gives Virgin Galactic's Future Astronaut customers a glimpse of what lies ahead.

Michael Colglazier, Chief Executive Officer of Virgin Galactic, said: "Today's flight showcased the inherent elegance and safety of our spaceflight system, while marking a major step forward for both Virgin Galactic and human spaceflight in New Mexico. Space travel is a bold and adventurous endeavor, and I am incredibly proud of our talented team for making the dream of private space travel a reality. We will immediately begin processing the data gained from this successful test flight, and we look forward to sharing news on our next planned milestone."

Virgin Galactic fulfilled a number of test objectives during the flight, including: Carried revenue-generating scientific research experiments as part of NASA's Flight Opportunities Program. Collected data to be used for the final two verification reports that are required as part of the current FAA commercial reusable spacecraft operator's license. Tested the spaceship's upgraded horizontal stabilizers and flight controls and validated EMI reductions.

Following the flight, and in line with normal procedures, Virgin Galactic will conduct a review of all test data gathered and thoroughly inspect the spaceship and mothership. Once the team confirms the results, the Company plans to proceed to the next flight test milestone.

To celebrate the first human spaceflight from New Mexico, the Zia Sun Symbol of New Mexico's state flag was placed prominently on the exterior of the Spaceship. In addition, Virgin Galactic flew green chile seeds, which are synonymous with the state's rich agricultural and culinary history.

"Fifteen years ago, New Mexico embarked on a journey to create the world's first commercial spaceport,'' said Sir Richard Branson. "Today, we launched the first human spaceflight from that very same place, marking an important milestone for both Virgin Galactic and New Mexico. I am proud of the team for their hard work and grateful to the people of New Mexico who have been unwavering in their commitment for commercial spaceflight from day one. Their belief and support have made today's historic achievement possible."

Deutsche Telekom and Inmarsat to Deliver European Aviation Network

European airline passengers will now have access to Europe's fastest inflight Wi-Fi service, the European Aviation Network (EAN).

On more than 250 aircrafts across the continent, this marks a paradigm shift in the airline passenger experience with incomparable speeds, uninterrupted coverage and significantly lower latency than any other inflight Wi-Fi network in the continent.

The connectivity solution - developed by Inmarsat,global mobile satellite communications, and Deutsche Telekom, in partnership with leading European companies such as Thales, Nokia, Airbus, Cobham and Eclipse Technics - has been available to over 20 million passengers to date, travelling on more than 200,000 flights throughout Europe, covering key destinations such as London, Madrid, Barcelona, Geneva and Rome.

Philip Balaam, President of Inmarsat Aviation, said: "EAN has transformed the inflight broadband market in Europe, offering unprecedented performance that has been truly embraced by airlines and their passengers. Usage has consistently increased since it entered commercial service and EAN experienced record data traffic in the summer and autumn months last year, reflecting an even stronger desire to stay connected amongst passengers flying during the COVID-19 pandemic.

"An important factor in crossing more than 250 aircraft activations, including British Airways' entire short-haul fleet, has been the record-breaking installation time we have achieved with EAN – less than nine hours per aircraft. This will ensure a smooth rollout on remaining IAG aircraft and we're excited that even more passengers will soon have access to the industry's best-in-class inflight connectivity, providing the same quality of broadband that people expect on the ground, from the comfort of their cabin."

Rolf Nafziger, Senior Vice President at Deutsche Telekom Global Carrier and Global Business, said: "EAN is perfectly adapted to Europe's unique telco infrastructure and a true game-changer in inflight connectivity. For passengers, it offers an unparalleled connectivity experience while in the air above the European continent. For carriers, it provides a highly compelling business case due to its lightweight, small and low maintenance equipment."

EAN has been designed from scratch specifically for the needs of European aviation, delivering consistent inflight broadband across Europe, one of the world's most congested airspaces. EAN is highly advanced and its fully integrated system delivers consistent high-speed broadband on flights, enabling passengers to seamlessly browse the internet, stream videos, check social media, enjoy real-time interactive applications such as gaming, and more.

flydubai Expands its Operations to Romania

flydubai, the Dubai-based airline, started the flights to Cluj-Napoca in Romania. The airline operates starting from 20.03.2021, twice-weekly flights between Dubai International (DXB) and Avram Iancu International Airport Cluj (CLJ).

flydubai operates a double daily service between Dubai International (DXB) and Bucharest Henri Coanda International Airport (OTP). With the start of flights to Cluj-Napoca in March, the carrier will serve the Romanian market with a total of 16 weekly flights.

Multi-year Commercial Agreement between Satair, and Honeywell Aerospace

Satair, and Honeywell Aerospace have signed a multi-year commercial agreement covering the exclusive worldwide distribution for mechanical and air thermal components for use on Airbus A320, A330, A340, and A380 aircraft. Additionally, the distribution agreement covers the A350 platform on a non-exclusive basis.

This new agreement expands upon a long-standing and successful business relationship between the two companies in the business jet market, and represents Satair's and Honeywell's first joint advancement into the global commercial aviation aftermarket.

Bart Reijnen, Chief Executive Officer, Satair comments: "We are very pleased to develop our partnership with Honeywell Aerospace and build our commercial aviation aftermarket support. With this new program, we enhance our commitment toward continuous customer satisfaction through the fulfillment of on-time delivery for Airbus operators and maintenance providers worldwide. "

Honeywell's range of electronic and electro-pneumatic systems for air and thermal management deliver highly reliable and efficient operations with lower total costs of ownership for aircraft operators. These lightweight systems monitor and control cabin temperature and airflow in the cockpit, passenger, and cargo areas and provide cooling for avionics. They also manage the aircraft's engine bleed air systems and pneumatic de-icing systems.

Anthony Florian, Vice President, EMEAI, Honeywell Aerospace, "Honeywell's appointment of Satair is an expansion of our existing strong relationship. We already have two other agreements with Satair - a distributor agreement for the ADSB-Out Upgrade Pilot Program, and a non-exclusive worldwide distributor agreement for Honeywell's JetWave satellite communications products. This partnership will serve to further strengthen our relationship."

Matt Jessee, Head of Business Development, Global Distribution, Satair adds: "With this new agreement, we are scaling our business to meet increasing global demands. We are enthusiastic about the future and our fruitful partnership with Honeywell Aerospace."

Rohde & Schwarz Delivers New Radio Systems for RNoAF Evenes Airbase

The Norwegian Defence Materiel Agency has awarded Rohde & Schwarz a contract to modernize Evenes Airport with highly secure communications solutions.

Evenes Airport is being upgraded to become one of two Royal Norwegian Air Force bases and an advanced operational base for F-35 fighter and P-8 maritime surveillance aircraft, with permanent NATO quick response alert contingency and periodic training activities. One of the many innovations that will be installed are new HF and V-/UHF radio systems for military air traffic control by Rohde & Schwarz. First deliveries are expected in 2021.

"Rohde & Schwarz is proud to deploy our latest ATC communications technology in Norwegian airspace and support our armed forces with these solutions," Ove Ladegård, CEO Rohde & Schwarz Norge AS, said. "It is our aim to provide RNoAF with the best solution that allows the customer to continue their operations safely and reliably, while preparing to meet future challenges."

Two A330-200 Passenger-to-Freighter Order from Turkmenistan Airlines

Turkmenistan Airlines has placed an order for two A330-200 Passenger-to-Freighter (P2F) converted aircraft, becoming a new Airbus customer. The order marks the first time an Airbus aircraft is sold in Turkmenistan. The A330-200P2F will enable the airline to further develop and boost its international cargo route network. The deliveries of the aircraft are planned in 2022, making Turkmenistan Airlines the first operator of this type in Central Asia.

The A330 passenger to freighter conversion programme was launched in 2012 resulting in the in time re-delivery of the A330P2F prototype end of 2017. The A330P2F programme is a collaboration between ST Engineering Aerospace, Airbus and their joint venture Elbe Flugzeugwerke GmbH (EFW). ST Engineering had the programme and technical lead for the engineering development phase, while EFW is the holder and owner for all Supplemental Type Certificates (STCs) for the current Airbus conversion programs including for A330P2F and leads the industrialization phase and marketing for these programmes. Airbus contributes to the programme with the manufacturer data and certification support.

The A330P2F programme has two variants – the A330-200P2F and A330-300P2F. The A330-200P2F is an optimal solution for higher-density freight and longer-range performance. The aircraft can carry up to 61 tons of weight to over 7700 km, offering more cargo volume and lower cost-per-ton than other available freighter aircraft types with a similar range. In addition, the aircraft incorporates advanced technology, including fly-by-wire controls, offering to airlines additional operational and economic benefits.

FAI Renews Multi-Year Partnership with McLaren Racing

FAI Aviation Group has renewed its partnership with world-famous race team, McLaren Racing. Most recently, FAI organised the trip which departed from Farnborough Airport, Hampshire, the UK's first carbon neutral airport, to Bahrain International Airport for the first race of the season, the Bahrain Grand Prix.

The multi-year partnership aligns two internationally recognised and established brands, leaders in their fields, both committed to excellence. The McLaren partnership enables FAI to raise its profile within the Formula 1 community. The FAI Aviation Group is represented on the rear floor section of the McLaren MCL35M race cars for the 2021 Formula 1 season.

FAI has been at the forefront of supporting the Covid pandemic response and last month was honored with the Pandemic Response Special Award at the Middle East Annual Aviation Achievement Awards.

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